

The Motherhood Penalty in Cross-National Perspective: The Importance of Work-Family Policies and Cultural Attitudes

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**The Motherhood Pay Gap in Cross-National Perspective:
The Interaction of Work-Family Policies and Cultural Attitudes**

Mothers' employment and earnings partly depend on social policies and cultural norms supporting women's paid and unpaid work. Previous research suggests that work-family policies are deeply shaped by their cultural context. Using original social policy data, micro data from the LIS, and attitudinal data from the ISSP, we examine country variation in the overall and partial associations between motherhood and wages, in cultural attitudes surrounding women's employment, and in childcare and parental leave policies. We then model how cultural attitudes moderate the impact of policies on women's earnings across countries. Associations between wages and policies supporting maternal employment are amplified by cultural norms regarding gender, caregiving, and employment. Parental leaves and public childcare are associated with higher earnings for mothers when cultural support for maternal employment is high, but have less positive or even negative relationships with earnings where cultural attitudes support the male breadwinner/female caregiver model.

During the last three decades, women's engagement in the workforce, cultural norms supporting employment among mothers, and work-family policies aimed at shaping mothers' employment have all changed dramatically throughout the industrialized world. Work-family policies are thought to equalize mothers' employment opportunities and wages, by helping women maintain a relationship with the labor market, even after they have children. Feminist scholarship also claims that broader cultural norms regarding gender, work, and family play a significant role in the formulation, institutionalization, and efficacy of these work-family policies (Jenson 1987, 1990; Lewis 1992; Koven and Michel 1992; Pedersen 1993; Gordon 1994; Mink 1995; Pfau-Effinger 1998, 2004; Orloff 1999; Van der Lippe and Van Dijk 2002; Kremer 2006, 2007). Much of this research offers rich comparative case analysis on the development and implementation of work-family policies. Relatively absent in the literature is an examination of how cultural attitudes regarding mothers' employment relate to the effectiveness of these policies cross-nationally. Given this, we take a new approach to investigating how cultural understandings of men's and women's roles and institutional factors such as work-family policies combine in relation to outcomes such as earnings, cross-nationally. We argue that work-family policies work in concert with gendered cultural norms about the roles and responsibilities of mothers, to produce a range of outcomes that do not simply rely on cultural beliefs or policies – but an interaction of the two.

Much of the literature on work-family policies tends to treat family policies as mechanically affecting employment outcomes for mothers, with policies serving as a catalyst for women's movement into the labor force. Such an analysis views the decisions of mothers and employers as simply responding to the policy context, assuming rational actors striving simply

for economic gain (Kremer 2007). Yet, decisions about employment and caregiving are made in a larger context, which includes cultural support (or lack thereof) of mothers' employment and caregiving. As Pfau-Effinger (1998, 2004) argues, policies do not shape employment choices in a cultural void: instead policies interact with culture to influence women's (and men's) choices about managing work and family.

To the extent that the literature on work-family policies ignores country differences in levels of cultural support for employed mothers, it may overestimate the impact of policies on women's employment outcomes, as Kremer (2007) cautions. We investigate how outcomes for mothers are associated with cultural norms and work-family policies, and how cultural norms and policies combine to shape wages, in order to better analyze this interplay. While drawing on important insights from previous research, our analyses provide new evidence in support of the intersection of culture and politics in affecting mothers' economic outcomes. Previous research on the importance of culture in shaping policy legislation and success has primarily utilized a comparative case approach to develop insights on the interplay of culture and social policies (Kremer 2007; Pfau-Effinger 2004). We extend this research with a twenty-two country cross-national analysis to examine whether policies and cultural attitudes combine in consistent ways to shape maternal earnings across countries with varying socio-political settings.

We focus on earnings as our outcome measure, because although childless women's and men's pay has been converging over the last two decades, mothers' wages continue to lag behind all others (Waldfogel 1998b). The motherhood wage penalty refers to how, after controlling for differences in experience, education, hours work, and other factors, mothers *still* earn less than childless women. It is well-established that a nontrivial part of the motherhood penalty results from mothers' decisions to reduce labor force participation in order to provide care for children,

yet the penalty that remains *even after* adjustments for mothers' greater forgone work experience, pre-empted education and training, and choices to work part-time. This wage difference is an important source of inequality among women and between women and men. The negative effects of children on mothers' wages are well documented, and appear to vary significantly cross-nationally (Budig and England 2001; Harkness and Waldfogel 2003; Author 2007a, 2011; Sigle-Rushton and Waldfogel 2004). Experimental and audit studies document that discrimination in call-backs for interviews, hiring, promotion, and wage offers against mothers from potential employers may be a source for the residual penalties observed in survey data (Correll et al. 2007; Glass and Fodor 2011). However, in studies such as ours, we are able to recognize only the motherhood gap left after controlling for factors that might explain differences between childless women and mothers. We can measure, however, the cultural attitudes that may encourage or discourage employment discrimination against mothers, and the work-family policies that may help or deter mothers' ability to combine paid and unpaid work. Thus, we hope to shed light on the cultural and policy associations with motherhood-based earnings inequality.

In order to examine cultural values, we draw upon attitudinal data from the International Social Survey Programme (ISSP) to examine country-level differences in norms and preferences for women's engagement in paid and unpaid labor. Here, we consider family values such as support for the male breadwinner/female caregiver model and beliefs that children and family life suffer when a mother works. In order to analyze policies, we collect policy data to examine maternity and parental leaves as well as publicly funded childcare for very young (0 to 2 years) children. We use data from the Luxembourg Income Study Database (LIS), which provides the best cross-national data for comparing income across OECD countries (OECD 1995), to examine

mothers' wages, relative to childless women. We look for associations between cultural values and policies, and the interaction of cultural values and policies, with wages.

Cultural Values and the Motherhood Wage Gap

When it comes to women's paid and unpaid work, and the family policies that address imbalances, culture matters. As Padamsee (2009, p. 426) argues:

At the core of every policy challenge...lies a set of ideas that help make sense of the problematic condition, its origins, and its potential solutions. Gendered meanings inform our understandings of what a change like increasing labor force participation among women means, why it would occur, whether it is a problem or not, and what policy solutions might be needed or possible.

Work-family policies themselves may reflect gendered meanings about the role of women in employment and families. For example, three-year parental leaves may reflect notions that mothers *should* provide care for young children; and the combination of these very long leaves with conservative understandings of the gender division of labor may reinforce each other to result in lower wages for mothers.

A substantial body of feminist literature recognizes the important influence of gender ideologies on welfare state policies (Jenson 1987, 1990; Lewis 1992; Koven and Michel 1992; Pedersen 1993; Gordon 1994; Mink 1995; Orloff 1999; Van der Lippe and Van Dijk 2002; Kremer 2006, 2007). For example, Kremer (2006) suggests that welfare states promote certain "ideals of care," which define good care and good caregivers, and these ideals are embedded in the welfare state policies. Van der Lippe and Van Dijk (2002) argue that childcare facilities are more likely to exist in a culture supportive of maternal employment. Simply put, pre-existing cultural

expectations concerning the appropriateness of mothers' employment may shape policy formation.

Yet, culture plays a role not only *through* policy, but also more broadly in terms of the norms and expectations that shape mothers' employment and wage outcomes, as well as the gendered division of household labor (Pfau-Effinger 1998, 2004; Cooke 2006; Kremer 2007; Van der Lippe et al. 2011). Work-family policies may reflect the gendered assumptions regarding care and employment, but are also further conditioned by dominant cultural expectations for women (and men). Indeed, cultural norms regarding maternal employment may play a large role in explaining why mothers' labor force outcomes differ as much as they do (Pfau-Effinger 1998, 2004; Kremer 2007). In tandem with policies, then, pre-existing cultural expectations regarding maternal employment may also influence the motherhood pay gap because they may shape women's decisions about employment as well as employers' understanding and treatment of mothers in the workforce.

In considering mothers' employment outcomes, certain cultural values regarding men's and women's roles in the household and workplace may be particularly important. For example, ideologies regarding male breadwinning/female caregiving may play a role in determining wages for women; countries where the male breadwinner ideology is more ingrained may be associated with lower maternal employment and wages for mothers. On the other hand, countries where gender ideologies support both men's and women's contribution to the household income may be associated with higher wages for mothers. At the same time, maternal employment outcomes might hinge on cultural ideas about the importance of maternal caregiving. So gender ideologies that suggest that families or children suffer when mothers work, or ideals of care that emphasize mothers' care for children (Kremer 2007), may similarly be associated with lower wages for mothers.

