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Labor Force Participation, Family Policy Change, and Second Birth Rates in South Korea

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Abstract: In recent decades, while female labor force participation rates in South Korea have increased, the country's fertility rates have dramatically declined. It has been argued that the country's family planning program, which was first implemented in 1962, initiated the fertility plunge. This study explores the association between women's labor force participation and second birth rates in South Korea. It also examines how the South Korean family planning program (among other factors) contributed to this relationship. By applying an event history analysis to longitudinal data from the Korea Labor and Income Panel Study (KLIPS), the study shows that second birth rates declined continuously through the 1980s. The trend began to reverse in the late 1980s, although the reversal was only temporary, and second birth rates had shifted downward again by the turn of the new century. Women with employment experience after first birth had significantly lower second birth rates than homemakers, which suggests that labor force participation after first birth signals an interruption in a woman's reproductive career. The adjustment of the family planning program in 1989 seems to have temporarily stimulated the second birth rates of homemakers in particular.

Keywords

Female labor force participation, family planning program, second births, South Korea

Introduction

Beginning in the 1960s, women's labor force participation rates have increased worldwide. Increases in women's education, women's growing preferences for non-domestic roles, men's gradual acknowledgement of women's employment, and growth in occupations that are frequently attractive to women are some of the myriad factors that have fostered this development (England and Farkas, 1986). Over the same period, fertility has declined in many parts of the world. In the 1960s and the 1970s, the Total Fertility Rates (TFRs) of many OECD countries dropped below replacement level. Against this background, female labor force participation in South Korea (hereafter referred to as Korea) has increased modestly. However, the country's fertility decline has been sharp. Korea's TFR was approximately six children per woman in 1960. By 2001, this value had decreased to 1.30, and Korea became one of the lowest low-fertility countries in the world. It has been argued that Korea's family planning program, which was initiated in 1962, stimulated this fertility plunge (Choe and Retherford, 2009).

Previous studies have addressed fertility development in Korea (Kye, 2008; Choe and Retherford, 2009; Anderson and Kohler, 2013; Ma, 2013a). For example, Choe and Retherford (2009) present the development of parity progression ratios over the 1960-2007 period. Kye (2008) examines the role of educational expansion in first marriage and first birth behavior. Ma (2013a) demonstrates the relationship between women's employment and entry into motherhood. Thus far, however, the relationship between Korean women's labor force participation and their likelihood of continued childbearing remains under-studied. We have little knowledge about whether women's labor force participation depresses or enhances the probability that they will have more than one child. How did the development of Korea's family planning program contribute to this relationship? What are the roles of social policies with respect to reconciling women's work and family responsibilities? The present paper addresses these issues from an individual-level perspective by considering the role of individual factors, such as demographic and background characteristics, in addition to the role of the spouse's socio-economic status in explaining second birth behavior in Korea.

This study makes the following contributions to social science research. First, although numerous studies worldwide have focused on higher-order childbearing, relevant knowledge in this field regarding East Asian countries in particular is limited. This study addresses this literature gap by investigating Korea. Second, Korea has experienced profound socio-economic and demographic change over the past five decades. During this period, women have become increasingly well educated and more active in the labor force. Previous research has shown that women's employment stability propels entry into motherhood in Korea (Ma, 2013a). The present study enriches our understanding of the employment-fertility relationship by examining the association between employment and continued childbearing. Third, it has been argued that Korea's family planning program was the main driving force behind Korea's fertility decline. However, how the implementation, adjustment and abolishment of this program affected higher-order births has not been addressed at the individual level. Finally, Korea belongs to the group of East Asian developed societies in which welfare systems mainly rely on family principles. Thus, the current findings regarding how Korean women juggle work and family life are likely to resemble situations in other East Asian countries that have a similar welfare context.

The paper begins with a brief review of the relevant research on continued childbearing. A detailed account of Korea's socio-economic context follows. The data, method, and findings are presented in the empirical section. The paper concludes with a summary of the findings and a discussion of the policy implications.

Relevant research on continued childbearing

A large body of research, most of it conducted in Europe and the US, has focused on women's continued childbearing after becoming a mother. Women's education, women's labor force participation, family-related social policies, and economic (un-)certainty have been the most widely studied factors in relation to fertility.

Education and continued childbearing

According to economic theories of opportunity costs, women suffer a loss of earnings when they take a break from the labor force for childbearing and childrearing (Becker's 1981). In addition, well-educated women suffer higher opportunity costs. To minimize this loss, women with high earning potential, such as the well-educated, tend to postpone or even forgo childbearing. Upon becoming a mother, the well-educated may concentrate their births over a short period of time to be able to resume their professional career as soon as possible after attaining their desired family size (Brewster and Rindfuss, 2000).

Evidence from Scandinavia shows that well-educated women tend to postpone childbearing. However, after the first child, such women frequently "catch up" in their fertility. They proceed more quickly to second births than less-educated women (Hoem and Hoem, 1989; Kravdal, 1992a; Kravdal, 2001; Kreyenfeld, 2002; Oláh, 2003). In Sweden, "power couples" (in which both members of the couple are highly educated) have higher second birth fertility than other couples because they can combine their careers and continued childbearing (Dribe and Stanfors, 2010). Consistent with these findings, the positive effect of education on continued childbearing is also evident in the United Kingdom and Italy (Baizán, 2007). By contrast, a negative effect of education on continued childbearing is observed in Russia, where low-educated women have higher second birth transition rates than other women (Billingsley, 2011). In Austria, a woman's educational level has little influence on her second- and third-birth intensity; instead, the education of her partner plays an important role (Hoem et al., 2001; Prskawetz and Zagaglia, 2005).

Labor force participation and continued childbearing

It is well documented that women's employment is closely linked with their likelihood of proceeding to higher-order births. In a study of 12 European countries, Adsera (2011) finds that both unemployed women and women who hold unstable jobs tend to postpone second births. In addition, second birth delays are significant in countries with high unemployment.

Resuming employment after entry into motherhood is one of many important transitions in a woman's life course. Women who undergo this transition must master juggling the acts of daily life and balance work and family life. A woman may be less willing to have another child when she is intensively involved in her employment. Employed mothers in southern Europe have lower fertility rates than housewives. The conventional model of men's employment combined with housewifery is related to higher second and higher-order births (Baizán, 2007). Similarly, evidence from Austria shows that working mothers are less likely to proceed to second and third births than mothers who stay at home (Hoem et al., 2001; Parskawetz and Zagaglia, 2005). Hoem and Hoem (1989) find that both second- and third-birth rates of housewives in the 1960s and 1970s exceeded those of women in the labor force in Sweden. These authors argue that a woman's choice of employment when she has a small child reflects her role orientation. Her employment history after the first birth indicates her position on a scale that separates those who are more family-oriented from those who are more job-oriented. Baizán (2007) also posits that women who follow the conventional model by leaving the labor market near their first birth, or even before their first birth, may be a select group that has particularly low labor market attachment and/or low labor market prospects; thus, parenthood and the role of housewife may be particularly attractive to these women.

