Influence of age of child on differences in life satisfaction of males and females: Comparative study among East Asian countries.

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Abstract

Using individual-level data for China, Korea, and Japan for 2006, this research examines how the age of children influences life satisfaction for males and females in East Asian countries. Our results show that the life satisfaction of males is barely affected by a child of the relationship, whereas the life satisfaction of females with a young child is lower than that of females who do not have a child. This result holds for countries at different development stages. There is also a gender differential regarding the effect of young children on life satisfaction. Furthermore, the more developed the country, the greater this difference becomes.

1. Introduction

Life satisfaction[1] has long been a topic of interest to sociologists but not economists. Although some authors have developed economic models that offer an explanation as to why parents need to have children from an economic perspective (for example, Becker 1981; Barro and Becker 1989; Boldrin and Jones 2002; Moav 2005)[2], there has been little research on marital happiness in economic literature. Nevertheless, in recent years, a number of economists have investigated the impact of socioeconomic conditions on different measures of subjective well-being (SWB), measured as self-reported levels of happiness or life satisfaction (for an excellent review, see Dolan et al. 2008). These empirical studies primarily focus on the effects of microeconomic and macroeconomic conditions on individual well-being (life satisfaction and happiness).[3] The family structure seems to be one of key determinants of SWB. The empirical evidence from economics of happiness literature states that having children increases SWB (Dolan et al. 2008). However, in psychology literature, there are several studies that suggest that the presence and number of children decrease life satisfaction (for instance, White et al. 1986; Tsang et al. 2003; Twenge et al. 2003).

Child care is needed more when children are young, particularly before they enter primary school. In addition, females are likely to spend much more time on child rearing than males. The effect of children on parental satisfaction appears to depend on

[1] In formal literature, several terms are often used interchangeably to introduce the same concept: marital satisfaction, marital happiness, and marital quality. See Campbell et al. (1976) for a methodological discussion on happiness and satisfaction. In this paper, we use the term marital satisfaction because the survey specifically asks about satisfaction.

[2] Children can be considered as an investment good, or may serve as cheap labor. Another reasoning to have children is to get support for the old age as a way of reducing economic uncertainty but also to secure economic, physical, and emotional care.

[3] The influence of happiness on various facets of modern life has been also examined. For instance, Sabatini (2011) found a positive relationship between happiness and health status.

the age of the child and the gender of the parent. Recently, in the sociological literature, Dew and Wilcox (2011) examined how the presence of a child influences life satisfaction, but not the effect that the child's age may have on life satisfaction. Clark et al. (2008) used German panel data to show that parents' life satisfaction decreased over time, with higher levels at the birth of a child, and lower levels when the child is 5 years old. However, it is not fully explored about how the impact of the age of a child on life satisfaction differs across genders. Further, the majority of studies confirm that the negative impact of children on life satisfaction focus on individualistic countries such as the United States and Canada. Nevertheless, the relationship between children and life satisfaction may also vary according to cultural context (for example, Dillon and Beechler 2010). In this paper, we are interested to see if this effect can be found in collectivist cultures, as in Asia (Moghaddam et al. 1993). There are differences in economic development and cultural values among Asian countries, thus, it is of interest to compare the influence of the child's age on parental life satisfaction in these countries.

The aim of this paper is to examine the association between children's ages and life satisfaction across genders using a large individual dataset from several Asian countries (China, Korea, and Japan) at different development stages. This study is the first attempt at a cross-country analysis of the association between age of child and life satisfaction in three major Asian countries—China, Japan, and Korea. We also use compatible cross-country (individual-level) data that enable us to consistently compare the results among the countries. The key contribution of this paper is to provide a comparative approach regarding the association between age of children and life satisfaction, and to determine whether this varies for men and women. The remainder

of the paper is organized as follows.[4] Section 2 provides the hypothesis. The section3 describes the data and empirical methodology. Section 4 reports the main empirical results and section 5 concludes.

2. Hypothesis

Females can be pregnant while males cannot, and female productivity at work often declines during pregnancy. Furthermore, females typically cannot work for a while after they give birth. From the view point of economics, females are thought to have a comparative advantage with respect to helping with homework and providing child care. Males have a comparative advantage at working to earn money. In addition, parents are more inclined to invest in a son's rather than a daughter's education. As a consequence, the larger human capital of males results in higher wages in the labor market compared to females. This leads to females becoming housewives rather than full-time employees in the workplace. Recently, researchers have paid much attention to the role played by "identity" in human behavior. In the case of housework, females may consider doing that task as part of their self image. Thus, time for housework increases their utility (Akerlof and Kranton 2000).

After giving birth, women are likely to devote more of their time and energy to their children. They spend less time with their spouse and devote more time to domestic duties (Nomaguchi and Milkie 2003; Dew and Wilcox 2011)[5].

The existence of a child can increase the utility of parents, and thus a child can

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[4] Given the cross-sectional nature of the data, we are not able to provide our results in terms of cause and effect, but rather, in terms of association. Indeed, one might also argue the existence of reverse causality between children and marital satisfaction.

[5] It is also plausible that life satisfaction can decline because the expectations of women regarding equitable and fair work are not met (Twenge et al. 2003; Dew and Wilcox 2011), including a husband's lack of contribution to housework. Women are happier when they can share their domestic tasks and child care with their husbands (for instance, Amato et al. 2003).

be considered a consumption good in the utility function (Becker, 1981). That is, a child has a positive effect on life satisfaction of parents. Alternatively, parents are obligated to provide child care when the child care market has not been well developed. Providing child care reduces leisure time and decreases utility. Time for child care is thus considered the cost of a child. As a result, children have a negative effect on utility. That is, children can reduce the life satisfaction of a female. Considering the positive and negative effects of having a child, children can reduce life satisfaction when the negative outweigh the positive effects.