Yet what is crucial is not merely how cultural values are related to maternal employment outcomes, but how the same policies may be associated with different maternal outcomes – based on underlying cultural ideologies. Simply put, policy effects are influenced and conditioned by cultural contexts and norms (Padamsee 2010). Pfau-Effinger (2004) considers how changes in cultural traditions interact with social institutions – including the welfare state, labor market, and family – to shape changes in women’s employment. For Pfau-Effinger (2004), three dimensions affect women’s employment: the *gender culture* (values regarding work, care, and gender), the *gender order* (welfare and labor market policies, which reinforce the gender culture) and the *gender arrangement* (the division of labor within families). Pfau-Effinger (2004) argues that changes in cultural traditions interact with social institutions – including the welfare state and labor market (*gender order*), and family (*gender arrangement*) – to shape women’s employment. Similarly, Kremer (2007, p. 83) argues that her further specification of “care ideals can contribute to an understanding of why employment rates have not increased everywhere as much as they could, given high rates of childcare...” Thus, even in the face of policies enacted to support mothers’ employment, we may expect persisting wage penalties if the policies are not in sync with the gender culture and gender arrangement, pointing to the importance of examining how cultural norms about mothers’ employment interact with policies.

Cultural attitudes may be disharmonious not only with social policies, but also with one another, even within the same country, and even within the same individual. What appear to be similar measures of similar attitudes, for example, “family life suffers if woman works full-time” and “preschool child suffers if mother works,” may not be consistently held by individuals, or have consistent relationships with other variables. Sjöberg (2010) demonstrates intra-individual ambivalence in gender-role attitudes on precisely these measures; in countries witnessing rapid

change in women's roles, highly educated women are more likely to disagree that family life suffers if a woman is employed, but more likely to agree that preschool children suffer from maternal employment. Thus, gender-role attitudinal measures may relate to motherhood wage gaps and to maternal wages in dissimilar ways, pointing to the need for a multi-dimensional approach to measuring and analyzing culture and work-family policies.

Work-Family Policies and the Mothers' Wages

Although individual-level factors, such as education, some of the pay gap between mothers and childless women, a significant portion of the wage penalty cannot be explained by individual-level factors (Budig and England 2001; Harkness and Waldfogel 2003). Moreover, what we measure as "individual-level" factors may be profoundly shaped by cultural norms and family policies in a cross-national context. For example, although employment hours are measured as an individual factor (reflecting an individual's decisions about how many hours she chooses to work), country-level policies surrounding working-time regulations or parental leaves may shape an individual's decision about how many hours to work, and cultural attitudes about the appropriateness of maternal employment may similarly constrain this decision.

Most scholars assume that family-work reconciliation policies broadly are positively related to outcomes such as wages, although this research generally focuses on gender differences in wages or employment rather than the motherhood pay gap, even though these policies are most squarely aimed at mothers (Mandel and Semyonov 2005; Pettit and Hook 2005, 2009).¹ We focus on two major groups of policies that may differentially influence wages, by supporting mothers' engagement in employment and care: parental leaves surrounding the birth of a child and care during the child's preschool years; and childcare policies for very young (0 to 2 years old) children

(Evans 2002; Gauthier and Bortnik 2001; Gornick and Meyers 2003; Jaumotte 2003; Morgan and Zippel 2003; Pettit and Hook 2005). These policies target the pressures families face in balancing care and employment and appear to be strongly associated with higher levels of women's employment (Gornick and Meyers 2003; Pettit and Hook 2005, 2009), though their associations with motherhood wage differentials are less well established (Waldfogel 1998b; Author 2011).

Leave policies (i.e., maternity and parental leave available to women) are meant to support parental caregiving, while enabling employment continuity.² The length of leave impacts mothers' ability to remain employed, employers' perceptions of the long-term employability of mothers, and, subsequently, mothers' wages (Glass and Fodor 2011). Studies show curvilinear associations between leave length and women's employment outcomes (Pettit and Hook 2005; Kenworthy 2009; Evertsson and Duvander 2006). For example, moderate leaves reduce pay gaps, by ensuring that women remain attached to their workplaces while their children are infants. However, no or short leaves increase pay gaps through unrealized work experience, as women may choose to leave employment, rather than return to work when infants are very young. Similarly, long leaves are linked to decreased employment continuity and earnings (Buligescu, Crombrughe, Montesoglu and Montizaan 2008; Morgan and Zippel 2003; Pettit and Hook 2005), while ensuring that women remain "on the hook" for care (Bergmann 1998, 2001). Employers may interpret the usage of multi-year leaves negatively, and subsequently demote or layoff mothers returning after a leave, or decline to hire mothers with these leaves on their resumes (Glass and Fodor 2011). While these curvilinear relationships are documented in the literature, it is unknown how the relationship between employment outcomes and leave may be altered depending on the level of cultural support for maternal employment, and the level of cultural conservativeness regarding the gender division of paid and unpaid work. We consider this policy and culture interaction below.

Childcare policies also impact mothers' earnings. While childcare programs were adopted both to provide education and to support parents' employment, these programs – particularly those for children under the age of three – are explicitly recognized as helping families balance care and employment (Gornick and Meyers 2003; Kamerman and Kahn 1991). Indeed, childcare costs have strong associations with women's employment; Han and Waldfogel (2002) argue that in the U.S., reducing childcare costs could substantially raise employment of both married and single mothers. Cross-nationally, Pettit and Hook (2005, 2009), show that high levels of childcare positively affect women's labor market participation. State-provided or -subsidized childcare, measured as percentage of children in state-supported care, may decrease the motherhood wage penalty by allowing mothers the opportunity to engage in paid employment (McDonald 2000), particularly when children are very young. Yet, particularly for very young children, there is notable cross-national variation in the length of time a child is in care each day, and how well the childcare hours map onto the normal working hours of employed women. For example, while Sweden, Finland, and Belgium have the highest rates of 0-2 year-olds in full-time childcare (ranging from 19 to 31 percent), part-time childcare for his age group is much more common in the Netherlands (36 percent), Spain (25 percent), and the UK (24 percent) (Lewis 2009). Our measure captures the overall enrollment of infants (aged 0 to 2) in publicly funded care, but we recognize that due to country differences in care provision, childcare may not have uniform associations with wages across countries. In particular, we do not know how childcare provision across countries with varying gendered cultures may look. We keep this in mind as we hypothesize the form these relationships may take.

Hypotheses

All of this discussion leads us to predict the following interactions between policy and indicators of gender culture in shaping the wages of mothers:

Parental Leaves and Cultural Indicators

1. Parental leave should have more positive relationships with the wages of mothers when cultural support for maternal employment is higher, and support for a traditional gender division of labor is lower. In these cultural contexts, leaves should be viewed as employment enabling, helping new mothers balance early care demands with structured returns to paid work.
2. Parental leave should have less positive, or even negative, relationships with maternal wages when cultural support for women combining work and care is lacking, and cultural encouragement of mothers to choose unpaid caregiving over paid employment is higher. Here, mothers are likely encouraged to take very long leaves, which serve to separate mothers from employers, rather than enabling a timely return to employment.

Publicly Funded Childcare and Cultural Indicators

3. Publicly funded childcare, particularly for very young children, should be employment enabling and mitigate wages lost for bearing children. If childcare and culture are mutually reinforcing, we should see a stronger positive impact of publicly funded childcare on maternal wages where broader cultural support for working mothers and egalitarian gender values are higher.
4. Publicly funded childcare for the youngest children varies cross-nationally in the length of time a child is in care each day, and how well the childcare hours map onto the normal working hours of employed women. It may be that the form childcare takes in countries with low cultural support for working mothers of infants will not be very compatible with

employment. Thus, we may find less positive, or possibly negative, associations between childcare provision for infants and wages when cultural support for maternal employment is low and where attitudes favor the male breadwinner/ female caregiver family model.

Other Country Level Factors

Our discussion about how policies and culture may affect mothers' earnings depends, in part, on mothers being in the labor force. But we know that there are large cross-national differences in women's employment rates. In countries with few women in the labor market, small motherhood pay gaps may not signal the same outcome as small wage gaps in countries with high levels of women's employment, due to potentially greater positive selectivity into employment when women's employment rates are low. To address cross-national variation in women's labor force participation, we include a control variable that measures women's employment rates.

We include a measure of the proportion of a country's workforce that is located in the public sector. Generally, the public sector is more likely to enforce work-family policies that could reduce the motherhood penalty (Nielsen, Simonsen, and Verner 2004). We include the Gini coefficient as a measure of income inequality. It may be that countries with larger motherhood wage penalties simply have greater overall income disparities, similar to the impact of income inequality on gender gaps in wages (Blau and Kahn 1992, 1996, 2003; Mandel and Semyonov 2005). Lastly, because a wide array of developed economies are represented among our countries, including post-socialist eastern European nations, we include a control for each country's Gross Domestic Product value in current US prices in our pooled country analyses of mothers' earnings (United Nations 2010).

Individual Level Controls

Before we can examine how broader values and policies influence the motherhood pay gap, we must first control for any individual-level factors that past research shows to affect this gap (Anderson et al. 2003; Avellar and Smock 2003; Budig and England 2001; Lundberg and Rose 2000; Sigle-Rushton and Waldfogel 2004; Waldfogel 1998a and 1998b).³ These include differences in human capital and family structure.

