Lowest-Low Fertility: A Theory of Normative Rigidity and Economic Context

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Explaining the emergence of "lowest-low" fertility in postindustrial societies is a central concern of contemporary demography. Recent work has brought gender equity issues more centrally into theoretical formulations regarding lowest-low fertility. We build on this and emphasize the norms that affect men's behavior as well as women's. Of particular importance, we argue, are norms regarding men's proper fulfillment of the breadwinner role. The paper develops and tests a theoretical framework that prioritizes the strength and rigidity of family- and gender-role norms together with the structural environment that facilitates or hampers adherence to these norms, especially on the part of men.

Introduction

Extremely low fertility in a number of postindustrial societies has become one of the most written-about demographic phenomena of recent years. After decades of concern about unbridled population growth in the world, demographers and policy-makers were caught by surprise when the total fertility rate in a number of postindustrial societies dipped below a "lowest-low" level by the 1990s.[1] This surprise only increased as other societies subsequently joined the ranks of lowest-low fertility countries and it became clear that the drop to extremely low fertility appears to be a secular rather than a cyclical phenomenon (Lesthaeghe and Moors 2000).

The emergence of lowest-low fertility poses many challenges to demographers as well as many opportunities. Just as the demographic transition motivated demographers to develop rich theoretical explanations of fertility that combined proximate and distal mechanisms,

[1] "Lowest-low" fertility has been defined by some scholars as a total fertility rate below 1.5 and by other scholars as a total fertility rate below 1.3 (Kohler, Billari, and Ortega 2002; McDonald 2000).

cultural and structural influences, and period-specific effects, the "second demographic transition" has also created a complicated and rich terrain for theoretical and empirical investigation.

This paper proposes a theoretical framework that combines attention to family and gender-role norms with the structural conditions that make it possible for individuals and couples to make family formation decisions consistent with those norms. The distinctive contributions of the paper are two: 1) We highlight the importance of men's normatively-prescribed roles, giving them as much primacy as women's, and 2) we incorporate two low-fertility societies (Japan and South Korea) into our analysis that have not featured prominently in the more Eurocentric literature on the contemporary fertility transition (Morgan 2003). Together with Singapore, Taiwan, and Hong Kong, Japan and South Korea exhibit fertility rates comparable to those of Southern European and a number of Eastern European nations.[2] They resemble Southern Europe in demonstrating the paradox of very low fertility within a cultural context of strong family norms (Dalla Zuanna and Micheli 2004; Tsuya and Bumpass 2004). This paradox is central to the theoretical framework we develop in the paper.

Our paper proceeds as follows. We first give a brief overview of dominant theoretical explanations for the development of very low fertility across various country contexts, highlighting in particular the work of McDonald and others who emphasize the effects of an uneven pace of change in gender equity in the private and public spheres (Mason 1997; McDonald 2000; Mills et al. 2008; Torr and Short 2004). In section two we outline what we term a *theory of normative rigidity and economic context*, based on the interaction between rigid definitions of family, conservative gender-role attitudes, and a structural context that

[2] China is excluded from the discussion here, given the government's explicit population control measures as represented in the one-child policy.

gives primacy to the male breadwinner role. Section three details our analysis strategy and section four presents the results of a time-series analysis of total fertility rates for 26 OECD countries.

Our analysis demonstrates that total fertility rates tend to be lowest in countries characterized by adherence to a narrow definition of "family" and a conservative sex-role ideology. These countries tend to be characterized by a complementary employment protection regime that prioritizes job security for prime-age males, reinforcing the strength of a breadwinner regime and its supporting ideology. Young male job insecurity, measured by the unemployment rate for men age 25-29, is also closely related to low fertility; such insecurity is particularly relevant for fertility in those countries characterized by the most conservative family- and gender-role ideologies. Higher levels of female labor force participation also exert a dampening influence on total fertility in country settings dominated a conservative ideology that emphasizes the primacy of women's motherhood role. In the final section of the paper we discuss implications for future analyses using multilevel models.

Explaining Lowest-Low Fertility

While fertility fell in all Western industrial countries and in Japan after the mid-1960s, countries show varying patterns of fertility decline (Rindfuss et al. 2003). To take but a few examples, total fertility rates dropped in the U.S. from close to three children per woman in 1965 to just two children by 1990; Japan's fertility rate started from a lower level in 1965 but dropped steadily and dramatically over the period; Spain's rate started relatively high (at 2.9 children per woman) in 1965 but fell precipitously after the late 1980s, reaching 1.2 at the end of the 1990s.