It has been noted that the characteristics of women's jobs after childbirth do not appear to impact their higher-order birth rates substantially. For example, in an investigation of women in Sweden who were involved in the labor force after their first birth, Hoem and Hoem (1989) reveal that full-time workers have slightly higher higher-order birth intensities than part-timers; however, the difference was small and was not significant. The total time spent in the labor force similarly did not have a significant association with the likelihood that working women would have another child. The weak role of cumulative labor force participation during motherhood has also been found to characterize Great Britain (Wright et al., 1988). In Norway, Kravdal (1992b) finds that labor force participation has no significant impact on third-birth fertility among two-child mothers. Women who appear to be firmly attached to the labor market in the Nordic context do not necessarily have lower fertility rates than those who are less attached.

Social policies and continued childbearing

Knowledge of the design of social policies in different contexts may help improve our understanding of the association between labor force participation and continued childbearing. In general, relatively high fertility may appear in countries in which social policies mitigate women's work-life role conflict. In countries that encourage traditional gender roles and in which women are forced to decide between employment and family life, low fertility is more likely to occur (Brewster and Rindfuss, 2000). When women must choose between work and family, both low fertility and low female labor force participation are prevalent (OECD, 2007a).

The present research suggests that social policies that facilitate women's ability to reconcile work and family life impact fertility. In Europe, the countries with relatively high fertility rates are mostly located in Scandinavia and in Western Europe. In France, family life has been a public policy issue for decades. By shifting their objectives from alleviating the cost of having children to helping support the reconciliation of work and family life, French family policies have helped maintain the country's relatively high fertility rates (Letablier, 2003). Van Bavel and Różńanska-Putek (2010) note that France's generous family policies promote third-order births and potentially stimulate second births. In the Nordic countries with universalistic welfare regimes, social policies support women's labor force participation and promote gender equality. The effects of the opportunity to work flexible hours, paternal uptake of parental leave, and the availability of a public childcare system facilitate not only women's labor market involvement but also their fertility (Andersson *et al.*, 2004; Duvander and Andersson, 2006; Duvander *et al.*, 2010). The facilitating effect of childcare services on fertility has also been observed in Switzerland and other European countries (Bonoli, 2008; Van Bavel and Różńanska-Putek, 2010).

By contrast, low fertility rates characterize those countries that encourage a traditional gendered division of work and care (e.g., Germany and Italy) and in which the governments offer less policy support to allow women to reconcile work and family obligations (Matysiak and Vignoli, 2008). The lower transition rates to second and third births among Austrian working mothers relative to mothers who stay at home embody the

tension between advancing gender equality and the dominance of traditional norms, in addition to the incompatibility between motherhood and labor force participation (Hoem et al., 2001; Parskawetz and Zagaglia, 2005).

Many other micro- and macro-level factors, such as the husband's earning power, the cost of educating children, values related to having children, and economic uncertainties, are important indicators of continued childbearing. For example, Billingsley (2011) reveals a remarkable decline of second birth rates during economic uncertainty in Russia. In Austria, men's social class has a substantial impact on family decisions to have more children (Hoem et al., 2001; Prskawetz and Zagaglia, 2005).

The previous research on continued childbearing has mainly focused on Western countries. Thus, we know little about transitions to higher-order births in the Pacific Asia area. The current study closes this gap by presenting evidence linking women's labor force participation and continued childbearing in South Korea. Before presenting my data, methods and results, I outline a brief review of Korea's socio-economic, demographic, and institutional context.

The Korean context

Figure 1 displays the TFRs of Korea compared with those of selected OECD countries. Korea is one of the last OECD countries to undergo the fertility transition, but it stands out because its fertility decline is the sharpest. Fertility decline occurs for many reasons. In the context of Korea, the decline was arguably fuelled by implementing the family planning program, which was initiated in 1962. Expanding educational opportunities for women, increasing female labor force participation, postponement of marriage and entry into motherhood, financial crises, changing attitudes toward marriage and childbearing, and the increasing costs of educating children are also important factors that underpin fertility decline.

Korea's family planning program and fertility development

Dating back to the 1950s and 1960s, Korea experienced rapid population growth, high population density, high fertility, and a poorly developed industrial economy *(*Jones and Leete, 2002). Korea's total fertility rate was near the six-child level in 1960 (see Figure 1). As with many other Asian countries, Korea viewed its growing population as an obstacle to economic development. In 1962, the government implemented a family planning program to control population growth (Rhee, 2007). This program was at the top of Korea's national agenda and an integral part of its national economic plan (Cho, 1996; Choe and Retherford, 2009). From the 1960s to the 1980s, great efforts were made to propagate the norm of small-sized families (Cho, 1996). Table 1 presents an overview of this program's development.

In the 1960s, the goal of the population control campaign was to reduce both the number of unwanted births and the ideal number of children in a family. Abortions increased, and free contraception services were offered. During the late 1970s and the 1980s, the government encouraged reducing the typical family size to two children or fewer. Discrimination against girls was discouraged. Partly because the goals of reducing population growth and restricting family size had been achieved, the government shifted its population control policy from offering free contraceptive services to a non-subsidized contraceptive system in 1989 (Cho, 1996). In 1996, a new population policy with an emphasis on population quality and welfare was instituted, signifying the official abolishment of the previous anti-natal policy (Cho, 1996).

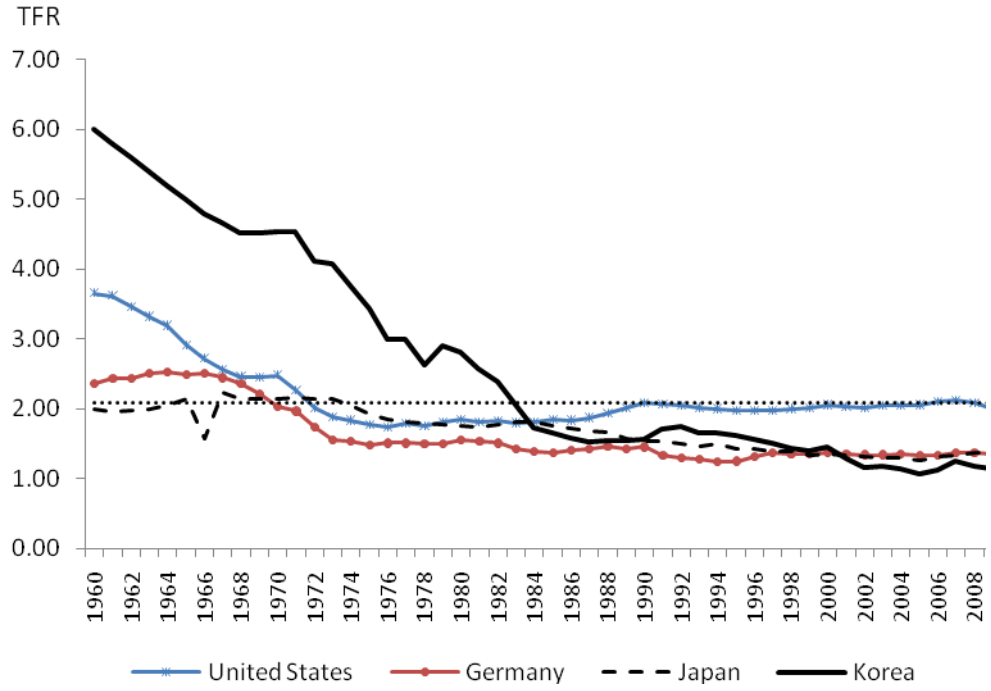
Figure 1 clearly shows that Korea's TFR decreased from 6.0 in 1960 to below replacement level in 1983. In 1988, it reached a low mark of 1.55. However, the adjustment of the family planning program did not mark the end of Korea's long-term fertility decline. After a brief trend reversal, its fertility level continued to stagnate during the 1990s and then headed downward again even faster at the turn of the century. The breakthrough to 1.3 in 2001 marks the onset of Korea's "lowest-low" fertility era. In 2005, Korea's TFR reached its nadir, 1.08. Since then, it has remained below 1.3, anchoring Korea as one of the lowest low-fertility countries in the world.

