Untangling Puzzles: Socioeconomic Development, Gender Equity, and Low Fertility

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Introduction

The interrelations between fertility, socioeconomic development, and gender equity have been ubiquitous in demographic research over the last decade. Research on this front has progressed tremendously, enhacing our knowledge behind the drivers of fertility differentials in low fertiliy countries.

While new empirical findings and theoretical frameworks provide insight into the interrelations between socioeconomic development, gender equity, and low fertility, puzzling exceptions and outliers in these findings call for a more all-encompassing framework to understand the interplay between these processes. After examining three 'puzzles' in the literature, we propose a novel and innovative approach to analyze and understand the interrelations between development, gender equity, and fertility. This approach not only explains historical periods of low fertility but also sheds light on why there exists such large variance in fertility rates among today's developed countries--indeed itself a big puzzle in the field of demography.

Puzzle 1: Early 20th Century Fertility Nadirs and Late-20th Century Fertility Reversals

Our story begins with a look at the past. Most contemporary demographic research focuses on fertility changes that have taken place over the last half of the 20th century to the present. Surprisingly little attention has been given to very low fertiliy rates throughout Europe and the English speaking countries during the first half of the century.

Among "early developers" (e.g., Western European/Northern Europe and English speaking countries that began industrialization in the 19th century), fertility was so low in the early 20th century that such levels have not since been experienced in the majority of these countries. When comparing fertility over time periods with different mortality rates, it is prefered to use the Net Reproduction Rate (NRR) as opposed to the Total Fertility Rate (TFR). An NRR of 1 reflects a fertility level that ensures each generation will exactly replace itself, while an NRR below 1 translates into successively smaller generations and a negative intrinsic population growth rate (Preston et al. 2001). In developed countries today, generational replacement occurs with fertility rate of around 2.08 (i.e., NRR=1 when TFR=2.08), whereas in the same countries a century ago, a fertility rate between 2.5 and 3.5, depending on the country's mortality regime, was necessary to reach generational replacement (Espenshade et al. 2003; Sardon 1991).

Table 1 compares fertility trends for select Western European countries and Figure 1 displays these in graphical form. We chose to compare cohort fertility rates rather than period fertility rates because the former indicates the actual number of children born to a birth cohort of women while the latter is a semi-synthetic measure subject to distortive tempo effects (Bongaarts and Feeney 1998; Sobotka and Lutz 2009). Together, Table 1 and Figure 1 show that fertility nadirs occurred in the early

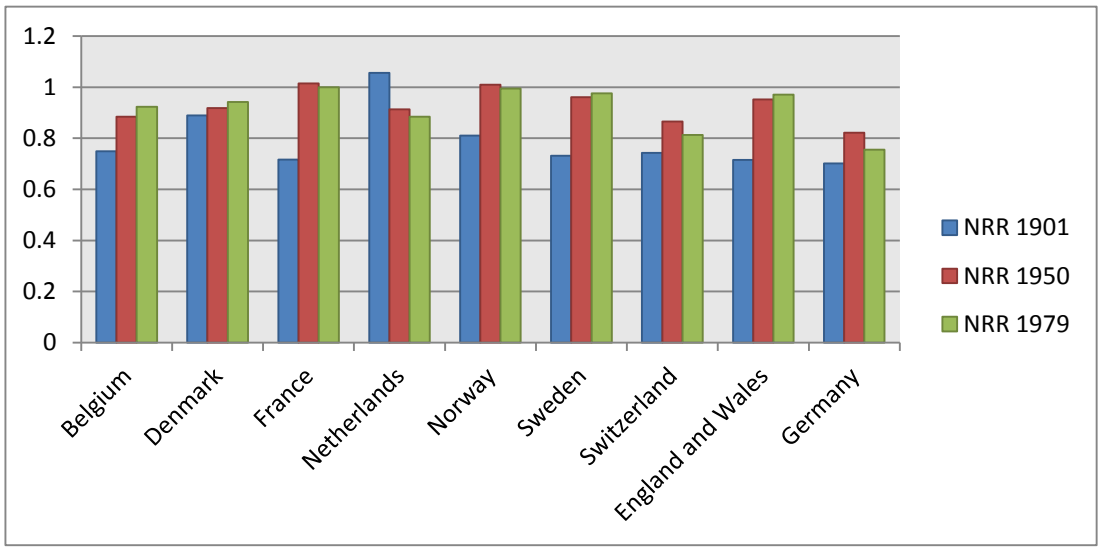
20th century (with the exception of the Netherlands); that fertility has risen, in some cases dramatically, over the latter half of the 20th century; and that the indicator of generational replacement, the NRR, has robustly been much closer to 1 over the latter half of the 20th century than over the first half.

Table 1: Cohort TFRs in European Countries, Early 20th Century and NRR Comparisons

Cohort TFRs in European Countries, Early 20th Century and NRR Comparisons					
Country	*Cohort Year*	*CTFR 1901*	*NRR 1901*	*NRR 1950*	*NRR 1979*
Belgium	1906	2.03	0.749	0.885	0.923
Denmark	1901	2.2	0.89	0.918	0.942
France	1901	2.12	0.717	1.014	1.000
Netherlands	1901	2.86	1.056	0.913	0.885
Norway	1901	2.07	0.81	1.010	0.995
Sweden	1901	1.88	0.732	0.962	0.976
Switzerland	1901	1.99	0.743	0.865	0.813
England and Wales	1901	1.96	0.715	0.952	0.971
Germany	1905	2.12	0.702	0.822	0.755

(Source: Sardon (1991) for early 20th century cohort fertility data and Myrskylä et al. (2012) for late 20th century data [1])

Figure 1: Net Reproduction Rates (NRR) in Select European Countries for Cohorts Born in 1901, 1950, and 1979



While fertility did not reach all-time lows in the US and Australia, a similar story unfolded: fertility took an impressive fall in both countries in the first three decades of the 20th century, and in

[1] Cohorts born in 1979 have not yet finished their childbearing years. We use Myrskylä et al.'s recently published cohort fertility projections.

economically progressive areas, childlessness levels rose to unprecedentedly high levels (approaching 30% in the northeastern US and 25-30% in Australia) (Morgan 1991; Rowland 2007).