The low fertility levels characterizing countries that have moved through this second demographic transition are historically unprecedented, and have generated significant

attention from demographers. Explanations for "lowest-low fertility" can be categorized into two general theoretical groupings: 1) Those that prioritize the degree of compatibility or incompatibility between childrearing activities and market work for women. This family of explanations emphasizes women's opportunity costs and the direct costs of family formation per se, including structural conditions such as the cost of housing, cost of childcare, and cost of children's education; and 2) explanations that focus more heavily on the normative and ideological context within which fertility decisions are made, including attention to the normatively-sanctioned contributions of men and women to the household and to the public sphere. In categorizing theoretical approaches in this way, we do not claim that they are mutually exclusive but rather that they place greater priority on certain mechanisms of fertility change over others.

Work-Family Incompatibility, Women's Opportunity Costs, and the Cost of Children. Many scholars have focused on the incompatibility between women's childrearing responsibilities and labor market opportunities as a driver of low fertility levels (Ahn and Mira 2002; Brewster and Rindfuss 2000; Del Boca et al. 2008; DiPrete et al. 2003; Rindfuss and Brewster 1996; Rindfuss et al. 2003). As a representative recent article states, "Women's labor force participation lies at the heart of most explanations for fertility levels and change in low fertility societies" (DiPrete et al. 2003: 439).

The relationship between fertility and women's increasing labor market opportunities and participation stems from the new home economics paradigm in human capital research (Becker 1981; Willis 1974). New home economists developed the idea of the "household production function" and the opportunity costs women incur when they forgo earnings in the labor market to devote time to childrearing. While Becker's focus was principally on women's expected returns from market work and the downward pressure this would exert on fertility, many demographers have shifted attention to what Rindfuss and Brewster (1996)

term the social organization of work and childrearing. A growing body of empirical research has explored the ways that institutional arrangements and social policies can lessen mothers' opportunities costs by making it easier for them to simultaneously combine employment and childrearing or to temporarily exit the labor force and re-enter with lower penalties. Some scholars have examined country-level variation in the institutional and policy landscape in order to test whether conditions that ameliorate the work-family conflict for women can explain variation in total fertility rates across countries (Büttner and Lutz 1990; Gauthier 2007; Rindfuss and Brewster 1996). The policy-oriented literature has produced mixed results, with countries such as Japan and South Korea, for example, exhibiting a broad mix of pro-fertility policies but extremely low fertility levels. A smaller number of studies have focused on the direct costs of family formation, including housing, childcare, and children's education. Many of these studies emphasize how the secular shift in parental concerns from child "quantity" to child "quality" with late industrialization has exerted downward pressure on fertility.

Gender Equity. A second strain of research has broadened the emphasis on work-family incompatibilities and the "costs" that childrearing imposes on women by arguing for greater attention to the *relative degree* of gender equity in households vs. the labor market. In a widely-cited article, McDonald predicted as follows: "Very low fertility rates will persist unless gender equity within family-oriented institutions rises to much higher levels than prevail today. In a context of high gender equity in individual-oriented institutions, higher gender equity in family-oriented institutions will tend to raise fertility" (2000: 438). Further, McDonald has suggested that the influence of changes in gender equity may be most apparent in the study of low fertility, i.e. the recent and sustained fall of fertility to lowest-low levels.

This theoretical position emphasizes not only cross-national variation in the social-institutional context of fertility but also the dominant *social norms* concerning men's and women's intra-familial roles. Theoretical and empirical literature tied to this perspective, for example, focuses on the ways that strong familism and rigid gender roles in Southern Europe have contributed to plummeting birth rates (Dalla Zuanna and Micheli 2004; De Rose, Racioppi, and Zanatta 2008). Clearly, family norms and gender-role norms vary highly across country contexts and exert influences on how individuals and couples define the "normal" family (e.g. normative acceptance or rejection of out-of-wedlock childbirth, ideas concerning intergenerational obligations and responsibilities, etc.) and how they conceptualize the roles of wife, husband, mother, and father and the interplay between these roles and market roles.

Despite the considerable attention generated by McDonald's gender equity approach to fertility, our perception is that demographers have not adequately incorporated the second half of the gender equity equation—changes in *men's* normatively-sanctioned roles in the private and public spheres—into either theoretical or empirical work on low fertility. If one is to take seriously the idea of gender equity and the "gender system" in a country (Mason 1997; Presser 2001), it is crucial not to restrict the focus to women. Rather, it is important to also consider how conceptions of the husband/father as breadwinner have or have not changed over time. Likewise, we need to recognize that in societies where social norms place very heavy responsibility in mothers' hands for childrearing, social norms tend to simultaneously valorize male responsibilities as being primarily *outside* the household rather than in the performance of "women's work" (Fujita 1989; Fuwa 2004; Ochiai and Molony 2008). Starkly put, we assert that it is time to "bring men back in" to theoretical and empirical work on low fertility by taking seriously the idea of gender equity in the public and private spheres and thereby attributing equal explanatory power to the amount of change or stasis in men's opportunities for engaging in positively sanctioned activities in each sphere.