The relationship between life satisfaction and children may also vary according to the age of the child. The amount of time required for child care is greater when the child is young because infants require almost constant attention and care. Older children demand less care and spend much of their time in school. Thus, they create less of a conflicting role for parental caregivers (Kalenkoski et al. 2009; Twenge et al. 2003). It seems plausible that life satisfaction declines after the birth of a child and recovers as the child becomes older and more independent.

Women are expected to be the primary caregiver for the child, especially in Asian countries where lifestyle is based on Confucianism. In addition, this effect can be stronger in developed countries because there is perhaps less family support (female relatives who are available to help with child care) (see Dillon and Beechler 2010). This might be caused in part by a decline of social capital in developed countries (Putnam 2000). Furthermore, the opportunity cost of child care appears to increase as the human capital of females increases. In more developed countries, females have more education. Thus, their human capital is larger. In addition, females are more likely to have opportunities for higher earnings in these countries. As a consequence,

the opportunity cost of a child becomes higher. Hence, the existence of a child is thought to result in decreased life satisfaction in developed countries.

The argument above can be formalized in a simple empirical model, which is based heavily on Cigno (1991, Ch 6). The cost of a child is convincingly assumed to be negatively associated with life satisfaction of parents. Hence, an increase in the cost of a child leads to a decrease in the parents' life satisfaction. Under such an assumption, the cost function of a child is expressed as:

Let b denote the rate of benefits payable to the parents for each child, and e the expenditure for a child. The total opportunity cost of child rearing is expressed as $f_i(h, w_i)$ where h is denoted as the home time devoted to a child and w the wage rate. Suffix i is the gender of parents. Furthermore, h is a decrease in age of a child represented as g. w is an increase in human capital represented as k. In addition, w increases in d, denoting level of economic development in the country where parents live. The total cost of a child function $c_i()$ is written as

$$C = c_i(b, e, h, w_i) = e - b + f_i(h(g), w_i(k_i, d)). \tag{1}$$

c_i is an increase in e and f_i, and a decrease in b. Further, f_i is specified as:

$$f_i(h(g), w_i(k_i, d)) = \frac{1}{g} k_i^\alpha d^\beta \tag{2}$$

where $\alpha > 0, \beta > 0$.

It is possible for C to be negative, and thus rearing a child can increase parents' life satisfaction. C can be negative even if e and f_i are positive if b is large enough. Partial differential equations are:

$$\frac{\partial f_i}{\partial d} = \frac{\beta}{g} k_i^\alpha d^{\beta-1} > 0 \tag{3}.$$

$$\frac{\partial f_i}{\partial k} = \frac{\alpha}{g} k_i^{\alpha-1} d^\beta > 0 \tag{4}.$$

And then,

$$\frac{\partial^2 f_i}{\partial k \, \partial g} = -\frac{\alpha}{g^2} k_i^{\alpha-1} d^\beta < 0$$

(5)

As seen in (3), the cost of a child is higher in more developed countries. We interpret (4) as suggesting that increases in i's human capital results in an increase in the cost of a child. If (5) is true, the cost of a child is high when i's human capital is high, and the child is young. To put it differently, an interaction between increases in i's wage rate and a decrease in the child's age leads to an increase in the cost of a child, which results in a decrease in i's life satisfaction.

We assume that the human capital of females is smaller than that of males. Therefore, females are more likely to spend time on child rearing than on earning money. That is, the cost of a child is larger for females than for males. The hypothesis can be postulated as follows:

Hypothesis: Females experience greater life dissatisfaction compared with males when the child is young. This negative effect of small children on life satisfaction is larger in more developed countries.

3. Data and methodology

3.1. Data

The empirical analysis in this paper is based on micro data collected from the CGSS (Chinese General Social Surveys), JGSS (Japanese General Social Surveys),

and Korean Social Surveys (Korea), which were conducted in 2006 and provided by the East Asian Social Survey Data Archive (EASSDA 2006). These surveys provide rich information regarding respondents' demographic and socioeconomic status and other particular aspects of the surveyed country. The surveys were designed uniformly and have common questionnaires, which make them largely comparable with each other. With the aim of comparing the effect of age of child on life satisfaction between different countries, we used the integrated EASS data collected by participating institutions in China, Korea, and Japan.[6] In the first survey round, the questionnaire incorporated a special module on "Family in East Asia (EASS 2006)". This family module questionnaire included questions concerning behaviors and attitudes of respondents toward their family members and relatives. Specifically, it focused on intergenerational support, attitudes toward the obligation to support aged parents, and attitudes to primogeniture.[7] Three survey rounds have been conducted so far.

From the three countries, China, Korea, and Japan, 7,872, 2,500, and 3,998 individuals were invited to participate in the survey, respectively. The survey collected data from 3,208 (China), 1,605 (Korea), and 2,130 (Japan) individuals, with response rates of 38.5%, 65.7%, and 59.8%, respectively. The construction of samples used in this research is shown in Table 1. Furthermore, we exclude those who have missing values for the dependent variable, life satisfaction. As a result, the sample included 3,208 respondents from China, 1,603 from Korea, and 2,125 from Japan, when it was

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[6] The participating institutions in China, Korea and Japan are as follows: the Department of Sociology, Renmin University of China (Bijin); Survey Research Center, Sungkyunkwan University (Seoul); JGSS Research Center, Osaka University of Commerce (Osaka); and the Institution of Taiwan also participated in EASS. This paper attempts to compare countries representing different stages of economic development. Taiwan and Korea are considered to be at a similar level of economic development. Hence, Taiwan was excluded in this paper.

