Happiness and Fertility Globally and Across Countries: Does the Context Matter?

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Abstract

The literature on fertility and subjective well-being has neglected comparative analysis. We investigate the relationship between fertility and happiness globally using data from the World Values Surveys from 86 countries. Findings based on individual level regressions indicate that globally, happiness decreases with the number of children, but analyses by individual and macro level contextual indicators reveal large heterogeneity in this association. We find that the negative association between happiness and number of children decreases with age, and changes to positive above 40. This suggests that small children may have a negative effect on well-being, but as children grow older the positive aspects of parenthood dominate. The age gradient exists for both men and women; for those in good and bad health; and in all welfare regimes. However the positive association at ages above 40 is stronger for women than for men; for those in poor than in good health; and in countries where old-age support depends largely on the kin. These results suggest that the happiness effect may be partially attributable to upward intergenerational support. Analyses by welfare regime show that the negative fertility-happiness association at young adult ages is weakest in Social Democratic states which may reflect the comparatively generous governmental support for families. We also find that the positive fertility-happiness association at mid- to older ages is strongest in Former Socialist countries, where old-age support is largely the responsibility of the family. Further, we find that the positive association at mid- to older ages is strongest in low- to mid-fertility countries, and weakest in high fertility countries, possibly reflecting differential selection into parenthood at high parities. Overall, our findings show that the relationship between the number of children and well-being is sensitive to context, and highlight the importance of the welfare regime and the country's stage in the fertility transition, as well as individual level factors such as health and stage in the life-cycle.

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Motivation

Strong cultural beliefs that children positively affect the well-being of parents, and especially women, pervade much of the world (Baumeister 1991; Blake 1979). These beliefs have bolstered norms about the desirability of having children (McQuillan et al. 2007; Thornton & Young-deMarco 2001; Toulemon 1996). Although the taboo against childlessness has decreased in much of Europe and North America (Connidis 2001; Park 2002), levels of childlessness have remained low (Kohler, Billari &Ortega 2002). Contrary to this popular belief and academic work that has argued that children (and marriage) contribute to individual's well-being (Fawcett 1988; Friedman, Hechter & Kanazawa 1994; Hoffman & Manis 1979; Hoffman, Thornton & Manis 1978; Jones & Brayfield 1997), a large literature in the U.S. has found a negative or insignificant relationship between the happiness of parents and their fertility (Cleary & Mechanic 1983; Gore & Mangione 1983; Hakim 2003; Lovell-Troy 1983; McLanahan & Adams 1987; Nomaguchi & Milkie 2003). To our knowledge, little has been done in comparative perspective. In this paper, we examine the relationship between the subjective well-being of parents and fertility cross-nationally and test seven mechanisms through which well-being and the number of children may be related.

Research on life satisfaction and parenthood in North America has found that children do not increase the well-being of parents (McLanahan & Adams 1987). Among the non-elderly, those with children have either similar or higher levels of distress (Cleary & Mechanic 1983; Gore & Mangione 1983; Lovell-Troy 1983; McLanahan & Adams 1987) and among the elderly, there is no significant relationship between parenthood and life satisfaction (Connidis & McMullin 1993; Koropeckyj-Cox, Pienta & Brown. 2007; Rempel 1985).

There are several hypothesized mechanisms for the inexistent or negative association between well-being and fertility. While children may bring meaning and joy to life, they may also increase economic hardship (Ross & Huber 1985), decrease the quality of spousal relationships or the amount of support provided by partner (Pleck 1983), decrease privacy or employment outside the home (Gove 1984), or increase mutual obligation to friends or neighbors who help with children (Belle 1982). However, most studies have not been able to test more than one of these mechanisms.

The literature on well-being and fertility is largely focused on North America, although there are some studies from European and Scandinavian contexts. These studies using European data find no differences between parents and non-parents (Hansen et al. 2009; Bergman & Daukantaite, 2006; Savolainen et al. 2001) or a weak positive relationship between children, especially the first child, and life satisfaction (Kohler et al. 2005; Daukantaite & Zukauskiene 2006; Dykstra & Wagner 2007). Hansen et al. (2009) interprets the fact that parenthood is either unrelated to or positively related to well-being as suggesting that the family-friendly policies in these strong welfare states help families cope with the stresses of combining parenthood, marriage and work. Scandinavian countries' welfare states have aimed to equalize the cost of raising young children to alleviate the financial and other burdens on parents (Sorensen 2006).

Contributions

As the relationship between fertility and well-being is theorized to vary according to institutional and cultural context (Mirowsky & Ross 2003), our understanding of the topic will benefit from more research in non-U.S. and non-European settings. Ours is the first analysis that we know of that analyzes fertility and subjective well-being globally and across countries.

Moreover, much previous work has not examined important moderating influences at the individual level such as socioeconomic status, health, and welfare regime (Glenn & McLanahan 1982; Keizer et al. 2009). In this paper, we explore how the relationship between happiness and fertility varies with five factors: a) demographic factors such as age, gender, and partner status; b) economic well-being, c) physical well-being, d) the type of welfare regime, e) the stage of fertility decline.

Research Questions

In this paper, we address the following questions:

1) What is the relationship between subjective well-being and number of children globally?
2) How does the relationship between subjective well-being and number of children vary by:
    a) Demographic factors: age, gender, and partnership status?
    b) Economic well-being?
    c) Health status?
3) Does the relationship between subjective well-being and number of children vary by welfare regime, as public support for parenthood varies?
4) Is the relationship between subjective well-being and number of children different for countries in different phases of the fertility transition?

Data

To examine the relationship between subjective well-being and fertility cross-nationally, we use the World Values Survey (WVS). The WVS assesses the state of socio-cultural, moral,

and political values through a series of questionnaires implemented with face-to-face interviews. It is the largest international survey that includes questions on life satisfaction and happiness and is close to representative of various national populations. In this analysis, we use survey waves conducted between 1981 and 2005. We include all women and men above age 15, for whom we have no missing data on key variables. Of the 328,449 respondents, we limit the analysis to include only individuals that are missing no data on our variables of interest, either because of non-response or differences in the country questionnaires omitting questions of interest. Thus, our analytic sample is comprised of 201,988 respondents from 87 countries or regions (Germany is broken into its former East and West boundaries).

Dependent Variable

The dependent variable in this analysis is the respondent's level of happiness about his or her life. Respondents were asked, "Taking all things together, would you say you are very happy, quite happy, somewhat happy or not at all happy?" We treat happiness as a continuous variable with observed range from one (not happy at all) to four (very happy). In pooling the data and comparing the reported level of happiness across respondents, we assume that the association between reported life satisfaction and number of children can be compared across contexts and individuals. We control for contextual and country level variables in the analyses, as it has been shown that reported life satisfaction levels vary greatly across countries and contexts (Borooah 2006).

Key Explanatory Variable

Our key explanatory variable is the number of children that the respondent has. Respondents were asked, "Have you had any children?" We code the number of children as: none, one, two, three, or four or more.

Other Independent Variables

In our analysis, we explore how the fertility/happiness relationship varies with the demographic factors of age, sex, and marital status. Respondents' age at interview was reported in years and we code age as: 15 to 19, 20 to 29, 30 to 39, 40 to 49, and 50 and above. When conducting analysis on subpopulations when sample sizes are smaller, we collapse age groups to 15 to 19, 20 to 39, and 40 and above. Marital status is coded as whether the respondent is single, married, living as married, separated or divorced, or widowed. We also combine marital status groups to a two category variable coded as partnered (married or living as married) or not partnered (single, separated or divorced, widowed) to simplify categories. We examine the individuals' subjective state of health. Respondents were asked, "All in all, how would you describe your state of health these days?" We code responses as either good/very good or fair/poor/very poor.