Table 1: Development of Korea's population control policy (1962-1996)

	TFR	Major measures	Slogan
1960s	6.00 (1960)	Free contraceptive and information services offered through family planning workers at health centers.	Have a limited number of children and raise them well.
1970s – 1980s	4.53 (1970) 2.06 (1983) 1.53 (1987)	The norm of small families is encouraged; Free contraceptive services; Female sterilization program (1976); Priority to sterilization acceptors with two or fewer children in allocating public housing (1978); Eradicate the traditional preference for sons; and Priority to sterilization acceptors with two or fewer children in housing loans, livelihood loans, medical services, education allowances, etc.	Stop at two regardless of sex; and A well-bred girl surpasses ten boys.
1989	1.56 (1989)	Shift from free contraception distribution through government programs to a non-subsidized system.	
1996	1.57 (1996)	New population policy that stresses population quality and welfare, signifying the official abolishment of the family planning program.	

Source: Cho (1996)

Figure 1: Total fertility rates of Korea compared with those of selected OECD countries



Source: OECD (2012a)

Based on Korean census data, Choe and Retherford (2009) present parity progression ratios for Korea during the 1960-2007 period and find that the third- and higher-order birth trends have plummeted dramatically in Korea since the 1970s, the fall of second birth fertility began in the early 1980s, and the first birth trend declined noticeably from the mid-1990s. They argue that Korea's population control policy has played a major role in the country's fertility decline. According to Jones (2007) and S-S Lee (2009), the fertility decline during the period of population control practice was mainly driven by reduced childbearing within marriage. The continued low fertility levels since the 1990s have largely resulted from delayed marriage and entry into motherhood, which are closely connected with Korea's education expansion and sequential increase of female labor force participation.

Education expansion, female labor force participation and financial crisis

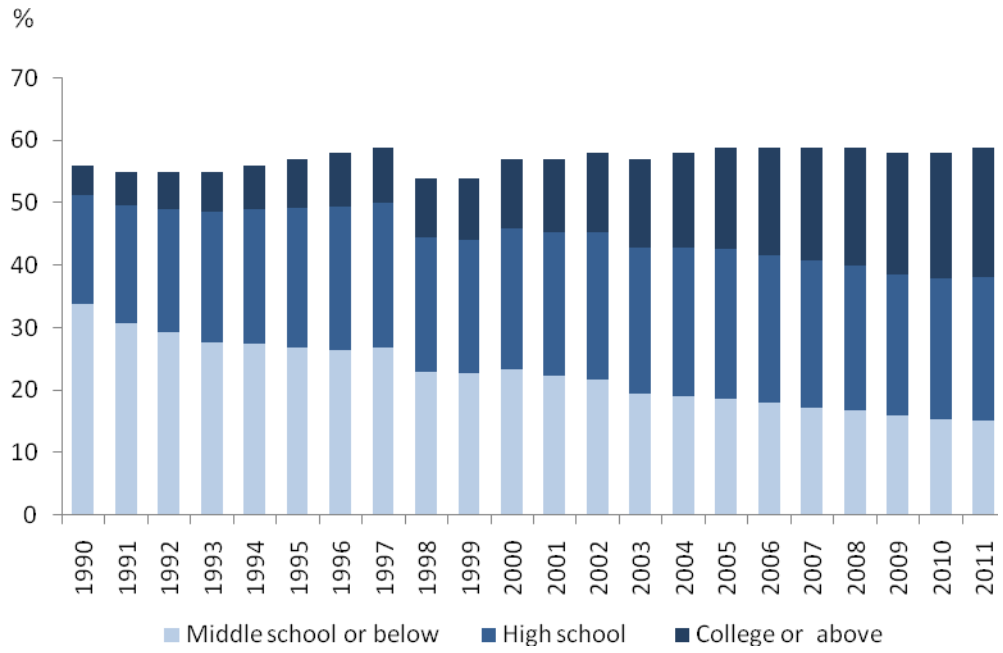
Korea has experienced dramatic economic development since the 1970s. By the late 1990s, it had developed into one of the world's most industrialized societies. The country's economic success has paralleled with remarkable increases in education, particularly among women (Jones, 2011). Statistics show that the proportion of female high school graduates who advanced to higher education was only 20% in 1975. This rate increased to 34% in 1985, 50% in 1995, and 81% in 2005 (Choe and Retherford, 2009; Frejka et al., 2010). Tsuya, Choe and Wang (2009:16) posit that the educational advancement of young Korean women during the last three decades is "nothing but spectacular" and "unprecedented in the recent history of the world".

In parallel with attaining higher educational levels, women have tended to aspire to higher levels of economic activity. Figure 2 presents the employment rates and educational attainment of women aged 20-49 since 1990. Clearly, employed women have become better educated. In the early 1990s, only a small proportion of employed women had obtained an educational level of college or above. The proportion during the 1970s and 1980s was even smaller. By 2011, nearly one-third of female labor force participants were college graduates. Meanwhile, the overall employment rates have remained at less than 60% during the last two decades. Largely due to the unexpected outbreak of the Asian financial crisis in late 1997, women's employment rates dropped in 1998.

Only a few studies address how women's educational attainment and labor force participation are related to fertility in Korea. For example, Kye (2008) finds evidence that the influence of educational expansion on delaying first marriage has been strong. Once married, Korean women have children quickly. Well-educated women tend to marry and become mothers later than less-educated women. Ma (2013a) shows the extent to which it is typical for Korean women to leave the labor force upon family formation and expansion. Nonetheless, women with stable employment positions have a higher likelihood of entering motherhood than other women. Ma (2013a) also shows that first-birth fertility in Korea has declined since the 1990s. The 1997 financial crisis exacerbated this decline. Uncertain of the future, many Koreans postponed marriage and childbearing. By the time Korea's economic health had recovered in 2002, no sign of first-birth fertility

recovery had yet emerged. It seems that social uncertainty during the downturn period increased the constraints for family formation and expansion. It is likely that social instability during the crisis period led to second birth stagnation as well.