While most demographers are aware that fertility was low during the early half of the 20th century in Western Europe, many have written these low fertility rates off as a consequence of economic and political instability during the interbellum period (e.g., Lesthaeghe and Surkyn 2008; Sobotka 2008; Frejka and Sordon 2004). In recent years, however, this claim has been empirically refuted. Van Bavel (2010), for example, argues that low fertility during the interwar period was due to processes now associated with the Second Demographic Transition rather than economic hardships. In initial disbelief to Van Bavels findings, Goldstein (2012) modestly exclaimed that after "torturing the data", he was not able to find any effect of the great depression on fertility rates, and conceded to Van Bavel's argument.

Among the handful of drivers of low early 20th century fertility laid out by Van Bavel was the difficulty women faced to combine work and family—i.e., the "work vs family conflict". Social scientists of the early 20th century like Edin (1932), Myrdal (1941), Tandler (1927), Charles (1934), Darwin (1919), von Ungern-Sternberg (1938), and Wieth-Knudsen (1937), all directly discussed the negative associations between fertility and female educational attainment/labor market participation. In Sweden, a country now championed for its family friendly environment, it was documented that very low fertility was driven partly by female laborers who found it difficult to combine childcare with a career (Van Bavel 2010; Edin 1932). In the United States and Australia, nearly half of female university graduates in the early 20th century remained childless, while the other half reached fertility levels well below replacement (Cookingham 1984; Mackinnon 1993; Holmes 1998). High incidences of childlessness among working women were also documented in England and Wales (Kelsall and Mitchell 1959) and Germany (von Ungern-Sternberg 1938). As Van Bavel and Kok (2010) observe: "for well-educated women in the early twentieth century, to become a mother often meant forfeiting a career."

The first puzzle is identifying what changed regarding the work-family conflict over the latter half of the century to cause fertility to increase.

Puzzle Two: Gender Equity and Fertility

During the outpour of low and lowest-low fertility research, McDonald (2000, p. 427) postulated that very low fertility in advanced countries "is the outcome of a conflict or inconsistency between high levels of gender equity in individual-oriented social institutions and sustained gender inequity in family-oriented social institutions". In other words, where traditional social norms regarding childrearing, household work, and breadwinner roles prevail, women are more likely to view having a family as being at odds with pursuing career aspirations. On the other hand, where familial gender equity is high (i.e., parental work, childrearing, and breadwinner roles are more evenly shared), women are better positioned to pursue both family and career aspirations. Because the so called "family versus work conflict" is necessarily stronger and more pervasive in the less gender equal countries, a sizeable fraction of women in these societies stop childbearing after parity one or remain childlessness (see Kohler et al. 2006).[2]

[2] In fact, many studies have found that *within countries*, couples who share household and child care evenly have a higher liklihood to reach higher order births than those with an uneven distribution of unpaid work (e.g., Cooke 2004 for Germany, Cooke 2003 for Italy, Torr and Short 2004 for the US, and Olah 2003 for Hungary).

Since McDonald's article appeared in the early 2000s, this theory has become widely accepted and empirically supported (Mills 2010; Myrskylä et al. 2011; Myrskylä et al. 2012; Brinton and Lee 2010).

While the relationship between gender equity and fertility is both logically convincing and empirically supported, the literature lacks a compelling theory explaining the heterogeneity in gender equity within the developed world. If gender equity is a requisite for achieving sustainable fertility levels, it is important to understand where gender regimes come from and how and why they change over time. For example, why have Sweden, the United States, and the Netherlands seen impressive advances in gender equity over the last half-century while family norms and high levels of gender inequity have remained stubborn to change in Italy, Japan, and Korea?

Puzzle Three: **High Levels of Development and Fertility—Causation or Correlation?**

In 2009, Myrskylä, Kohler, and Billari challenged, as they call it, "one of the most solidly established and generally accepted empirical regularities in the social sciences"—that is, the negatively associated relationship between fertility and development (Myrskylä et al. 2009). The trio demonstrated that fertility falls with development until countries reach a certain level of "advanced development" (.9 on the Human Development Index), after which fertility declines reverse. Follow-up studies have come to different conclusions regarding the causality of this "j-curve" relationship. Some argue that the correlation is spurious (e.g. Furuoka 2013), while others illustrate that the relationship between high levels of development and fertility decline reversals is contingent on having high levels of gender equity (Myrskyla et al. 2011).

A puzzling component of Myrskyla's j-curve is why lowest-low fertility persists in countries like South Korea and Japan, two countries ranking very high on health, wealth, and education indicators. If low household gender equity explains these outliers, as Myrskyla et al. (2011) argue, what is the relationship between socioeconomic development and gender equity? Why do most "highly advanced" countries above the .9 HDI threshold tend to have high levels of household gender equity but not all?

Recapping our three puzzles:

1) Why did fertility hit all-time lows in many Western/Northern European and English-speaking countries in the early 20th century and subsequently rise over the latter half of the 20th century?
2) What explains the large degree of heterogeneity in familial gender equity in developed countries?
3) Is the relationship between very high levels of development and reversals in fertility declines causal? Why is gender equity prevalent in most highly developed societies but not all?

The Importance of Pace and Onset of Socioeconomic Development: A New Approach

Though perhaps not entirely conspicuous at first glance, the three puzzles we present are in fact deeply connected when one considers the evolution of both socioeconomic development and social, behavioral, and attitudinal norm changes. Much of the attention in the development-fertility literature focuses on *levels* of socioeconomic development, measured usually by the Human Development Index (HDI), GDP, or educational attainment (e.g., Bongaarts and Watkins 1996; Myrskylä et al. 2009; Espenshade et al. 2003). A sorely neglected piece of the puzzle is how the *onset* and *pace of development*

are associated with fertility. Additionally, the literature lacks an explanation on how the pace and onset of socioeconomic development relate to contemporary variation in gender equity among developed countries.