We use two measures of socioeconomic status. The first is household income level. Respondents were shown a card representing a scale of incomes ranging from 1 "lowest income decile" to 10, the "highest income decile. Respondents were asked in which group their household was in, "including all wages, salaries, pensions and other incomes that come in." We code relative household income into three groups: low (deciles 1 to 4), medium (deciles 5, 6), and high (deciles 7, 8, 9 and 10[1]). Our second measure of socioeconomic status is self-reported social class. Respondents were read "People sometimes describe themselves as belonging to the working class, the middle class, or the upper or lower class. Would you describe yourself as belonging to the: upper class, upper middle class, lower middle class, working class, or lower class?" We code socioeconomic status as: low (working or lower class), middle (middle and

[1] We include self-reported income decile 7 in the high income category as otherwise the group would have been small, only 14 percent of the sample. With decile 7 included, the proportion is 22 percent.

lower middle), or high (upper middle or upper class). We focus on relative income and social class because they are relative measures within each society we analyze, rather than educational attainment which has very different distributions across countries.

We also examine two contextual level variables- welfare regime and stage of fertility decline. Welfare regime is an extended categorization of Esping-Andersen's typology (1990). We add countries to his social democratic, conservative, and liberal welfare regimes that fit his criteria and create two additional categories: Former Socialist countries and Developing nations. The list of countries in each welfare regime category is included in Table 1 in the Appendix. We examine the stage of fertility decline of each country by coding the total fertility rate (TFR) for each country and survey year into categories. The source for most of the country level data is the World Bank Development Indicators Database. We use linear interpolation to fill in the TFR for years in which it is missing, using data from prior and later time periods. Data for Taiwan, East and West Germany, and Andorra were not available from this database. We gathered these fertility data from Lee (2009) for Taiwan, Lechner (2001) for East and West Germany, and from the CIA World Fact Book (2010) for Andorra. The TFR for each country and survey year is shown in Table 2 in the Appendix. We construct a categorical fertility variable for the fertility of the country in that period. It is coded as: lowest low (TFR<1.3), low (TFR 1.3-2), moderate (TFR 2-3), high (TFR≥3).

Methods

To estimate the association between number of children and happiness, we use linear regression models. First, we estimate two global models. Model 1 controls for only number of children, age, and sex. In Model 2, we add controls for marital status, relative income, and

socioeconomic status. All models control for country differences and year of interview. Next, we examine how the relationship between fertility and happiness varies on seven key dimensions. We estimate models stratified by the age of respondent, sex, partnership status, relative income, health status, welfare regime, and stage of fertility transition. We chart the coefficients for the number of children by these key variables in Figures 1 to 8.

Results

Sample characteristics in Table 1 reveal large contextual differences in happiness and number of children in our analytic sample. In the table, we rank countries according to the mean level of happiness. Tanzania, El Salvador, and Venezuela rank highest in happiness, with mean happiness above 3.4 in these countries. Moldova, Belarus, and Albania rank the lowest, with mean happiness below 2.5. The number of children respondents have at the time of the survey also varies between countries, from the Dominican Republic, Andorra, and Ethiopia under 1.20 to Jordan with 3.09[2]. As the countries sampled have different age distributions, the mean age of each country's sample varies from 28.8 in the Dominican Republic to almost 50 in Switzerland. Similarly, there are large differences in the proportions married. While less than twenty percent of respondents in Indonesia were married, more than 85 percent were married in China.

Global Results

First, we examine the relationship between subjective well-being and number of children globally. Tables 2 and 3 present coefficients for linear regression models predicting the level of reported happiness among all respondents in all countries in the analytic sample. We show

[2] The Ethiopian and Dominican figures are low because the samples are considerably younger than the overall sample (mean age 29.9 for Ethiopia and 28.8 for Dominican Republic. Moreover, as mentioned above, the sampling of the population in the World Values Surveys are not random, especially in developing countries.

results from two models. Model 1 estimates the association between number of children and happiness, controlling for age, sex, country, and year. Model 2 includes all the variables from Model 1 and also income, socioeconomic status, and marital status. The coefficients for the number of children (one, two, three, four or more) are estimated in reference to those with no children.

The results from Model 1 suggest that compared to those with no children, those with one, two, or three children have significantly *higher* reported happiness. At parity four, there is no significant difference in reported happiness from those with no children. In Model 2, we add controls for marital status, income, and socioeconomic status, which are all related to both fertility and happiness. Including these confounders yields different associations between fertility and happiness than found in Model 1. Results from Model 2 show that having one, two, three, or four or more children is associated with significantly *lower* reported happiness than those who are childless. Having one or two children is associated with 0.03 unit decrease in happiness ($p<0.001$), and having 4 or more children is associated with even larger decrease in happiness (0.055 units; comparison to 1 or 2 children: $p<0.05$). As Model 2 better controls for the potentially confounding variables of marital status and socioeconomic position than Model 1, our results suggest that globally, having children is associated with decreased happiness.

Results by Age, Sex and Partnership Status

Next we explore how the relationship between subjective well-being and number of children varies by demographic factors- age, sex, and partnership status. Both happiness and number of children vary throughout the life course with age. Moreover, the relationship between happiness and number of children may depend on age because the way in which parenthood changes as children develop. Figure 1 plots coefficients from linear regression models for the

number of children, estimated separately for the respondents' age group (15 to 19, 20 to 29, 30 to 39, 40 to 49, 50 and above). The results indicate that the effect of children on happiness depends strongly on age. In the youngest age groups (less than 30), happiness decreases approximately monotonically with number of children. At ages 30 to 39, the negative association vanishes, and at older ages (40 to 49, 50 and above) the association of number of children and happiness changes to positive so that those with three children are happiest.

The observed age gradient in the happiness-fertility link in Figure 1 could indicate that the effect of having children changes as people age, or it could signal cohort or period differences in happiness-fertility link. To study this, we estimated the happiness-fertility association for two periods, 1981-1996 and 1997-2007, which divides our sample to approximately two equal parts. Comparing the age gradient for these two time periods allows us to analyze whether the aging or cohort explanation is more accurate. Figure 2 shows the results of this exercise. We observe a similar age gradient in the happiness-fertility link for both periods. This result rejects the idea that there are period or cohort differences and supports the aging explanation for the gradient in the happiness-fertility link.

We next explore whether there are sex differences in the relationship between happiness and children. To retain large sample sizes we have collapsed age categories to 15 to 19, 20 to 39, and 40 and above. We do not present results for parity three or more for the 15 to 19 age group because of the small sample size. Figure 3 shows that negative association of having children and happiness at ages 20 to 39 does not differ markedly by sex. However, at older ages, the positive association between children and happiness is stronger for women than for men. This may be because of a sex difference in how men and women perceive older children and grandchildren. Prior research suggests that grandmothers contribute to the well-being of

grandchildren more than grandfathers (Sear & Mace 2008). Causality may flow in two directions, whereby grandmothers who help their grandchildren improve the lives of their grandchildren and also draw utility from helping. It also may be because mothers retain closer relationships than fathers to their adult children (Umberson 1992) and grandchildren (Eisenberg 1988; Roberto & Stroes 1992). Another explanation is that women have more health problems in later life than men (Oksuzyan, Vaupel & Christensen 2008), and children may be able to help with problems arising from worse health.

We next turn to whether the relationship between children and happiness varies by partnership status. Figure 4 shows the happiness-fertility relationship by age and partnership status. We observe that within each age group, the happiness-fertility association is remarkably similar between partnered and not partnered. Further analyses (Results not shown) indicate that the similarity was true also if men and women were analyzed separately.

Results by Economic Well-Being and Health Status

The next question is how the fertility-happiness relationship varies by economic well-being and health status. Figures 5a, 5b, and 5c show the association between fertility and happiness by age and income group. Figures 5a and 5b, which show the results for 15-19 and 20-39 year age groups, indicate that while the income differences are small, the negative association between happiness and fertility is strongest among those with fewer financial resources, and weakest among those with best financial resources. High income may help alleviate the burden of raising children, for example through paid childcare. High income may also be a proxy for postponement. In this case, the high income group would include more people who in their 30s are still voluntarily in parity 0 or 1, whereas among the low income group parity 0 and 1 may be signs of infertility or problems finding a partner. However, at ages

40 and above (Figure 5c), where the associations between happiness and fertility is positive, there are no differences between income groups.