The motherhood penalty is partially explained by differences in human capital. Highly educated mothers incur a smaller penalty than the less educated (Andersen et al. 2003). Mothers who interrupt their employment to accommodate childcare incur larger penalties due to foregone experience and seniority (Gangl and Ziefle 2009; Klerman and Liebowitz 1999). Similarly, mothers who remain employed but reduce their hours worked, also incur a larger child penalty (Budig and England 2001; Gangl and Ziefle 2009; Waldfogel 1997). Research examining whether mothers trade family-friendly workplace characteristics as compensating differentials for lower wages shows mixed results. German evidence indicates that mothers sort into lower-paying or lower wage-growth establishments prior to having children (Beblo, Bender, and Wolf 2008). In the U.K. and U.S., Gangl and Ziefle (2009) find that motherhood wage penalties can be explained by mothers' shifts into jobs with potentially more family-friendly characteristics, such as part-time work. Although we control for part-time status in our analyses, the LIS data lack detailed measures on employers and workplaces.

In addition to worker and workplace characteristics, the motherhood penalty varies by family structure. Budig and England (2001) find that married women incur larger penalties for motherhood. Yet, cross-nationally, married women do not always suffer the largest motherhood

penalties.⁴ Comparative work shows that in certain contexts motherhood penalties are largest for single women, while in other countries there is no difference between single and married mothers (Gangl and Ziefle 2009; Author 2007a). Finally, the motherhood penalty may result from unmeasured self-selection into motherhood and employment on factors that influence earnings. To control for within-country selection processes, we use Heckman selection models (described in the methods section).

Research Design

Data and Measures

Our study uses data from multiple sources. Microdata come from the LIS, an excellent source of secondary cross-national survey data on households, income (including transfer income), and employment. Analyses use Wave 4 and Wave 5 (representing the 1990s and early 2000s) of the LIS data for 22 countries. For all countries, the sample is restricted to adult women, age 25 to 49 (prime years for childrearing), who are not in the military.⁵ Table 1 presents the sample sizes after we apply our sample restrictions, as well as values on our country level variables.

[Table 1 about here]

From the LIS, individual-level independent variables include human capital and labor supply, job characteristics, family composition, and demographic characteristics. Human capital measures include educational attainment measured with a dummy variable=1 to indicate post-secondary education or occupational training leading to certification. We use respondent's age as a proxy for labor market experience.⁶ Labor supply is measured using a dummy variable indicating full-time status, i.e., 30 or more weekly working hours⁷ Family characteristics include whether the

respondent has children living at home (mother=1) and marital status (married/cohabiting=1, otherwise=0).⁸

We compiled a country-level social policy database, structured after those developed by Gornick and Meyers (2003), Gornick, Meyers, and Ross (1997), Gauthier and Bortnik (2001), and Jaumotte (2003). Our database includes 22 countries: Australia, Austria, Belgium, Canada, the Czech Republic, Finland, France, East Germany⁹, West Germany, Hungary, Ireland, Israel, Italy, Luxembourg, the Netherlands, Poland, Russia, the Slovak Republic, Spain, Sweden, the United Kingdom, and the United States. With a few exceptions, the survey data was collected in or around the year 2000.¹⁰ We match our policies measures to the LIS survey year for each country, lagging the measurement of the leave policies to two years prior to the survey year.¹¹ Policy dimensions include maternity/paternity leave, parental care leaves, and childcare.

Following predecessors (Gauthier and Bortnik 2001; Gornick and Meyers 2003; Waldfogel 1998a), we include policy measures (e.g., number of weeks and benefits levels), and policy usage.¹² From this database we use the percentage of children age 0-2 in publicly supported care, and country level values are presented in Table 1. The leave measure we use is the total number of weeks of combined paid maternity and parental leave (paid and unpaid), and country values on this measure are given in Table 1. Leave length and the percentage of infants in care are not strongly correlated, cross-nationally. The Pearson's correlation coefficient for these two policy measures is .201, indicating a weak positive correlation.

We use several measures from "Family and Changing Gender Roles" modules (1994 and 2002) of the International Social Survey Program (ISSP).¹³ We match ISSP items from the survey year closest to the LIS survey year.¹⁴ Specifically, we use items measuring cultural attitudes towards the gender division of market and non-market work and towards maternal care in order to

tap into the cultural values we believe are most important.¹⁵ Country values on these cultural indicators are presented in Table 1. While the two cultural measures tapping the suffering of preschoolers and families if mothers work are highly positively correlated (Pearson's correlation coefficient =0.88), these two measures are not correlated with the measure of support for male breadwinner/female caregiver families (Pearson's $r = .08$ and 0.15 , respectively). We use both measures beliefs about preschoolers and families suffering from women's employment, despite their high correlation, because past research shows these attitudes can be inconsistently espoused, particularly within countries witnessing rapid change in women's education and employment patterns (Sjöberg 2010).

Finally, we also include a set of country-level control variables that are all presented in Table 1: women's employment probabilities, the Gini coefficient, the size of the public sector, and per capita GDP. To control for country level differences in women's labor force participation, we calculate predicted employment probabilities of women, while controlling for factors that might shape women's employment such as age, education, marital/cohabitating status, number of children, and other household income. We include this measure of women's employment probabilities as a control variable.¹⁶ The Gini Coefficient is drawn from the LIS key figures. Public sector size is calculated from the LIS data as the proportion of all workers whose jobs are located in the public sector. GDP for each country is drawn for the relevant year from the 2010 United Nations National Accounts Main Aggregates Database (United Nations 2010). All GDPs are expressed in current prices U.S. dollars. Data for each control measure are shown in Table 1.

Analytical Approach

Our first set of analyses establishes the variation in the motherhood pay gap between mothers and childless women across the 22 countries in our analysis. Here the dependent variable is the natural log of annual earnings where each national currency is measured in constant 2000 U.S. dollars. Using logged earnings enables us to minimize the effect of outliers and interpret coefficients in a straightforward manner: multiplying the coefficient by $100*(e^b-1)$ gives us the percent change in earnings, given a 1-unit increase in the independent variable.¹⁷ Cross-national differences in the motherhood pay gap could result from differential selection of women into employment across countries. To control for this, we employ a Heckman sample selection correction estimation procedure where transfer income¹⁸, other household wage income (household wages minus the respondent's wages), and presence of a preschooler comprise our selection criteria.

After establishing the wage gap between mothers and childless women across countries, we turn to estimating a pooled-country model to test for statistical interactions between motherhood status, policies, and cultural indicators. These models also employ a Heckman selection correction using the same selection criteria as the by-country models (presence of preschooler, transfer income, and other household income). Our approach to modeling country-level differences in cultural attitudes and family policies in a one-level model where the dependent variable is measured on the individual level presents estimation challenges. Pooling data across countries allows us to model multiple country-level variables and test for complex interactions among country-level predictors. While coefficients and standard errors for individual-level measures and coefficients for country-level measures are unbiased in such a model, standard errors for country-level measures and their interaction with individual-level measures are underestimated due to heteroskedasticity in the error term. To correct for this, we use the Huber-White Sandwich

estimator (Huber 1967; White 1980). This reduces the likelihood that the standard errors on the country-level measures are artificially small. One potential problem of this analysis is linked to our small (21) number of countries. Typically researchers argue that such models should have at least 30 level-2 cases. Otherwise, the Huber-White Sandwich estimator correction for inflated standard errors may not fully deflate the standard errors (Maas and Hox 2004). Simulations show that with 30 level-2 cases, the Huber-White corrected standard errors are still about 15 percent too small (Maas and Hox 2004). Given this, if we assume that 21 cases produce standard errors that are even more severely underestimated, by 25 percent, this would mean that the alpha level to use for such inflated standard errors that would correspond to a .05 significance level when standard errors are not underestimated would equal $p < .0045$. We consider this stricter alpha level in our interpretation of the tables and figures.

In the pooled-country analysis we tested for 3-way interactions, including mother*policy, mother*culture, culture*policy, and mother*culture*policy. In five of our six models, the 3-way interactions were significant at the standard $p < .05$ alpha level: the exception is the 3-way interaction between motherhood, percentage of 0-2 year-olds enrolled in publicly funded care, and level of agreement that family life suffers if woman works. At the stricter $p < .0045$ alpha level, the 3-way interaction between motherhood, child care for 0-2 year-olds and level of agreement with the belief that preschool children suffer if mother works is also non-significant. The non-significant 3-way interactions here tell us that the 2-way interaction effect between the attitude and policy measures is the same for mothers and childless women. However, the policy and cultural attitude 2-way interaction effects are significant, despite not varying by motherhood status, as our next stage of modeling will show.