Theory and Predictions

We term our emerging theoretical framework a *theory of normative rigidity and economic context*. We propose a theoretical framework that gives primacy to *family norms, gender-role norms,* and the *structural conditions facilitating conformity to these norms*. More precisely, we suggest that fertility in societies with rigid family norms and gender-role norms will be more likely to drop to lowest-low levels in the contemporary (post-1990) period than will fertility in societies with less rigid and conservative norms. Moreover, we argue that the strength of such norms will interact with the availability of structural conditions for men and women to fulfill those normative prescriptions. To wit, societies that continue to prescribe a strong breadwinner role for men will be able to sustain replacement- or near-replacement level fertility only to the extent that economic conditions facilitate young men's successful entrance into the breadwinner role. Our reasoning is consistent with that of Bernardi et al. (2008) in their comparative study of fertility in the former East Germany and West Germany; they found that the effect of economic security on fertility is conditioned by the social context.

We also postulate that in societies with a family- and gender-role ideology that positively sanctions the housewife role and expresses ambivalence regarding working women's ability to be good mothers, the rate of female labor force participation will be inversely related to fertility. This prediction is consistent with empirical work demonstrating either a neutral or a positive correlation between total fertility rates and female labor force participation in postindustrial societies (Rindfuss et al. 2003).

Consistent with calls on the part of several social demographers to use country-specific knowledge to enrich theory and research on the second demographic transition (Kertzer 2005; Knodel 1997; Mason 1997) and to devote greater attention to middle-range

theory (Presser 2001), our theoretical framework draws specifically on our detailed knowledge of gender inequality and family norms and patterns in East Asia, one of the world regions that now exhibits uniformly low fertility rates. Women's attainment of higher education, especially university, has increased markedly in Japan and South Korea over the past 20 years (Brinton and Lee 2001). But female labor force participation in both countries continues to be characterized by an M-shaped curve with age, a pattern that has largely been replaced in Western societies by more continuous labor force participation across women's life course (Brinton 1993; Brinton 2001; Ochiai and Molony 2008; Tsuya and Bumpass 2004). This is due to a combination of forces that include a heavy cultural emphasis on the primacy of mothers' role in childrearing and the education of children, a corporate culture that valorizes worker commitment to the firm, and a strong breadwinner ideology. Norms regarding the centrality of mothers' role in childrearing ares especially strong in Japan (Fujita 1989; Ochiai and Molony 2008). Beginning in the late 19th century, Japanese family ideology sanctified the role of "good wife, wise mother" (*ryōsai kenbo*) as the female role ideal (Uno 1993). While this ideology has weakened in recent years, Japanese society is distinct even within East Asia in terms of placing very heavy responsibility on the shoulders of the mother in raising happy and well-educated children (Ochiai and Molony 2008).

Individual-level attributes of husbands and wives (such as age and education) have been found to exert little influence over the division of household labor in Japan and South Korea, suggesting very strong norms governing women's primary responsibility for the household and men's specialization in market work (Fuwa 2006; Tsuya et al. 2000). While husbands' contribution to household labor is higher in South Korea and the U.S. when wives work either part-time or full-time, husbands' household labor contribution in Japan increases only when wives work full-time and thus have a highly constrained amount of time (Tsuya et al. 2000).

South Korea boasts the longest working hours of any advanced industrial society, and upwardly mobile men in both Japanese and Korean business settings continue to face strong pressures to participate in after-hours socializing with coworkers (Ogasawara 1998). These normative obligations keep middle- and upper-middle class married men out of the household for long hours extending into the evening. Adding to this are long commuting times in the large metropolitan centers of both countries (Brinton 2001; Brinton et al. 1995; Tsuya et al. 2000); this further contributes to men's time away from the household and consequently to women's difficulties in balancing work and family.

Our theoretical framework gives rise to several hypotheses with regard to total fertility rates in industrial and postindustrial societies:

1) Total fertility rates will tend to be lower in postindustrial societies that exhibit conservative family- and gender-role norms;

2) The relationship between total fertility and the dominant family- and gender-role norms in a society will be stronger in:

a) Countries that have a labor market structure and labor market regulations supporting a male-breadwinner model, and

b) Countries experiencing higher unemployment among men in the prime family formation years (age 15-29), leading to greater perceived economic insecurity on the part of young men and lower expectations of being able to fulfill the breadwinner role.

3) Levels of labor force participation among women in the prime childbearing years will depress the fertility rate in countries with conservative family- and gender-role norms, as these countries' prioritization of mothers' responsibilities for childrearing create work-family conflicts for women that are most likely to be exacerbated by second and third births.