We next turn to differences by the health status of respondents. Figure 6 presents the happiness-fertility relationship by age and health status. We have categorized health status as good/very good and fair/poor/very poor. The results do not suggest any strong differences in the happiness-fertility link by health. In both health groups, we observe a similar age gradient. The largest difference is in the magnitude of the positive happiness-fertility relationship at ages above 40 between those in good or bad health. The finding that the association is stronger for those in bad health could indicate that children provide care for their ill parents. Among the healthy this care is not needed, thus the association with having children and happiness is weaker.

Analysis by Welfare Regime

Our next research question asks whether the relationship between subjective well-being and number of children varies by type of welfare regime, where the public support for parenthood differs. We hypothesized that during the prime childbearing years, the relationship between fertility and happiness would be less negative in the Social Democratic states that provide the greatest support for childbearing. We also hypothesized that people with children at older ages would be much happier than those without in places with weak welfare states such as Developing nations because children often act as insurance at older ages.

Figure 7a shows the association between fertility and happiness for the age group 20-39. The figures shows that in all welfare regimes except Social Democratic, happiness declines monotonically with number of children so that childless people are happiest and those with four or more children are the least happy. In the Social Democratic welfare regime, happiness declines until parity two, but then starts to rise, and is the same for those with four or more

children as it is for childless people. This partially supports our hypothesis that the relationship between happiness and childbearing would be the least negative in Social Democratic nations, however only for parity three and four.

Figure 7b shows the happiness-fertility association for the age group 40 and above. In this age group the association between happiness and fertility is flat for Social Democratic, Conservative, and Developing countries. For Liberal countries, there is weak indication that first children may be associated with decreased happiness. For Former Socialist countries, there is a strong positive association between fertility and happiness so that those with three children are happiest. For this same country group the negative association between fertility and happiness in the age group 20 to 39 was strongest. This demonstrates the importance of the life cycle stage in the happiness-fertility relationship. Our hypothesis about the importance of children at older ages in states with weak welfare states did not hold up in this analysis.

Taken together, the results by welfare regime suggest that the negative association between fertility and happiness in young adult ages is weakest in Social Democratic countries, and the positive association between fertility and happiness in mid- to old ages is strongest in Former Socialist countries. These country groups include states with mostly low or very low fertility rates (for example, Sweden year 2005 TFR = 1.77, Bulgaria year 2005 TFR = 1.31, Czech Republic year 1999 TFR = 1.13). In the Social Democratic states, comparatively high happiness levels for those with children may be related to the policies aimed at collectively alleviating the burden an individual faces in childrearing. In the Former Socialist states, the positive association between happiness and fertility at mid- to older ages may be related to the long-standing tradition of governments to promote pronatalist ideas and policies, both before and after the collapse of the Soviet Union (Zhurzhenko 2001; Yelizarov 2008), and to the

increasingly important role of adult children in providing care for their elderly parents in the post-Soviet era (Iecovich et al. 2004).

Analyses by Stage of Fertility Decline

We next analyze how the happiness-fertility link depends on the stage of the fertility decline. Figure 8a shows the association between fertility and happiness by overall fertility level for the age group 20 to 39. The figure indicates that in all fertility regimes, with the exception of lowest-low fertility (TFR<1.3), happiness declines with the number of children so that those with none or only one child are happiest, and those with three or more children are least happy. In lowest-low fertility regimes, the decline in happiness by parity stops at parity three, and those with four or more children are happier than those with only one child but not quite as happy as childless people.

Figure 8b presents similar results for the age group 40 and above. The figure indicates a gradient in the happiness-fertility relationship, similar to what was observed for age. In high fertility regimes, the happiness-fertility relationship is flat, but the lower the overall fertility level, the more positive the happiness-fertility relationship becomes, strongest in the lowest-low fertility countries. The results by stage of fertility decline suggest that the demographic transition modifies the fertility-happiness relationship in a straightforward, yet unexpected way. The lower the overall fertility of the society, the happier those are who have children compared to those without. This may be because of selection of those who value children the most into childbearing.

Discussion

Despite a large academic and popular literature supporting the idea that children contribute positively to their parents' well-being (Friedman et al. 1994; Morgan & King 2001), most empirical research conducted in the U.S. finds an insignificant or negative relationship between the happiness of adults and parenthood (Cleary & Mechanic 1983; Hakim 2003; McLanahan & Adams 1987 Nomaguchi & Milkie 2003).[3] There have been several mechanisms and moderating influences at the individual level proposed to explain this such as financial hardship, physical health, and changes in marital quality (Gove 1984; Pleck 1983; Ross, Mirowsky & Goldsteen 1990; Ross & Huber 1985). However, few studies have examined more than one at once. Moreover, the relationship between fertility and well-being is theorized to vary according to institutional and cultural context, yet research on this topic is focused either on the U.S. (Mirowsky & Ross 2003, McLanahan & Adams 1987; Nomaguchi & Milkie 2003) or Europe (Bergman & Daukantaite, 2006; Savolainen et al. 2001; Kohler et al., 2005; Daukantaite & Zukauskiene, 2006; Dykstra & Wagner, 2007; Sorensen 2006).

This article considers the relationship between fertility and well-being globally, across institutional contexts. We tested how the association between fertility and well-being varies with seven factors. First we tested demographic factors such as age, gender, and partner status. We then examined the individual level factors of economic well-being and physical health, and two contextual level factors- welfare regime and the stage of fertility decline of the country.

Prior research has found differences in the relationship between fertility and happiness among the elderly and non-elderly. Among the non-elderly, those with children have similar or higher levels of distress than those without children (Cleary & Mechanic 1983; Gore &

[3] In a separate analysis by country (not shown), we confirmed with the World Values Survey data the negative association between number of children and happiness in the U.S. for all age groups.

Mangione 1983; Lovell-Troy 1983; McLanahan & Adams 1987). However, prior research has not found significant differences in life satisfaction between those who are parents and the childless (Connidis & McMullin 1993; Koropeckyj-Cox et al. 2007; Rempel 1985). We document more subtle age differences in the relationship between happiness and fertility throughout the life course. We find that in the youngest age groups, happiness decreases approximately monotonically with the number of children. However, at ages 30 to 39, the negative association disappears and at older ages the association of number of children and happiness changes to positive.

There are several possible mechanisms that could cause the observed age gradient in the happiness-fertility link. For example, the age gradient could indicate period or cohort differences in the happiness-fertility link. Our analysis, however, showed that the gradient exists independently of survey period. In addition, the age gradient exists independently of sex, income, partnership status, health status, welfare regime, and stage of demographic transition. Thus the age gradient may be better explained by life cycle differences. At younger ages, the time and money costs of raising children are generally higher than they are at older ages, when also the children are older.[4] As the children get older, they become more independent and require less care and resources. As the children reach adulthood, approximately when the parents are 40-60 years old, the children may become a resource themselves, providing financial and emotional support for the elderly parents. In addition, children usually leave the parental home, which may decrease the negative effect they have on the quality of spousal relationships or and on the amount of support provided by partner (Pleck 1983). This explanation for the age gradient would imply that those older people who are more in need of kin help would gain more from having

[4] Our data did not have information on the ages of children or whether the children are present in the household. Therefore we have to use parent's age as a proxy for the family life cycle.

children than those who are less dependent. Our findings that the positive fertility-happiness association is stronger for women than for men, for those in poor health than those in good health, and for the Former Socialist States than for other welfare regimes are all consistent with this prediction.