Because two of the variables in the 3-way interactions are continuous (both the culture and policy indicators), interpretation of these 3-way interactions is extraordinarily difficult. We choose to estimate the models separately by motherhood status and use only 2-way interactions with continuous variables (between culture and policy measures). Results from the 3-way interactive models in all cases showed that the relationships between policy and culture were less strong and less significant for childless women than for mothers, as we would expect. We focus on the coefficients from the policy and culture interactive models predicting maternal wages, and we graph these interactions to aid in the interpretation of results.

Our analysis aims to 1) document and compare the extent of the motherhood wage gap across 22 countries using separate within-country regression models, with an eye toward understanding how much self-selection and individual-level controls account for these penalties, 2) establish that cultural and policy measures statistically interact to shape wages and evidence stronger relationships for mothers, compared to childless women in a pooled regression model, and 3) graphically show how cultural norms moderate the effects of policies in a pooled regression model to shape maternal wages, net of individual-level and country-level controls.

Findings

The Motherhood Penalty

Table 2 presents results from three models: 1) using OLS to estimate the gross effect of motherhood (not controlling for other factors) on annual earnings, 2) using Heckman selection models to re-estimate the gross model, where selection criteria predicting employment include presence of a preschooler in the home, other household income (and its square), and transfer

income, and 3) using the Heckman approach to estimate a net model, controlling for all individual-level measures (married/cohabiting, age, high educational attainment, and full-time hours). The final column reports what proportion of the original motherhood wage penalty cannot be explained by individual selectivity or characteristics. To ease interpretation, all coefficients are transformed into percentage associations with wages ($100*(e^b-1)$).

[Table 2 about here]

Model One demonstrates, across these 22 countries, remarkable variation in the presence and size of the motherhood penalty. We find unadjusted motherhood wage penalties in 20 countries. The OLS coefficients reveal the full wage differences between mothers and childless women, and ranging from non-significant associations in Israel and East Germany to a wage penalty exceeding 50 percent in West Germany, Luxembourg, the UK and the Netherlands. These initial figures demonstrate the full degree of earnings inequality between women with and without children across countries.

Model Two re-estimates the gross model, but this time using Heckman selection criteria. In many countries, a sizeable portion of the unmeasured differences between women that influence their selection in the labor market and are linked to wages and mothering are eliminated in the Heckman selection. Differential selection of mothers and childless women into the labor market completely accounts for the wage penalties found in Belgium, Finland, France, and Sweden. But (reduced) motherhood penalties persist in 16 countries, suggesting that mothers are penalized in diverse settings. Penalties are highest in Luxembourg, the Netherlands, and the UK, although they are also quite high in West Germany, Austria, and Ireland.

In Model Three, with controls for individual-level factors, the motherhood pay gap is entirely explained in a total of 9 countries: Australia, Belgium, East Germany, Finland, Hungary,

Italy, Israel, Russia, and Sweden.¹⁹ In other words, in these nations, employed mothers do not appear to earn lower wages than other employed women, controlling for individual-level characteristics and differential selection into the labor market. In addition, individual-level controls also explain more than one-half of the motherhood pay gap in most other countries, with the exceptions of Austria, Spain, the Czech Republic, and the Slovak Republic. Surprisingly, adding individual level controls to the model makes penalties re-emerge in France. This indicates that employed French mothers have greater amounts of human capital or more positive characteristics than French childless women, and these characteristics protect mothers from lost earnings.

Despite the inclusion of individual-level controls, many mothers (in 13 of the 20 countries with initial motherhood penalties) incur significant wage penalties. These wage penalties range from 7.5 percent in France to 33 percent in West Germany. Penalties are smaller or non-significant in Scandinavia and Eastern European nations. Non-European countries show relatively moderate wage penalties. Our net motherhood penalty findings are not entirely surprising. The Scandinavian countries, Israel, and Eastern European countries have made efforts to stimulate women's labor market participation, and have a longer history of work-family policies than many of the other countries. Australia also has lower levels of wage inequality than other non-European countries, which may benefit mothers vis-à-vis other women. France and Belgium have consistently operated somewhat differently from their continental European peers, providing more support for working mothers (Esping-Andersen 1999; Gornick and Meyers 2003; Author 2007a). At the same time, wage penalties to mothers are relatively strong in Canada, the U.S., the U.K., and Ireland, and even stronger in Austria, Germany, the Netherlands, and Luxembourg.

These findings emphasize that wage penalties to motherhood are not simply a given. In some contexts, mothers are no more likely to earn lower wages than women without children. We

are most interested in how policies and cultural norms interact to shape these outcomes. We next examine the interactions between policy measures from our newly collected database, cultural attitudes from the ISSP, and the wages of women generally, and mothers particularly, in these nations, controlling for the factors mentioned above.

Contextual Analysis: Linking Penalties to Policies and Culture

We turn, then, to examining whether culture and policy combine to differentially affect the earnings of mothers and childless women. Table 3 presents results from pooled-country Heckman selection models with Huber-White Sandwich estimators with the full set of individual-level and country-level controls. Table 3 tests for 3-way statistical interactions between motherhood status, policy (leave or childcare, depending on the model), and the three separate indicators of cultural attitudes. These models do not include Luxembourg because it is not included in the ISSP data.

[Table 3 about here]

The first three columns offer results for the parental leave models, and the last three columns show results from the childcare models. Each of the parental leave models shows significant 3-way interactions, demonstrating that policies and culture have different associations for mothers and childless women, and that the impact of policy on wages is shaped by cultural attitudes. Similarly, we find significant 3-way interactions between motherhood status, policy and culture for our childcare policy measure and two of the attitudinal measures. The 3-way interaction with the cultural indicator “family life suffers if woman works full-time” is non-significant, indicating that the childcare policy and culture interactive effect on wages does not differ for childless women and mothers. The nature of these differential associations is difficult

to discern from the numbers in Table 3, and will be illuminated in the next step of our analysis. At the stricter level of significance ($p < .0045$), one additional 3-way interaction would not be statistically significant: the interaction between motherhood status, parental leave length, and the cultural measure “preschool child suffers if mother works.” This indicates that the interaction between culture and policy may not differ for mothers and childless women. However, the significance findings for all of the other coefficients in all pooled-country models remain the same at the $p < .0045$ level.

To make these complex 3-way interaction models intelligible, we next split the sample by motherhood status and estimate 2-way interaction models (between policy and culture) separately for mothers and childless women. We note that for the lone cultural measure (family life suffers) described above, the separate models for mothers and childless women are not significantly different. In every other case, we found that the strength of the policy and cultural indicator interaction was significantly stronger for mothers than for childless women. We present results from these models for mothers only in the following six figures, and full regression results can be found in Appendix Table A-1.

The Figures 1a-1c graphically show the effect of weeks of parental leave on wages, with separate lines representing level of agreement with the relevant cultural indicator. Data points to identify low, medium, and high agreement on the cultural indicator are shown in Table 1 in the final three rows. To establish these values, we sorted countries by their values on an indicator and looked for natural breaks in the distribution to identify clusters of countries with the highest values and with the lowest values on these indicators. High values are underlined in Table 1 and low values are italicized. We then chose the median value within cluster to represent the high agreement and low agreement levels in the following graphs. We used the overall country

median on each cultural indicator to represent the moderate agreement level. In all graphs, the dotted line represents the most egalitarian values, the dashed line represents moderate values, and the solid line represents the most conservative values on the relevant cultural indicator. We verified the robustness of our results by running jackknife analyses, where we dropped one country from the analysis at a time and re-estimated the model. Results are robust for the parental leave: however, the child care models were significantly different when Russia was excluded from the analysis. To eliminate the distorting effects of the Russian case in the childcare models, we excluded Russia from those regressions.

[Panel of Figures 1a-1c about here]

Cultural supportiveness for mothers' employment amplifies the associations between parental leave length and wages. Figure 1a shows how the effect of leave length on wages varies by level of agreement with the statement "Preschool child suffers if mother works." At all levels of agreement with this cultural indicator, job-protected parental leave has positive associations with maternal earnings, where the most positive associations are found at moderate-length leaves, while the shortest and the longest leaves are associated with smaller positive associations with earnings. The three curves representing cultural differences show that, while the shortest and the longest leaves have similar associations with wages for the three different levels of cultural attitudes, the association between moderate-length leaves (77 to 97 weeks) and wages are dramatically stronger for egalitarian gender cultures and weakest for conservative gender cultures. Thus, where the belief that maternal employment harms preschool children is the lowest we find the most positive relationships between moderate-length parental leaves and wages, and where the belief that maternal employment harms children is the strongest, we see the least positive associations of parental leave and wages. This figure shows a clear interaction between

parental leave and culture, offering support for our first two hypotheses, which posited that parental leave would help mothers most in countries where cultural norms support maternal employment.