Data and Measures

We use country-level variables to predict the total fertility rate. Because of the statistical limitations associated with a small number of cases (27 countries), we employ a time-series strategy and use a country's yearly *total fertility rate* (1990-2008) as the dependent variable. Our independent variables are time-varying as well, with the exception of employment protection legislation and our measures of family- and gender-role ideology and norms. Both the dependent variable (country-level total fertility rate) and our time-varying independent variables are drawn from the OECDstat database, and the employment protection index is also drawn from OECD calculations.[3] The attitudinal measures are drawn from the second wave of the World Values Survey, conducted in 1995. As described below, we use a cluster analysis procedure to construct country groupings based on their similarity in family- and gender-role norms and ideology.

Independent Variables. We use three variables to measure the availability of employment for young men. First, *young male unemployment* is the ratio of unemployed men age 25-29 to the total male population of this age. Based on our theoretical framework we expect male unemployment in the prime family formation years to exert downward pressure on fertility, as an unfavorable employment environment will make it difficult for young to men to move into the breadwinner role. Because we expect this mechanism to be especially strong in countries with strong pro-family and conservative sex-role regimes, in our multivariate analysis we also include an interaction term with the country clusters.

Our second measure of the stability of young men's employment situation is the *ratio of male youth (age 15-24) unemployment to that of prime-age males (age 25-54)*. This indicates the employability of young vs. older men. As such, the measure likely reflects both

[3] OECDstat can be accessed by registered institutional or individual users at http://stats.oecd.org/ The employment protection legislation index is taken from the *2004 OECD Employment Outlook.*

the cyclical economic environment as well as the relative employment vulnerability of younger, less experienced workers vis-à-vis more experienced workers. For example, in countries such as Japan with strong firm-internal labor markets, the negative effect of economic recession tends to be stronger for women and for younger men than for middle-aged men. With longer average job tenure, the latter group of workers experiences much less risk of being laid off; firms tend to reduce their hiring in lean economic times rather than dismiss "core" workers (Brinton, in press; Genda 2003).

Our third measure of employment vulnerability for young men is an indicator of the institutional environment regulating employment, namely, an indicator of the *stringency of employment protection legislation (EPL).* This is an index created by the OECD to measure the strength of country-level regulations regarding the hiring and dismissal of workers. The OECD reports an index for each OECD country in the late 1990s and an index for all but eight countries in the late 1980s. For these eight countries we used the late 1990s score and for all others we took an average of the late 1980s and 1990s scores.

We use data from the second wave (1995) of the World Values Survey (WVS) to construct variables measuring attitudes related to family- and gender-role norms and ideology. There are currently five waves of WVS; we chose the second wave because it has the most complete set of family- and gender-role ideology questions for the largest number of countries (27). Even so, there are a few countries without a complete set of variables. In these cases, we used data from the closest subsequent wave that included the variable for that particular country.[4]

We included ten questions from WVS. These questions are a subset of the larger set chosen by Inglehart and Norris in their analysis of gender equality (2005). While an

[4]A few questions are missing in the second wave for Australia, New Zealand, South Korea, and Turkey, but in all cases these questions were asked in the third wave of the survey (with the exception for South Korea, where one question was asked only in the fourth wave).

argument could be made for including all attitude questions related to gender and family, including for example a preference for sons over daughters and the appropriateness of female candidates for political office, we chose instead to focus specifically on the questions most relevant to our theoretical framework. Our selection was directed by our theoretical interest in attitudes pertaining to the family (e.g. the perceived importance of marriage and children, the nature of intergenerational relations, and the definition of "family") and to the appropriate roles of men and women in the household and the labor market. Appendix 1 lists the six WVS questions we consider indicative of *family ideology* and the four questions we consider indicative of individuals' attitudes toward *men's and women's proper roles in the household and the labor market*.

Finally, we include several control variables in our multivariate analysis in order to capture the level of economic development (measured as *logged GDP per capita*), economic growth rate (*annual percent growth in GDP*), quality of female labor supply (*proportion of women enrolled in tertiary education, summed across age groups*)[5], and married female labor force participation (*estimated by the labor force participation rate of women age 25-44*). While many recent aggregate-level studies have reported a positive correlation between the total fertility rate and female labor force participation from the 1990s onward, studies tend to use a measure of the latter that is not age-specific. Instead we restrict the measure to the age group (25-44) that is most likely to have the highest concentration of mothers with young children. While we are agnostic with respect to the main effect of this variable on the total fertility rate, we predict that in countries with conservative family- and gender-role norms, labor force participation among women in this age group is likely to depress fertility because of the strong normative emphasis on "good" mothering.

[5] The proportion of females with tertiary education is measured as the total number of women in college and university divided by the population of females in the relevant age group (e.g. 20-25).