A theme in the literature is that women and men experience the transition to parenthood in different ways (Cowan et al. 1985; LaRossa & LaRossa 1981; Umberson & Williams 1999). Women may experience more costs to having children than men, especially in stress and mental well-being (Scott & Alwin 1989; Simon 1992). Some have argued that this is because they are more often the primary caretaker (Ross & Van Willigen 1996). However, it is unclear whether parenthood is differentially related to mental health for women and men (Nomaguchi & Milkie 2003). Unlike prior literature we find that the negative association between happiness and children during prime childbearing years does not differ by sex. However, above age 40, the positive association between number of children and happiness is stronger for women than for men. We believe that this may be due to the fact that grandmothers are more involved with the lives of their children and grandchildren than grandfathers, that they extract greater utility from these relationships, or that they value support for possible health problems more than older men.

The degree to which parenting might affect stress may depend on marital status and socioeconomic position (Ross & Huber 1985; Umberson &Williams 1999). In the U.S., single mothers are more likely to report higher levels of stress than married mothers (Avison 1995), but this may also be to their on average lower socioeconomic position. Therefore in investigating childrearing and happiness, it is important to take socioeconomic position into account. In our global models we control for socioeconomic position and find little difference in the relationship between fertility and happiness between the partnered and unpartnered. We also tested for

differences by socioeconomic position in the relationship between fertility and happiness. We find that while the income differences are small in magnitude, the negative effects of children on happiness below age 40 are strongest among those with lowest incomes and weakest among those with highest incomes. As shown by Ross and Huber (1985), children increase economic hardship. High income may help alleviate the burden of raising kids, for example through paid childcare. High income may also be a proxy for postponement, so that the high income group may include more people who in their 30s who are (still) voluntarily childless or have only one child, whereas the low income group may include more involuntary low fertility.

Our analysis of the fertility-happiness link by health status did not reveal qualitative, but did reveal small quantitative differences. For those in good or bad health, the association of fertility with happiness changes from negative to positive over age. However, the negative association at young adult ages is weaker for those in poor health than for those in good health, and the positive association at mid- to old ages is stronger for those in poor health than for those in good health. This may be related to the care and support adult children provide to their parents. Among the healthy, the demand for such care is lower, potentially explaining why the positive association of children and happiness is weaker than it is for less healthy parents.

In contrast to research conducted in the U.S. where parents report similar to slightly higher distress than non-parents, research in Europe has found either insignificant or slightly positive associations between children and life satisfaction (Bergman & Daukantaite 2006; Daukantaite & Zukauskiene 2006; Dykstra & Wagner 2007; Hansen et al.2009; Kohler et al. 2005; Savolainen et al. 2001). This may be because the family-friendly policies in strong European welfare states help new parents cope with the stress of combining work and family (Hansen 2009) and alleviate the financial burdens of parents (Sorensen 2006). We found that the

negative association between fertility and happiness at young ages is weakest in Social Democratic countries, where the public support for parenthood is strongest. However, we also find that the positive association between fertility and happiness above age 40 is strongest in Former Socialist countries. This may be related to the strong pronatalist policies promoted by some of the Former Socialist states, which may influence attitudes towards parenthood, and also to the important role of adult children in providing care for their elderly parents in these states. We also examine how the relationship between happiness and fertility varies by the fertility of the society. We find that countries at different stages in the demographic transition have different relationships between fertility and happiness. The lower the overall fertility, the happier are those who have children after prime childbearing years. This may be because of selection of those who value children the most deciding to have children, whereas in higher fertility contexts social and other pressure forces a less select group of people to have a large family. Therefore we are hesitant to interpret the gradient in happiness-fertility over TFR levels to indicate true effects. Rather, the gradient may reflect compositional differences.

There are three major limitations to this analysis. First, our explicit reference group is childless people. Choice of this reference group may be criticized in two ways. First, as childlessness is rare in most societies, this group of people are probably different from those who have one or more children in many unobserved dimensions, including health, social skills, and career perceptions. However, implicit in our analysis, and explicit in our discussions, is the comparison of those with two or more children to those with only one child; those with three or more children to those with one or two children, and so on. In fact, the effect of having one *additional* child (compared to staying in whatever the previous parity was) can easily be seen from the slopes of the results in Figures 1 to 8. A potentially more important criticism is that the

childless group may be compositionally different in different contexts. For example, those who intrinsically strongly desire to have children are likely to have them both in high and low fertility societies, whereas those who would rather not have children may forego having them more often in low fertility societies, but may have children due to social and other pressures in higher fertility societies. Thus the proportions of childless people may differ by context and the degree of selection. However, as discussed above, our results also show comparisons of those with two children to those with only one child; those with three children to those with two children, and so on. Therefore the potential specificity of the childless group does not prevent a meaningful interpretation of our results.

Second, having children is a decision, which exposes our regression results to the endogeneity bias. More specifically, while we control for a large array of observed characteristics, we do not control for unobservable differences in people's preferences. An example of a study on the happiness-fertility link in which unobserved characteristics are partially controlled for is Kohler et al. (2005), which uses twin data to control for unobserved social and genetic differences. However, the results by Kohler et al. (2005) indicate that the sign and magnitude for the coefficient for the number of children in a regression on happiness is in most cases the same in standard ordinary least regression and in twin-differences model. This suggests that the unobserved heterogeneity bias in our ordinary least squares regression results may not be large.

Third, the design of our study assumes that life events such as having children matter for happiness. This is in contrast with the setpoint theory of happiness, which asserts that a large fraction of variation in well-being is due to social or biological endowments, and while life events may temporarily change experienced well-being level, this change is transitory

(Csikszentmihalyi &Jeremy 2003; Kahneman 1999). The endowments, which according to the setpoint theory, determine happiness may not be captured by survey questionnaires. However, twin studies have demonstrated that important life events do change happiness and not just temporarily (Kohler et al. 2005). Our results, which suggest that significant life event such as having a child have long-lasting but potentially time-varying effects on happiness, are consistent with these findings which suggest that happiness is not set to a point.

In summary, our analysis contributes to the literature on well-being and fertility in several ways. To the authors' knowledge, this is the first analysis that takes a global, cross-cultural look at the relationship between fertility and well-being. We find both similarities and differences in the happiness-fertility relationship across contexts. Our strongest finding, which has not been well established before, is that the link between happiness and fertility evolves from negative to neutral to positive over age. This age gradient is present for both sexes, at all income levels, for those in good and bad health, for those who are partnered and who are not, and for all welfare regimes, and at all stages of fertility decline. We find that those who are likely to have a higher demand for care and support from kin at mid- to older ages are more likely to gain in terms of happiness from having children. This point is illustrated, among other things by the findings that the positive happiness-fertility association at ages above 40 is stronger for those in poor health than for those in good health, and in the Former Socialist countries where old-age support is largely based on family ties than in Social Democratic, Conservative or Liberal states where much of old-age support comes from the state or from own savings. Taken together, these findings indicate that the relationship between the number of children and well-being is sensitive to the context, and highlight the importance of the broader socioeconomic context, including the

country's stage in the fertility transition, as well as individual level factors such as the stage in the life-cycle and financial resources.