Figure 2: Employment rates of women aged 20-49 by educational attainment of employed women, Korea, 1990-2011



Sources: OECD labor force statistics database & Korean Statistical Information Service (KOSIS) 2012

Social expectations of women and social policies related to women's work-life balance

Traditionally, Korean women have been considered the main caregivers of the household, and men have been the primary breadwinners. Women may work before marriage, but society expects them to quit their jobs upon marriage. Their career prospects must give way to their family commitments when required. Raising children and performing household chores become their main responsibilities after marriage. Figure 3 presents men's and women's employment profiles by age groups and calendar periods in Korea. Women's employment rates are much lower than those of men. The persistent M-shaped patterns reflect that women's working careers are curtailed during the primary childbearing ages (25-35). Over time, Korean women have adopted the following distinct strategy to arrange their work-family life: labor market entry, labor market exit upon

family formation and expansion, and labor market re-entry when the household has less need for them to be at home. Whereas women once exited the labor market at 25-29 years of age, these years have now become the peak ages for women's labor force involvement. The labor market exit period has gradually shifted to 30-34 years of age, which indicates that women have postponed their main childbearing ages.

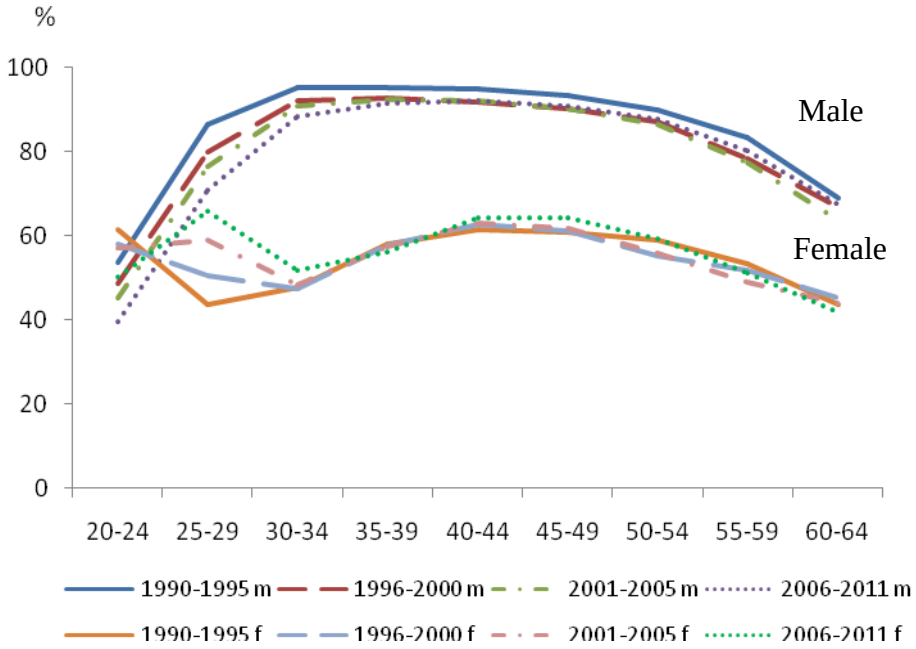
Korea is a society of familialism; the government has encouraged families to take responsibility in caring for the welfare of family members (Kwon et al., 2010). The majority of Korean men believe that every member of the family benefits if a woman stays at home and tends to the household (Lee and Eun, 2005). This normative pressure is conducive to the observed M-shaped pattern of female employment (Kwon et al., 2010). Anderson and Kohler (2013) argue that a lack of support in public policy, such as childcare facilities, makes it difficult for the average woman to avoid such societal expectations. Figure 4 demonstrates that the number of women who leave the labor market at 25-34 years of age has been shrinking over time. Apparently, an increasing number of women are finding it difficult to quit paid work for homemaking (Eun, 2007).

Measured against the OECD's three policy directives (flexible working opportunity, day-care services and paid parental leave with job protection) in helping women to combine work and family responsibilities, Korea's achievement has been modest (OECD, 2011). First, the opportunity to work flexible hours is rare. The normal weekly average number of working hours in Korea is the highest among the OECD countries (OECD, 2012b)[1]. Second, day-care services for children below the age of three have been insufficient. As of 2005, only 20% of children below the age of three had access to childcare services. Third, paid maternity leave with job protection was not available until 2001. After 2002, parents who were under the protection of employment insurance could enjoy the benefit of parental leave. Typically, those who hold stable employment positions are more likely to be covered by this benefit. The uptake of parental leave was likely low because the income compensation was only one-eighth of a woman's ordinary

[1] In 2000, Koreans had to work 52 hours per week, on average, which is well above the OECD average of 40 hours. As of 2011, the hours were reduced to 45 hours per week.

income and one-tenth of a man's typical income (K-H Lee, 2009). Fathers' uptake was almost negligible (OECD, 2006).

Figure 3: Male and female employment rates by ages and calendar periods, Korea, 1990-2011



Source: OECD (2012a)

In 2006, the Korean government announced an action program, "the First Basic Plan for Low Fertility and Aged Society" (known as the Basic Plan), in an attempt to transfer some of the burden of childrearing from family to society (Jones, 2011). As of 2008, the childcare enrollment rate for children under the age of three had increased to 38%, surpassing the OECD average of 30% (OECD, 2012a). As of 2011, couples who are under the protection of employment insurance can enjoy 40% of their ordinary wage for 12 months when taking parental leave (MOEL, 2011).

Several studies have examined how Korean working women juggle their work and family responsibilities. Ma (2013a) finds that leaving the labor force at an early stage of family life was previously common practice. However, in recent years, women have become more likely to remain in the labor force up to and into pregnancy. After becoming a mother, women with good labor market standings have a higher likelihood of resuming employment without career interruption than other women (Ma 2013b). Job-

protected maternity leave increases these women's job continuity. Many others shift to homemaking after childbearing. Some make a quick return to employment after a brief exit, whereas others return after their youngest child turns a certain age (Ma 2013b).

Other factors

Many other crucial factors are linked to women's probability of having an additional child. One such factor is the cost of educating children. A good university education is a necessity for attaining a well-paid and secure job in Korea (Seth, 2002; Eun, 2007; Choe and Retherford, 2009). To ensure that their children can enter an elite university and have a successful future, many parents send their children to private tutoring or after-school learning institutes (so-called "cram schools" [2]) to prepare them for competitive college entrance exams. The cost of this type of education is high. The average amount that was spent on monthly private education expenditures reached 240,000 won (US$208) per student in 2009. These costs discourage couples from having more than one or two children (Anderson and Kohler 2013). Many parents in Korea perceive the high cost of raising and educating children as a significant problem (OECD 2007b). The notion of "quality over quantity" of children is pervasive (Anderson and Kohler 2013). Furthermore, with large supplies of university graduates flooding the job market, the competition for a good job has become increasingly heated, particularly during the financial crisis and thereafter (Choe and Retherford, 2009). Fierce competition on the job market may also depress couples' desire for large families.

Value changes may also influence fertility developments. Educational expansion has empowered women's economic independence. Opportunities in the labor market have freed women from the necessities of financial dependence on men. Women's non-domestic roles have become more acknowledged, particularly among younger generations (Bumpass and Choe, 2004). Marriage and childbearing, which were once the primary obligations of women, are no longer viewed as universal responsibilities. Instead, they have become a matter of choice (S-S Lee, 2009). Life options for young women

[2] Cram schools were once deemed illegal in Korea because they were considered to promote social inequality. In the 1990s, however, they received government approval and have exploded in popularity ever since (Anderson and Kohler, 2013).

have broadened, and the primacy of women's domestic role has been challenged by competing values (Jones, 2011). Concerned with individual life goals and self-actualization, women might curtail the intensity of their desire for a large family.