[7] The data were provided by the website of EASS (http://www.eass.info/about/about01.php) accessed on November 1, 2009.

limited to those who responded to the question regarding life satisfaction. [8] Furthermore, after excluding observations from those without valid answers for key explanatory variables such as age, education, and household income, the sample size was 2,247 individuals from China, 959 from Korea, and 1,021 from Japan. Final sample size appears to be gender balanced across the surveyed countries (see Table 1).

3.2.   Dependent variable

The outcome variable of interest is self-reported life satisfaction. In the current study, we assumed that marital happiness reflects more directly and accurately perceptions regarding family-related issues. In particular, this measure derives from the respondents' answers to the question, **"All things considered, how satisfied are you with your life as a whole these days?"** on a five-point scale (1 = "strongly dissatisfied" to 5 = "strongly satisfied"). As can be seen in Figure 1, the distribution of life satisfaction varies across East Asian countries. The most frequent response in China and Korea was 3. However, in China, the rate of those who responded 2 (dissatisfied) was about 45 %, which is far larger than the rate of those who responded 4 (satisfied). On the other hand, in Korea, the rate of those who responded 4 (satisfied) was about 30 %, which is far larger than the rate of those who responded 2 (dissatisfied). Hence, Korean respondents were more likely to be satisfied with their life than Chinese respondents. The rate of participants in Japan who responded 4 (satisfied) was 37 %, which was almost the same as the rate of those who responded 3. Furthermore, the rate of Japanese participants who responded 5 (very satisfied) was about 10 %, which is approximately two times larger than that of Koreans. This

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[8] The number of missing values excluded from the study was 622, 552, and 618 for China, Korea and Japan, respectively.

suggests that Japanese individuals are more inclined to be satisfied with their lives than are Koreans. These results considered together imply that degree of life satisfaction is positively associated with level of economic development. As assumed in the model, wage rate was positively associated with level of economic development and seemed to affect life satisfaction through various channels. This is in line with the argument that wage rate increases the opportunity cost of child rearing, which influences life satisfaction.

3.3.   Independent variables

Variable definitions and summary statistics of the independent variables used for the estimations are reported in Table 2. As mentioned earlier, the psychological and economic costs of having a child are profoundly associated with the age of the child. For instance, the time required for active care is longer when the child is younger (see Kalenkoski et al. 2009). Thus, age of child appears to be associated with life satisfaction. Hence, *Child_12, Child13_18*, and *Child_19* are incorporated to capture the age of child effect.[9] The period prior to a child entering junior high school is captured by *Child_12*, when a mother must pay special attention to child care. For instance, primary school students finish their school day early and they are too young to look after themselves. Thus, it is necessary for parents to take care of the younger children outside of school hours. After entering junior high school, children often

[9] The education system is similar in China, Korea, and Japan as follows: elementary school age is 6–12-year-olds. After graduating from elementary school, students advance to junior high school (3 years) and the high school (a further 3 years). This means that students usually graduate from high school at 18 years old. After completing high school, university is a further 4 years. Information regarding the education systems in China, Korea, and Japan can be accessed as follows: http://www.mext.go.jp/b_menu/hakusho/html/hpbz198103/index.html. (accessed on July 28, 2010); http://education.stateuniversity.com/pages/1400/South-Korea-EDUCATIONAL-SYSTEM-OVERVIEW.html. (accessed on July 28, 2010); and http://www.edu.cn/20041203/3123354.shtml. (accessed on July 28, 2010).

develop into troubled teenagers, and so the relationship between child and parent enters a different stage, which is captured by *Child13_18*. Parents are required to make an effort to maintain a good relationship with their child, leading to higher economic and psychological costs. Once the teenage years have passed, a child becomes adult and is considered to be independent of their parents, captured by *Child_19*.[10] The reference group holds those who do not have any children. If the cost of raising a child is the main reason for a decrease in parents' life satisfaction as proposed by the hypothesis, *Child_12* and *Child13_18* are predicted to take the negative sign. The coefficient's absolute value of Child_12 is larger than that of *Child13_18*. In addition to the age of the child, *Number of children* was incorporated as an independent variable to capture the effect of quantity of children. Because of "scale economy", the marginal cost of rearing children decreases as the number of children increases. On the other hand, the positive effect of rearing children on life satisfaction declines if marginal utility decreases as the number of children increases. It is not clear whether the marginal cost of rearing children outweighs the marginal utility. Accordingly, *Number of children* took both signs. Number of children was slightly over 2 in Korea and Japan. Number of children was 1.7 in China, although a one-child policy was adopted in 1979. Prior to that, there was no restriction on number of children. This might be the reason why the number of children was more than 1 in China.

Education levels of partners are usually considered control variables in life satisfaction literature (for instance, White and Rogers 2000). The wife's education level has a positive effect on the husband's earnings and vice versa (e.g., Mano and Yamamura, 2011; Yamamura and Mano, 2012). There are a number of studies

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[10] Once a child becomes independent, the parents' cost of having a child is thought to be invariable.

suggesting that the quality of marital relationships is positively associated with partners' education level (e.g., Stanley et al. 2006; Halfrod et al. 2003). In this study, education level was coded as years of schooling completed by respondents and their spouses (*Education* and *Spouse's education*). Females lose a large amount of their potential income as a consequence of leaving work to give birth and raise children.[11] The higher a female's opportunity cost becomes, the higher her education level (Cabinet Office, Government of Japan 2005). In our sample as presented in Table 2, *Education* for females was 7.6, 11.9, and 12.1 years in China, Korea, and Japan, respectively. This suggests that years of schooling are greater in more developed countries. Furthermore, in all countries, *Education* for females was less than *Education* for males. The difference in *Education* between males and females was 1.2, 1.0, and 0.5 years in China, Korea, and Japan, respectively. It follows from this that the difference in human capital between genders diminishes in accordance with economic development. That is, it is appropriate to argue that the mother's opportunity cost of a child becomes larger in more developed countries, reducing life satisfaction. This is consistent with the hypothesis proposed earlier.