TABLES

Table 1. Unweighted Sample Characteristics by Country, World Values Survey (1981-2005) (N=201,988)

Country	#	Mean Happiness	Mean # Children	Mean Age	Percent Married
All Countries	201,988	3.03	1.97	41.5	61.9
Tanzania	1001	3.49	2.81	38.3	52.9
El Salvador	977	3.47	2.39	37.7	39.4
Venezuela	2104	3.46	2.27	36.4	41.6
Nigeria	3872	3.39	2.23	32.5	56.9
Netherlands	1313	3.38	2.02	43.9	70.4
Ireland	1147	3.37	2.65	45.7	67.8
Saudi Arabia	1303	3.34	2.19	32.2	59.6
Switzerland	1976	3.34	1.59	49.2	56.3
Trinidad and Tobago	973	3.34	2.09	42.4	38.8
USA	3962	3.34	2.02	45.9	59.2
Sweden	2466	3.33	1.55	45.8	49.8
Australia	2998	3.32	1.82	45.8	56.3
Thailand	1477	3.32	2.16	45.6	69.7
Belgium	3516	3.31	1.81	46.4	64.8
Malaysia	1195	3.31	1.64	31.8	50
Colombia	2962	3.3	1.99	36.6	42
Luxembourg	589	3.3	1.41	42.5	61.5
Denmark	674	3.27	2.29	47.2	75.5
New Zealand	930	3.27	2.13	46.2	60.7
Philippines	1181	3.27	2.74	38.8	72.6
Britain	2412	3.26	1.53	46.3	65.8
Cyprus	1031	3.26	1.71	41.6	64.8
Norway	952	3.25	1.69	43.4	55.2
Vietnam	2412	3.25	2.37	41.5	74.3
Canada	3026	3.24	1.89	44.3	55.2
Ghana	1421	3.24	1.99	33.9	46.2
Austria	2549	3.23	1.76	46.8	65.9
Andorra	936	3.21	1.05	40.4	40
Mali	981	3.21	2.87	36.7	69.5
Mexico	5154	3.2	2.48	37.2	56.5
South Africa	7461	3.2	1.98	38.5	45.9
France	2683	3.19	1.97	44.8	62.4
Malta	931	3.19	1.95	45.6	70.1
Finland	1696	3.17	1.6	44.9	43.9
Indonesia	2515	3.17	2.16	39.2	17.7
Japan	3487	3.16	1.8	47.4	80.2
Uganda	526	3.12	2.21	31.4	43.7
Taiwan	1875	3.11	2.01	42.8	68.8
Argentina	2590	3.1	2.11	43.6	55.4
Chile	4040	3.1	2.26	41.8	58.2
Brazil	3703	3.09	2.24	39.2	52.1
Burkina Faso	1170	2.99	2.52	34.3	55.2
Egypt	5636	2.99	2.68	39.8	72.7
India	6556	2.99	2.67	40.2	85.7
Algeria	835	2.98	2.29	37.3	52.8
Italy	3971	2.98	1.52	45.2	66.3
Bangladesh	2833	2.96	2.33	34.6	76.7
China	4541	2.96	1.88	41.9	86.1
Pakistan	2525	2.96	2.19	37.3	69.8
Rwanda	1336	2.96	2.4	34.4	52.5
Peru	3754	2.94	2.04	36.2	40.9

East Germany	2741	2.93	1.64	46.2	59.9
Jordan	1109	2.91	3.09	36.3	67.4
Poland	3657	2.91	1.94	46.3	65.8
Czech Republic	4554	2.89	1.73	46.7	66.1
Azerbaijan	1698	2.88	1.76	36.5	63.3
Ethiopia	1406	2.87	1.03	29.9	39.7
Portugal	1109	2.85	1.62	42.5	60.4
Croatia	1992	2.84	1.42	41.7	63.2
Macedonia	1608	2.83	1.68	42.2	73.4
Iran	1992	2.82	1.78	34.3	56.9
Slovenia	1889	2.8	1.52	44.3	60.3
Hungary	1919	2.78	1.65	47.1	65.7
Zambia	1035	2.77	1.72	29.4	31
Latvia	1087	2.72	1.29	42.7	52.4
Georgia	1934	2.71	1.43	40.7	60.5
Slovakia	3116	2.7	1.88	44.3	69.4
Estonia	962	2.65	1.49	43.6	57
Zimbabwe	809	2.65	2.71	35.5	60.4
Ukraine	3001	2.58	1.48	45	67.7
Armenia	1785	2.56	1.72	38.3	59.3
Lithuania	863	2.55	1.63	44.5	66.9
Romania	2697	2.54	1.6	46.3	69
Bulgaria	2490	2.5	1.55	45.9	70.3
Russia	1786	2.5	1.56	46.6	62.7
Moldova	2764	2.47	1.77	42.8	67.5
Belarus	1869	2.43	1.63	44.1	65.6
Albania	1877	2.42	2.14	40.9	71.9

* Happiness is measured on a scale of 1 to 4, with 1 "not happy at all to 4, very happy."

Table 2. Coefficients from Linear Regression Models Predicting Happiness, Model 1 (N=201,988)

Variable	Coefficient	SE	t	p value	95% CI	
Number of Children (none)						
One	0.041	0.005	7.95	0.000	0.031	0.051
Two	0.062	0.005	13.09	0.000	0.053	0.072
Three	0.060	0.005	10.80	0.000	0.049	0.071
Four or more	0.002	0.006	0.30	0.766	-0.009	0.013
Demographic Variables						
Female	0.007	0.003	2.47	0.014	0.001	0.014
Age (15-19)						
Ages 20-39	-0.094	0.008	-11.66	0.000	-0.110	-0.079
Age 40+	-0.192	0.009	-22.25	0.000	-0.209	-0.175

* Coefficients for country and year dummy variables not shown.
* R squared = 0.12

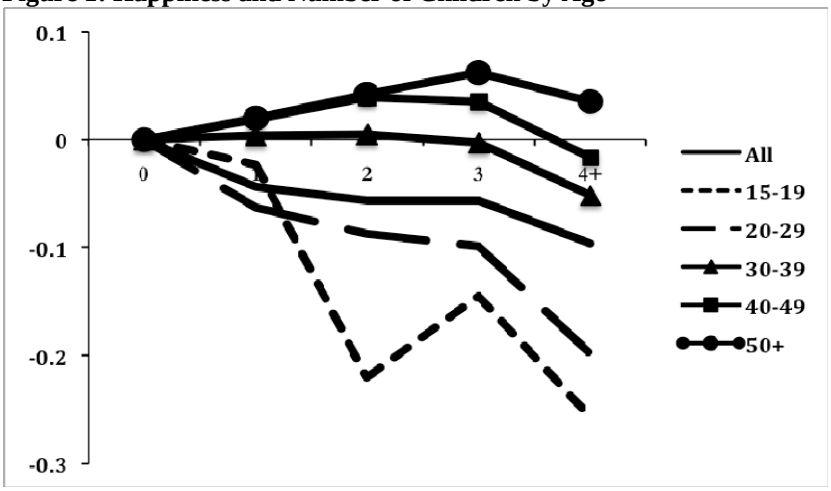
Table 3. Coefficients from Linear Regression Models Predicting Happiness, Model 2 (N=201,988)

Variable	Coefficient	SE	t	p value	95% CI	
Number of Children (none)						
One	-0.032	0.006	-4.77	0.000	-0.045	-0.020
Two	-0.034	0.006	-5.40	0.000	-0.046	-0.022
Three	-0.026	0.007	-3.39	0.000	-0.039	-0.012
Four or more	-0.055	0.007	-6.64	0.000	-0.069	-0.041
Demographic Variables						
Female	0.035	0.003	11.36	0.000	0.029	0.041
Age (15-19)						
Ages 20-39	-0.111	0.008	-13.79	0.000	-0.127	-0.095
Age 40+	-0.181	0.009	-20.88	0.000	-0.198	-0.164
Income (High)						
Low Income	-0.164	0.005	-34.84	0.000	-0.173	-0.155
Mid Income	-0.054	0.004	-12.57	0.000	-0.062	-0.045
Socioeconomic Status (low)						
Middle	0.121	0.004	32.70	0.000	0.114	0.129
High	0.121	0.004	42.68	0.000	0.201	0.220
Marital Status (Married)						
Cohabiting	-0.083	0.007	-11.27	0.000	-0.097	-0.069
Separated/Divorced	-0.277	0.007	-38.12	0.000	-0.291	-0.263
Widowed	-0.243	0.007	-36.78	0.000	-0.256	-0.230
Single	-0.157	-.006	-24.95	0.000	-0.169	-0.144