We propose that the pace and onset of socioeconomic development are two crucial elements one must consider to understand gender regimes today. The pace and onset of development also give us insight into explaining fertility variation in the developed world, both indirectly, via the intrinsic relationship between gender regimes and fertility trends, and directly, through various social and economic processes that occur after periods of rapid socioeconomic development.

Before we proceed, it is important to clarify some terms. The "*onset*" of development refers to the period during which development began, while the "*pace*" of development refers to the duration of time it takes (or has taken) for countries to reach advanced levels of development. In this paper, early *developers* (or *early industrializers*) are the set of countries whose industrial revolutions began in the 19th/early 20th century, and whose living standards for the average man increased greatly during this same period; these include **the United Kingdom (UK), France, Sweden, Denmark, Luxembourg, the United States of America (USA), Iceland, Canada, Switzerland, the Netherlands, New Zealand, Belgium, Finland, Norway, Australia, and Austria**. *Late developers* (or *late industrializers*) constitute a group of countries that have experienced overwhelming increases in living standards and development from the mid-20th century onwards. Concentrated largely in Southern Europe, East Asia, and Eastern Europe, second-wave developers include: **Spain, Italy, Portugal, Singapore, Hong Kong, South Korea, Taiwan, Poland, Czech Republic, Bulgaria, and Hungary**.

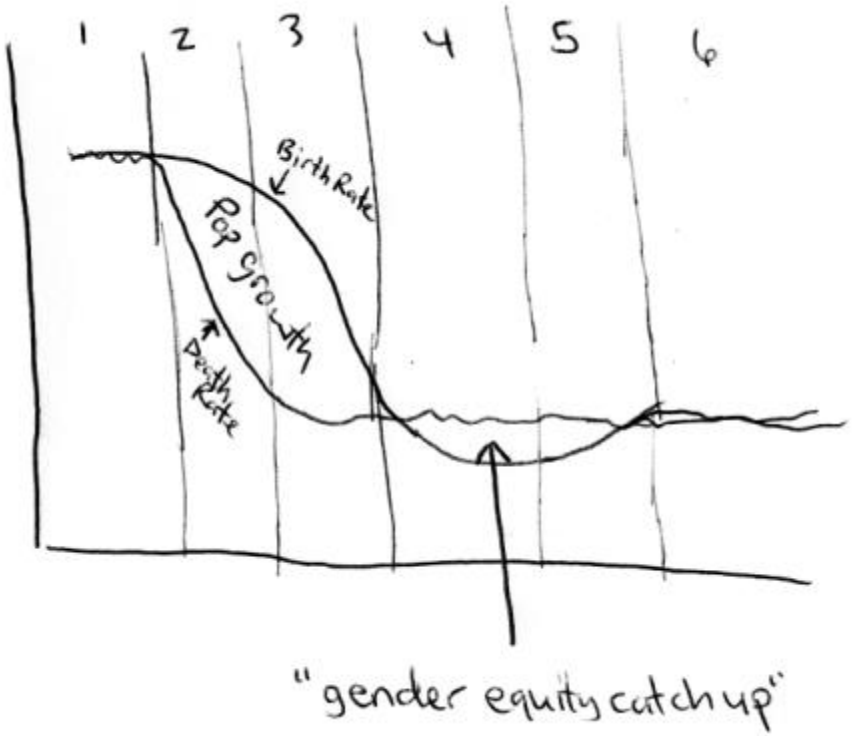
Germany, Italy, and Japan share characteristics with both *early* and *late developers*. On the one hand, these three countries had experienced economic growth and improvements in living standards prior to WWII, and were integral players in the early 20th century global economy. On the other hand, the war-torn and politically fragmented Axis powers all experienced drastic setbacks in living standards during the war (see Scheck 2008; Zamagni 1993; and Dower 2000). These years of hardship were followed by "economic miracles" ("*il miracolo economico*" in Italian, "*Der Wirtschaftswunder*" in German, and "高度経済成長" in Japanese), which set the course for these "post-war re-developers" to quickly improve living standards and regain their foothold as economic powerhouses. Thus, while post-war re-developers historically align with early developers, *they have experienced quick development over the second half of the 20th century*, and as such, share many of the same demographic and social characteristics with other late developers.

The Theory

Drawing on historical and contemporary trends, we postulate that countries hit "fertility nadirs" following periods of quick socioeconomic development. During this period, rapid gains in institutional gender equity are made while family gender equity lags (in other words, women's access to education and employment increases while family/household norms remain unchanged). This period of incongruent gender equity leads to a "family-work conflict" for career-oriented women. As a result, a period of low fertility persists—often decades long—during which family gender equity (also called "household gender equity") begins to change. These changes are facilitated by optimal social, demographic, and economic factors which, similar to the demographic dividend in relation to economic development, open a window of opportunity for advances in household gender equity. Institutional responses to the "family-work" conflict often accompany and reinforce these changes.

Our theoretical framework can be directly incorporated as part of the demographic transition (see Figure 2). In Phase 4, fertility bottoms out to all-time low levels, in part due to a clash between *traditional* family gender equity and *modern* institutional gender equity. Over time, family gender equity "catches up" to institutional gender equity as a consequence of institutional, demographic, societal, cultural, and economic changes, effectively weakening the work-family conflict and, as a result of a weaker work-family conflict, leading to increases in fertility. If one were to place developed countries in the transition in Figure 2, Western/Northern European and English-speaking countries, the forerunners of the demographic transition and industrialization, would fall roughly in Phase 5. Southern Europe and East Asian countries, most of whom began industrialization in the 20th century, would fall in Phase 4 of the transition.

Figure 2: Extended Demographic Transition



From a historical perspective, our theory holds up quite well. In the early 20th century following periods of rapid development, a "work-family conflict" and clash between institutional and family-oriented gender equity persisted for a period in Western Europe, Northern Europe, and the English speaking countries, serving as a contributing factor to the then-very low fertility rates (think "Puzzle 1"). During prolonged periods of low fertility, gender norms began changing in an equitable direction and institutional responses weakened the "work-family conflict", leading to an upward march of fertility from previously lowest levels. In many "early industrializers", we have witnessed recent increases in both period and cohort fertility (Goldstein et al. 2009; Myrskyla et al. 2013), and declines in childlessness levels. Furthermore, recent cohort fertility projections indicate a high likelihood of further completed (cohort) fertility increases (Myrskyla et al. 2012).

