

Transitions to Marriage and Parenthood in Taiwan: Their Causes and Consequences

Introduction

The second demographic transition theory illustrates how the decrease in marriages affects fertilities in developed countries. In the late 20th century, individualism became more common, while traditional organizations, like families and marriages, faded away. As a result, beginning in Northern Europe, we see that total fertility rates declined to below the replacement level (2.1). Recently, however, we found that in some western countries, such as the UK and the US, the total fertility rates stopped declining and turned back to around 2.0. An increasing number of unmarried mothers mitigate the possible negative effects of the decline and/or delay in marriages.

On the contrary, Taiwan may be a good example to help us to re-examine the second transition theory. The theory has a problem in its too much emphasis on the influences of marriages, while women often give births without marriages in western countries. Yet, the relationship between the fertility and marriage are still strong in many other countries including Taiwan. Second, Taiwan, as a highly industrialized country in Asia, merges many western and oriental cultural elements, and thus is an excellent case to observe how cultures influence fertilities differently from many western countries. More importantly, only in 30 years, the total fertility rates in Taiwan decreased from 2.455 to 0.895. This huge decline in a short period of time is very worthy to conduct research.

In this study, we argue that the expansion of higher education, particularly that among women, is the main reason for fertility decrease in Taiwan. The first demographic transition theory (FDT) and second demographic transition theory (SDT) apply to Taiwanese society quite well. According to the government statistics, the marriage in Taiwan has experienced a great crisis. Although the individualism is the main cause in SDT, the source of individualism is still largely left unexplained. Recently, a number of Taiwanese women have received

higher education, and this availability of higher education might have helped them to acquire individualistic orientations and economic independence. As a result, traditional norms and values regarding family relationships might have become less compatible with many of them. The attitudinal change, in turn, may have been translated to their recent changes in marital and childbearing behaviors.

Backgrounds

The decline of total fertility rate in Taiwan is quite drastic, especially compared to other countries. For example, Figure 1 represents the changes in total fertility rates in France, Germany, Japan, South Korea, Taiwan, USA, and UK between 1981 and 2010 (The World Bank 2012; Ministry of the Interior 2012). In 1981, the fertility rate in Taiwan was the highest among these countries (2.455), while it became the lowest in 2010 (0.895). The magnitude of decrease in Taiwan is by far the greatest (1.560). Although East Asian countries (Japan, South Korea, and Taiwan) all have the problem of “lowest low fertility” (Kohler, Billari, and Ortega 2002), the situation in Taiwan is more serious, and a number of studies try to explain the reason (Chang and Lee 2001; Lu 2007; Tsai 2007).

Insert Figure 1 About Here

Based on the historical changes in birth rates and death rates, Blacker (1947) suggested four stages of the demographic transition, including high stationary, early expansion, late expansion, and low stationary. Coale and Hoover (1958) further applied economic developments to explain how those stages evolved. For instance, the pre-modern society was in a high stationary stage where the birth rate and death rate were very high. However, after the industrialization improved our quality of life, the death rate began to decline, while the birth rate was still high, resulting in a rapidly increasing population in this stage (early expansion). The third stage is the late expansion. Although the birth rate was beginning to decrease, it was still higher than the death rate. The population, therefore, was still growing.

The last is the low stationary stage. During this period, both the birth rate and death rate were equally low, resulting in a near-zero population growth.

This transition indeed happened in Taiwan in the 20th century (Le 1990). With the rapid economic development, the GDP per capita in Taiwan increased from 158 U.S. dollars in 1951 to 18,588 U.S. dollars in 2010. Like other industrialized countries, Taiwan also experienced the four stages, but it only spends 60 years on the first transition (Tsai 2007). In Figure 2, we can clearly observe four stages in Taiwan. Chen, Wang, and Chen (1986) and Lee (1990) point out that before 1920, the crude birth rate and death rate were both high in Taiwan. Then, the crude death rates decreased after 1920, but the crude birth rates were at the same level until 1950. After 1980, both the crude birth rate and death rate became very low.

Insert Figure 2 About Here

The explanation based on the demographic transition, however, is not sufficient to account for the declining fertility rates in Taiwan after industrialization. In fact, fertility rates in many western countries are all under replacement level, and this is an unexpected result by the first transition. Van de Kaa (1987) proposed another theory on the second demographic transition. In the west, the second transition occurred around the late-20th century to 21st century, resulting from individualism and materialism (Van de Kaa 1987; Lesthaeghe and Surkyn 1998). During this period, people place more emphasis on individual accomplishments and personal needs, instead of marriages and families (Van de Kaa 1987). The marriage rates decreased and divorce rates increased. In addition, cohabitation and premarital pregnancy became common in western societies.

The second demographic transition seems a reasonable explanation for the low fertility rates in Taiwan in the 21st century. Like western countries, Taiwan also experienced the challenge of the disorganization of marriages. Some statistics reveal that the marriage in Taiwanese society is not required any more (Department of Household, M.O.I 2012a). Figure 3 represents the changes in marriage and divorces rates in Taiwan for the past 30 years or so.

The pattern is obvious; the marriages rates constantly decreased and the divorce rates increased. The importance of marriage might have declined in Taiwan as it did in the west.

Insert Figure 3 About Here

Moreover, delayed marriages are another warning sign for marriages. Figure 4 shows the mean ages at first marriage for Taiwanese men and women, respectively (Department of Household, M.O.I 2012b). For both men and women, the mean ages increased since 1980. The increase is slightly larger for women. During this time, on the average, the mean age at first marriage for women increased by 5.4 years (24 to 29.4), while the change was 4.2 years for men (27.6 to 31.8). The older the people marry, the shorter time they have to conceive. Women's fecundity also decreases after a certain age. Delayed marriages thus negatively affect fertility rates (Jones 2007).