* Coefficients for country and year dummy variables not shown.
* R squared = 0.16

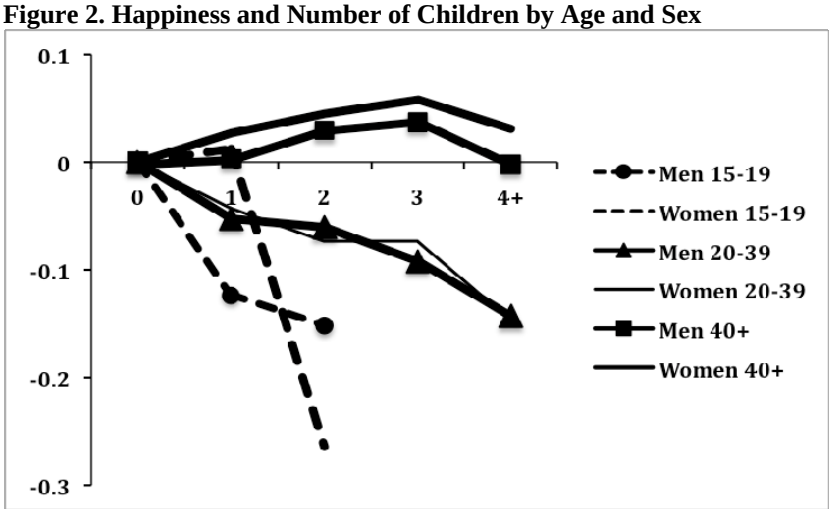
FIGURES

Figure 1: Happiness and Number of Children by Age



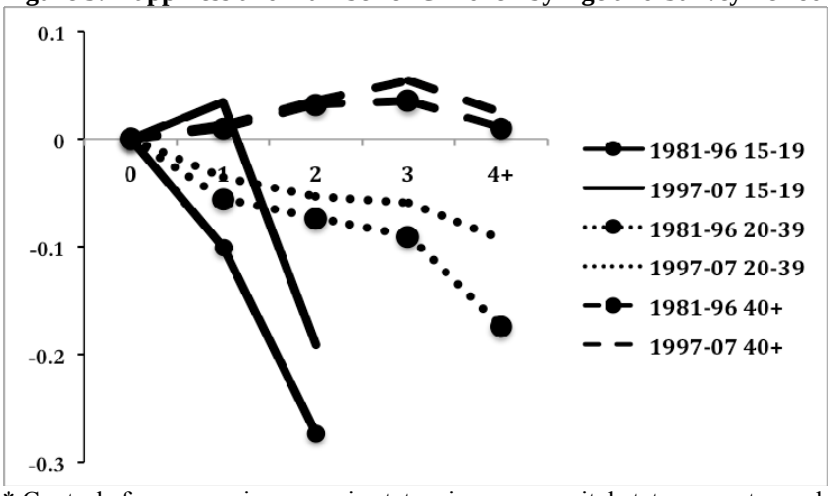
* Controls for sex, socioeconomic status, income, marital status, country and year.

Figure 2. Happiness and Number of Children by Age and Sex



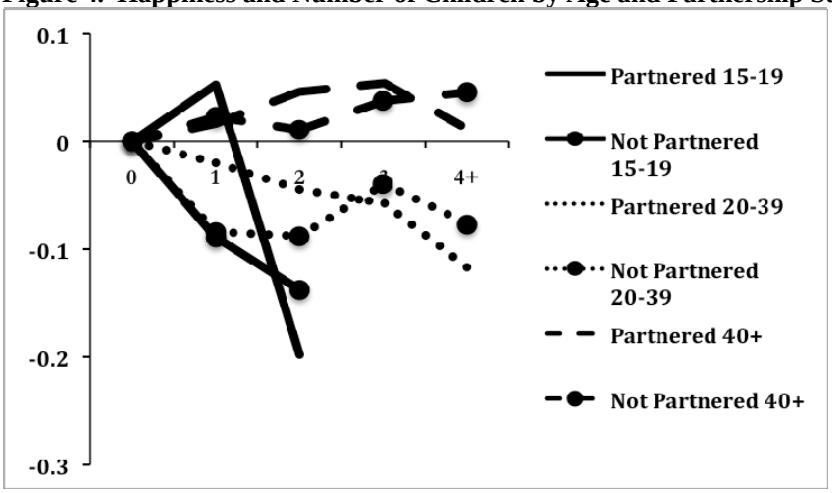
* Controls for socioeconomic status, income, marital status, country and year.

Figure 3: Happiness and Number of Children by Age and Survey Period



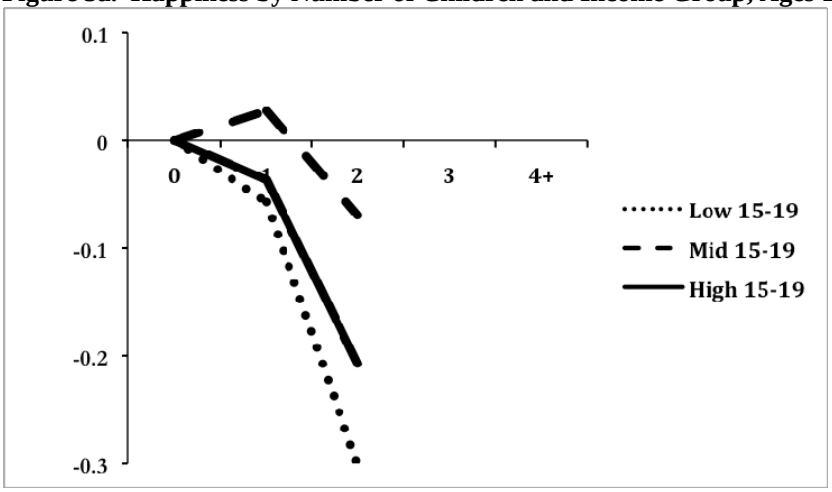
* Controls for sex, socioeconomic status, income, marital status, country and year.

Figure 4. Happiness and Number of Children by Age and Partnership Status



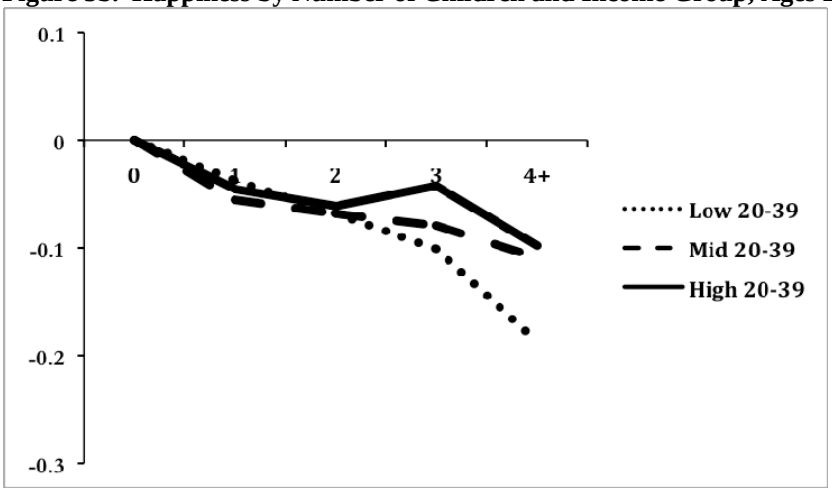
* Controls for sex, socioeconomic status, income, marital status, country and year.