When we turn to the other attitudinal measures, our findings that supportive cultures amplify the relationship between parental leave length and wages are consistent. Figures 1b and 1c show how the association between parental leave length and wages depends on the level of agreement with our other two cultural indicators, “Family life suffers if woman works,” and “A man’s job is to earn money while a woman’s job is to look after home and family.” Again we see the same curvilinear relationship between leave length and wages, but we see more dramatic differences by levels of agreement with these cultural indicators. As with Figure 1a, we find that leave lengths are associated with higher maternal wages most in egalitarian cultural contexts, and less so in moderate gender cultural contexts. In egalitarian cultural contexts, leaves of 115-121 weeks have the most positive association with wages; in moderate gender cultures, leaves of 97-117 show the most positive association with wages. We also find that leaves help least in conservative gender cultures, and notably, we find that very long leaves depress maternal wages in very gender conservative cultural contexts. In Figure 1b, leaves longer than 90 weeks begin to show a negative impact on mothers’ wages in conservative gender cultures. In Figure 1c this crossover point is 137 weeks. Perhaps in gender conservative cultural contexts, very long parental leaves lead to either job re-entry at less well-paying positions, or have stigmatizing effects on mothers that lead to lower wages. Indeed, in their extensive interviews with employers in Hungary, Glass and Fodor (2011) find that employers of mothers who utilized three years of leave restructure their workplaces to eliminate the pre-leave job, downgrade the mother’s job upon her return, or pressure “exceptional” workers to take shorter maternity leaves. The legacy

of maternity leave is enduring in Hungary, as mothers are “screened out” at subsequent job applications or channeled into lower-level positions (Glass and Fodor 2011). In any case, there appear to be wage penalties for very long parental leaves in countries with conservative gender cultural attitudes.

The next panel of figures shows how the association between the percentage of 0-2 year-old children enrolled in publicly funded childcare and wages differs for countries with egalitarian, moderate, and conservative gender attitudes. Because only one country has childcare rates above 34 percent (Israel), we truncate the range for the X-axis at 34 percent to attenuate the effect of this outlier. Figure 2a shows overall positive associations between the level of enrollment of toddlers in childcare and wages when cultural attitudes are very supportive or somewhat supportive of mothers of preschoolers being employed. The association is stronger for egalitarian gender countries (i.e., countries with the least level of support for the “preschool child suffers if mother works” measure). In conservative cultural contexts, we see no association between the percentage of 0-2 year-olds in publicly funded childcare and wages; this is evidenced by the slope of the line falling along the zero value of the X-axis for the full range of childcare values. The findings of Figure 2a support our third hypothesis, which stated that childcare would have generally positive associations with earnings and these would be the strongest where cultural attitudes were more supportive of women’s employment.

This third hypothesis is also supported in Figure 2b, which shows positive associations of the percentage of 0-2 year-olds in childcare with mothers’ wages in each type of cultural context. Again, we see a positive association between childcare and wages that is strongest in egalitarian cultures and weakest in conservative gender cultures. The positive associations between childcare enrollment and maternal wages are also found for egalitarian and moderate gender

culture contexts in Figure 2c, with the strongest relationships found in the most egalitarian contexts, as we predicted. However, in cultural contexts most supportive of the male breadwinner/female caregiver family structure, the statistical model presented in Figure 2c predicts increasingly negative associations between childcare and earnings. It is worthwhile to note that of the countries with high support for the male breadwinner model, the percentage of 0-2 year-olds in child care ranges from 1 to 16 percent, with the majority of countries below 10 percent (Russia excluded). Thus, we must interpret these negative associations cautiously. Why would high rates of publicly funded childcare be associated with reduced wages in countries with high support for a male breadwinner/female caregiver family model? Our fourth hypothesis states that this may be the case to the extent that publicly funded childcare in gender conservative countries may be conceived of as education for young children, rather than as a policy tool enabling mothers to be employed (Morgan 2006). In such countries, facilitated limited-time play groups, predominately part-time care, and care hours that do not map easily onto normal working hours may all depress mothers' ability to hold a high-paying or full-time job, and thus produce low-wage forms of employment among mothers, particularly mothers of very young children. This may contribute to negative relationships between childcare and wages in conservative male-breadwinner cultural contexts.

To summarize, the broad finding across all of these analyses is that culture amplifies the relationships between parental leave and maternal wages, and of childcare policies with maternal wages. Countries with more egalitarian attitudes have stronger positive associations between wages and policies, while in countries with a conservative gender culture we find consistently attenuated policy associations with wages, and occasionally, even negative policy associations with wages. This has strong implications for the motherhood wage penalty, suggesting that

policies may be most effective at reducing the motherhood penalty when cultural support for maternal employment is strong.

Discussion and Conclusions

In this study our goals were three-pronged: 1) to demonstrate the overall pay gaps between mothers and childless women across 22 countries and to discern how much of these gaps could not be explained by individual-level factors; 2) to test whether cultural attitudes moderate the relationship between family policies and wages differently for mothers and childless women, net of individual factors and country-level controls; and 3) to empirically demonstrate how cultural attitudes intersect with family policies to impact maternal earnings, net of individual and country-level factors. Our goals allow us to consider the ways in which policy effects are conditioned by cultural contexts and norms (Padamsee 2010).

Our findings show significant motherhood pay gaps in the most countries. Mothers earn less than childless women in 60 percent of our 22 countries, after controlling for differences in human capital, family structure, and differential selection into the labor market and motherhood. There are a number of contexts (primarily Scandinavian and Eastern European) where there is no motherhood penalty in earnings, once differential selection into motherhood and the labor force is controlled. For those countries with unexplained motherhood pay gaps, there is significant variation in the size of these pay gaps, ranging from 4.5 percent in Italy to 33 percent in West Germany. Since much of the gender wage gap is likely driven by differences between parents (as evidenced by converging wages between childless men and women), this is an important finding. Clearly, wage inequality for motherhood is variable across these countries, even after we take individual level differences between mothers and childless women into account.

We next asked whether family policies and cultural attitudes may be linked, cross-nationally, to these wage outcomes. The analysis presented in Table 3 expands on past country case comparative studies of Pfau-Effinger (2004) and Kremer (2007) that argue that cultural attitudes may moderate the impact of family policies. Specifically, we test whether cultural attitudes and family policies impact wages across countries with varying socio-political contexts. We found evidence to support such cross-cutting effects, and evidence to support that mothers and childless women experience the impact of policies and cultural attitudes on their earnings differently in five of the six models estimated. Our analyses reveal that cultural attitudes amplify, and even change the nature of, associations between parental leave, publicly funded childcare, and maternal earnings. Broadly, mothers living in cultural contexts where attitudes supporting maternal employment are high appear to benefit most from job-protected parental leave and publicly funded childcare for 0-2 year-olds. The wages of mothers in these egalitarian cultural contexts are most strongly supported by moderate-length parental leaves and higher enrollments of very young children in publicly supported care. The wages of mothers in cultural contexts that offered more moderate support for maternal employment also benefitted from these family policies, but to a substantively lower degree than in egalitarian cultural contexts. In stark contrast are the associations between policies and maternal wages in cultural contexts that espouse very conservative attitudes about the impact of maternal employment on family life and the appropriateness of a gender division of labor within the family.

Our study does have two methodological limitations. As we discussed in our methods section, due to the small number of level-2 cases, our standard errors could still be inflated despite the Huber-White correction. We verified that our results of contextual measures, except for two of the 3-way interactions, were robust even if our standard errors are underestimated by

25 percent. Future research might be better served by a multi-level modeling strategy to examine these relationships, which would require a far greater number of countries, or multiple time points across countries, to render sufficient power to model complex relationships among multiple variables at the country level. A second potential limitation of our study is that, despite the country-level control variables included in our models, unobserved differences between countries on factors that shape the interplay of culture and policy in impacting women's wages may lead us to overestimate these relationships. While we are cautious to talk only of associations rather than causal effects, future research using multiple time points for each country may be able to move closer to claims about causal relationships. Finally, the data we use do not allow us to consider how the gender division of labor within the home may be *also* shaping the effects that we observe differentially both within and across countries. Future research should consider how to better model not only the effects of the gender culture and gender order on women's outcomes, but also the gender arrangements within the home (Pfau-Effinger 2004).

Despite these limitations, this study advances the state of knowledge of work-family policies and women's economic outcomes. Our study offers at least three novel contributions. First, we specifically theorize and estimate how cultural attitudes and social policies combine with motherhood to shape wage inequalities among women. While past scholarship has demonstrated the link between culture and family policy, we newly bring this link to bear on wage inequalities associated with motherhood. Second, we extend past arguments and findings to examine whether cultural attitudes and work-family policies have robust interactions across a wide range of countries. In this large-scale cross-national design, we found that the interplay between cultural attitudes and work-family policies was surprisingly robust in relation to the

motherhood wage gap and maternal earnings alone. Finally, we offer new findings that, across countries representing a diversity of socio-political and historical settings, cultural support for maternal employment amplifies the positive associations between family policies and wages, while cultural support for male-breadwinner ideology is linked to reduced family policy effects of supporting maternal wages.