Methods

We use hierarchical cluster analysis (Everitt et al. 2001) to create clusters of countries based on the distribution of responses in each country to each of the 10 attitude questions. We chose hierarchical clustering because of its appropriateness for smaller samples. We employ Ward's linkage method, which uses an analysis of variance approach to evaluate the distances between clusters and minimize the sum of squares of any two clusters formed at each step. This method is regarded as very efficient but tends to create clusters of small size, which is consistent with our theoretical framework. That is, we are striving to create country clusters that are internally consistent with regard to family- and gender-role norms but we are also striving to create as many clusters as are theoretically meaningful.

Our multivariate analysis strategy is based on several considerations. Errors estimated from pooled panel data using ordinary least-squares regression tend to be biased because the errors are temporally autoregressive, cross-sectionally heteroskedastic, and cross-sectionally correlated. Accordingly, we follow Beck and Katz (1995) and use panel-corrected standard errors corrections for first-order autoregression (AR1) and the imposition of a common rho for all cross-sections.[6] The Prais-Winsten estimations transform the estimations from OLS taking into account auto-correlated errors, and thus produce more rigorous significance tests.

Results

Hierarchical cluster analysis produced five country clusters based on the WVS family- and gender-role ideology measures (see Appendix 2). The clusters are as follows:

[6] We used STATA Version 10 for this procedure.

Cluster 1: Australia, Canada, Ireland, New Zealand, UK, USA
Cluster 2: Denmark, Finland, Iceland, Netherlands, Norway, Sweden
Cluster 3: Austria, Belgium, France, Germany, Italy, Mexico, Spain
Cluster 4: Czech Republic, Hungary, Poland, Portugal, Slovakia, Turkey
Cluster 5: Japan, South Korea

These country groupings accord well with those utilized in the political and social science literature on welfare-state regimes, categorizations which have been heavily influenced by Esping-Andersen's conceptualization of regime types as representing "qualitatively different arrangements between state, market, and family" (Esping-Andersen 1990: 26). With few exceptions, Cluster 1 represents liberal welfare-state regimes characterized by minimal market regulation; Cluster 2 includes the social-democratic welfare states; Cluster 3 includes Western and Southern European countries and is characterized by conservative and strongly corporatist welfare states; Cluster 4 is comprised mainly of the post-socialist societies of Eastern Europe; and Cluster 5, the smallest cluster, includes the two East Asian OECD countries (Japan and South Korea). The fact that Japan and South Korea form a distinct cluster supports our argument that it is important to include these in the analysis of lowest-low fertility, as they appear to represent a category unto themselves with respect to family- and gender-role ideology.

Table 1 reports the means and standard deviations of all variables; again, all of our variables except for employment protection legislation are time-varying and are measured at the country-level for the period 1990-2008. The final number of countries used in our analysis is 26; Iceland is excluded from the analysis because the OECD does not report an employment protection regulation measure for it.

Table 2 shows the zero-order correlation coefficients between all pairs of variables. As expected, the total fertility rate shows a negative and statistically significant correlation with the unemployment rate for 25-29 year-old males; the ratio of male youth to prime-age

male unemployment is negative but is not statistically significant. Also consistent with our prediction, a country's fertility rate is negatively correlated with the strength of its employment protection legislation. Countries whose employment regulations protect already-employed "core" (regular) workers tend to exhibit lower fertility rates, in line with our theoretical framework privileging the level of employment opportunity for young men who are embarking on their work lives. All of the control variables exhibit a statistically significant negative relationship with fertility. The negative relationship is particularly strong for female labor force participation. A scattergram reveals that this negative relationship is particularly driven by the two countries in our sample (Mexico and Turkey) exhibiting the highest fertility rates.[7]

Our regression analysis of total fertility rates is shown in Table 3. The first model includes all of the independent variables, the second model adds interactions between the male age 25-29 unemployment rate and each country cluster, and the third model instead adds the interaction between the female labor force participation rate and each cluster. In each model, Cluster 2 (consisting principally of the Northern European countries) is the reference group for other clusters. We chose this cluster as the reference category because it clearly represents the countries with the most liberal conceptions of family and gender roles.

Model 1 shows that even with the addition of other independent variables, the association between the young male unemployment rate and fertility is strongly negative, as is the association between employment protection legislation and fertility. While not our principal focus, there are also strong negative correlations between fertility and two of the control variables: labor force participation of women age 25-44 and logged GDP per capita.

[7] If these countries are excluded from the analysis, the relationship between total fertility and female labor force participation is positive. Moreover, we note that we use a more age-restrictive measure of female labor force participation than many other studies. Taken together, these considerations suggest that the zero-order correlation we find is not inconsistent with other studies.

Compared to Cluster 2 (the cluster of countries with the most liberal family- and gender-role norms), countries in all other clusters have total fertility rates that are significantly lower. Moreover, the magnitude of the relationship is precisely as we would predict: Cluster 1 countries (the liberal market regimes) have somewhat lower fertility than the Cluster 2 countries, followed by Cluster 3 (the strongly corporatist welfare states), Cluster 4 (Eastern Europe), and Cluster 5 (East Asia). These patterns clearly mirror the strength of rigid family- and gender-role norms.