An additional pathway that may affect continued childbearing in Korea is couples' gender preference for children, a pervasive Confucian-influenced value that has permeated East Asian countries throughout history. Traditionally, a woman and her husband took full responsibility for caring for her husband's parents (Chung and Das Gupta, 2007). The woman's primary and filial duty in life was to bear sons for her husband's lineage. The willingness to have a male child might drive a woman to continue childbearing if the first child is a daughter.

Research questions

Korea's fertility declined rapidly from the 1960s to the 1980s because of the family planning program, which was enforced during the same period. However, adjusting and even abolishing the program did not halt the decline. Previous empirical research has shown that educational expansion delayed women's family formation and expansion. Once married, highly educated women are more likely to enter motherhood than lower educated women. Women with good labor market standing have higher intensity to become a mother and a greater likelihood of resuming employment after childbirth without career interruption. However, little is known about women's transition to higher-order births and how women's labor force participation is linked to these transitions. Based on relevant research centering upon continued childbearing and the specific context of Korea, the current study addresses the following research questions. Due to the limited cases of third births and births of higher order in the data, I only focus on second birth rates.

1. What is the association between Korean women's labor force participation and second birth fertility?
2. How has Korea's second birth trend developed over time? How has the development of Korea's family planning program helped shape this trend?
3. What are the policy implications of these findings?

Data and methods

The data that were used for analyses are from waves 1 to 10 of the Korea Labor and Income Panel Study (KLIPS), Korea's only labor-related panel survey, which was initiated by the Korea Labor Institute. The first wave was conducted in 1998 with an original sample of 5,000 households in urban areas. Direct face-to-face interviews with the household reference person or spouse were undertaken to collect information on household members who were over 15 years of age. In special cases, other methods were used, such as self-administered questionnaires or telephone interviews.

In the first survey, both retrospective household data, such as demographic characteristics and changes in household composition, and individual socio-economic data, such as work history and job characteristics, were collected. The survey was conducted annually to track changes in the characteristics of households' and individuals' economic and social activities. If an individual within a household turned 15 years old, or if an individual over 15 years of age joined a sampled household, he or she was included in the survey. New respondent data were collected regarding retrospective information. If some members of the households moved out and formed new families, the new household and its members were tracked as well. The most recent data for this study are from wave 10, which was conducted in 2007. The rich longitudinal information on women's fertility, work, job features, and characteristics of married women's husbands serves as valuable input to undertake an event history analysis of second birth fertility.

The current observation commenced from the month of first birth; one-child mothers were tracked each month until a second birth. When there was a disruption of the first marriage, the observation was censored. If there was no second birth, the observation ended at either the last interview time or age 45. Because a woman's childbearing probability is largely reduced after a long duration from the first birth, I also censored at ten years after first birth. To better capture the link between women's post-birth work and their second birth decisions, I subtracted 9 months from the date of a reported second birth. For women who did not have a second child before the censoring time, I also predated 9 months for consistency. Thus, the dependent variable in this study is the

confirmed conception of a second live birth. In this paper, the terms "conception of second live birth" and "second birth" are used interchangeably.

Of the 3323 one-child mothers who entered the observation window, 2231 proceeded to have a second child. Table 2 presents the descriptive statistics of the covariates that were used for analysis. Time since first birth was the basic time factor and was grouped into 0-12 months, 13-30 months, 31-60 months, and more than 60 months, representing up to 1 year, 1-2.5 years, 2.5-5 years, and more than 5 years after the first child was born. The main explanatory variables were calendar years, woman's education, labor force participation before the first birth, and labor force participation after first birth. Factors such as the woman's age, childhood residence, gender of the first child, and husband's earning potential were also taken into account.

The calendar year variable was grouped into 1980-84, 1985-89, 1990-94, 1995-99 and 2000-06. Episodes before 1980 were left-censored because there were an insufficient number of cases for the analysis of these earlier years. The first two calendar periods cover the period when the concept of reducing family size was propagated and free contraceptive services were offered. The 1990-1994 years represent the period when the free contraceptive service was abolished. The last two periods indicate the time after the family planning program was officially abolished.

Women's educational attainment (time-varying) was categorized as low, middle, and high, representing secondary school or below, high school, and college or above, respectively. Women's labor force participation (LFP) experience before first birth is a dummy variable that assesses whether women had employment experience before becoming a mother. Women with no labor market experience before entry into motherhood were categorized as homemakers, whereas those who had employment experience were categorized as labor force participants. "LFP after first birth" is a time-varying dummy variable that represents women's work experience after first birth. During episodes when they stayed at home, the women were labeled as homemakers. By contrast, beginning with the month in which they became involved in economic activity, they were considered as having post-birth work experience and labeled as labor force participants.

Women's career paths after entry into motherhood were unstable. As discussed above, women with a well-established career before first birth are more likely to resume pre-birth employment without career interruption. Many others tend to become homemakers for some time before considering returning to the labor force. My data show that mothers entered and exited the labor market and changed jobs frequently after first birth. To capture how women's second birth intensity varied by their labor market characteristics after first birth, I specified three expanded models for employed mothers based on the characteristics of the first job that a woman undertook during motherhood. I expanded the category "participant" of "LFP after first birth" by occupational status, income, and type of workplace (see Appendix 1).

Based on occupational scoring based on the socio-economic index (SEI) defined by Ganzeboom and Treiman (1996) and illustrated in Appendix 2, occupational status was stratified as low (e.g., elementary workers), middle (e.g., clerks and sales workers) and high (e.g., managers and professionals); occupational status was represented with a socio-economic index score of "SEI <40", "SEI 40-50", and "SEI>50", respectively. Income was evenly divided into three parts based on the ordered distribution of income values of one-child mothers in employment within each calendar year, as follows: values lower than the 33rd percentile represented a low level of income; values higher than the 66th percentile represented a high level of income; and values in between represented a middle level of income. Workplace was grouped into private sector, public sector (including state-owned enterprises), and other. Women who failed to report the above labor market characteristics were categorized as "missing" for the respective covariate.

Furthermore, I accumulated women's postpartum work history to capture the association between the cumulative employment time after first birth and second birth intensity (see Appendix 1). This variable is time-varying. During the months when women stayed at home, they were characterized as "homemaker". From the first month they entered the labor force, their work history was categorized into three levels, up to 1.5 years, 1.5 to 3 years and more than 3 years. It is expected that the more time that women spend in the labor force when their children are small, the less likely they are to continue childbearing.