Although the decline of marriages has happened in many countries, its influences in Taiwan are quite significant. Because of the traditional norm, the premarital pregnancy, unlike that in the west, is still culturally unacceptable in Taiwan (Shieh 2006). For example, in the United States, 41% of children are born to unmarried women in 2009 (Hamilton, Martin, and Ventura 2010), while in Taiwan, the corresponding figure was only 3.91% (Ministry of the Interior 2010). In other words, in the west, marriages are not necessary for childbirth. Lower marriages rates may not strongly affect fertility rates in some western countries, but they directly result in lower fertility rates in Taiwan (along with many other Asian countries).

Insert Figure 4 About Here

As explained by the second transition theory, traditional ideas on family and marriage have lost importance in many societies. Studies on American families generally point out that personal attitudes toward marriages have changed quite a bit in these years (Bolzendahl and Myers 2004; Schreiber 1978; Mason and Lu 1988). Many people do not believe marriages as a goal of their life. Comparative research also reports a similar development in other western

countries. For example, Gubernskaya (2010), by looking into some countries' data across different years including Austria, (West) Germany, Great Britain, Ireland, the Netherlands, and the U.S., finds that they shifted away from the traditional value regarding marriage and family between 1988 and 2002. Raymo and Iwasawa (2005) also reach a similar conclusion in their study in Japan.

People are also more open-minded regarding their gender relationships. Many studies indicate that both men and women not only accept but also support more egalitarian relationships between them (Ciabattari 2001; Pampel 2011; Thornton, Alwin, and Camburn 1983; Thornton and Freedom 1979). For instance, it has been supported that married men should share housework with their wives and there should be no obstacle for women to have full-time jobs. In spite of clear progresses on men and women, men and women still show different attitudes toward gender roles.

Different attitudes between men and women toward gender relationships and marriages lead to the unfavorable development in many marriages in Taiwan. The attitudinal change regarding gender relationships is slower for men than that for women (Ciabattari 2001; Wilkie 1993) and Taiwan is not an exception. Men are more likely to believe in the traditional division of labor between breadwinners and homemakers than women (Mason and Lu 1988). The different attitudes toward gender roles between men and women further explain why they look at marriages from different perspectives. Studies show that men in the U. S. usually exhibit greater optimism than women to have a happy marriage (Larsen, Harding, and Klein 2011) and the mean marital satisfaction is higher for men than women (Kamo 2000). The gender differences are even greater in East Asia. Tsuya and Bumpass (2004) compare attitudes toward marriages utilizing nationally representative samples in the United States, Japan, and South Korea, and find that the difference in the U. S. is smaller than those in Japan and South Korea. While men look forward to marriages more than women do in all three countries, the larger differences in Japan and South Korea may hinder women

from getting married.

Taiwan is not special in this aspect. Like other western countries, Taiwanese people are more egalitarian in gender relationships now. On the other hand, there still are quite large gender differences. Recent changes in men's attitudes, for example, primarily focus on female employment, while those among women stress gender role segregation within families (Lu 2011). Men are also less willing to engage in housework, even when their wives have jobs (Lee, Yang, and Yi 2000). These different values make Taiwanese men more optimistic (or nonchalant) about marriages than women (Lin and Raghurir 2005).

We reviewed the literature on demographic transitions and applied transition theories to the decrease of the total fertility rates in Taiwan. We also noted that the marriage is more important in Taiwanese society, and the gender inequality in attitudes causes a crisis of marriages. Then, our next question is why women become more egalitarian and why their attitude change is greater than men's. Education may be a key to the questions.

According to current literature, education plays an important role in the formation of gender role attitudes (Ciabattari 2001; Thornton, Alwin, and Camburn 1983). This relationship is even more significant among women (Baker and Annis 1980; Etaugh and Spandikow 1981), because they not only learn necessary skills for the job market in the future, but also contact new ideas including feminism. Hence, with more college-educated people, we expect that more people support gender equality and have egalitarian values.

Scholars also agree that education is negatively related to women's marriage or fertility behaviors (later or no marriage and no children; Kravdal and Rindfuss 2008; Raymo 2003; Rindfuss, Bumpass, and John 1980). The higher education has expanded very quickly in Taiwan (Peng, Hsung, and Chi 2011), shown in Figure 5, representing the numbers of undergraduates and graduates in Taiwan from 1950 to 2011. Though the numbers increased during the entire period, the increase accelerated after the mid-1990s. The number of female students has been very close to that of male students. The situation is more apparent if we

compare Taiwan with neighboring countries, such as Japan and South Korea. As seen in Figure 6, the differences in female gross enrollment rates in higher education among Taiwan, Japan, and South Korea had increased from 1999 to 2008. We can thus expect further increase in the unfavorable attitudes toward marriages and further decline in marriage stability in Taiwan (Sassler and Schoen 1999).

Insert Figure 5 About Here

Insert Figure 6 About Here

The two demographic transition theories, however, do not explain why the fertility rate in Taiwan is the lowest. The influence of marriages and divorces on fertility rates is much larger in Taiwan because the childbirth behavior is relatively conservative. With the expansion of higher education, women form more egalitarian gender attitudes and nontraditional attitudes toward marriages than men. These gaps resulted in a serious problem, preventing women from entering marriages and giving birth. That might be why, in Figure 4, the increase in mean age at first marriage for women is faster than men.