Negative experiences like unemployment are expected to influence life satisfaction. Unemployment affects individuals beyond simply income loss; it also influences people at an emotional level, and often leads to depression. The stress resulting from one partner being unemployed and the necessity of taking care of a child may also aggravate partner life satisfaction. To consider the employment status of the respondents, we included a dummy variable that takes a value of 1 when the individual

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[11] In Japan, if a female university graduate returns to employment as a part-time or casual worker, her rate of lost earnings will be over 80% of her potential lifetime wages (Cabinet office, Government of Japan 2005, Ch. 3).

is unemployed. The sign for *Unemployment* is expected to be negative.

Few studies have addressed the relationship between family income and life satisfaction, and the empirical evidence is mixed. While some studies find a positive association between family income and marital happiness (Amato et al. 2003), others find no association (Amato and Rogers 1997). To take into account family income, we included household income (*Income*) measured as the total net income of the household from all sources. Life satisfaction seems to depend on age in part because people are more likely to succumb to a disease as they become older. In addition, spouse's age seems to be a key determinant of life satisfaction. For instance, a husband or wife requires support from surrounding people as their spouse becomes older. Hence, one is obliged to provide spousal care. To control for respondent's and spouse's ages, respondent and spouse generation dummies were included as independent variables because the effect of age on life satisfaction is possibly non-linear.

3.4.   Methodology

As life satisfaction is ordered and discrete, an ordered probit model was used (for more details, see Greene 1997). Ordered probit analysis has been used in the literature to examine the determinants of life satisfaction (e.g., Lee and Ono 2008; Oshio et al. 2011). The estimated function takes the following form:

$Life\ Satisfaction_i = \alpha_1\ Child\_12_i + \alpha_2\ Child13\_18_i + \alpha_3\ Child\_19_i + \alpha_4\ Number\ of\ Children_i + \alpha_5\ Education_i + \alpha_6\ Spouse's\ education_i + \alpha_7\ Unemployment_i + \alpha_8\ Income_i + e_i + u_i,$

where *Life Satisfaction* represents the dependent variable in the case of the respondent , α represents regression parameters, e_i is the vector of generation dummies, and u_i is the

error term that follows a standard normal distribution.

When the coefficient takes the positive sign, a positive change in the independent variable decreases the probability of the lower ranked outcome and increases the probability of the highest ranked outcome. However, "the marginal effects of the regressors on the probability are not equal to the coefficients" (Greene 1997, p. 927). Therefore, we encounter a difficulty in the interpretation of coefficients. Instead of coefficients, the marginal effects can be calculated in each dependent variable category (Greene, 1997, p. 927–931). Hence, for a closer examination of estimation results, in addition to coefficients, as presented in Table 5, we also report the marginal effects of key variables such as *Child_12, Child13_18*, and *Child_19* in Prob(*Life Satisfaction* = 1), Prob(*Life Satisfaction* = 2), Prob(*Life Satisfaction* = 3), Prob(*Life Satisfaction* = 4), and Prob(*Life Satisfaction* = 5).

4. Estimation results and interpretation

4.1. Child age dummy

Tables 4 and 5 display the results for males and females, respectively. Starting with the results for males, Table 4 shows that *Child_12*, *Child 13_18*, and *Child_19* take the positive sign in columns (1) and (3). Further, *Child 13_18* is statistically significant in columns (1) and (3). In addition, *Child 12* is statistically significant in column (3). These results can be interpreted as suggesting that a young child improves males' life satisfaction in China and Japan. This implies that the benefit of a child outweighs the cost. This might be partly because the husband is less inclined to spend time on child rearing, and thus opportunity cost is sufficiently small. In contrast,

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Child_12, *Child 13_18*, and *Child_19* take the negative sign in column (2), while being statistically insignificant. Therefore, the age of the child does not influence males' life satisfaction in Korea. This suggests that the cost of a child neutralizes the benefit of a child.

For females, the coefficients for *Child_12* and *Child 13_18* produced negative signs in columns (2) and (3). Furthermore, *Child_12* was statistically significant at the 1 % level in columns (2) and (3). In addition, *Child 13_18* was statistically significant at the 1 % level in column (3). However, it is interesting to observe that *Child_19* took the negative sign in column (2) and the positive sign in column (3). Furthermmore, results were not statistically significant. This implies that the cost of a child outweighs the benefit in Korea and Japan when the child is small. However, the cost neutralizes the benefit after the child graduates from high school. In contrast, coefficients for *Child_12, Child 13_18*, and *Child_19* were not statistically significant in column (1). It follows from this that the cost of a child neutralizes the benefit of a child in China, regardless of the child's age. These results reveal that the presence of children before they enter junior high school reduces life satisfaction in females in Korea and Japan. Teenagers in junior high school have a detrimental effect on life satisfaction for females only in Japan, not in Korea. In addition, the age of a child has no effect on life satisfaction of females in China.

It is interesting to observe that *Number of children* was not statistically significant in all estimations in Tables 3 and 4. The marginal cost of a child declines as number of children increases. Accordingly, the marginal cost of a child does not outweigh the marginal benefit of a child.