Our research supports previous researchers' assertions that policies do not operate in a vacuum, but must be theorized in relation to larger cultural norms and values. As such, our analyses provide new evidence for the way culture and politics interact to create outcomes for women, and particularly mothers. Gendered meanings matter, and particularly matter in understanding employment outcomes for mothers. As we argue, culture plays a role not only *through* policy, but in its interactions *with* policy.

ENDNOTES

¹ There is a debate within the literature on whether work-family policies may create trade-offs, disadvantaging women in the labor market in certain ways. We do not focus on that debate in this paper, although our data speaks to the question.

² There are a range of different kinds of leaves available, including paid and unpaid maternity leave around the birth of a child, unpaid and paid parental leave, and childcare leave. Paid leaves also vary in the level of compensation, from relatively low flat-rate benefits to more substantial wage replacement. We focus upon the length of a combined maternity and parental leave for simplicity here, although in other research we examine differences across different leave schemes.

³ Experimental research demonstrates employer discrimination in the hiring and wage setting of job applicants who signal motherhood on résumés (Correll, Benard, and Paik 2007), relative to those who do not. Although we believe discrimination matters, our data lack measures of this factor.

⁴ In many countries, cohabitation is akin to marriage, thus we treat cohabitators as married couples.

⁵ This age restriction excludes those engaged in post-secondary schooling and mothers whose children may be adults who no longer live in the family home. Due to data limitations, only mothers with children living in their household can be identified. This likely leads to underestimation of the penalty because mothers whose children have left the home could still suffer from reduced earnings, but would be coded as childless women in our sample.

⁶ While not an ideal measure of experience, this is commonly used when actual work experience is lacking (see Filer 1993; Stewart 2000).

⁷ For countries where more detailed labor supply measures are available, we re-estimated the models using weekly hours and annual weeks worked. The motherhood penalty estimates tend to be slightly more conservative using the more detailed labor supply measure.

⁸ We ran models with married, and with married and cohabiting grouped together; there are no notable differences, so we include the cohabitators in these analyses.

⁹ We examine former East and West Germany separately, due to the persistent differences in employment patterns and different policy legacies (Rosenfeld, Trappe, and Gornick 2004).

¹⁰ For the Slovak Republic we use data from 1992, for the Czech Republic from 1996 and for Poland from 2004 because of data availability.

¹¹ Of course, it is likely that the lagged effect is longer, especially given our measurement of motherhood. Without longitudinal individual-level data, however, we believe that this is the best approach to take.

¹² For example, we include the percentage of children in publicly supported care, which taps the availability of government-sponsored childcare slots (for example, though subsidized childcare exists in the United States, it can be difficult to access).

¹³ These data are available through the Leibniz Institute for the Social Sciences:

<http://www.gesis.org/en/services/data/survey-data/issp/modules-study-overview/family-changing-gender-roles/2002/>.

¹⁴ For Italy and Canada, only 1994 ISSP data was available.

¹⁵ We use the following ISSP survey questions, which ask respondents to answer using a 5-point likert scale, including “strongly disagree, disagree, neither disagree nor agree, agree, and strongly disagree”: a) “A pre-school child is likely to suffer if his or her mother works”; b) “All in all, family life suffers when the woman has a full-time job”; c) “A man’s job is to earn money; a woman’s job is to look after the home and family.”

¹⁶ Although we also employ Heckman selection models that attempt to reduce the effect of labor market selection that could influence the motherhood wage penalty at the individual-level, they may be inadequate in addressing large cross-national differences in these selection processes.

¹⁷ To ensure the robustness of findings, we estimated models using different transformations of the dependent variable. These transformations included a) the natural log of national currencies, and b) (following Mandel and Semyonov 2005) the ranking score of individuals wages in their country's (percentile) earnings distribution. Findings were robust across these transformations of the dependent variable.

¹⁸ Transfer income totals the amount of social and private transfers from the following sources: Social Transfers = sickness benefit, occupational injury and disease benefit, disability benefits, state old-age and survivors benefits, child/family benefits, unemployment compensation benefits, maternity and other family leave benefits, military/veterans/war benefits, other social insurance benefits, social assistance cash benefits, and near-cash benefits; and Private Transfers = alimony/child support and regular private transfers (e.g., regular cash transfers from relatives or charitable organizations).

¹⁹ In all of these analyses, the controls act as expected (education, weeks worked, and age are positively associated with wages, while part-time employment is negatively associated with wages). Interestingly, partnership status (married or cohabiting) has a negative effect in Canada, the Czech Republic, Finland, France, and Poland, an insignificant effect in Australia, Austria, Belgium, Germany, Hungary, Luxembourg, the Netherlands, Russia, the Slovak Republic, Sweden, the U.K., and the U.S., and a positive effect in Israel.

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Table 1. Data Sources, Sample Sizes, and Country-Level Variable Values for All Countries in Analyses

Country: (Year=2000 unless noted)	N: Wom., 25-45 yrs	Policy:% 0-2's in public care	Policy: Max. weeks parental leave	Culture: Child suffers if mother works	Culture: Family suffers if wife works	Culture: Agree that he earns & she cares	Control: Female employ. rates	Control: Public sector size	Control: GDP per capita	Control: Gini Coeff.
Australia '01	2,267	5	52	<u>58.35</u>	<u>57.35</u>	24.17	.610	.164	20,233	.317
Austria	775	4	85.4	38.81	42.03	18.24	.766	.274	23,886	.257
Belgium	1,017	30	27.9	34.82	38.31	16.03	.762	.312	22,797	.279
Canada	9,769	5	25	31.32	25.74	<u>58.66</u>	.727	.190	23,623	.315
Czech Rep '96	8,965	1	154.8	46.21	43.01	<u>45.43</u>	.752	.222	6,016	.259
Finland	3,144	22	43.5	32.92	<i>19.39</i>	9.8	.626	.273	23,527	.246
France	3,588	29	158.8	37.68	40.77	12.91	.690	.295	21,830	.278
Germany -E	948	34	160.8	<i>28.04</i>	<i>23.51</i>	10.79	.775	.232	23,152	.231
Germany- W	3,337	10	160.8	50.26	42.02	17.03	.652	.220	23,152	.280
Hungary '99	592	10	108	<u>63.67</u>	<u>50.94</u>	36.33	.630	.367	4,792	.292
Ireland	916	3	14	32.74	34.36	14.62	.611	.180	25,436	.313
Israel '01	2,299	41	57.6	42.33	39.12	25.5	.593	.170	20,503	.346
Italy	2,307	6	34.4	<u>66.74</u>	<u>61.91</u>	29.4	.514	.155	19,212	.333
Luxembourg	979	3	42	NA	NA	NA	.729	.111	46,392	.260
Netherlds. '99	2,028	6	16	36.65	41.69	10.55	.762	.253	25,998	.231
Poland '04	10,980	2	121.2	51.97	37.09	39.53	.699	.291	6,610	.507
Russia	1,209	21	87.4	<u>64.10</u>	<u>62.16</u>	<u>57.65</u>	.829	.379	1,771	.434
Slovak Rep '92	6,783	16	154.8	48.67	<u>51.92</u>	<u>47.19</u>	.746	.435	2,141	.189
Spain	1,613	5	154.8	46.80	<u>50.02</u>	16.91	.497	.157	14,422	.336
Sweden	4,034	33	77.4	<i>20.15</i>	<i>22.17</i>	<i>5.21</i>	.847	.337	27,907	.252
UK '99	8,193	2	18	34.19	32.92	12.91	.670	.192	25,598	.347
US	17,164	6	12	35.64	36.83	19.72	.734	.158	34,390	.368
Low Cat. Med.				24	22	7.5				
Median				40	41	19				
High Cat. Med.				62	56	52				

Notes: For cultural measures, we group countries into high, median, and low value groups in order to graph interaction effects. “High” groups are underlined, “low” groups are italicized, and midpoint values for all groups are shown in the final three rows of Table 1.