Hypotheses

We do not intend to identify factors affecting only fertility in Taiwan. To examine fertility alone, we have to restrict our sample to those past reproductive age, say 40 or 45. If we did that, however, we might not tap into the behavior of recent cohorts, which probably is the major reason of recent fertility decline in Taiwan. Given that there are only a small proportion of births out of wedlock in Taiwan, we examine three outcomes; not married, married without children, and married with children. By comparing non-married people and married people with children to married people without children, we can examine factors affecting decisions to marry and to have children separately, yet at the same time.

With more highly-educated women in Taiwanese society, some of them possess more egalitarian values and are less interested in marriages. This may be why the marriage rate has

decreased. Even though most women still get married eventually, many of them marry late nowadays. Fertility rates in this situation will go down.

Based on the argument above, we propose the following hypotheses:

1. Women possess, on the average, more egalitarian gender role attitudes and more nontraditional attitudes toward marriages than men.
2. The effect of education on attitudes may be different between men and women.

According to recent articles, women with higher education are more egalitarian than men with the same level of higher education. Thus, we expect that the effect of education is stronger for women than for men.

3. For highly educated-women, the opportunity costs of marriages are high. Thus, we expect that women's education decreases the probability that they are married. This is not the case for men.
4. Likewise, well-educated women incur higher opportunity costs for raising children. Thus, we expect that women's education decreases the probability that they have children. This is not the case for men.
5. Attitudes toward marriage will affect the probability of both men and women being married, while the gender role attitude only affects women regarding their marital status.
6. Attitudes toward marriage will not affect the probability of both men and women having children, while the gender role attitude only affects women regarding their parental status.

Methods

Data

Data were obtained from the Taiwan Social Change Survey (TSCS), conducted in 2006. The survey had been conducted with a nationally representative sample every year and focuses on different topics every year. The 2006 survey dealt with the issues of families and marriages, so this survey is suitable to the present study.

Besides basic socioeconomic variables, the 2006 survey offers two critical but slightly different sets of questions—gender role attitude and attitude toward marriages (see Appendix 1). The former is related to gender relationships within and outside families, while the latter is about the various aspects of marriages.

Models

In the present study, we utilize two different models to examine the factors related to attitudes, and those related to marital status and/or parental statuses. The attitudes include gender role attitudes and attitudes toward marriage, both measured with 7-point scales. Considering them as interval variables, we employ OLS. To measure marital and parental statuses, however, we assign three outcomes; not currently married, married without children, and married with children. We employed a multinomial logit model for this outcome variable, treating married without children as the reference category.

In addition, to make formal comparisons of the effects of education and age between men and women, we combine men and women as one sample, and use interaction terms (female*education and age*education) to make comparisons. On the other hand, in the second model to predict marital/parental statuses, we run two analyses for men and women separately.

Variables

Dependent Variables

Three dependent variables are examined:

1. Egalitarian Gender Role Attitude—Four questions measure the respondent's gender role attitude. Each question is made of a 7-point scale from strongly disagree (1) to strongly agree (7). If necessary, we reverse-code the responses so that high scores represent the egalitarian direction. We then create the gender role attitude variable by averaging the

values of four questions. The higher the value is, the more egalitarian the respondent is (1-7).

2. Nontraditional Attitude toward Marriage—Much like the gender role attitude, there are five questions about attitudes toward marriage. We calculate the mean value of the five responses for each respondent to create a measure for the attitude toward marriage. If necessary, we reverse-code the responses so that the score represents the nontraditional direction. Respondents have more nontraditional attitudes toward marriage if their scores are higher (1-7).
3. Marital and Parental Statuses—To represent three outcomes of marital/parental statuses, we code them to not currently married (0), married but don't have children (1), and married with children (2). We treat this as a nominal variables with “married but don't have children” as the reference category.

Independent Variables

The following are included as independent variables:

1. Gender—Male (0) or female (1)
2. Age—Age in years
3. Education—Years of schooling
4. Income—Monthly household income in ten thousands New Taiwanese dollars. The households earn over 250 thousand dollars are all recoded as 250.

Results

Table 1 represents the descriptive statistics of the variables included in our models. The total sample size is 1,878. The mean age is 44.362, ranging from 19 to 92. The average years of education is 11.343 (about high school degree), ranging from 0 to 22 years. The mean household income is \$83,133.65. The numbers of men and women are very close to each other (50.3% and 49.7%). More respondents are already married with children (69.3%) than

married without children (2.9%) or not married (17.8%).

Insert Table 1 About Here

The average score for egalitarian gender role attitude is 4.292 and that for nontraditional attitude toward marriage is 4.172. Both results show that Taiwanese people are close to the mid-point (4.0) regarding gender relationships and marriages ($(1+7) / 2 = 4.0$). The regression estimates on the two attitudinal measures are shown in Table 2. Regarding egalitarian gender role attitude, being female and education are both positively and significantly related. Women, in general, are more egalitarian than men regarding gender relationships. Highly educated people have more egalitarian beliefs. The two interaction terms have interesting interpretations. First, younger women have more egalitarian attitudes than the older women ($b = -.018 - .007 = -.025$), while this effect is weaker for men ($b = -.018$). Moreover, the positive effect of education is stronger for women than for men. We can further confirm the result in Figure 7. The gap in egalitarian values between men and women increases with the level of education.

The influence of gender on attitudes toward marriage is similar to that on gender role attitudes. Women have more nontraditional attitudes toward marriage than men do. However, the two interaction variables are insignificant if the dependent variable is attitude toward marriage. In other words, the effects of age and education are not different by gender.