4.2.　　　　Marginal effect of a child's age

For a closer examination of the effects of *Child_12, Child13_18*, and *Child_19* exhibited in Table 4, Table 5 (a), (b) and (c) shows a marginal effect on the life satisfaction of females in China, Korea, and Japan, respectively. In Table 5 (a), *Child_12, Child13_18*, and *Child_19* are not statistically significant, which is consistent with results in Table 4. This means that age of a child does not influence life satisfaction for females in China.

We now turn to Korea. As shown in column (1) of Table 5 (b), coefficients for *Child_12, Child13_18*, and *Child_19* are 0.02, 0.007, and 0.001, respectively. That is, the marginal effect of age of a child declines as the child becomes older. Furthermore, coefficients for *Child_12* are statistically significant at the 1 % level, whereas those for *Child13_18* and *Child_19* are not statistically significant. This implies that females who have a child that is younger than junior high school age, have a 2% higher probability of being strongly dissatisfied with life. We see from column (5) of Table 5 (b) that coefficients for *Child_12, Child13_18*, and *Child_19* are –0.04, –0.01, and –0.002, respectively. In line with column (1), the marginal effect of the age of a child diminishes as the child becomes older. In addition, coefficients for *Child_12* are statistically significant at the 1 % level, whereas those for *Child13_18* and *Child_19* are not statistically significant. It follows from this that females who have a child that is younger than junior high school age, have a 4% lower probability of being strongly satisfied with life. Apart from columns (1) and (5), results in other columns shows that, in Korea, the marginal effect of age is smaller as the child becomes older.

Focusing attention on Japan, we look at Table 5 (c). In column (1), coefficients for *Child_12, Child13_18*, and *Child_19* are 0.01, 0.008, and 0.001,

respectively. This means that the marginal effect of a child's age declines as the child becomes older. Furthermore, *Child_12* and *Child13_18* are statistically significant, whereas *Child_19* is not. We interpret this as suggesting that females who have a child that is younger than junior high school age, have a 1% higher probability of being strongly dissatisfied with life, whereas females who have a high school student have a 0.8% higher probability of being strongly dissatisfied with life. With respect to column (5), coefficients for *Child_12, Child13_18*, and *Child_19* are –0.05, –0.03, and –0.0008, respectively. Similar to results in column (1), *Child_12* and *Child13_18* are statistically significant, whereas *Child_19* is not. Furthermore, females who have a child that is younger than junior high school age, have a 5% lower probability of being strongly satisfied with life, whereas females who have a high school student have a 3% lower probability of being strongly satisfied with life. Apart from columns (1) and (5), results in other columns show that, in Japan, the marginal effect of age is smaller as the child becomes older.

As presented in columns (1)-(5) of Table 5 (b) and (c), combined results for Korea and Japan show that the marginal effect of *Child_12* in Japan is larger than the effect in Korea, with the exception of column (1). Considering results for China, Korea and Japan together lead us to argue that the negative effect of having young children is greater in more developed countries. Combined results of Tables 3, 4 and 5 strongly support the hypothesis proposed in Section 2.

4.3.   Control variables

Concerning the results for males exhibited in Table 3, coefficients for *Income* take the positive sign and are statistically insignificant in columns (2) and (3). This

result is in line with previous evidence in life satisfaction literature (Amato and Rogers 1997). Consistent with our theoretical predictions, *Unemployment* yields the negative sign and is statistically significant in column (2). That is, economic condition is considered to be the major determinant of life satisfaction in Korea and Japan. In contrast, *Income* and *Unemployment* do not influence life satisfaction in China. In addition, results of *Income* and *Unemployment* for females exhibited in Table 4 are similar to those in Table 3. The socio-economic system of China, which is based on socialism, is different from Korea and Japan. Therefore, in China, unemployed and low income people are more likely to be secured socially through, for instance, income redistribution. This might be one of the reasons why Chinese people are not affected by *Income* and *Unemployment.*

4.4.   Discussion

As also observed in Western countries (Akerlof and Kranton 2000), disparity concerning child care and housework between males and females exists and persists in Asian countries. There is evidence that females who live with their parents are more likely to participate in the labor market (Sasaki 2002; Mano and Yamamura 2011). A reason for this is that the parents (grandparents) can raise the child, enabling the mother to work. For instance, in a traditional Japanese farming village, "women are usually also employed … in households with a grandmother, she often takes care of young children, while the mother works in the field" (Henry 1981, p. 87). Support for child care through family ties and community network appears to be on the wane because long-term economic development has led to a decline in social capital (Putnam 2000). China is considered to be in a highly developed stage at present. Korea has

followed Japan and has experienced incredible economic growth, however, it is not yet considered to be a highly developed country. Japan experienced rapid economic growth in the post-war period and has become one of the most developed countries worldwide. Thus, Japanese women have had to address childcare issues, and the childcare industry is considered to be essential to help mothers raise their children, rather than with reciprocal care via informal social networks. Nevertheless, nursery schools, for example, are in short supply in Japan, and mothers are more likely to raise a child than to also participate in the labor market because of a shortage of childcare services (Cabinet Office, Government of Japan 2005; Date and Shimizutani 2007). Economic development can further increase the economic and psychological costs for females of raising children. In other words, the effect of having young children on satisfaction depends on the change in socioeconomic conditions.