Table 2. Coefficients Expressed as Percentage Effects for Motherhood on the Natural Log of Annual Wages, by Country

	Gross motherhood penalty (OLS)	Gross motherhood penalty (Heckman)	Net motherhood penalty^a (Heckman)	% of Penalty Explained by Selectivity & Indiv. Char.	% of Penalty Unexplained by Selectivity or Controls
Continental European					
Austria	-43.11% ***	-31.20% ***	-26.21% ***	46%	54%
Belgium	-16.97% ***	-9.43%	-4.11%	100%	0%
France	-18.29% ***	5.87%	-7.50% *	61%	39%
W Germany	-57.68% ***	-38.12% ***	-32.97% ***	53%	47%
Luxembourg	-53.33% ***	-47.74% ***	-29.81% ***	54%	46%
Netherlands	-50.34% ***	-44.35% ***	-25.92% ***	57%	43%
Mediterranean					
Italy	-13.58% ***	-13.50% ***	-4.50%	100%	0%
Spain	-15.89% ***	-16.31% ***	-15.72% **	1%	99%
Eastern European					
Czech R.	-15.04% ***	-13.15% ***	-10.33% ***	33%	67%
E Germany	-12.28%	18.53%	-3.34%	NA	NA
Hungary	-24.50% **	-19.51% *	-18.05%	100%	0%
Poland	-17.06% ***	-16.97% ***	-5.07% ***	72%	28%
Russia	-22.28% **	-24.12% **	-15.55%	100%	0%
Slovak R.	-16.89% ***	-17.63% ***	-9.70% ***	45%	55%
Scandinavian					
Finland	-21.89% **	13.43%	2.33%	100%	0%
Sweden	-23.89% ***	7.04%	-2.08%	100%	0%
Non- European					
Canada	-31.34% ***	-17.55% ***	-8.42% *	77%	23%
Australia	-34.10% ***	-20.31% ***	3.98%	100%	0%
Ireland	-41.20% ***	-35.53% ***	-21.02% **	56%	44%
Israel	-7.50%	0.20%	-2.76%	NA	NA
UK	-52.95% ***	-40.31% ***	-10.60% ***	85%	15%
US	-31.68% ***	-26.07% ***	-15.89% ***	55%	45%

Note: *** p>.001, ** p>.01, * p>.05, + p>.10; two-sided test. ^a Age, relationship status, part-time status, and education are controlled in the net model.

Table 3. Associations of Motherhood, Family Policies, Cultural Measures, and their Interactions with Wages, from Heckman Selection Models with Huber-White Sandwich Estimators

	(1) Child Suffers & Leave	(2) Family Suffers & Leave	(3) He Earns She Cares & Leave	(4) Child Suffers & Ch. Care	(5) Family Suffers & Ch. Care	(6) He Earns She Cares & Ch. Care
Intercept	11.201 (.111)	10.866 (.099)	9.572 (.063)	11.330 (.086)	10.657 (.075)	10.193 (.061)
Mother	-.206 (.090)	-.707 (.095)	-.318 (.030)	-.174 (.040)	-.062 (.040)	-.313 (.018)
Cohabiting/Married	-.079 (.008)	-.084 (.008)	-.089 (.008)	-.077 (.008)	-.078 (.008)	-.086 (.008)
Age	.014 (.001)	.014 (.001)	.014 (.000)	.014 (.001)	.014 (.001)	.014 (.001)
Part-time	-.497 (.008)	-.502 (.008)	-.579 (.008)	-.489 (.008)	-.483 (.008)	-.507 (.008)
Post-Second. Degree	.504 (.007)	.511 (.007)	.506 (.007)	.488 (.007)	.497 (.007)	.501 (.007)
Gini Coefficient	-1.785 (.053)	-2.484 (.049)	.366 (.070)	-1.540 (.046)	-1.680 (.048)	-1.534 (.046)
Size of Public Sector	-.037 (.001)	-.032 (.001)	-.035 (.000)	-.037 (.001)	-.033 (.001)	-.036 (.001)
GDP per Capita	6.8E-05 (6.0E-07)	6.9E-05 (5.5E-07)	-1.7E-07 (1.2E-06)	5.7E-05 (4.9E-07)	6.2E-05 (4.3E-07)	6.0E-05 (5.0E-07)
Women's Emp. Rates	-2.522 (.073)	-1.927 (.063)	.522 (.067)	-2.318 (.073)	-1.615 (.064)	-1.260 (.064)
Policy Indicator	.025 (.002)	.006 (.003)	.016 (.001)	.019 (.002)	.011 (.002)	.013 (.001)
Policy Indicator Squared	-1.8E-04 (1.4E-05)	-2.5E-06 (1.6E-05)	-6.3E-05 (6.2E-06)			
Cultural Indicator	-.013 (.002)	-.010 (.002)	.026 (.001)	-.009 (.001)	-.009 (.001)	-.001 (.000)
Mother*Policy Indic.	-.001 (.003)	.020 (.003)	.009 (.001)	.013 (.002)	.006 (.002)	.010 (.001)
Mother*Policy Squared	5.0E-05 (1.5E-05)	-1.1E-04 (1.7E-05)	-5.3E-05 (6.3E-06)			
Mother*Culture	-.001 (.002)	.013 (.003)	.005 (.001)	-.001 (.001)	-.005 (.001)	.003 (.001)
Culture* Policy Ind.	-4.2E-04 (6.4E-05)	-1.6E-05 (7.4E-05)	-1.5E-03 (5.9E-05)	-4.5E-04 (5.5E-05)	-2.5E-04 (5.7E-05)	-6.8E-04 (5.0E-05)
Culture*Policy Squared	3.4E-06 (3.6E-07)	-5.1E-07 (4.2E-07)	6.2E-06 (3.3E-07)			
Mom*Cult.*Policy	1.7E-04 (6.9E-05)	-4.4E-04 (8.2E-05)	-2.0E-04 (5.0E-05)	-2.3E-04 (6.0E-05)	-7.3E-06 (6.6E-05)	-1.3E-04 (5.4E-05)
Mom*Cult.*Policy Sqrd.	-2.0E-06 (4.0E-07)	2.2E-06 (4.5E-07)	1.1E-06 (2.8E-07)			

Notes: All models include control for imputed values on hours and selection criteria: presence of preschooler, ln other household income and its square, and ln transfer income. Statistically significant coefficients are bolded (p<.05).

Figure 1a. Predicted Change in Wages for Leave Length by Level of Agreement with "Preschool Child Suffers if Mother Works"

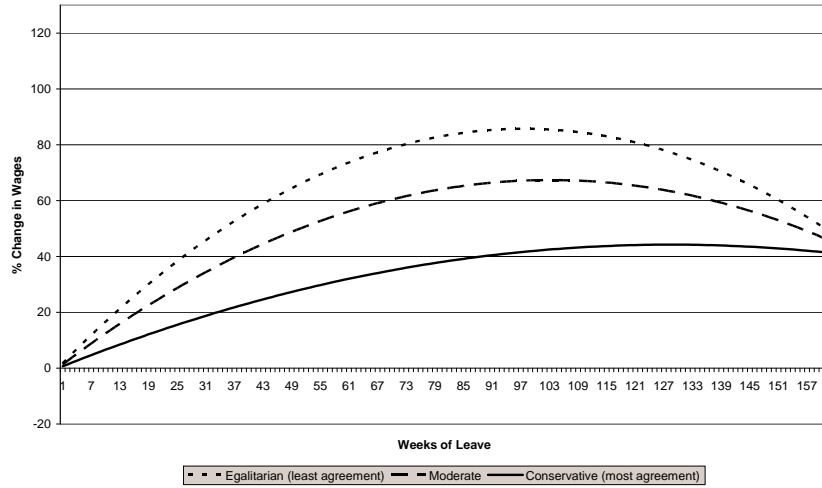


Figure 1b. Predicted Change in Wages of Leave Length by Level of Agreement with "Family Suffers if Woman Works Full-time," Mothers Only

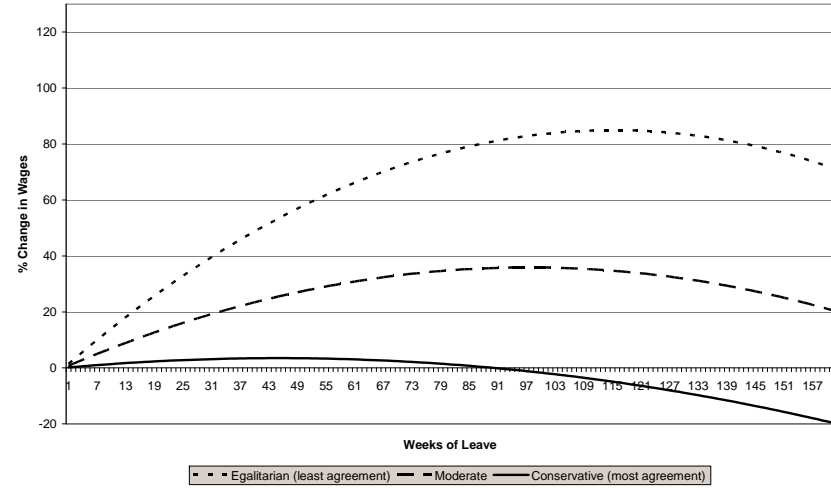


Figure 1c. Predicted Change in Wages for Leave Length by Level of Agreement with "A Man's Job is to Earn Money; A Woman's Job is to Look After Home and Family," Mothers Only