Figure 5a. Happiness by Number of Children and Income Group, Ages 15-19



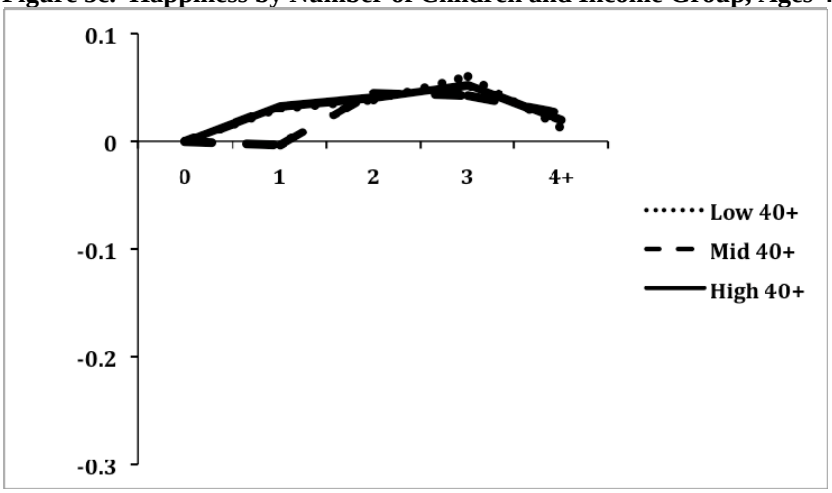
* Controls for sex, socioeconomic status, marital status, country and year.

Figure 5b. Happiness by Number of Children and Income Group, Ages 20-39



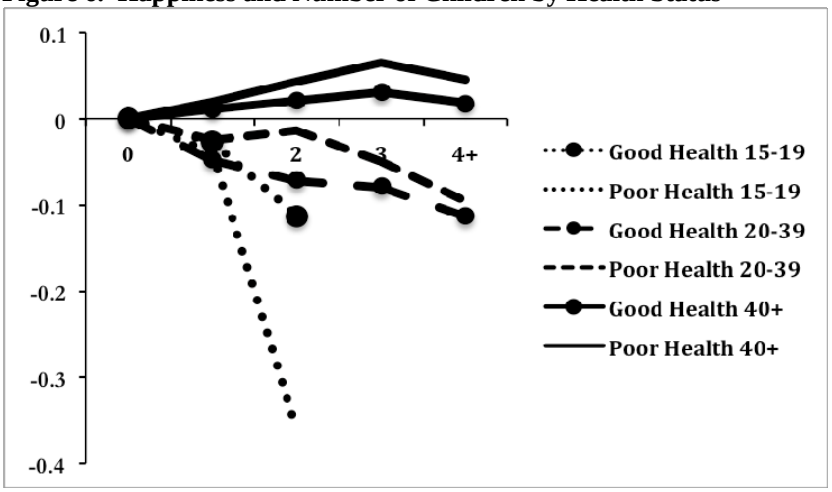
* Controls for sex, socioeconomic status, marital status, country and year.

Figure 5c. Happiness by Number of Children and Income Group, Ages 40+



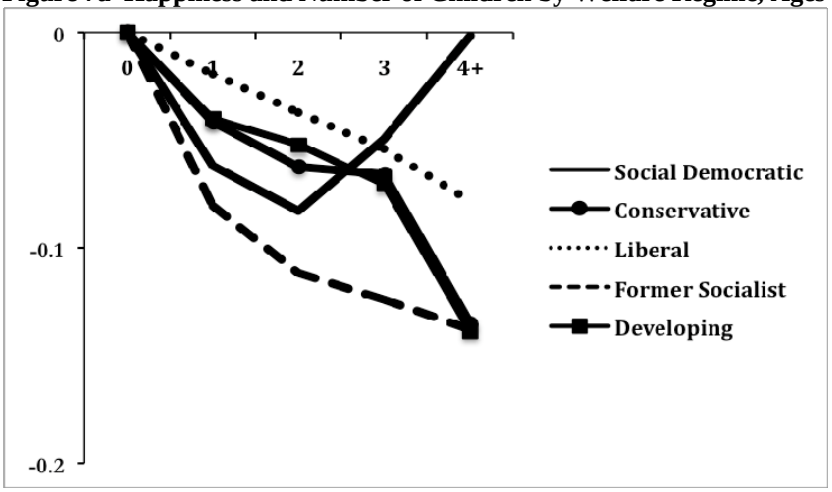
* Controls for sex, socioeconomic status, marital status, country and year.

Figure 6. Happiness and Number of Children by Health Status



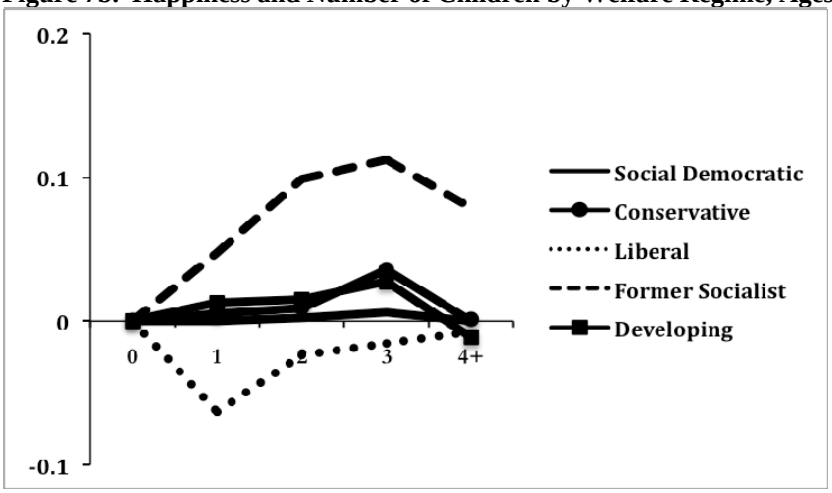
* Controls for sex, socioeconomic status, income, marital status, country and year.

Figure 7a Happiness and Number of Children by Welfare Regime, Ages 20-39



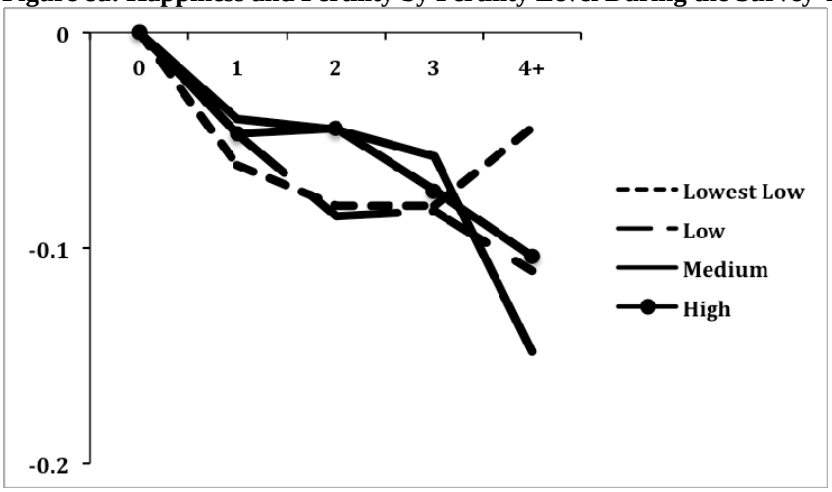
* Controls for sex, socioeconomic status, income, marital status, country and year.

Figure 7b. Happiness and Number of Children by Welfare Regime, Ages 40+



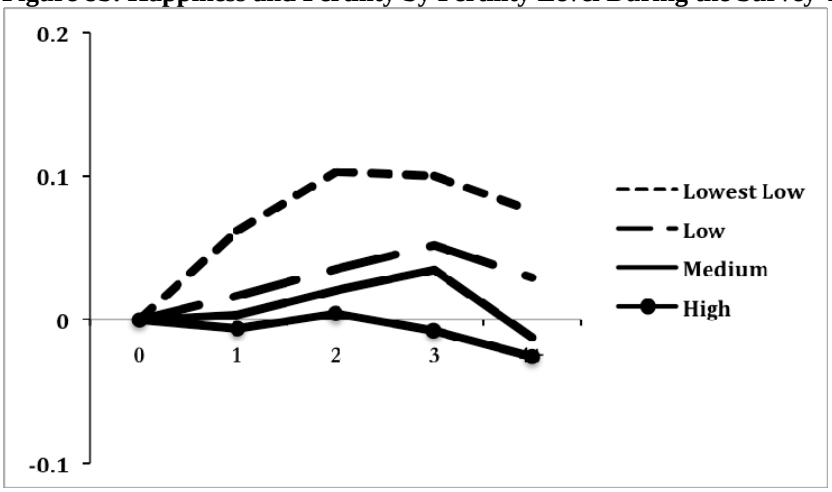
* Controls for sex, socioeconomic status, income, marital status, country and year.