Model 2 adds in the interaction between young male unemployment and the country clusters. We expected this interaction term to be negative and statistically significant for those country clusters with the most conservative family- and gender-role norms (especially Clusters 3, 4, and 5). The interaction term was negative for all clusters in comparison to the Northern European cluster, but statistically significant only for East Asia (Cluster 5).

Finally, Model 3 includes the interaction between the female labor force participation rate and the country clusters. Relative to the liberal Northern European country cluster, female labor force participation in the prime childrearing ages exerts a downward effect on fertility in other country clusters. The pattern of coefficients is in line with our expectations, as the magnitude of the coefficients increases with the degree of family- and gender-role conservatism of the country cluster. The exception is Cluster 5 (East Asia), where the effect on fertility is not conditioned by the female labor force participation rate. Interestingly, when South Korea is omitted and Cluster 5 represents only Japan, the coefficient is negative and statistically significant. While we expected this result for Cluster 5 itself, it is interesting that the result is indeed produced when the focus is restricted to the country (Japan) that we have argued has the strongest emphasis on intensive mothering.

Conclusion

The second demographic transition provides a rich basis for fertility theorizing that explicitly incorporates a gender perspective (Mason 1997; McDonald 2000; Presser 2001). McDonald's gender equity theory posits that the uneven progress towards gender parity in the home vs. the workplace in many postindustrial societies depresses fertility rates. Following McDonald, we heed the increasing calls among social demographers to build gender norms and roles into theoretical frameworks that address the emergence and persistence of lowest-low fertility across a number of postindustrial societies. We also draw on our country-specific knowledge of two important East Asian cases, Japan and South Korea, to articulate how society's normative expectations of men, especially as breadwinners, operate in concert with women's prescribed roles in the family and the labor market to affect overall fertility.

Our theory of normative rigidity and economic context predicts that advanced industrial countries with conservative family- and gender-role norms tend to exhibit the lowest total fertility rates. Cluster analysis based on attitudinal data from the World Values Survey for 27 OECD countries produced five distinct country clusters spanning Northern Europe to East Asia. We tested our theoretical predictions using pooled country-level data for the period 1990-2008.[8] With the Northern European cluster as the reference group, coefficients for all clusters are negative and statistically significant. Furthermore, the magnitude of the negative coefficients also corresponds to our predictions, as East Asia (with arguably the most conservative family- and gender-role regimes) has the lowest total fertility when country-level characteristics are controlled. Higher unemployment rates for men in the prime family formation ages (25-29) and an employment protection regime that privileges currently-employed full-time workers also depress fertility. The effect of young male unemployment is exacerbated in countries characterized by the most conservative family- and

[8] As mentioned earlier, Iceland was omitted from the multivariate analysis due to the fact that the OECD does not provide a score for Iceland on the employment protection index.

gender-role regimes (Japan and South Korea), as young men in these contexts are particularly unlikely to marry and become parents unless they can foresee with some certainty an ability to fulfill the normatively-prescribed breadwinner role. Similarly, in countries with conservative family- and gender-role ideologies, higher labor force participation rates among women in their prime childrearing years is associated with lower fertility. In these contexts women face strong pressure to raise "high-quality" children while their husbands concentrate primarily on providing economically for the family.

The total fertility rate is a convenient and intuitively appealing outcome measure for use in comparative studies such as the present one. But as a summary measure, it obviously obscures the heterogeneous processes that may produce it in different country contexts. For example, a low total fertility rate in one country may be due to the propensity of couples to have one child. A similarly low total fertility rate in another country may be traceable to higher proportions of childless women on the one hand and higher proportions of two-child couples on the other, or traceable principally to women's decision to delay marriage and childbearing (Shirahase 2000). Recent studies (De Rose and Racioppi 2001) have argued for the use of multilevel analysis (hierarchical linear modeling) in the comparative study of low fertility in order to simultaneously measure the influence of contextual- and individual- or couple-level determinants. Multi-level modeling has yielded important findings in comparative research on the household division of labor (Fuwa 2004; Hook 2006). We view such modeling as a promising methodological strategy in comparative fertility studies. In the larger project of which this paper is a part, we intend to extend the theoretical framework laid out in this paper and employ micro-level data to assess the contextual- and individual-level determinants of fertility outcomes, including the duration between marriage and first birth and the probability of a second birth. Our ultimate goal is to shed further light on how

individual- and couple-level fertility behaviors are conditioned by the larger cultural and economic context, especially in “lowest-low” fertility settings.