Table 2: Descriptive statistics for covariates in the main effects models

	Person-months		Second birth conceptions
Time since first birth			
0-12 m	25574	19%	501
13-30 m	38339	29%	1107
31-60 m	31369	24%	504
>60 m	35880	27%	119
Woman's age			
15-24	14953	11%	382
25-29	55128	42%	1276
30-34	41771	32%	525
35-44	19310	15%	48
Childhood residence			
Seoul capital area	34493	26%	575
Other metropolitan areas	21113	16%	369
Other provinces	75556	58%	1287
Gender of first child			
Boy	75692	58%	1124
Girl	55470	42%	1107
Calendar years			
1980-84	25353	19%	405
1985-89	30614	23%	431
1990-94	25046	19%	481
1995-99	20501	16%	436
2000-06	29648	23%	478
Education			
Low	40147	31%	455
Middle	61117	47%	1231
High	29898	23%	545
LFP before first birth*			
Homemaker	43567	33%	558
Participant	87595	67%	1673
LFP after first birth*			
Homemaker	88412	67%	1649
Participant	42750	33%	582
Husband's education			
Low	29592	23%	333
Middle	57323	44%	1068
High	44247	34%	830
Total	131162		2231

a) Notes: *LFP – Labor force participation

b) Source: KLIPS, author's own calculations

Woman's current age, childhood residence, first child's gender and husband's educational level were controlled for. Childhood residence (residence at age 14) was utilized to control the contribution of women's background to their second birth intensity. This variable was grouped into the following three categories: the Seoul National Capital Area (including Seoul, Incheon and Gyeonggi-do)[3], other metropolitan areas (including Busan, Daegu, Daejeon, Gwangju and Ulsan), and other provinces (the remaining nine provinces of South Korea). The gender of the first child was included as an important indicator of continued childbearing in a society with a long history of son preference.

Ignoring the husband's contribution to second births would cause bias when studying fertility in a context in which the husband is considered to be the household's main breadwinner. In the current study, the husband's education served as a proxy for his socio-economic status. It is expected that women with well-educated husbands have higher second birth rates than other women because their well-educated husbands have the potential to aggregate the economic resources that are necessary for a large family.

Findings and discussion

Results of the main effects models

Table 3 presents the hazard ratios of second birth intensity from the main effects models. Model 1 involved only woman's age, childhood residence, first child's gender and calendar years. Models 2 to 5 added education, labor force participation before first birth, labor force participation after first birth and husband's education in a stepwise manner.

[3] Seoul, or the Seoul Special City, is the capital and largest city of South Korea. The Seoul National Capital Area includes the Incheon metropolis and most of Gyeonggi province. Approximately half of Korea's population currently lives in the Seoul National Capital Area, and nearly one-quarter live in Seoul. However, the proportion of births in this region is relatively low.

Table 3: Relative risks of second births, Korea 1980-2007

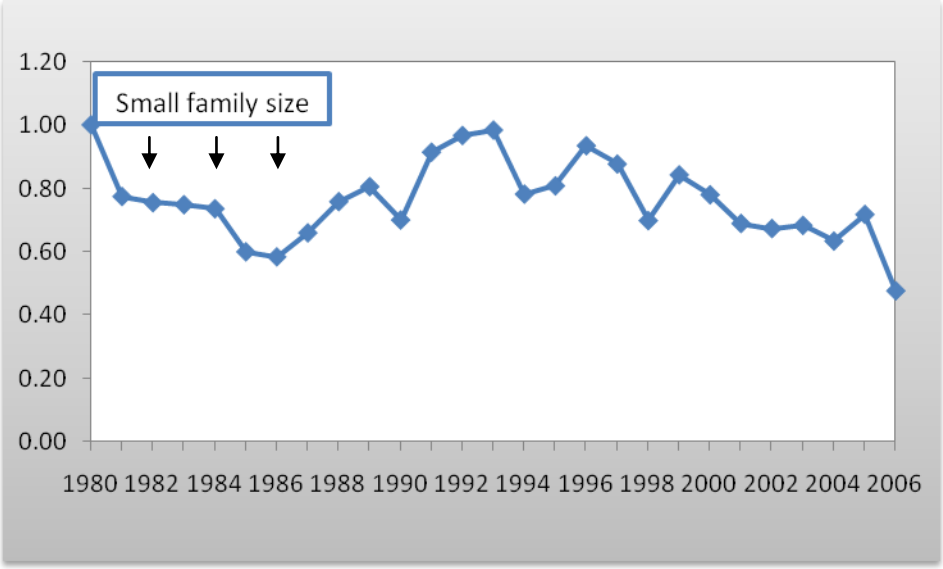
	Model 1		Model 2		Model 3		Model 4		Model 5	
	Haz. ratio	P>z	Haz. ratio	P>z	Haz. ratio	P>z	Haz. ratio	P>z	Haz. ratio	P>z
Time since first birth										
0-12 m	0.65	***	0.65	***	0.65	***	0.64	***	0.64	***
13-30 m	1		1		1		1		1	
31-60 m	0.64	***	0.65	***	0.65	***	0.67	***	0.67	***
>60 m	0.18	***	0.19	***	0.19	***	0.20	***	0.20	***
Woman's age										
15-24	1.06		1.08		1.09		1.11	*	1.12	*
25-29	1		1		1		1		1	
30-34	0.78	***	0.79	***	0.79	***	0.80	***	0.79	***
35-44	0.26	***	0.27	***	0.27	***	0.27	***	0.27	***
Childhood residence										
Seoul capital area	1		1		1		1		1	
Other metropolitan areas	0.99		1.00		0.99		1.00		1.00	
Other provinces	1.03		1.05		1.05		1.05		1.06	
Gender of first child										
Boy	1		1		1		1		1	
Girl	1.20	***	1.18	***	1.19	***	1.19	***	1.19	***
Calendar years										
1980-84	1.08		1.14	*	1.17	**	1.17	**	1.17	**
1985-89	1		1		1		1		1	
1990-94	1.36	***	1.30	***	1.27	***	1.28	***	1.27	***
1995-99	1.34	***	1.26	***	1.22	***	1.23	***	1.22	***
2000-06	1.05		1.00		0.96		0.98		0.97	
Education										
Low			1		1		1		1	
Middle			1.30	***	1.29	***	1.27	***	1.16	**
High			1.22	***	1.20	**	1.21	***	1.08	
LFP before first birth										
Homemaker					1		1		1	
Participant					1.19	***	1.24	***	1.24	***
LFP after first birth										
Homemaker							1		1	
Participant							0.85	***	0.85	***
Husband's education										
Low									1	
Middle									1.16	**
High									1.22	**
Constant	0.02		0.02		0.02		0.02		0.02	
No. of subjects	3323									
No. of conceptions	2231									
Time at risk	131162									
LR chi2	1052.11		1071.74		1082.81		1093.41		1099	
Log likelihood	-3977.93		-3968.12		-3962.59		-3957.29		-3954.49	
Prob > chi2	0.00		0.00		0.00		0.00		0.00	

a) Notes: Statistical significance: ***p<.01; ** .01<p<.05; and * .05<p<.10

b) LFP: Labor force participation

c) Source: KLIPS, author's own calculations

Figure 4: Relative risks of second births by single years for one-child mothers in Korea, 1980-2006 (Reference category: 1980)



a) Source: KLIPS, author's own calculations

The calendar period estimates demonstrate that the second birth trend fluctuated over the study period (see Table 3). To capture how the trend developed in more detail, I expanded Model 5 by replacing calendar periods with single years while standardizing all other variables; the results are presented in Figure 4. During the 1980s, the second birth trend headed toward its nadir, with birth rates decreasing by 40%. From the late 1980s, a clear reversal emerged. In the early 1990s, the trend returned to the level of 1980. This level was sustained for 10 years. However, at the turn of the new century, the trend declined further.

