



# Does Having Children Bring Life Satisfaction in Europe?

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## Abstract

This study investigates the effect of having children on parents' life satisfaction and happiness in Europe. We utilize four waves of the European Values Survey (EVS) from 1981 to 2008. To identify causality, we use instrumental variables estimation. We exploit time and country level variation in five family policies as instruments for having children. For parents who have had children due to the generosity of family policies, having children increases parent's life satisfaction by 0.33–0.41 points on a 10 point scale. This effect is significantly more pronounced when parents are over the age of 50. Yet, children's effects on life satisfaction and happiness is negative for single and full-time working parents. The positive effect of having children on life satisfaction and happiness has substantially eroded over the EVS waves which explains the reductions in the fertility rate in Europe.

**Keywords** Fertility · Subjective well-being · Family policies

**JEL Classification** I12 · I31 · I18

## 1 Introduction

Why do people continue to have children despite the easy availability of contraceptives in the majority of developed countries? The economic theory of fertility suggests that for a person to decide to have children, the utility of having children must outweigh the time and monetary costs of having children (Becker 1960). Social norms that support having children were functional as a means to provide labor in agricultural societies and providing social insurance for parents when they got older. However, in the current economic structure in today's developed countries, for the most part, children are a financial burden for parents. Moreover, reliable pension systems have largely replaced the parents' reliance of children to financially support them in their later life. As functionality of social norms for childbearing has reduced in developed countries, 93% of participants in the 2008 wave of European Values survey consider that having children is a personal decision and 52% reject the idea that raising children is a societal duty. Yet, the social norm's psychic function still continues as many people are still of the opinion that having children will bring joy and

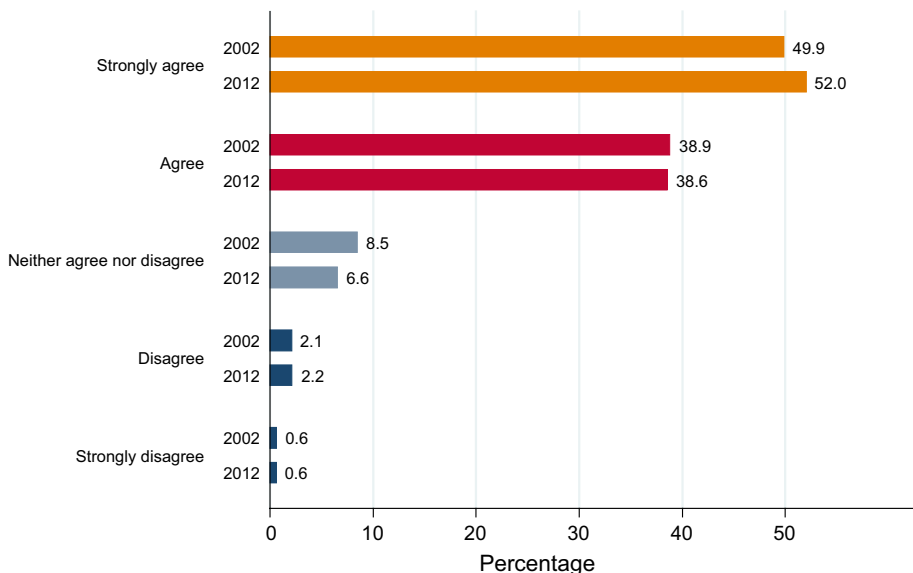
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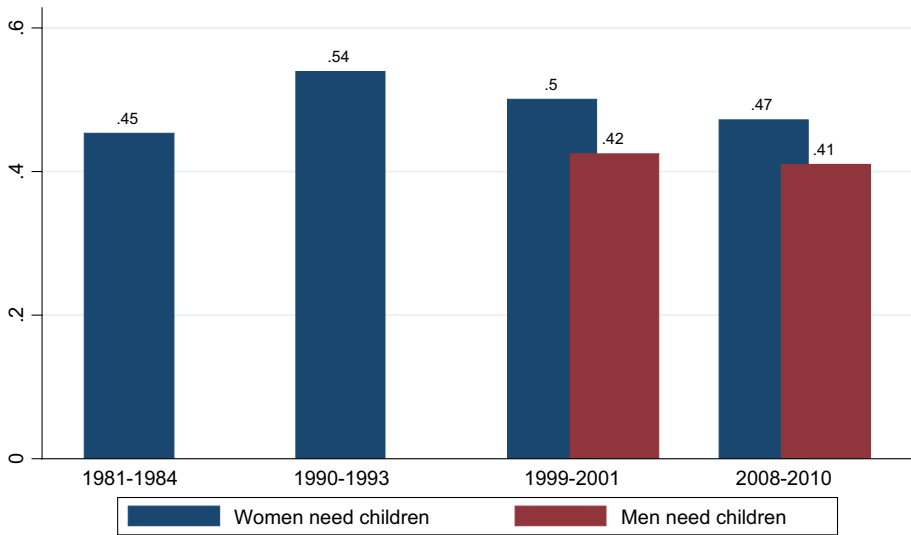
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increase parents' well-being (Fig. 1). Again, for the same set of countries, many people believe that children are a necessity for fulfillment in life (Fig. 2).