5. Conclusion

Socioeconomic conditions vary across East Asian countries. However, they also appear to share similar cultural backgrounds that differ from those of Western countries. Furthermore, East Asian countries have experienced the rapid economic growth and so the social and family ties were thought to change drastically. This seems to influence life satisfaction. Hence, it is worthwhile to examine family relationships and life satisfaction by comparing East Asian countries. Using individual-level data from EASS (East Social Survey) from 2006, this study examines how the age of children influences the life satisfaction of males and females in China, Korea, and Japan.

We found via the ordered probit estimation that (1) life satisfaction of males is

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positively affected by the presence of small children, whereas the life satisfaction of females who have a child younger than 12 years old is lower than that of females with no children. (2) The greater the marginal effect of age of the child, the more developed a nation's economic condition.

We considered that finding (1) is due to the imbalance of child care between males and females result in each country. That is, females are more likely to be the primary caregiver for young children and so feel the associated stress from it, putting pressure on their psychological state. The division of labor within a household is a further reason for the differences in life satisfaction between genders. In our interpretation, the opportunity cost of child rearing becomes higher where people have attained higher levels of education and in more developed country. Accordingly, child rearing affects female life satisfaction to a greater degree in the process of economic development. Thus, we derive the argument that life satisfaction is in part influenced by the division of labor within households and the opportunity cost of child care.

As found by prior works (Sasaki 2002; Mano and Yamamura 2010), female labor supply partly depends on whether females live with their parents or not. In addition, Shields et al. (2009) exhibited that life satisfaction is affected by the characteristics of the parents' neighborhood. That is, help from parents and reciprocity arrangements with other community members appear to play a significant role in reducing the physical and psychological burden of child care. Hence, the effect of young children on life satisfaction is considered varied, and dependent on socioeconomic conditions such as family structure and networks within the neighborhood. Economic development is strongly related to family structure and neighborhood relationships, which are, however, not considered in detail in this paper. Furthermore, it is interesting to

compare the most developed Western countries with Japan, because while they are all labeled 'developed countries', they have very different historical and cultural backgrounds. Thus, these are issues that require further investigation in future studies.

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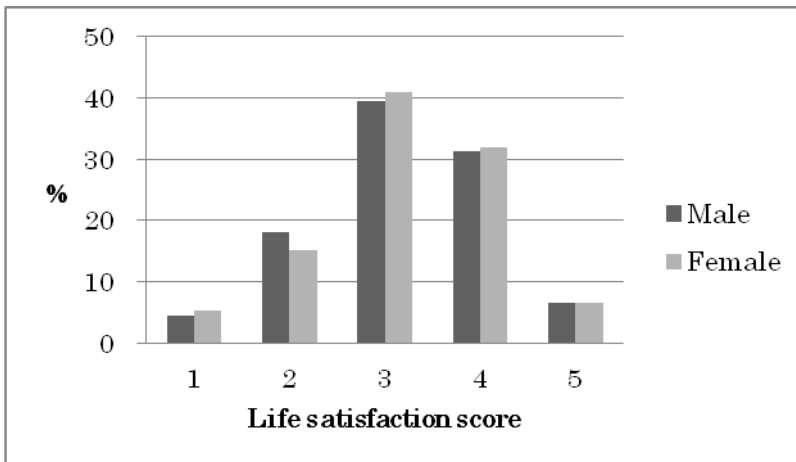between males and females. *Applied Economics Letters*, 17(10),
1009–1012.

Yamamura,E. & Mano, Y. (2012).An investigation into the positive effect of an
educated wife on her husband＇s earnings. Forthcoming in *International Advances in Economic Research*.

Figure 1. Ratings of life satisfaction by gender
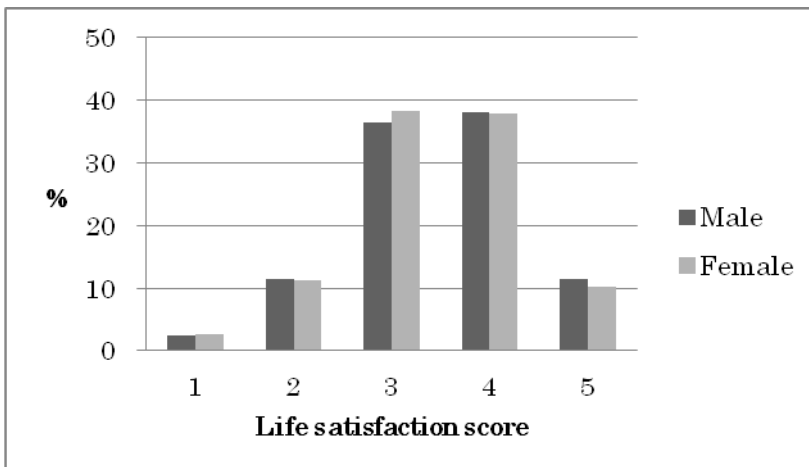 from 1 (strongly dissatisfied) to 5 (strongly satisfied)
(a) China
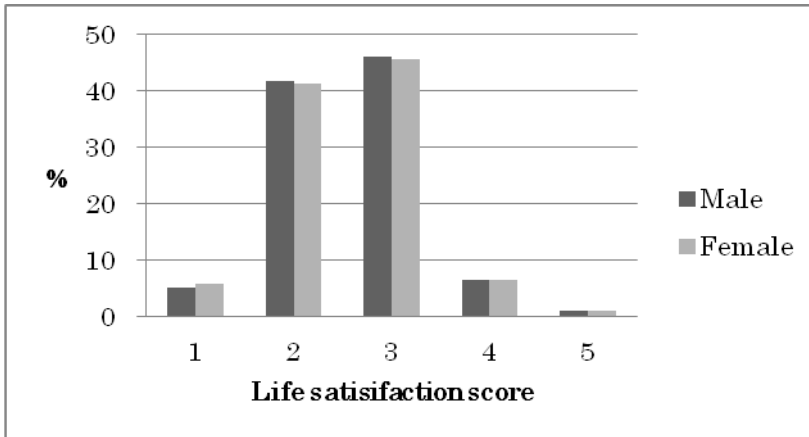
(b) Korea

(c) Japan

Source: EASS data 2006

Table 1.