Figure 8a: Happiness and Fertility by Fertility Level During the Survey Year. Ages 20-39



* Controls for sex, socioeconomic status, income, marital status, country and year.

Figure 8b: Happiness and Fertility by Fertility Level During the Survey Year. Ages 40+



* Controls for sex, socioeconomic status, income, marital status, country and year.

APPENDIX

Appendix Table 1. Welfare Regime Categorization

Social Democratic	Conservative	Liberal	Former Socialist	Developing
Austria	Andorra	Australia	Albania	Algeria
Belgium	Finland	Canada	Azerbaijan	Argentina
Denmark	France	Ireland	Armenia	Bangladesh
Luxembourg	Italy	New Zealand	Bulgaria	Brazil
Netherlands	Japan	Britain	Belarus	Chile
Norway	Malta	USA	Croatia	China
Sweden	Portugal		Czech Republic	Colombia
	Spain		East Germany	Cyprus
	Switzerland		Estonia	Dominican Republic
	West Germany		Georgia	Egypt
			Hungary	El Salvador
			Kyrgyzstan	Ethiopia
			Latvia	Ghana
			Lithuania	India
			Macedonia	Indonesia
			Moldova	Iran
			Poland	Jordan
			Romania	Malaysia
			Russia	Mali
			Slovakia	Mexico
			Slovenia	Morocco
			Ukraine	Nigeria
			Macedonia	Pakistan
				Peru
				Philippines
				Rwanda
				Saudi Arabia
				South Africa
				South Korea
				Taiwan
				Tanzania
				Thailand
				Trinidad & Tobago
				Turkey
				Uganda
				Uruguay
				Venezuela
				Vietnam
				Zambia
				Zimbabwe

Appendix Table 2. Total Fertility Rate of Countries and Survey Years in the Analytic Sample

Country	Year	TFR	Country	Year	TFR	Country	Year	TFR
Albania	1998	2.40	Dominican Repub.	1996	3.08	Malaysia	2005	2.71
Albania	2002	2.29	East Germany	1990	1.45	Mali	2005	6.59
Algeria	2002	2.53	East Germany	197	1.05	Malta	1991	2.04
Andorra	2005	1.31	East Germany	1999	1.17	Malta	1999	1.71
Argentina	1991	2.93	Egypt	2000	3.43	Mexico	1990	3.31
Argentina	1995	2.74	Egypt	2005	2.99	Mexico	1996	2.75
Argentina	1999	2.52	El Salvador	1999	3.05	Mexico	2000	2.41
Armenia	1997	1.75	Estonia	1996	1.33	Mexico	2005	2.20
Australia	1995	1.82	Ethiopia	2005	5.57	Moldova	1996	1.67
Australia	2005	1.79	Finland	1996	1.76	Moldova	2002	1.28
Austria	1990	1.45	Finland	2005	1.80	Moldova	2005	1.50
Austria	1999	1.34	France	1981	1.94	Morocco	2001	2.50
Azerbaijan	1997	2.07	France	1990	1.78	Morocco	2005	2.43
Bangladesh	1996	3.66	France	1999	1.79	Netherlands	1981	1.56
Bangladesh	2002	3.00	Georgia	1996	1.65	Netherlands	1990	1.62
Belarus	1996	1.31	Ghana	2005	4.4	New Zealand	1998	1.97
Belgium	1981	1.67	Hungary	1991	1.86	Nigeria	1990	6.71
Belgium	1990	1.62	Hungary	1999	1.29	Nigeria	1995	6.40
Belgium	1999	1.61	Iceland	1984	2.08	Nigeria	2000	5.92
Brazil	1991	2.70	Iceland	1990	2.31	Norway	1996	1.89
Brazil	1997	2.45	Iceland	1999	1.99	Pakistan	1997	5.00
Brazil	2005	2.04	India	1990	3.80	Pakistan	2001	4.59
Britain	1981	1.81	India	1995	3.39	Peru	1996	3.30
Britain	1990	1.83	India	2001	3.00	Peru	2001	2.93
Britain	1998	1.71	India	2005	2.68	Peru	2005	2.67
Bulgaria	1990	1.81	Indonesia	2001	2.39	Philippines	2001	3.52
Bulgaria	1997	1.09	Indonesia	2005	2.26	Poland	1990	2.04
Bulgaria	2005	1.31	Iran	2000	2.29	Poland	1997	1.51
Burkina Faso	2005	6.15	Ireland	1981	3.07	Poland	1999	1.37
Canada	1990	1.83	Ireland	1990	2.12	Poland	2005	1.24
Canada	2000	1.49	Italy	1981	1.62	Portugal	1990	1.43
Chile	1990	2.59	Italy	1990	1.26	Romania	1998	1.32
Chile	1996	2.28	Italy	1999	1.23	Romania	2005	1.32
Chile	2000	2.08	Italy	2005	1.32	Russia	1995	1.34
Chile	2005	1.97	Japan	1990	1.54	Rwanda	2005	5.58
China	1995	1.92	Japan	1995	1.42	S. Africa	1990	3.32
China	2001	1.88	Japan	2000	1.36	S. Africa	1996	3.04
China	2005	1.71	Japan	2005	1.26	S. Africa	2001	2.86
Colombia	1998	2.77	Jordan	2001	3.69	S. Africa	2005	2.78
Croatia	1996	1.67	Kyrgyzstan	2003	2.50	S. Korea	1996	1.58
Croatia	1999	1.38	Latvia	1996	1.16	S. Korea	2005	1.08
Cyprus	2005	1.42	Latvia	1999	1.16	Saudi Arabia	2003	4.09
Czech Republic	1991	1.86	Lithuania	1997	1.47	Slovakia	1991	2.05
Czech Republic	1998	1.16	Luxembourg	1999	1.73	Slovakia	1998	1.38
Czech Republic	1999	1.13	Macedonia	1998	1.90	Slovakia	1999	1.33
Denmark	1981	1.43	Macedonia	2001	1.75	Slovenia	1992	1.34

Appendix Table 2 Continued.

Country	Year	TFR	Country	Year	TFR	Country	Year	TFR
Slovenia	2005	1.26	Taiwan	2005	1.11	USA	1999	2.01
Spain	1981	2.03	Tanzania	2001	5.62	Uruguay	1996	2.5
Spain	1990	1.33	Thailand	2005	1.81	Venezuela	1996	3.04
Spain	1995	1.18	Trinidad & Tobago	2005	1.62	Venezuela	2000	2.83
Spain	1999	1.20	Turkey	1990	3.00	Vietnam	2001	1.88
Spain	2000	1.24	Turkey	1996	2.76	Vietnam	2005	2.21
Spain	2005	1.35	Turkey	2001	2.52	West Germany	1981	1.43
Sweden	1996	1.60	Turkey	2005	2.17	West Germany	1990	1.45
Sweden	1999	1.50	Uganda	2001	6.9	West Germany	1997	1,39
Sweden	2005	1.77	Ukraine	1996	1.30	West Germany	1999	1.39
Switzerland	1996	1.50	Ukraine	2005	1.20	Zambia	2005	5.96
Switzerland	2005	1.42	USA	1990	2.08	Zimbabwe	2001	3.66
Taiwan	1994	1.75	USA	1995	1.98			

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