Examining current trends in "late industrializers" (concentrated primarily in Southern Europe, East Asia, and to an arguable extent, Eastern Europe), we quickly see that the same series of events are unfolding as they did among "early industrializers": traditional gender norms regarding housework and parenting roles persist, leaving incongruently low levels of family-oriented gender equity and high levels of institutional gender equity; the work-family conflict, which stems largely from these conflicting realms of gender equity, is exacerbated by weak institutional support for childbearing; and as a result, fertility remains at very low levels. Of today's industrialized countries, fertility *and* gender equity are lowest in countries that have developed considerably over the last 50 years; among those countries that began industrialization in the 19th century, fertility ranges from moderately low to the replacement level, and household gender norms are much more equitable between the sexes.

In what follows, we attempt to bridge fragmented research on the interrelations between socioeconomic development, gender equity, and fertility. Furthermore, we offer a new theoretical approach to understanding these interrelations and support this approach with empirical results.

Gender Equity, Cultural Lag Theory, and Development

As touched on earlier in this paper, the link between high household gender equity and moderately high fertility in developed countries has become widely accepted in the fertility literature. Studies using both micro and macro level data bolster McDonald's theory: in the context of a 'developed' society, fertility remains very low so long as an incongruity between low household gender equity and high institutional gender equity exists. The theory, however, does not explain 1) why some developed countries have low household gender equity, and 2) why some developed countries have seen great advances in gender norm changes while others have not.

Why Low Gender Equity?

A particularly fitting sociological theory to explain the incongruities between household gender equity and institutional gender equity in compressed and long developers is that of the "culture lag". Ogburn (1922) observed that after material conditions change in a society, a "maladjustment" period occurs during which the individuals in that society fail to synchronize behavior and attitudes to the new material change. Ogburn (1922, p. 200) argued that "the extent of this [culture] lag will vary according to the nature of the cultural material, but may exist for a considerable number of years."

The two realms of gender equity in McDonald's framework—institutional-oriented gender equity and family-oriented gender equity--fit nicely within the context of cultural lag theory. Within the realm of institutional gender equity, political forces (e.g., suffrage movements) and economic forces are largely responsible for the rise in female labor force participation. Swift advances in the educational and occupational standing of women can be viewed as, in the words of Ogburn, changes in *material conditions*.

The lagging behavioral and attitudinal adjustments following changes in the institutional status of women are found in the realm of the household. Household gender equity lags institutional gender equity because the mechanisms of change are not material (economic or political forces), but rather behavioral concessions by individual spouses to take on more household responsibilities and create a more equitable home environment. We are not the first to draw this conclusion. In fact, the linkage between the political

and economic empowerment of women and their lagging status in the family can be traced as far back as Woodard (1933).

If we contextualize changes in institutional gender equity as material changes and changes in household gender equity as non-material changes, late developers (who experienced institutional gender equity changes later than early developers) must necessarily have lower household gender equity.[3]

Mechanisms of Household Gender Equity Change

Although cultural lag theory explains why incongruities between household and institutional gender equity exist in a society, it fails to explain the mechanisms through which household gender equity "catches up" to institutional gender equity.

Mechanism of Change 1: Female Labor Force Participation and Intergenerational Norm Transfer

A large body of literature suggests that greater female labor force participation directly leads to a reshaping of gender norms. "Wherever married women worked", Chafe (1976, p. 21) describes, "husbands performed more household chores, and that power within the family was shared to a greater extent between the man and woman."

A multitude of studies have found that, compared to children with a working father and at-home mother, children of dual-earner parents are more likely to possess egalitarian views toward gender roles, less likely to hold rigid stereotypes about "masculine" and "feminine" traits, and less likely to grow up with the expectation that the home is a woman's "place" (Gershuny et al. 2005; Moore and Sawhill 1976; Hoffman 1960; Heer 1958; Chafe 1976; Gilbert and Dancer 1992). Additionally, Thornton et al. (1983) find evidence that parental attitudes toward sex-roles play a critical role in shaping the attitudes of children. Lastly, in an influential study by Broverman et al. (1972, p. 73-74), the authors conclude that:

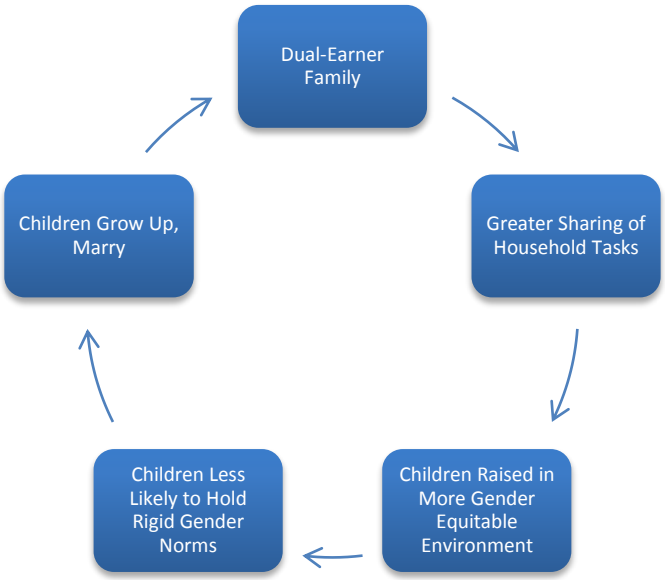
> [M]aternal employment status appears to be central to the role differentiation that occurs between parents. If the father is employed outside the home while the mother remains a full-time homemaker, the roles tend to be clearly polarized for the child. But if both parents are employed outside the house, their roles are more likely to be perceived as similar—not only because the mother is employed, but also because the father is more likely to share childrearing and other family-related activities.