Insert Table 2 About Here

Insert Figure 7 About Here

Table 3 represents the result of multinomial logistic regression analyses. While there aren't many significant relationships, all of them are in the predicted direction. Among women, the younger, the less likely to be married. They are also less likely to have children when they are young and/or they are well-educated. Also among men, the younger, the less likely to be married and the less likely to have children. Although it did not attain statistical significance, it appears that better educated men are more likely to be married ($p=.065$).

The fact that women's education is not related to their marital status is interesting. This might indicate that the opportunity costs are higher among women for having children than getting married. The finding also indicates that regardless of education, women in Taiwan would like to get married. Having children, however, is an entirely different matter, and recent increases in educational achievements by women in Taiwan must have contributed to their extremely low fertility rates. Neither gender role attitude nor attitude toward marriage is related to marital or parental statuses.

Insert Table 3 About Here

Conclusions

The second demographic transition theory refers to individualistic orientations among people in recent years. The theory predicted that the disorganization of marriages (low marriage rates and high divorce rates) in western countries would result in lower fertility rates. With more children out of wedlock, however, the importance of marriages has decreased. As a result, fertility rates in the United States and some European nations stopped their decline. On the other hand, owing to the traditional culture, marriages are still a prerequisite for child bearing in East Asia, including Taiwan. While we expected that the fading marriages lead to very lower fertility rates in Taiwan, our results indicate that increasing education among women affects childbirth rather than marriage.

The fertility rate in Taiwan is even lower than those in other East Asian countries. This might be because Taiwanese women develop highly egalitarian and nontraditional attitudes, though our results do not support this contention. The expansion of higher education in Taiwan after 1990 provides women with many opportunities. In comparison to neighboring countries such as Japan and South Korea, the degree of expansion is much larger in Taiwan. The influences of education on women are huge, as shown in our analysis on parental status. This strong relationship between women's education and parental status, however, may only

indicate the delay in childbirth. Since our analysis is based on cross-sectional data and includes younger people in the middle of childbearing period, there is a possibility that well-educated women may eventually have children. We need to wait for 10 years or so until we test this conjecture because a rapid expansion of women's education in Taiwan is of a recent past (see Figure 5).

The fact that the data are of a cross-sectional nature, rather than panel data, poses another potential issue of causal direction. Household income, for example, brings in the endogeneity problem, particularly for women. Our main finding on women's education, however, is immune from this potential problem.

References

- Baker, Christy. A. and Annis, L. V. (1980). Sex-role Stereotyping and the Feminism of Education Undergraduates. *Southern Journal of Educational Research*, 14, 79-87.
- Blacker, C. P. (1947). Stages in Population Growth. *A Survey of Eugenics*, 39(3), 88-101.
- Bolzendahl, Catherine I. and Daniel J. Myers. (2004). Feminist Attitudes and Support for Gender Equality: Opinion Change in Women and Men, 1974-1998. *Social Forces*, 83(2), 759-789.
- Chang, Ming-Cheng and Mei-Hui Lee. (2001). Fertility Trends in Below-Replacement Levels. *Journal of Population studies*, 23, 93-112.
- Chen, Kuan-Jeng , Te-Mu Wang, and Wen-Ling Chen. (1986). Causes and Consequences of Population Change in Taiwan. *Journal of Population studies*, 9, 1-23.
- Ciabattari, Teresa (2001). Changes in Men's Conservative Gender Ideologies: Cohort and Period Influences. *Gender and Society*, 15(4), 574-591.
- Coale, Ansley J. and Edgar M. Hoover. (1958). *Population Growth and Economic Development in Low Income Countries*. Princeton: Princeton University Press.
- Department of Household, M.O.I (2012a)
http://www.ris.gov.tw/zh_TW/346
- Department of Household, M.O.I (2012b)
http://www.ris.gov.tw/zh_TW/346
- Etaugh, Claire and Deborah Bohn Spandikow. (1981). Changing Attitudes Toward Women: A Longitudinal Study of College Students. *Psychology of Women Quarterly*, 5(4), 591-594.
- Gubernskaya, Zoya (2010). Changing Attitudes Toward Marriage and Children in Six Countries. *Sociological Perspectives*, 53(2), 179-200.
- Hamilton, Brady E., Joyce A. Martin, and Stephanie J. Ventura. (2010). Births: Preliminary Data for 2009. *National Vital Statistics Reports*, 59(3).

- Jones, Gavin W. (2007). Marriage and Very Low Fertility in Pacific Asia. *Population and Development Review*, 33, 453-478.
- Kamo, Yoshinori. (2000). Marital Adjustment. In Edgar F. Borgatta and Rhonda J. V. Montgomery (Eds.), *Encyclopedia of Sociology, Second Edition* (pp. 1725-1733). New York: Macmillan Publishing Company.
- Kohler, Hans Peter, Francesco C. Billari, and Jose Antonio Ortega. (2002). The Emergence of Lowest-low Fertility in Europe During the 1990s. *Population and Development Review*, 28(4), 641–681.
- Kravdal, Ø ystein and Ronald R. Rindfuss. (2008). Changing Relationships between Education and Fertility: A Study of Women and Men Born 1940 to 1964. *American Sociological Review*, 73(5), 854-873.
- Larsen, Marie Helweg. (2011). Will I Divorce or Have a Happy Marriage?: Gender Differences in Comparative Optimism and Estimation of Personal Chances Among U.S. College Students. *Basic and Applied Social Psychology* 33, 156-166.
- Lee, Mei-Lin (1990). Fertility Tempo and Fertility Transition in Taiwan. *Journal of Population studies*, 13, 145-166.
- Lee, Mei-Lin, Ya-Chieh Yang, and Chin-Chun Yi. (2000). The Division of Household Labor: Employment Reality or Egalitarian Ideology. *The Taiwanese Journal of Sociology*, 24, 59-99.
- Lesthaeghe, Ron J. and C. Wilson. (1986). Modes of Production, Secularization and the Pace of the Fertility Decline in Western Europe, 1870-1930. In Ansley J. Coale and Susan C. Watkins (Eds.), *The Decline of Fertility in Europe* (pp. 261-292). Princeton, NJ: Princeton University Press.
- Lin, Ying-Ching and Priya Raghubir. (2005). Gender Differences in Unrealistic Optimism about Marriage and Divorce: Are Men more Optimistic and Women more Realistic. *Personality and Social Psychology Bulletin*, 31, 198–207.