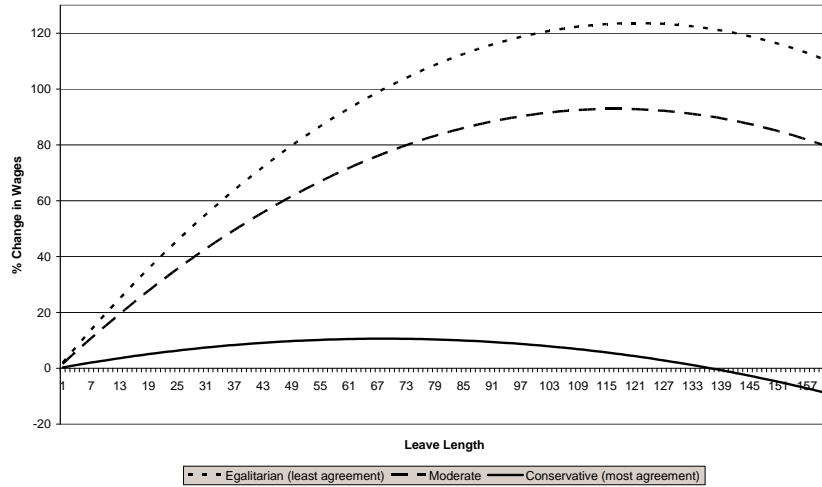


Figure 2a. Predicted Change in Wages of % of 0-2 year-olds in Childcare by Level of Agreement with "Preschool Child Suffers if Mother Works," Mothers Only

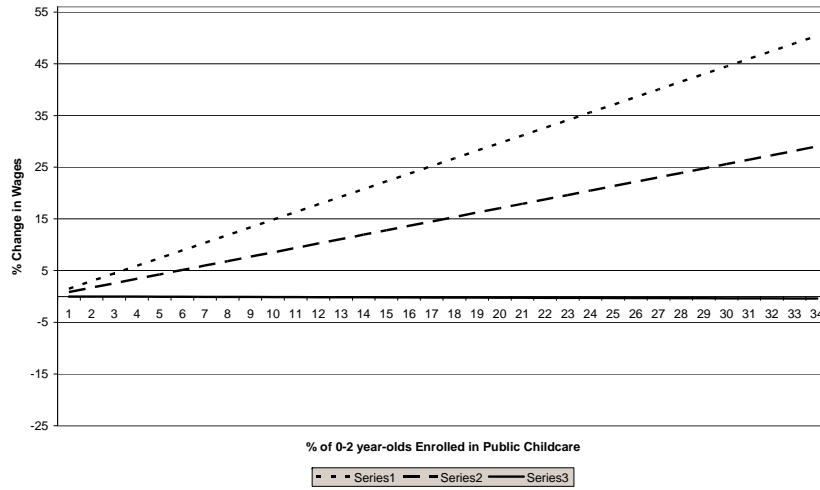


Figure 2b. Predicted Change in Wages of % of 0-2 year-olds in Childcare by Level of Agreement with "Family Suffers if Woman Works Full-time," Mothers Only

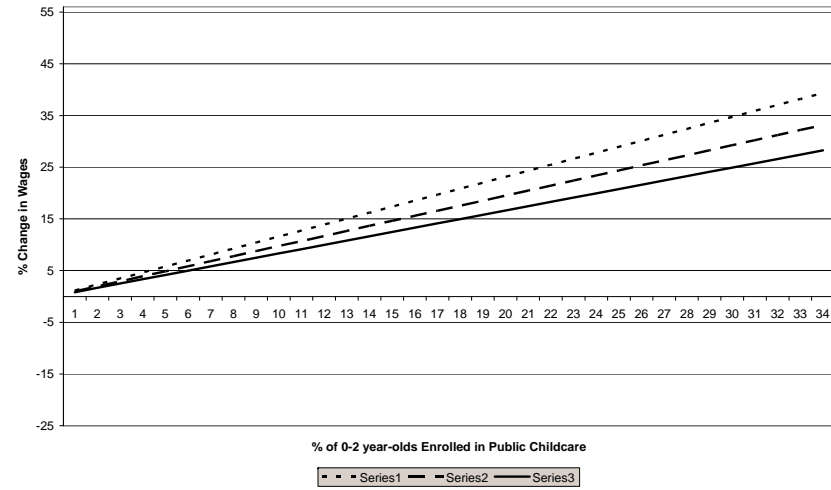
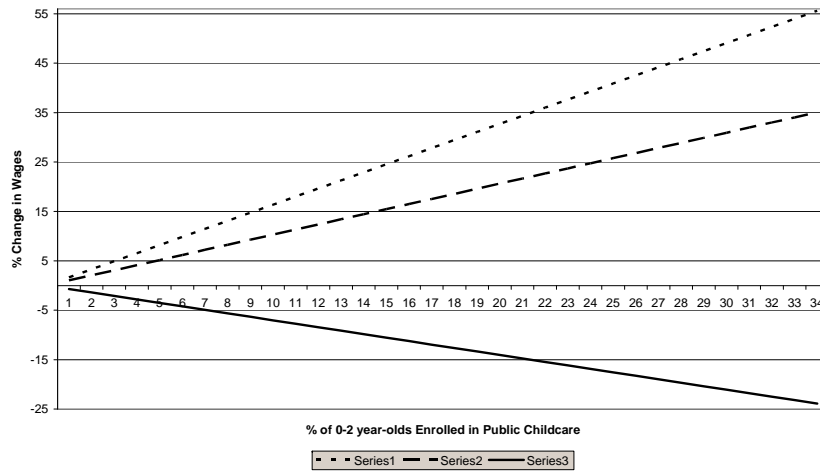


Figure 2c. Predicted Change in Wages of % of 0-2 year-olds in Public Care by Level of Agreement with "A Man's Job is to Earn Money; A Woman's Job is to Look After Home and Family," Mothers Only



Appendix Table A-1. Policies, Cultural Measures, and their Interactions Regressed on Maternal Wages, from Heckman Selection Models with Huber-White Sandwich Estimators

	(1) Child Suffers & Leave	(2) Family Suffers & Leave	(4) He Earns She Cares & Leave	(5) Child Suffers & Ch. Care	(6) Family Suffers & Ch. Care	(8) He Earns She Cares & Ch. Care
Intercept	11.085 (.113)	10.306 (.090)	9.325 (.072)	10.493 (0.103)	9.816 (0.085)	8.805 (0.076)
Cohabiting/Married	-.103 (.010)	-.109 (.010)	-.104 (.010)	-0.099 (0.011)	-0.101 (0.011)	-0.098 (0.010)
Age	.016 (.001)	.015 (.001)	.015 (.001)	0.017 (0.001)	0.017 (0.001)	0.017 (0.001)
Part-time	-.467 (.009)	-.474 (.009)	-.557 (.009)	-0.459 (0.009)	-0.457 (0.009)	-0.561 (0.009)
Post-Second. Degree	.536 (.008)	.545 (.009)	.536 (.008)	0.523 (0.008)	0.530 (0.009)	0.521 (0.009)
Gini	-1.635 (.060)	-2.415 (.056)	.470 (.080)	-0.868 (0.051)	-0.963 (0.053)	-0.898 (0.054)
Size of Public Sector	-.035 (.001)	-.030 (.001)	-.034 (.001)	-0.035 (0.001)	-0.032 (0.001)	-0.038 (0.001)
GDP per Capita	6.9E-05 (7.1E-07)	7.0E-05 (6.4E-07)	1.6E-06 (1.5E-06)	5.7E-05 (5.6E-07)	6.0E-05 (4.9E-07)	5.9E-05 (4.9E-07)
Women's Emp. Rates	-2.759 (.085)	-2.110 (.073)	.269 (.078)	-1.768 (0.090)	-1.013 (0.074)	-0.674 (0.078)
Policy Indicator	-.014 (.002)	.001 (.002)	.033 (.001)	0.024 (0.001)	0.014 (0.001)	0.030 (0.001)
Policy Indicator Sqrd	.024 (.002)	.023 (.002)	.026 (.001)			
Cultural Indicator	-1.3E-04 (8.5E-06)	-9.4E-05 (9.7E-06)	-1.2E-04 (4.6E-06)	-0.011 (0.001)	-0.012 (0.001)	0.044 (0.001)
Culture* Policy Ind.	-2.8E-04 (4.2E-05)	-3.9E-04 (4.7E-05)	-.002 (.000)	-3.9E-04 (2.9E-05)	-9.6E-05 (3.2E-05)	-1.7E-03 (7.6E-05)
Culture*Policy Sqrd	1.7E-06 (2.3E-07)	1.4E-06 (2.6E-07)	7.6E-06 (2.7E-07)			

Notes: All models include control for imputed values on hours. All models include selection criteria: presence of preschooler, ln other household income and its square, and ln transfer income. Statistically significant coefficients are bolded (p<.05).