These findings imply that shifts in gender norms and sex-roles occur *intergenerationally*: Parents in dual-earner families share household chores more evenly, which results in their kids holding greater egalitarian gender values. When these children age and enter in cohabiting/marital unions, they too will be more likely to accept greater household gender equity. As Moore and Sawhill (1976, p. 116) suggest, "in the past, attitudes and experiences tended to reinforce one another to create a kind of cumulative inertia, but once the system has been perturbed, any return to the previous status quo is quite

[3] REVISE THIS Cultural factors may partially explain why certain gender regimes exist today (e.g., Hajnal 1965; Alesina et al. 2011), though as we will discuss in more depth in, empirical evidence supports the notion that household gender equity has indeed evolved and that a strong "work-family conflict" was present in some of today's most gender equitable societies (e.g., Scandinavian).

unlikely…what these findings imply, of course, is that new experiences tend to generate new attitudes which may significantly influence the sex role behavior of the next generation of adults". The following flow-chart highlights this process:

Figure 3: Intergenerational Gender Equity Flow-Chart



Mechanism of Change 2: Institutional Reform

In many countries, public policy has been a contributing factor in influencing gender equity. Policies do not necessarily aim to increase household gender equity, but indirectly do so by alleviating cumbersome tasks which largely fall on women, such as child-care (Ronsen and Skrede 2008). Family-friendly policies are not only hailed for supporting working mothers and encouraging dual earner couples, but also for influencing the broader cultural and social environment (Ronsen and Skrede 2008).

Within Western and Northern Europe, there is a wide spectrum of family-friendly policies. These range from generous parental leave with high benefits and widespread childcare availability in the Nordic countries to a variety of childcare allowances and childcare options in France and Belgium (Neyer 2006; Ronsen and Skrede 2010; Letablier 2003). The Netherlands, Ireland, and Great Britain often have parental benefits provided through collective or contractual agreements, and provide childcare through public and private institutions either through publicly subsidized employer-arranged care (the Netherlands) or "working-family tax credits" (Great Britain) (Neyer 2006).

Family policies in English-speaking countries—especially in the United States—remain unquestionably less developed compared to those in Northern/Western Europe (McDonald and Moyle 2010). Yet English-speaking economies have evolved in such a way that the Anglo economic model partly compensates for lacking family-friendly policies. Characteristic to the Anglo model is market flexibility and high amounts of part-time work (Adsera 2004; Letablier et al. 2009; Lewis and Campbell

2007), easy re-entry in the labor market after childbearing (Letablier et al. 2009), as well as easy availability to make private childcare arrangements (Lueck et al. 1982). [4]

The scale and scope of policies affecting gender equity and the work-family conflict are too large to discuss in depth in this paper. For a more depth and cross-national trends, see McDonald (2002), Gauthier and Philipov (2008), Neyer and Andersson (2008), Sleebos (2003), and Neyer (2006).

Mechanism of Change 3: Gender Gain Window of Opportunity

The "demographic dividend" refers to a period during which a country's age structure provides infrastructure for economic growth (Bloom et al. 2003). According to this theory, a bulge of the working age cohorts allows for high productivity while smaller older and younger cohorts minimize dependency ratios. No one argues that the "demographic dividend" is a primary driver of economic development, but rather, that this unique age structure "greases the wheels" for socioeconomic development. Paralleling this logic, there is a strong argument to be made that a favorable population age structure facilitates advances in gender equity.

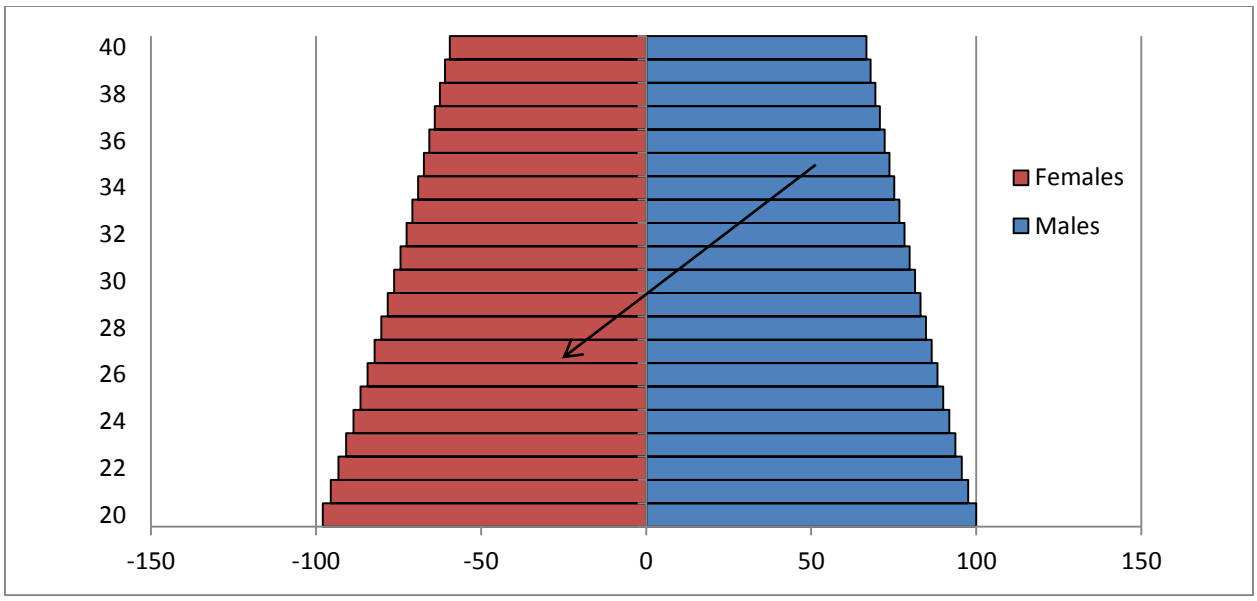
A marriage squeeze occurs when eligible females outnumber eligible males or vice-versa (Schoen 1983). Though typically discussed as a phenomenon in the African American community, a marriage squeeze can also occur on any population level. Theoretically, when the supply of females is greater than that of males, females experience greater competition in the marriage market amongst themselves and lose bargaining power in potential marriages (Angrist 2002). After all, a man who wishes to marry a "traditional" or homemaker wife has better chances to do so when he has more women from which to choose. The opposite should hold true when males are in a marriage squeeze: they face greater competition in the marriage market and therefore, to land a wife, must be willing to "pay a higher price" for a potential spouse (Ibid.). Consider the following two scenarios of marriage squeezes.