Appendix 1. Attitudinal Questions Measuring Family Ideology and Gender-Role Norms

In the cluster analysis we used the six World Values Survey questions we consider indicative of individuals' views regarding *family ideology* and the four questions we consider indicative of individuals' *attitudes toward men's and women's proper roles in the household and the labor market*.

Family ideology:

1. "If someone says a child needs a home with both a father and a mother to grow up happily, would you tend to agree or disagree?"

2. "If a woman wants to have a child as a single parent but she doesn't want to have a stable relationship with a man, do you approve or disapprove?"

3. "Do you think that a woman has to have children in order to be fulfilled or is this not necessary?"

4. "Do you agree or disagree with the following statement: Marriage is an outdated institution."

5. "With which of these two statements do you tend to agree:

> Regardless of what the qualities and faults of one's parents are, one should always love and respect them.
>
> One does not have the duty to respect and love parents who have not earned it by their behavior and attitudes."

6. "Which of the following statements best describes your views about parents' responsibilities to their children?

> Parents' duty is to do their best for their children even at the expense of their own well-being."
>
> Parents have a life of their own and should not be asked to sacrifice their own well-being for the sake of their children.
>
> Neither."

Attitudes toward men's and women's proper roles in the household and the labor market:

"For each of the following statements, do you agree strongly, agree, disagree, or disagree strongly?"

7. “A working mother can establish just as warm and secure a relationship with her children as a mother who does not work.”

8. “Being a housewife is just as fulfilling as working for pay.”

9. “Both the husband and wife should contribute to household income.”

10.“When jobs are scarce, men should have more right to a job than women.”