- Lu, Yu-hsia. (2011). Changes in Gender-role Attitudes in Taiwan, 1991-2001. *Taiwanese Journal of Sociology*, 48, 51-94.
- Mason, Karen Oppenheim, and Yu-Hsia Lu. (1988). Attitudes toward Women's Familial Roles: Changes in the United States, 1977-1985. *Gender & Society*, 2(1), 39-57.
- Ministry of the Interior (2010). Interior Affair for the Sixth Week in 2010.
http://www.moi.gov.tw/stat/news_content.aspx?sn=3829.
- Pampel, Fred (2011). Cohort Changes in the Socio-demographic Determinants of Gender Egalitarianism. *Social Forces*, 89(3), 961-982.
- Peng, Li-hui, Ray-may Hsung, and Chin-shan Chi. (2011). How Cohort, Gender, and Gendered Majors Affect the Acquirement of First Job's SES in the Context of Taiwan's Higher Education Expansion. *Taiwan Journal of Sociology of Education*, 11(2), 47-85.
- Raymo, James M. (2003). Educational Attainment and the Transition to First Marriage among Japanese Women. *Demography*, 40(1), 83-103.
- Raymo, James M. and Miho Iwasawa. (2005). Marriage Market Mismatches in Japan: An Alternative View of the Relationship between Women's Education and Marriage. *American Sociological Review*, 70(5), 801-822.
- Rindfuss, Ronald R. , Larry Bumpass, and Craig St. John. (1980). Education and Fertility: Implications for the Roles Women Occupy. *American Sociological Review*, 45(3), 431-447.
- Sassler, Sharon and Robert Schoen. (1999). The Effect of Attitudes and Economic Activity on Marriage. *Journal of Marriage and Family*, 61(1), 147-159.
- Schreiber, E. M. (1978). Education and Change in American Opinions on a Woman for President. *Public Opinion Quarterly*, 42, 171-182.
- Shieh, Wen-Yi. (2006). Why Marriage? A Study of the Commitment Influencing Factors of Engaged Couples in Taiwan. *Chinese Journal of Guidance and Counseling*, 20,

51-82.

The World Bank (2012a). *Data Bank: Fertility Rate, Total (Births per Woman)*.

<http://data.worldbank.org/indicator/SP.DYN.TFRT.IN>.

Thornton, Arland , Duane F. Alwin, and Donald Camburn. (1983). Causes and Consequences of Sex-Role Attitudes and Attitude Change. *American Sociological Review*, 48(2), 211-227.

Thornton, Arland and Deborah Freedman. (1979). Changes in the Sex Role Attitudes of Women, 1962-1977: Evidence from a Panel Study. *American Sociological Review*, 44(5), 831-842.

Tsai, Hung-Jeng (2007). Historical Formation of Population Policy in Taiwan. *Taiwanese Journal of Sociology*, 39, 65-106.

Tsuya, Noriko O. and Larry L. Bumpass. (2004). *Marriage, Work, and Family Life in Comparative Perspective: Japan, South Korea, and the United States*. Hawaii: University of Hawaii Press.

Van de Kaa, D. J. (1987). Europe's Second Demographic Transition. *Population Bulletin*, 42, 1-59.

Wilkie, Jane Riblett. (1993). Changes in U.S. Men's Attitudes toward the Family Provider Role, 1972-1989. *Gender & Society*, 7, 261-279.

Ying-Ching Lin. and Raghbir, Priya. (2005). Gender Differences in Unrealistic Optimism about Marriage and Divorce: Are Men more Optimistic and Women more Realistic? *Personality and Social Psychology Bulletin*, 31, 198–207.