Scenario 1

Imagine a population closed to migration in which the NRR for time *t*-40 to *t*-20 is 1.0202, yielding an annual intrinsic growth rate of 2% during this period (Figure 4). Because men marry, on average, at older ages than women (Heer and Grossbard-Shechtman 1981; Angrist 2002), the growing marriage market in this population (ages 20-40) makes it advantageous for older men to search for younger women, as the supply of younger female cohorts is greater than that of older male cohorts.

[4] Labor statistics of married women with children from 1960-1990 illustrate that women in the United States have increasingly found ways to manage both a job and family life. A solid indicator of this is the percentage of working mothers with children under three, which rose from 15 to 32 percent from 1959 to 1975 (Chafe 1976), and finally to 56 percent in 1990 (Census 2012)

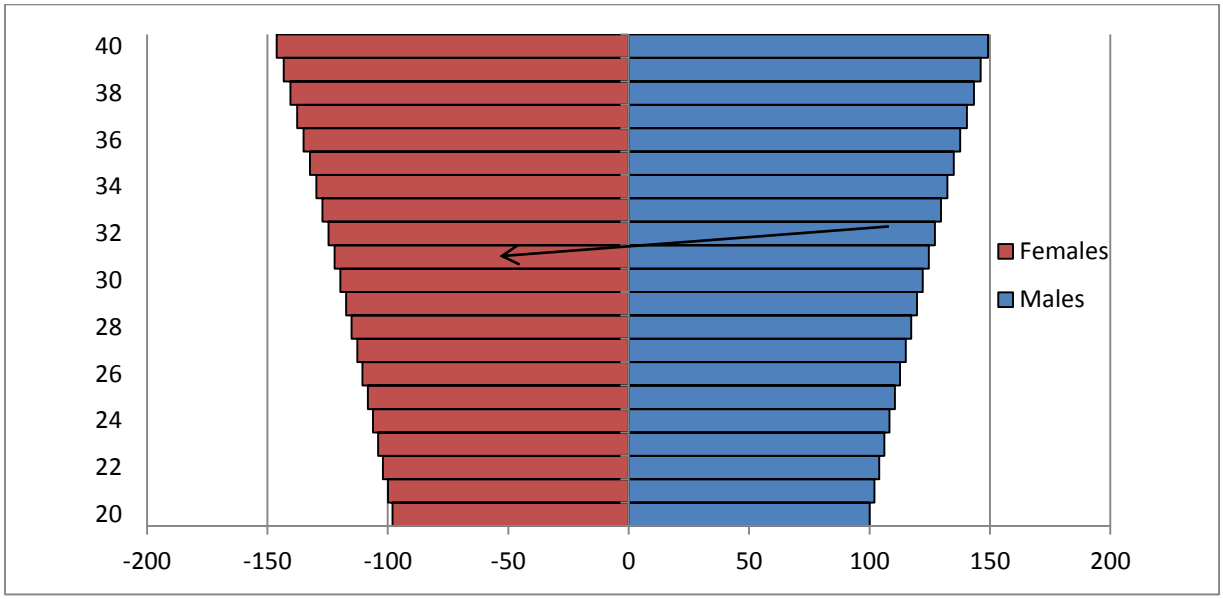
Figure 4: Marriage Market 1 where NRR>1



Scenario 2

Now imagine the reverse scenario: a population closed to migration has an annual NRR of .9802 during time *t*-40 to *t*-20 and an intrinsic growth rate of -2%, rendering each successive birth cohort smaller than the previous, like in Figure 5. Assuming women do not marry younger men, females in each birth cohort have a larger supply of men from which to choose.

Figure 5: Marriage Market 2 where NRR<1



There is an argument to be made that sub-replacement fertility in the early 20th century (i.e., NRRs<1) played a role in advancing gender equity during the mid to late half of the century in early

industrializers. Low fertility in the early 20th century engendered age structures in the mid-century which largely resembled scenario 2: cohorts of older males outnumbered younger cohorts of females. These age structures coincided during a period of rising female labor force participation as well as an emergence of quantifiable household gender norm changes (see next section on "Unpaid Work Changes").

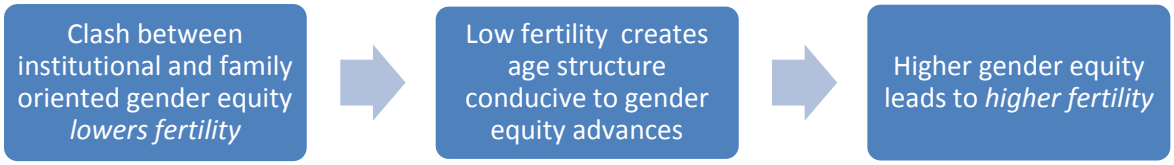
There has been a fragmented discussion in the literature that population age structures exerted catalytic pressure on gender norms in early developers. In Sweden, for example, Kabeer (2008) and Florin and Nilsson (1999) argue that sustained low fertility throughout the early 20th century and rapid economic growth led to labor shortages in the 1960s. Kabeer (2008, p. 249) asserts that the small nation of about 7.5 million had "a choice between encouraging immigration or persuading [more] women to increase their labor force participation". Gender advocates, backed by Sweden's strong labor unions, supported the latter position, prompting political parties to incorporate the ideals of gender equity in their platforms (Sandqvist 1992; Florin and Nilsson 1999; Kabeer 2008). "Getting mom a job and making dad pregnant", as put by one young parliamentarian in the 1970s, encapsulates the direction in which Swedish society wished to move (Klinth 2002). A string of policies and initiatives were to follow in order to get men and fathers more involved in family life and women more involved in the labor market (Nagy 2008; Klinth 2008).