Appendix 2. Hierarchical Cluster Analysis Results

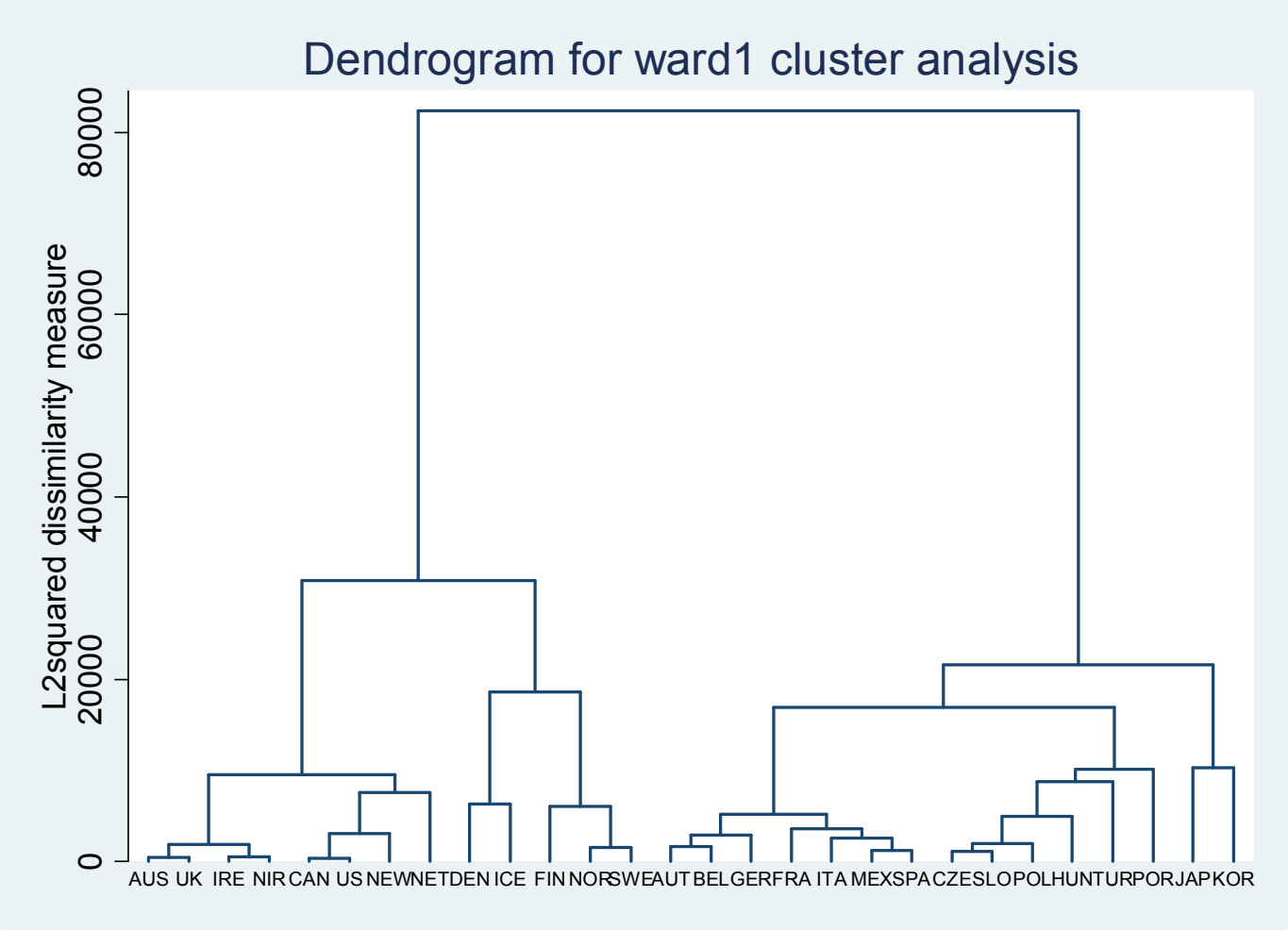

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Table 1. Descriptive Statistics

Variable	Mean	S.D	Min	Max
Total fertility rate	1.70	.39	.94	3.44
Male unemployment rate, age 25-29	8.45	4.25	1.95	25.93
Male youth/prime-age unemployment	2.66	.71	1.09	5.95
Employment protection legislation	2.26	.91	.20	4.55
FLFP, age 25-44	.72	.13	.29	.91
Female tertiary education[a]	55.39	22.18	-.10	105.42
Annual % growth in GDP	2.16	2.80	-14.57	1.30
Logged GDP per capita	9.61	.73	7.94	1.66

[a] See footnote 5 for the measurement of female tertiary education. The minimum value is less than 1.0 for one case (Slovakia) due to our use of multiple imputation to deal with missing data.

Table 2. Pearson Correlation Coefficients

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Total fertility rate	1												
2. Male unemployment rate, age 25-29	-.19*	1											
3. Male youth/prime-age unemployment	-.02	-.14*	1										
4. Emp. protection legislation	-.29*	.06	-.08	1									
5. FLFP, age 25-44	-.46*	-.03	-.09*	.03	1								
6. Female tertiary education	-.15*	-.04	.17*	-.36*	.52*	1							
7. Annual % growth in GDP	-.12*	.02*	-.03	.03	-.08	.08	1						
8. Logged GDP per capita	-.15*	-.26	.00	-.36*	.42*	.59*	-.08	1					
9. Cluster 1	.24*	-.07	-.08	-.70*	.04	.35*	.01	.28*	1				
10. Cluster 2	.08	-.12*	.01	.11*	.39*	.34*	-.03	.39*	-.27*	1			
11. Cluster 3	-.10*	.12*	-.05	.10*	-.13*	-.16*	-.11*	.09*	-.33*	-.30*	1		
12. Cluster 4	-.08	.17*	.00	.46*	-.10*	-.42*	.08	-.81*	-.30*	-.27*	-.33*	1	
13. Cluster 5	-.21*	-.18*	.18*	.04	-.26*	-.13*	.09*	.11*	-.16*	-.14*	-.18*	-.16*	1

*$p<0.05$

Table 3. Prais-Winsten Estimates of Determinants of Total Fertility Rates

	Model 1		Model 2		Model 3	
	beta	S.E	beta	S.E	beta	S.E
Male unemployment rate, age 25-29	-.010**	(.003)	-.005	(.004)	-.011**	(.003)
Male youth/prime-age unemployment	.007	(.016)	.003	(.016)	.006	(.016)
Employment protection legislation	-.082***	(.014)	-.079***	(.013)	-.045***	(.011)
FLFP, age 25-44	-1.423***	(.277)	-1.505***	(.262)	1.053**	(.367)
Female tertiary education	.000	(.001)	.000	(.001)	.000	(.000)
Annual % growth in GDP	-.006	(.003)	-.007*	(.004)	-.005	(.003)
Logged GDP per capita	-.251***	(.062)	-.247***	(.059)	-.361***	(.068)
Cluster 1	-.171***	(.038)	-.118*	(.056)	1.278**	(.478)
Cluster 3	-.414***	(.040)	-.364***	(.080)	1.284***	(.287)
Cluster 4	-.607***	(.074)	-.570***	(.096)	1.509***	(.382)
Cluster 5	-.741***	(.068)	-.525***	(.093)	-.717	(.592)
Unemployment rate*Cluster 1			-.008	(.007)		
Unemployment rate*Cluster 3			-.008	(.009)		
Unemployment rate*Cluster 4			-.006	(.007)		
Unemployment rate*Cluster 5			-.039**	(.014)		
FLFP*Cluster 1					-1.621*	(.642)
FLFP*Cluster 3					-2.044***	(.373)
FLFP*Cluster 4					-2.866***	(.482)
FLFP*Cluster 5					.793	(.931)
Constant	5.776***	(.644)	5.774***	(.610)	4.771***	(.745)
Common rho	.74		.71		.74	
R^2	.72		.72		.73	
N	494		494		494	