The trend fluctuations in second births reflect not only changes in Korea's family planning program but also changes in Korea's socio-economic situation. When the small family norm was propagandized and free contraceptive services were offered, the second birth trend declined. However, when the free service system was abolished, the trend began to reverse. Nonetheless, the social insecurity generated by the 1997 financial crisis again constrained family expansion. The sense of uncertainty during the economic downturn period and thereafter seems to have caused families to opt for smaller family sizes. Since the 1990s, the rising cost of educating children and the increasing

competition in university entry and in the job market may also have encouraged parents to treasure the "quality" rather than "quantity" of children.

Our estimations for women's employment before and after first birth reveal certain compelling results. Women had a higher second birth rate (by 24 percent) when they had labor force participation experience before the first birth than if they did not (Models 4 and 5). This finding underlines the importance of having a secure and stable social position before entering parenthood in Korean society and also suggests that more career-oriented women may speed up their continued parity progression. In comparison, women who were engaged in postpartum economic activity had significantly lower second birth intensity than homemakers. Retaining a job after first birth seems to signal an interruption of the childbearing career or may be viewed as an obstacle to continued childbearing in Korean society. To a certain extent, it reflects that support from social policy is insufficient to facilitate the reconciliation of women's productive and reproductive careers. In the context of demanding working hours, sparse childcare services, and restricted parental leave, opting for one sphere risks blighting the other. A further explanation of this pattern is that women who return to employment may be more career-oriented than those who do not and may be more satisfied with having only one child than homemakers might be.

The estimates for women's educational attainment from Models 2-4 reveal that women with a high school education were more likely to have an additional child than women with other educational levels. Labor force participation either before or after first birth did not largely impact these estimates. A significant change occurred when the husband's education was accounted for. Specifically, the difference across women's own educational levels was significantly reduced, indicating that a woman's second birth intensity in Korea substantially depends on her husband's education and his potential for aggregating the necessary economic resources for a large family. Estimates of the husband's educational attainment demonstrate that the likelihood that a woman will have a second child increases as the educational achievement of her husband increases.

The estimates of the other control variables show that the likelihood of having a second child is significantly reduced at five years after the first birth. The intensity is

lowered after women turn 30. The son preference was an important driving force for second birth fertility. The families that had a girl at first birth had an approximately 20 percent higher second birth intensity than families that had a boy at first birth. Women who grew up in the provinces had a slightly higher likelihood of having a second child than women who grew up in the Seoul area or in another metropolis; however, the difference in intensities was small and was not significant.

Results of the expanded main effects models

To determine the association between women's labor market characteristics after first birth and their second birth intensity, I expanded Model 5 into four additional models (Models 5A-5D). Specifically, I expanded the category of "LFP after first birth" with further details regarding occupational status, income, and type of workplace of the first postpartum job and time-varying cumulative employment duration after first birth while standardizing all other variables in Model 5 (Table 4). The estimates of the other variables resemble those that are presented in Model 5 and thus are not shown.

Among the one-child mothers in the labor force, high occupational status significantly enhanced the probability of continued childbearing. Likewise, middle- and high-income earners had a higher probability of having a second child than low-income earners, although the difference between the levels was small and insignificant. These results indicate that the influence of the potential to gather economic resources during motherhood on second birth intensity was positive. Model 5C shows that retaining a job in the public sector improved the likelihood of having a second child, although this difference was insignificant. Given that these women typically hold stable employment positions and that they are the potential beneficiaries of maternity or parental leave, this result implies that stable employment and eligibility for welfare benefits may play a positive role in the likelihood that a woman will continue childbearing. The expected negative effect of cumulative work experience during motherhood was not observed. This finding suggests that once women return to the labor force, their probability to continue childbearing is equally depressed, regardless of the duration of time spent in the labor force.

Table 4: Relative risks of second births by female labor market characteristics after first birth, standardized for other covariates (results from models expanded from model 5)

Model 5A	**Haz. ratio**	**p>z**	**Log likelihood**
Occupational status (first job after first birth)			-3952.89
Homemaker	1.36	***	
SEI<40	1		
SEI 40-50	1.17		
SEI>=50	1.26	*	
Missing *	1.24		
Model 5B			
Income (first job after first birth)			-3954.01
Homemaker	1.22		
Low	1		
Middle	1.12		
High	1.07		
Missing	1.01		
Model 5C			
Workplace (first job after first birth)			-3950.92
Homemaker	1.15		
Private	1		
Public	1.17		
Others	0.54		
Missing	0.93		
Model 5D			
Work experience (accumulated after first birth)			-3954.27
Homemaker	1.16	**	
<1.5 years	1		
1.5-3 years	0.94		
>3 years	1.00		

a) Notes: Statistical significance: ***p<.01; ** .01<p<.05; and * .05<p<.10

b) The estimation of missing values in "occupational status" is not statistically significant because of the limited number of cases in this category.

c) Source: KLIPS, author's own calculations

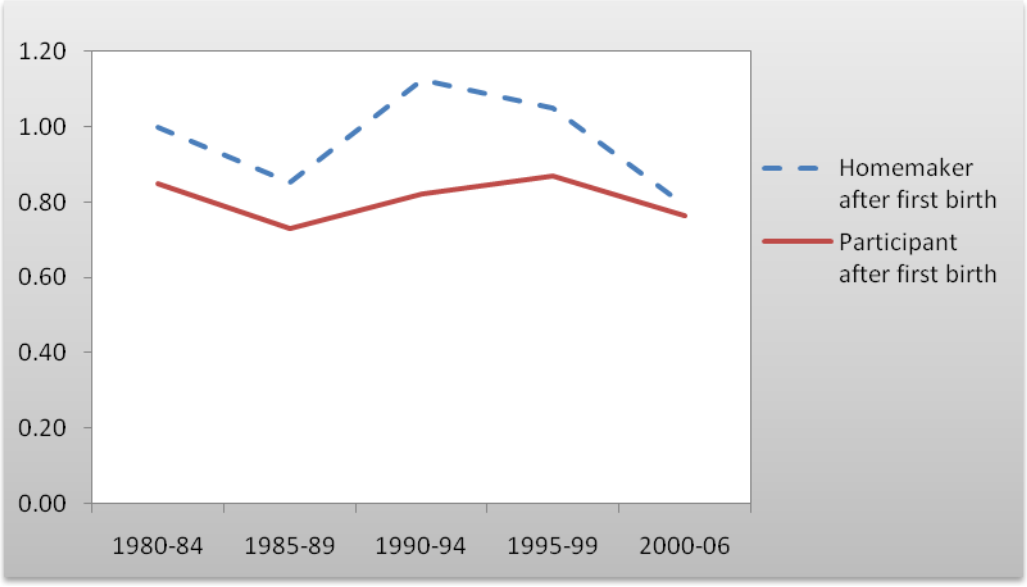
Results of the interaction models

The interaction term between the calendar period and women's employment activity after first birth warrants attention (see Figure 5). During the study's observation period, the women who stayed at home as homemakers after first birth were consistently more likely to have a second child than were one-child mothers in the labor force. The birth trends for both groups decreased in the 1980s. Beginning in the late 1980s, the trend for homemakers turned strikingly upwards. However, this reversal was temporary; the trend declined again at the turn of the century. This result suggests that the childbearing behavior of homemakers was particularly sensitive to the family planning program adjustment. The women in the labor force appeared to more slowly react to the policy change. Their second birth trend was also reversed, but at a more moderate pace, and the difference between the two groups became small over the last observation period.