A similar story unfolded in the United States. Decades of low immigration due to the restrictive "Johnson-Reed Act" combined with low levels of fertility from the 20s through early 1940s gave rise to a marriage squeeze for men—that is, an age structure favorable to women in the marriage market. Heer and Grossbard-Shechtman (1981, p. 62) contend that "the marriage squeeze [of the 1950s and 60s] was instrumental in reducing not only the proportion of females who could marry but also the compensation which men were obliged to give women for traditional wifely and maternal duties".

The following Figure (6) displays age structures of selected early developers in 1960. Note that each early developer, to varying degrees, is characterized by a marriage squeeze for men during this period while late developers of Southern Europe and East Asia show nothing of the kind.

Figure 6: Age Structures for Selected Early and Late Industrializers, 1960.

The following flow-chart highlights a simplified interplay between gender equity and fertility.



While we believe these three mechanisms of gender equity change are significant agents of gender equity change, there is no claim that they are the sole drivers. Social change is a complex and multifaceted phenomenon which is often times difficult to explain, much less quantify. Future research should focus not only on measuring gender equity change, but also seek to explain why it is occurring.

So far, we have covered *why* household gender equity lags institutional gender equity (cultural lag theory) and *how* the mechanisms through which changes in household gender equity occur (intergenerationally, institutionally, and demographically mechanisms). The next section presents empirical evidence for *when and where* household gender equity change has taken place.

Evidence of Gender Equity Advances in Early Industrializers: Unpaid Work Changes

The advances in family gender equity made in early industrializers over the second half of the 20th century up to today can be measured by a variety of indicators, including labor statistics (e.g., the share of working mothers with children), attitudinal views on gender roles, or the division of household tasks between men and women. While all are valid indicators, we discuss the division of household tasks between spouses given the rich literature and data availability of unpaid work differentials for a number of countries.

In 1988, Gershuny and Robinson noted a historical change in the household division of labor. Using time-budget surveys for the UK and the US, the authors showed that women's participation in household work declined substantially from the 1960s to 1980s, while men's participation increased (though remained much less than that of women) (Gershuny and Robinson 1988). Their findings closely paralleled similar findings for Canada, Holland, Denmark, and Norway, indicating progress in household gender equity.

Nearly 12 years later, Bianchi et al. (2000) found the trend toward household gender equity had continued so much so that household work had nearly been cut in half for women in the US since 1965, and doubled for men during this period. An international comparison of unpaid work trends by Hook (2006) revealed similarly optimistic results: over-time increases in unpaid work by men in Australia, Canada, France, Germany, the Netherlands, Norway, and the UK. Other more recent isolated findings have found similar longitudinal advances in household gender equity throughout Western countries (e.g., Sullivan 2006; Bianchi et al. 2006; Coltrane 2004). Lastly, a comparison of OECD countries shows that by and large, Northern/Western European and English-speaking countries have the smallest gap in the number of minutes women and men perform in unpaid work, while East Asian and Southern/Eastern European countries have the largest (OECD 2011).

Let us be clear. Inequalities *do* exist with regards to both the "quality" and "quantity" of household labor in "early developers". Women continue to bear most of the burden in the number of minutes spent on household labor, and the type of unpaid work performed by each sex varies (with men taking on more "masculine" tasks like yard work and home repair, and women more "feminine" tasks like cooking and cleaning) (Bianchi et al. 2006; England 2010; Lachance-Grzela and Bouchard 2010). Yet while inequalities in the division of household labor persist, it is impressive how much these disparities have shrunk over such a short time horizon. As Sullivan and Gurion (2008) optimistically describe, "men and women may not be fully equal yet, but the rules of the game have been profoundly and irreversibly changed…[a]ll these trends are likely to continue for the foreseeable future."

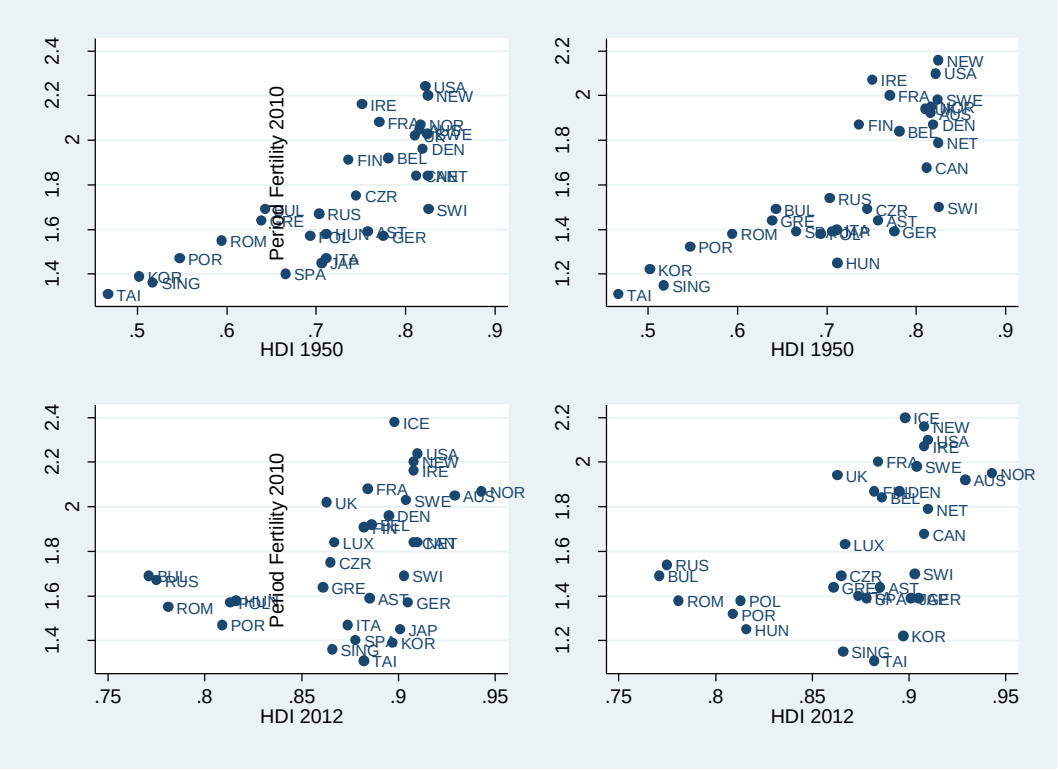
Lowest-Low and Very Low Fertility Countries

We hypothesize that the prevailing traditionalism regarding family norms, sex roles, and gender equity in Southern/Eastern Europe and East Asia is partly attributable to the fact that the **onset** of

socioeconomic development occurred much later than the "early industrializers", and that the **pace** of development occurred at such a rate that household gender equity still severely lags institutional gender equity. Given the close connection between low gender equity and low fertility, the fast pace and late onset of development contribute to late industrializers' low fertility rates via low gender equity.