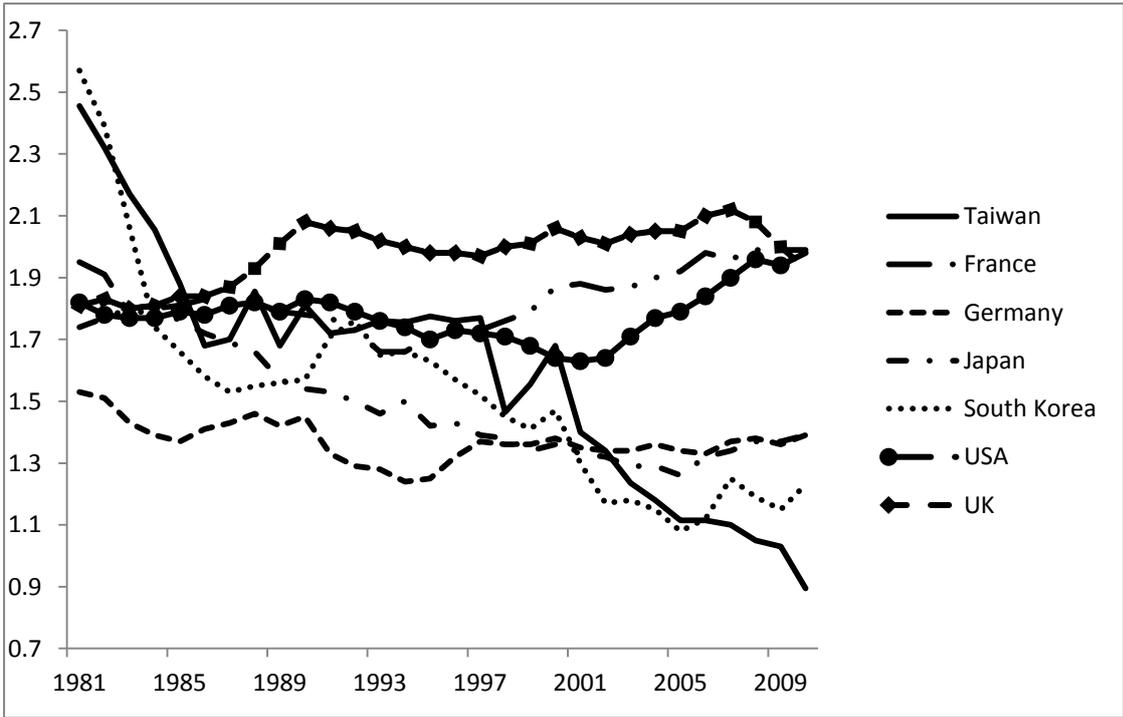


Figure 1. Total Fertility Rates in Various Countries, 1981-2010

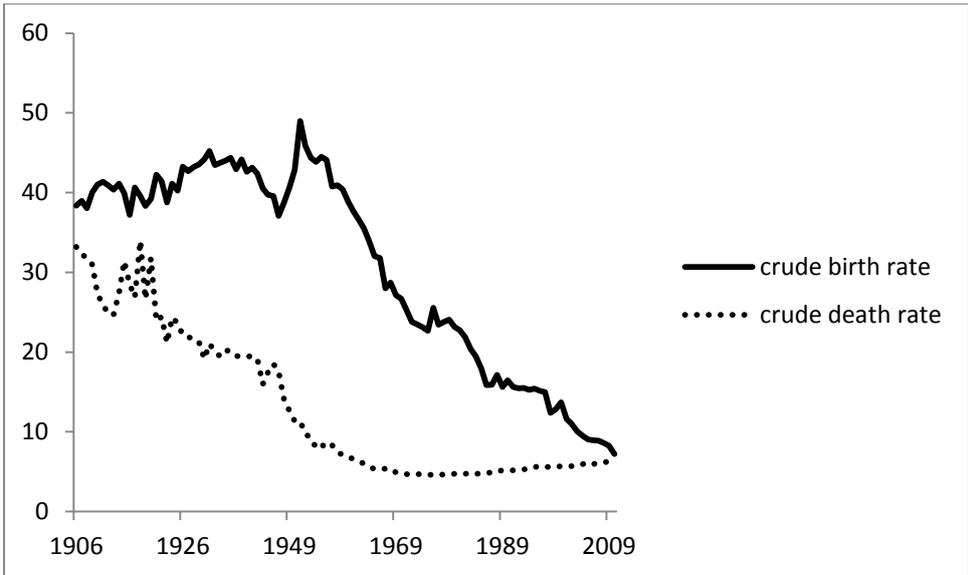


Figure 2. The Crude Birth Rates and Crude Death Rates in Taiwan, 1906-2010

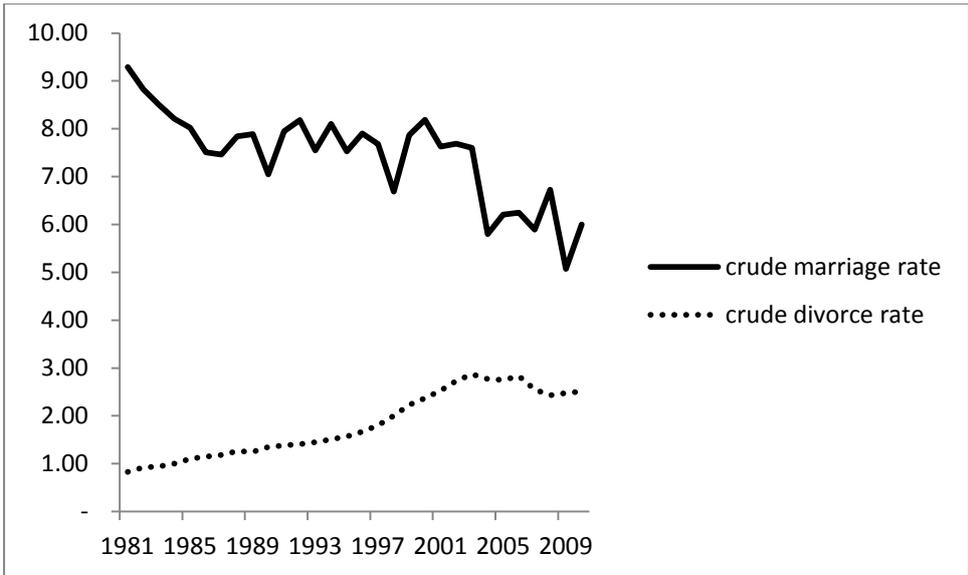


Figure 3. The Crude Marriage Rates and Crude Divorce Rates in Taiwan, 1981-2010

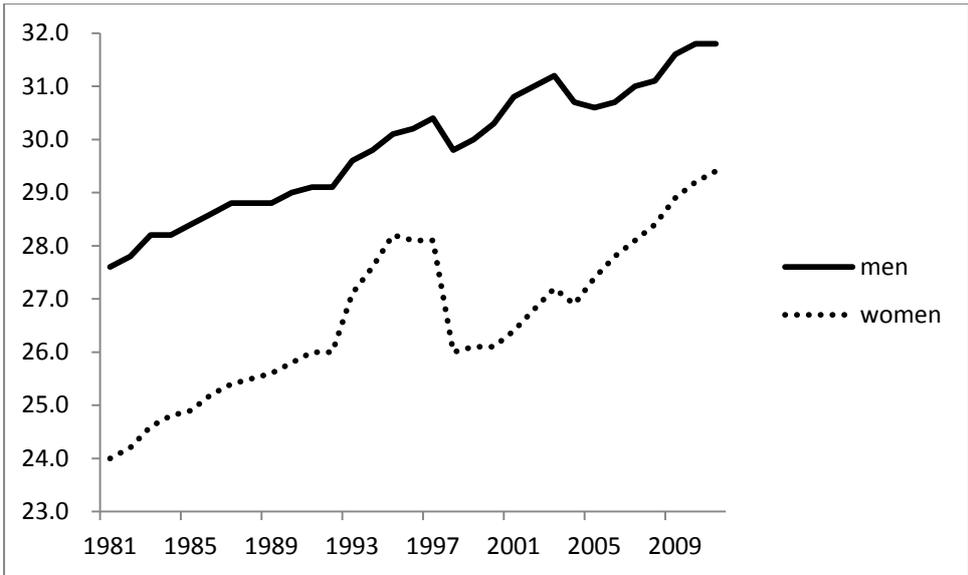