Construction of research sample

Description	China	Korea	Japan
Original sample	3208	1605	2130
Marriage satisfaction (dependent variable)	3208	1603	2125
Various independent variables	2247	959	1021
Male [a]	1005	424	509
Female [b]	1242	535	512

Note:

a. Samples used in male estimations.

b. Samples used in female estimations.

Table 2.

Variable definitions and mean values

Variables	Definition	China		Korea		Japan	
		Male	Female	Male	Female	Male	Female
Child_12	Dummy variable: 1 if respondent has child less than 12 years old; otherwise 0 (%)	31.4	31.9	43.2	47.9	21.8	24.9
Child 12_18	Dummy variable: 1 if respondent has child between 13 and 18 years old; otherwise 0 (%)	25.9	27.4	31.0	30.7	14.1	20.2
*Child 19_*	Dummy variable: 1 if respondent has child over 19 years old; otherwise 0 (%)	48.7	50.2	40.8	35.9	65.3	63.3
Number of children	Total number of children	1.7	1.7	2.3	2.2	2.1	2.1
Education	Years of schooling	8.8	7.6	12.9	11.9	12.5	12.1
Spouse's education	Spouse's years of schooling	7.9	9.2	11.7	13.2	12.0	12.7
Unemployment	Dummy variable: 1 if respondent is unemployed; otherwise 0 (%)	0.7	0.6	3.9	4.3	1.2	0.6
Income	Household income	21[a]	22 [a]	352[b]	354[b]	10 [c]	10 [c]
Generation 20	Dummy variable: 1 if respondent's age is between 20-29; otherwise 0 (%)	9.2	13.4	2.0	5.1	2.8	3.4
Generation30	Dummy variable: 1 if respondent's age is between 30-39; otherwise 0 (%)	26.5	28.0	21.9	34.0	14.2	15.8
Generation 40	Dummy variable: 1 if respondent's age is between 40-49; otherwise 0 (%)	25.2	26.0	37.8	34.5	13.9	21.0
Generation 50	Dummy variable: 1 if respondent's age is between 50-59; otherwise 0 (%)	24.8	21.6	17.1	15.3	22.7	26.4
Generation 60	Dummy variable: 1 if respondent's age is between 60-69; otherwise 0 (%)	14.3	11.0	11.5	8.2	25.1	22.9
Generation 70	Dummy variable: 1 if respondent's age is 70+ ; otherwise 0 (%)	0	0	9.7	2.9	21.3	10.5
Spouse's Generation 20	Dummy variable: 1 if spouse's age is between 20-29; otherwise 0 (%)	13.1	8.1	6.1	1.8	3.8	2.9

Spouse's Generation 30	Dummy variable: 1 if spouse's age is between 30-39; otherwise 0 (%)	28.6	25.8	31.5	27.0	16.3	12.3
Spouse's Generation 40	Dummy variable: 1 if spouse's age is between 40-49; otherwise 0 (%)	26.2	26.5	30.6	38.2	17.0	19.3
Spouse's Generation 50	Dummy variable: 1 if spouse's age is between 50-59; otherwise 0 (%)	22.8	23.8	16.7	16.2	25.1	24.8
Spouse's Generation 60	Dummy variable: 1 if spouse's age is between 60-69; otherwise 0 (%)	9.2	11.7	10.6	11.3	23.4	22.4
Spouse's Generation 70	Dummy variable: 1 if spouse's age is 70+ ; otherwise 0 (%)	0.1	4.1	4.5	5.5	14.4	18.3

Note: Values for dummy variables are rates for observations that take the value of 1. Values of EDU and INCOME are mean values.

a. Thousands of Yuan.

b. Thousands of Won.

c. Millions of Yen.

Table 3. Regression results for males' life satisfaction (ordered probit model)

Variables	(1) China	(2) Korea	(3) Japan
Child_12	0.01	-0.22	0.18*
	(0.63)	(-1.33)	(1.96)
Child 12_18	0.24**	-0.23	0.31**
	(2.35)	(-1.50)	(2.34)
Child 19_	0.05	-0.15	0.38
	(0.52)	(-0.72)	(1.26)
Number of	-0.03	0.04	0.03
children	(-0.64)	(1.09)	(0.56)
Education	-0.03	0.01	-0.02*
	(-2.33)	(0.54)	(-1.96)
Spouse's	-0.01	-0.006	0.05*
education	(-1.15)	(-0.47)	(1.71)
Unemployment	0.27	-0.94***	-1.27
	(0.67)	(-3.44)	(-0.89)
Income	$-1.78*10^{-6}$	$0.68*10^{-3}$***	0.04***
	(-0.84)	(2.90)	(3.00)
Generation 20	<Reference group>		
Generation 30	0.003	-0.20	0.40
	(0.01)	(-1.39)	(1.48)
Generation 40	0.23	-0.14	0.19
	(0.96)	(-0.56)	(0.58)
Generation 50	0.64**	-0.18	0.32
	(2.13)	(-0.95)	(0.95)
Generation 60	0.67*	-0.02	0.34**
	(1.95)	(-0.07)	(2.20)
Generation 70		0.50	0.54**
		(1.27)	(2.39)
Spouse's Generation 20	<Reference group>		
Spouse's	0.04	0.45***	-0.39
Generation 30	(0.33)	(3.22)	(-0.89)
Spouse's	-0.27	0.24	-0.79
Generation 40	(-1.25)	(1.11)	(-1.47)
Spouse's	-0.58**	0.17	-0.47
Generation 50	(-2.35)	(0.76)	(-1.21)
Spouse's	-0.76**	-0.22	-0.42
Generation 60	(-2.55)	(-0.66)	(-0.75)
Spouse's	-0.58	-0.70	-0.74
Generation 70	(-0.58)	(-1.19)	(-1.26)
Observations	1005	424	509
Log pseudolikelihood	-1047	-556	-629

Note: Numbers in parentheses are z-statistics calculated using robust standard errors clustered at the region. *, **, and *** indicate significance at 10%, 5% and 1% levels, respectively.