Another finding is notable: Figure 6 shows that in the 1980s, women who bore a girl for the first birth had a significantly higher probability of continued childbearing than did women who had a boy. However, this difference was substantially reduced over time. By the end of the observation, the difference was practically nonexistent. The result reveals that the son preference, which was once a prime notion and a driving force for family's continued childbearing, may have lost its influential power, perhaps because of the government's longstanding appeal in its population policy against gender discrimination.

I specified other interaction models for evidence of further interactive effects. These results are consistent with the multiplicative findings of the main effects model and thus are not presented in this paper.

Figure 5: Interactive effect of women's labor force participation after first birth and calendar periods, second births in Korea, 1980-2006 (Reference category: Homemaker after first birth, 1980-84)



Source: KLIPS, author's own calculations

Figure 6: Interactive effect of gender of first child and calendar periods, second births in Korea, 1980-2006 (Reference category: Boy, 1980-1984)

Source: KLIPS, author's own calculations

Robustness check

To assess the robustness of the estimates of the contribution of the independent covariates, I included the educational level of the women's parents and the women's religious identification into the analysis. I found that low educational attainment of parents slightly propelled women's second birth intensity. Furthermore, Catholic women had a slightly higher risk of having a second child than other women. An interaction term between a variable for age at first birth and the time factor reveals that women who became mothers after age 35 tended to have their second child sooner rather than later.

In addition, I expanded the category of "LFP before first birth" with detailed job characteristics regarding the woman's last job before first birth. The estimations show that among women with pre-birth employment experience, those with well-established careers (such as those with previous long work experience, high income and high occupational status) had a relatively higher probability of having a second birth. When women's current postpartum labor force characteristics were included, the role of these pre-birth job characteristics became vague and unclear. Furthermore, the interaction terms were modeled to determine whether women with good labor market standing before entry into motherhood concentrated their first and second births within a shorter period of time so that they could resume employment more rapidly after achieving a two-child family. There was no clear evidence of such an effect. Involving these new variables or re-specifying existing variables neither made notable changes in the main results nor improved the model's statistical fit in a significant manner. Therefore, these results are not presented.

Conclusion

South Korea has experienced dramatic economic development and fertility decline since the 1960s. Its family planning program, which began in 1962 as an integral part of its economic development program, was arguably a primary driving force behind the initial fertility decline. The present study explored women's transition to second birth childbearing against this background. This study enriched our understanding of Korea's fertility development by presenting evidence of the association between women's labor force participation and their second birth rates after standardizing other factors as well as evidence of how contextual factors, including the development of the family planning program and social policies concerning women's work-life balance, have contributed to this relationship. Event history analyses were applied to longitudinal survey data. Main effects models and interaction models were specified to address the research questions.

The results demonstrated that during the 1980s, the second birth trend was dropping to its nadir. From the late 1980s, the trend began to reverse and soon reached the level of 1980 again. However, this reversal was only temporary. At the turn of the new century, the birth trend declined anew and then leveled off until the end of the observation time. These findings reflect that the second birth development of Korea since 1980 has been largely associated with the development of Korea's family planning program. Furthermore, the social insecurity during and after the Asian financial crisis and the increasing cost of educating children underpin the most recent decline in second births.

The present study further shows that women's labor force participation before and after the first birth played important roles in their transition to second birth childbearing. Women's labor force participation before entry into motherhood was positively associated with their likelihood of having a second child. However, employment engagement after first birth signaled an interruption in a woman's reproductive career. The one-child mothers who had labor force participation experience after first birth had a significantly lower second birth intensity than homemakers. During the 1980s, when the family planning program was in full swing, the birth trends for both homemakers and labor force participants headed downward. The adjustment of the family planning

program appears to have temporarily enhanced the second birth rates of homemakers more strongly than those of women in the labor force.

This analysis also demonstrates that the duration of post-birth employment experience had no significant effect on women's second birth rates. It is clear that once mothers participate in the labor force, their second birth intensity is depressed. Among mothers in the labor force, those with better labor market standings (such as women with higher occupational status, higher income or public sector positions) have a relatively higher probability of having a second child, indicating the positive effect of economic resources and/or employment security on two-child family building.

This study also revealed that women at a high-school educational level were more likely to have a second child than women at other educational levels. When the husband's educational level was included, the woman's education lost its influential power, which implies that a woman's second birth intensity was highly susceptible to her husband's educational attainment. Given that high educational attainment is an important indicator of socio-economic status in Korean society, this result suggests that the maintenance of the two-child norm in Korean families is substantially dependent on the husband's potential to aggregate economic resources.

The findings of this study have certain implications for Korea's social policy directives. First, Korea's institutional efforts to eradicate the traditional preference for sons in the 1970s and the 1980s seems to have been efficient. Son preference, which has been pervasive in East Asian societies, has disappeared in South Korea. Alternatively, Korea's social policies concerning the reconciliation of women's work and family responsibilities should be reconsidered. In a context in which women work long hours, flexible working hours are nonexistent, childcare services are limited, and paid parental leave is not universal, the incompatibility of work and family responsibilities is prevalent. When mothers had to choose between their productive and reproductive careers, the choice of one signaled possibly forgoing the other. Since 2006, the Korean government has taken strides in creating a more family-friendly environment, and welfare expansions may have improved work-life compatibility. However, the available data for analysis only extend to 2007. To obtain a more updated picture of recent developments in Korea,

further research that is based on more recent data is required. I hope that the findings of this study, which serves the purpose of stimulating the ongoing debate in East Asia about whether to promote work-life balance policies, motivate further data collection.

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Appendix 1: Descriptive statistics of covariates for the advanced main effects models

	Person-months		Second birth conceptions
Occupational status (first job after first birth)			
Homemaker	88412	67%	1649
SEI<40	11611	9%	110
SEI 40-50	21502	16%	305
SEI>=50	7786	6%	144
Missing	1851	1%	23
Income (first job after first birth)			
Homemaker	88412	67%	1649
Low	4577	3%	64
Middle	5642	4%	107
High	6142	5%	104
Missing	26389	20%	307
Workplace (first job after first birth)			
Homemaker	88412	67%	1649
Private	9188	7%	147
Public	5329	4%	114
Other	1012	1%	7
Missing	27221	21%	314
Work experience (accumulated after first birth)			
Homemaker	88412	67%	1649
<1.5 years	18793	14%	337
1.5-3 years	10124	8%	156
>3 years	13833	11%	89
Total	131162		2231

Source: KLIPS, author's own calculations

Appendix 2: Korea standard classification of occupations (KSCO) and corresponding socio-economic index (SEI) scores based on Ganzeboom and Treiman (1996)

KSCO	SEI score
1. Managers	55
2. Professionals and related workers	70
3. Clerks	45
4. Service workers	40
5. Sales workers	40
6. Skilled agricultural, forestry, and fisheries workers	23
7. Craft and related trade workers	34
8. Equipment, machine operating and assembly workers	31
9. Elementary workers	20