Figure 4. The Mean Ages at First Marriage for Men and Women in Taiwan, 1981-2010

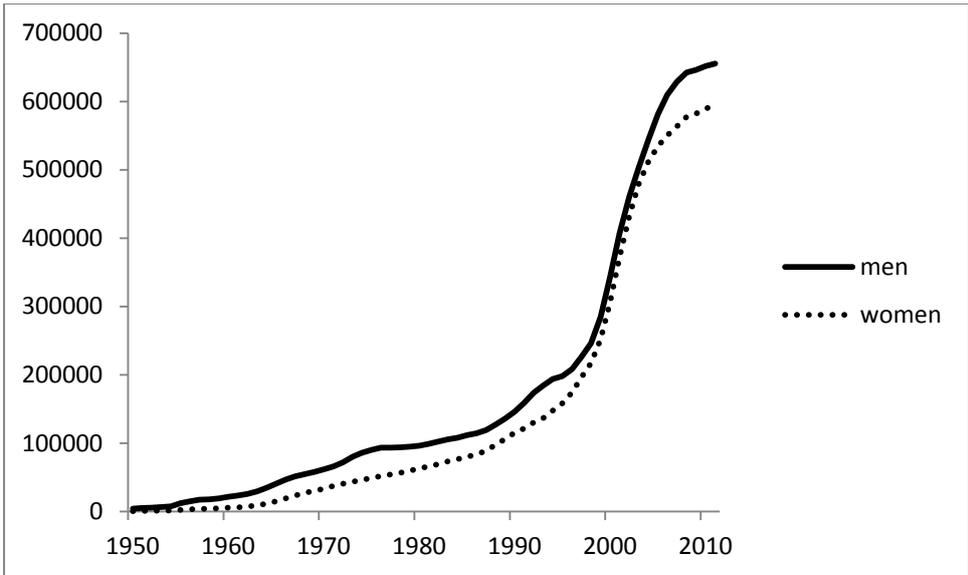


Figure 5. The Number of Male and Female Undergraduate and Graduate Students in Taiwan, 1950-2011

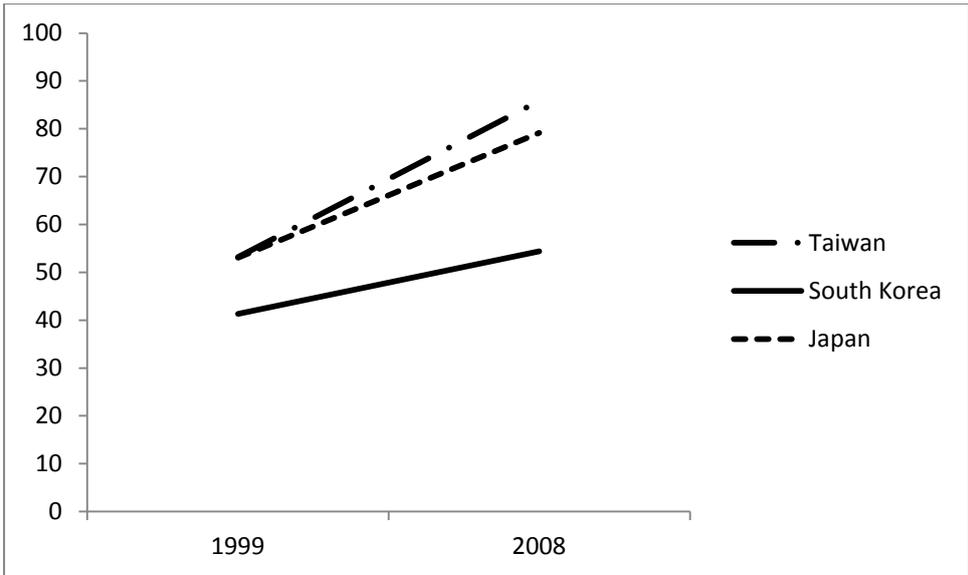


Figure 6. Female Gross Enrollment Rates in Higher Education in East Asia (Japan, South Korea, and Taiwan), 1999 and 2008