Table 4. Regression results for females' life satisfaction (ordered probit model)

Variables	(1) China	(2) Korea	(3) Japan
Child_12	0.15	-0.37***	-0.43***
	(1.36)	(-3.30)	(-2.82)
Child 12_18	0.15	-0.09	-0.29***
	(1.44)	(-0.99)	(-2.61)
*Child 19_*	-0.05	-0.02	0.05
	(-0.35)	(-0.10)	(0.04)
Number of children	-0.03	-0.02	-0.06
	(-0.66)	(-0.88)	(-0.70)
Education	-0.01	0.01	0.02
	(-1.24)	(0.54)	(0.57)
Spouse's education	-0.01	0.02	0.01
	(-1.20)	(1.08)	(0.30)
Unemployment	-0.50*	-0.48***	-0.56*
	(-1.85)	(-2.63)	(-1.92)
Income	$-3.38*10^{-6}$	$0.40*10^{-3}$**	0.06***
	(-1.65)	(2.26)	(3.44)
Generation 20	<Reference group>		
Generation 30	-0.05	0.14	-0.12
	(0.50)	(0.72)	(-0.17)
Generation 40	-0.09	-0.19	-0.35
	(-0.42)	(-1.04)	(-0.73)
Generation 50	-0.27	-0.36	-0.47
	(-1.05)	(-1.30)	(-1.38)
Generation 60	-0.49**	-0.20	-0.79**
	(-2.14)	(-0.68)	(-2.30)
Generation 70		-0.66	-0.85**
		(-1.59)	(-2.30)
Spouse's Generation 20	<Reference group>		
Spouse's Generation 30	0.09	-0.44	-0.12
	(0.51)	(-1.57)	(-0.27)
Spouse's Generation 40	0.42*	-0.51*	-0.47*
	(1.77)	(-1.67)	(-1.69)
Spouse's Generation 50	0.55**	-0.56	-0.63**
	(2.11)	(-1.27)	(-2.39)
Spouse's Generation 60	0.95***	-0.60	-0.10
	(3.09)	(-1.34)	(-0.26)
Spouse's Generation 70	1.04***	-0.46	0.21
	(3.95)	(-0.96)	(0.55)
Observations	1242	535	512
Log pseudolikelihood	-1340	-663	-620

Note: Numbers in parentheses are z-statistics calculated using robust standard errors clustered at the region. *, **, and *** indicate significance at 10%, 5% and 1% levels, respectively.

Table 5. Marginal effect of female estimations shown in Table 4.

(a) China

Variables	Strongly [a] dissatisfied (1)	Dissatisfied[a] (2)	Neither [a] (3)	Satisfied [a] (4)	Strongly satisfied [a] (5)
Child_12	-0.01 (-1.46)	-0.04 (-1.31)	0.03 (1.39)	0.01 (1.30)	0.002 (1.29)
Child 12_18	-0.01 (-1.45)	-0.04 (-1.41)	0.03 (1.46)	0.01 (1.41)	0.002 (1.33)
*Child 19_*	0.005 (0.34)	0.01 (0.35)	-0.01 (-0.35)	-0.005 (-0.35)	-0.001 (-0.34)

(b) Korea

Variables	Strongly [a] dissatisfied (1)	Dissatisfied[a] (2)	Neither [a] (3)	Satisfied [a] (4)	Strongly satisfied [a] (5)
Child_12	0.02*** (2.97)	0.05*** (3.50)	0.05*** (2.71)	-0.09*** (-3.32)	-0.04*** (-2.82)
Child 12_18	0.007 (0.93)	0.01 (0.97)	0.01 (1.03)	-0.02 (-0.96)	-0.01 (-1.05)
*Child 19_*	0.001 (0.10)	0.003 (0.10)	0.003 (0.10)	-0.005 (-0.10)	-0.002 (-0.10)

(c) Japan

Variables	Strongly [a] dissatisfied (1)	Dissatisfied[a] (2)	Neither [a] (3)	Satisfied [a] (4)	Strongly satisfied [a] (5)
Child_12	0.01** (2.25)	0.09*** (2.84)	0.07*** (3.59)	-0.12*** (-3.36)	-0.05** (−2.43)
Child 12_18	0.008** (2.29)	0.05** (2.30)	0.05*** (2.78)	-0.07*** (−2.74)	−0.03** (−2.04)
*Child19_*	0.0001 (0.03)	0.001 (0.03)	0.001 (0.03)	-0.001 (-0.03)	-0.0008 (-0.03)

Note: Numbers in parentheses are z-statistics. *, **, and *** indicate significance at 10%, 5% and 1% levels, respectively. *, **, and *** indicate significance at 10%, 5% and 1% levels, respectively.

a. In the questionnaire, marital satisfaction is evaluated by numerical numbers, ranging from 1 (dissatisfied) to 5 (satisfied).