HDI figures for 1950 plotted against 2010 period fertility and completed fertility for the 1979 cohort lend support to our hypothesis: the most developed countries in the mid 20th century—all "early industrializers"—have, on average, substantially higher fertility than the late industrializers. Among developed countries, HDI figures (an orthodox measure of socioeconomic development) for 2012 explain only about 18% of completed cohort fertility variation (for the 1979 birth cohort) and 22% of 2010 period fertility variation (see Figure 7) Remarkably, HDI estimates for the same countries in 1950 are much better predictors of today's fertility trends, explaining about 60% of current variation in both period and cohort fertility. While the graphs say nothing about family policies, gender equity, or labor market flexibility, the historical HDI figures suggest that the pace, and perhaps more importantly, the onset of development, are much more explanatory of current fertility trends than present-day development levels.

Figure 7: Top Left-Cohort Fertility (1979)[5] on HDI 1950[6]; Top Right-Period Fertility (2010) on HDI 1950; Bottom Left-Cohort Fertility (1979) on HDI 2012; Bottom Right-Period Fertility (2010) on HDI 2012



[5] 1979 Cohort Fertility values from Myrskyla et al. (2012)
[6] 1950 HDI estimates from Crafts (2002)

While the gap between institutional and family oriented gender equity remains large in late developers, there is evidence that some in these category are entering an incipient stage of cultural and social changes regarding gender norms and family values. For instance, Rindfuss et al. (2004, p. 843) make a compelling case that "major changes in Japan have converged to create conditions favorable for dramatic family change". Their conclusion stems from mounting tensions between traditional family expectations and changes in the labor market, educational system, consumer preferences, and women's desires for greater gender equity in marriage. Similar findings of the breakdown of strong familism have been observed in Italy (Rosina and Fraboni 2004) and Spain (Scott 2006). Just as "late industrializers" followed "early industrializers" in socioeconomic development, the former may well be following in the footsteps of the latter and be on the cusp of entering a similar epoch of greater household gender equity.

Addressing The J-Curve Puzzle (Puzzle 3):

Throughout this paper, we have focused largely on disentangling the first two puzzles we posed regarding 1) all-time fertility lows in the early 20th century and 2) gender equity heterogeneity and gender equity change in developed countries. The discussion that followed now helps us explicitly tackle our third puzzle: 3) "Is the relationship between very high levels of development and reversals in fertility declines causal? Why is gender equity prevalent in most highly developed societies but not all?"

As stated, Myrskylä, Kohler, Billari's fertility-development j-curve relationship argues that countries experience fertility decline reversals after surpassing a certain threshold of development (Myrskylä et al. 2009). While we do tend to see a reversal in fertility declines at advanced levels of development, small changes in development *per se* are not driving these changes. Relatively high fertility (as well as "fertility decline reversals") is prevalent in countries that began developing in the 19th century (e.g., Norway, the USA, the Netherlands, Australia, Sweden, etc.). As argued in this paper, thanks to greater gender equity, the causal mechanisms of very low fertility have begun to diminish in early industrializers, in part, because it has become less cumbersome (especially for women) to balance a work and family life. Because these countries had a head-start to development, they find themselves occupying the top spots of development indices. Nevertheless, their relatively high fertility and "fertility decline reversals" are not due to simply achieving a certain threshold of development, but rather due to having evolved into a society in which traditional norms no longer clash as hard with the facets and demands of modernity. While they have quickly caught up in literacy, life expectancy, and wealth over the last 50 years, late industrializers with comparable HDI levels as long developers (e.g., Japan, South Korea, and Hong Kong) serve as outliers to the j-curve fertility-development relationship, in part because persisting low gender equity drives fertility to very low levels.[7] Thus, even if the East Asian or Southern/Eastern European countries were able to reach HDI levels near 1, it would be unlikely that fertility would rebound to higher levels without changes in gender regimes, institutional structures, and social norms. The three mechanisms through which gender norms change rely on one important ingredient: time. Late developers have simply not had enough time for household oriented gender equity to catch up to institutional oriented gender equity.

[7] Other contributing factors to East Asia's ultra-low fertility rates, such as a stronger "quality-quantity" tradeoff have also been tied to the region's fast pace development story (Anderson and Kohler 2013).

Conclusion

Our contribution sheds light on the interrelations between three puzzles in the fertility literature: 1) why fertility has risen in some developed countries from all-time low levels in the early 20th century, 2) why gender equity varies within the developed world and how gender equity changes over time, and 3) why some highly developed countries remain outliers in the "j-curve" fertility-development relationship.

We argue that the pace and onset of development are two important factors to be considered when analyzing gender norms and fertility. While institutional norms regarding the place of women in education and the job market often accompany or timely precede economic development, behavioral and normative changes regarding gender roles lag sluggishly behind. During this lag, the so-called "work vs family conflict" arises during which fertility falls below replacement. Over time, a favorable demographic age structure, in tandem with intergenerational changes in gender roles and family norms and institutional responses to the "work-family conflict", bring about positive changes in household gender equity. These changes weaken the work vs family conflict and have a positive effect on fertility.

We began this article with a look at the past and feel it is appropriate to conclude with a speculative look at what our argument could imply for the future. Should our theory hold up, fertility will nudge closer to the replacement rate in the today's "developed world" as the gap between incoherent "institutional" and "family" oriented gender equity continues to close. Conversely, today's swiftly developing countries (including China, India, and Brazil, where nearly 3 of the world's 7 billion citizens live) could well enter periods of very low fertility should a similar evolution of incongruent realms of gender equity take place.

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