Table 1. Summary Statistics of the Variables Included

	Mean	S.D	Min	Max
Age	44.362	16.473	19	92
Education	11.343	4.484	0	22
Income/10000	7.434	5.399	0	25
Egalitarian Gender Role	4.292	1.074	1	7
Nontraditional Attitude toward Marriage	4.174	1.024	1.2	7
	Count	%		
Gender: Male	945	50.3		
Female	933	49.7		
Status: Not Married	523	17.8		
Married, No Children	54	2.9		
Married, With Children	1301	69.3		

Table 2. Ordinary Least Squares Regression to Predict the Egalitarian Gender Role Attitude and Nontraditional Attitude toward Marriage (N=1,878)

	Egalitarian Gender Role Attitude			Nontraditional Attitude toward Marriage		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Female	.265*** (.040)	.566*** (.116)	-.045 (.112)	.200*** (.044)	.411** (.128)	.081 (.124)
Age	-.013*** (.002)	-.017*** (.002)	-.013*** (.002)	-.012*** (.002)	-.015*** (.002)	-.012*** (.002)
Education	.093*** (.006)	.089*** (.006)	.104*** (.007)	.048*** (.007)	.046*** (.006)	.052*** (.008)
Income/10 000	.045*** (.012)	.045*** (.012)	.045*** (.012)	.003 (.004)	.003 (.004)	.003 (.004)
Income ² /1 0000	-.011* (.005)	-.011* (.005)	-.011* (.005)	--	--	--
Female* Age	--	-.007** (.002)	--	--	-.005 (.002)	--
Female* Education	--	--	.027** (.009)	--	--	.010 (.010)
Intercept	3.703*** (.132)	3.930*** (.155)	3.593*** (.136)	4.215*** (.138)	4.374*** (.164)	4.172*** (.144)
Adj R ²	.354	.357	.357	.137	.138	.137

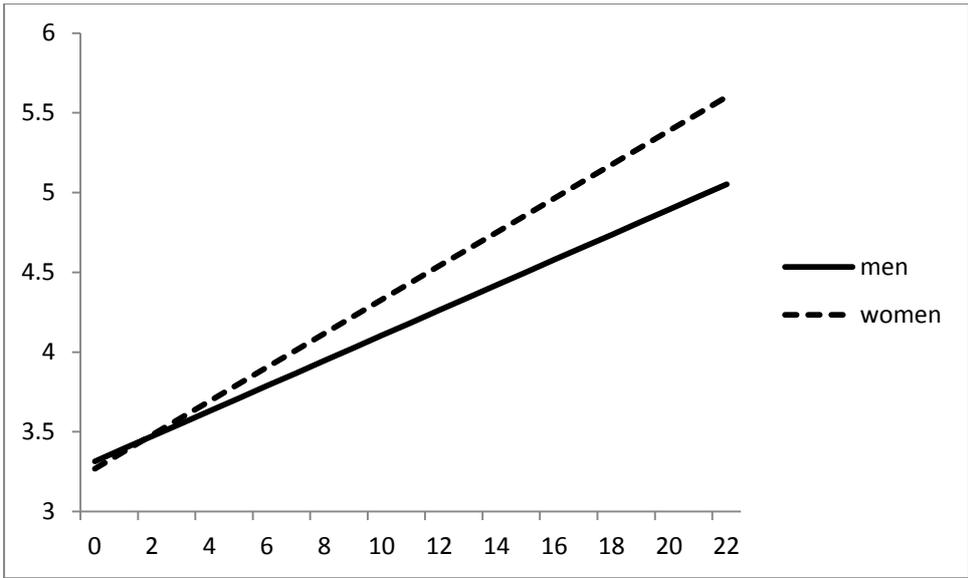


Figure 7. The Effect of Education on Egalitarian Gender Role Attitude for Men and Women

Table 3. Multinomial Logistic Regression to Predict Marital and Parental Statuses

	Men	Women
Unmarried		
(reference = married, no children)		
Age	-.134*** (.022)	-.095*** (.024)
Education	-.140 (.084)	-.068 (.100)
Income	-.028 (.040)	-.024 (.042)
Nontraditional Gender Role	.219 (.264)	.355 (.251)
Nontraditional Attitude toward Marriage	.313 (.230)	.154 (.232)
Intercept	6.712*** (1.774)	3.735* (1.853)
Married with children		
(reference = married, no children)		
Age	.069** (.020)	.081*** (.022)
Education	-.095 (.079)	-.321** (.095)
Income	.013 (.039)	.036 (.040)
Nontraditional Gender Role	-.018 (.253)	.084 (.242)
Nontraditional Attitude toward Marriage ¹	-.180 (.221)	-.170 (.225)
Intercept	1.950 (1.706)	4.025* (1.783)
	N= 945	933
LR X ²	643.54***	546.50***

¹ Nontraditional Gender Role and nontraditional attitude toward Marriage are insignificant in this model, but it is only because the reference group has fewer cases (standard errors increase). If we ran the logit model (only married vs. unmarried), the two variables are both significant in women's sample, and nontraditional attitude toward Marriage is significant in men's sample.

Appendix 1

Statements constituting gender role attitude:

1. It is more important for a wife to help her husband's career than to pursue her own career.*
2. A husband's job is to earn money; a wife's job is to look after the home and family.*
3. Men ought to do a larger share of household work than they do now.
4. During an economic recession, it is alright for women to be laid-off before men.*

Statements constituting attitude toward marriage:

1. It is not necessary to have children in marriage.
2. It is alright for a couple to live together without intending to get married.
3. People who want to divorce must wait until children are grown up.*
4. It is better to have a bad marriage than no marriage at all.*
5. It is better to have a bad marriage than divorce.*

Note: Statements with asterisks (*) are reverse-coded so that larger scores indicate egalitarian or non-traditional attitudes.