Yet, findings concerning the effect of having children on subjective wellbeing do not always align with popular beliefs. McLanahan and Adams (1987) find that adults who live with children have lower happiness and life satisfaction in the US. Nomaguchi and Milkie (2003) study suggests that being a married mother is associated with more housework and more marital conflict but less depression in comparison to married couples without children. Margolis and Myrskylä (2011) examined 86 countries using the World Values Survey and found a negative (positive) relationship between happiness and the number of children for developing (developed) countries. Aassve et al. (2012) shows a generally a positive association between having children and happiness using the European Social Survey-2006 round for people between the ages 20 and 50. These studies are based on cross-sectional data. Examining monozygotic twins in Denmark, Kohler et al. (2005) find a positive effect from the first child on life satisfaction for both males and females, although additional children is shown to have a negative effect on the female's life satisfaction but not the male's. Using longitudinal data from the United Kingdom, Clark and Oswald (2002) did not find any association between the first two children and psychological health when individual fixed effects are controlled for; whereas the third or higher order children are found to have a negative effect on mental health. Using longitudinal data from Germany, Clark et al. (2008) found a significant increase in life satisfaction for both men and women 1 year before the birth of their child and during the birth year, but then noted a sharp drop



**Fig. 1** Views on Children being Life's Greatest Joy in European Countries. The original question is as follows: Do you agree or disagree that "Watching children grow up is life's greatest joy", with answers ranging from strongly disagree to strongly agree. ISSP 2002 values refer to Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, the Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden and the United Kingdom. ISSP 2012 values refer to Austria, Czech Republic, Denmark, Finland, France, Germany, Iceland, Ireland, Norway, Poland, Slovakia, Spain, Sweden, Turkey and the United Kingdom



**Fig. 2** Percentage of those Who Agree that Women and Men need Children. For our set of countries, the question for women is administered to 66,103 individuals with 32,647 individuals believing that women need children in order to find fulfillment. This corresponds to an average of 49.39 %. For our set of countries, the question for men is administered to 43,718 individuals and 18,217 individuals agreed or strongly agreed with the following statement “A man has to have children in order to be fulfilled”. This corresponds to an average of 41.67 %

within 1 year following the birth. Using panel data from Britain and Germany, Myrskylä and Margolis (2014) note that up until the age of two, children increase happiness, and largely among those mothers who postpone childbearing. Using parental preferences for a mixed-sibling sex composition and twins as instruments, Delpiano and Simonsen (2012) evidence suggests that an increase in the number of children in a home damages the financial wellbeing and physical health of mothers.

Many life events do not have a lasting impact on an individual’s happiness (Brickman et al. 1978) because the vast majority of people move on from one event to another rather quickly. Psychologists argue for a ‘set point’ of happiness that is determined by genetics and stable personality traits. However, according to Mochon et al. (2008), smaller but more frequent encounters with events that impact on an individual positively or negatively can boost well-being, particularly if repeated with sufficient frequency. Parenthood entails frequent encounters with the child, at least up until a certain age. In addition, parenthood is irreversible (Friedman et al. 1994) and entails an almost an irrevocable commitment over a considerably long period of time (Turchi 1975). Therefore, having children can affect SWB on a long-term basis. Secondly, as opposed to predictions of set-point theory, Kohler et al. (2005) and Myrskylä and Margolis (2014) indicated that having the first child can increase happiness. Similarly, following the same women before and after child birth in Germany and Britain, Myrskylä and Margolis (2014) note that the first born child has a significantly positive effect on SWB and the effect persists over time for those who had children between 35 and 49 years old.

In this study, we examine the relationship between having children and the two most frequently measured aspects of subjective well-being in the literature, namely life satisfaction (to capture the cognitive evaluation aspect of wellbeing) and happiness (to capture the

affective component of wellbeing) in European countries using four waves of the European Values Survey (EVS) from 1981 to 2008.

We initially run OLS models. Accounting for country and year fixed effects and a large set of control variables, OLS estimates show a statistically significant positive association between having children and happiness in line with the findings of Margolis and Myrskylä (2011), Aassve et al. (2012) and Cetre et al. (2016).

To account for the endogeneity of having children better, we use variation in the following five family life related public policies as instruments: publicly funded family cash benefits, early childhood education benefits, other in kind family benefits, maternity leave in weeks, paid maternity and parental leave duration. These public policies are macro level variables annually available from the OECD's Social Expenditure Database and labor statistics. Theoretically, family related public policies are all expected to foster childbearing, either by lowering the opportunity cost and direct cost of having children or increasing income levels. These five family related public policies as our instrument set are jointly significant in explaining the reason for having children.

Our findings indicate that having children increases parents' life satisfaction by 0.33–0.41 points on a 10 point scale which is in line with the findings of Kohler et al. (2005) and Myrskylä and Margolis (2014). This is particularly more pronounced when parents are older than 50. However, having children does not significantly affect the happiness of parents. Yet, we also observe the notably negative effect of having children on single parents and full-time working parents. Overall, our results show that having children is more rewarding in terms of life satisfaction rather than happiness. When the strong positive relationship shown in OLS results are combined with the negative, albeit statistically insignificant, effect of having children on happiness, we can derive that happier people in the first place are more likely to have children, which supports the findings of Le Moglie et al. (2015) and Cetre et al. (2016).

This paper contributes to the literature on the effects of having children on the wellbeing of the parents. With the exception of Delpiano and Simonsen's (2012) work, the major drawback of previous studies is the endogeneity bias in having children. That is, if certain personality types are more likely to report higher life satisfaction and have children more often, then the difference in life satisfaction scores between parents and non-parents may be to the result of unobserved personality types. The previous studies using fixed effects models will provide an unbiased estimate of the effect of having children on subjective wellbeing if the only source of heterogeneity is time fixed personality related heterogeneity. However, Le Moglie et al. (2015) and Cetre et al. (2016) reveal that happiness also drives people to have more children. Thus, to identify the direction of causality IV models are necessary. Using IV models, Delpiano and Simonsen (2012) study the effect of extra children on marital prospects, financial situation and physical health but they do not address the effect on SWB.

This study is important, especially in a rapidly aging Europe. Our results pertain directly to current policy debates on how to induce fertility to return to levels that can maintain population growth.

## 2 Methodology

The relationship between having children and well-being can be formulized by the following equation:

$$H_i = C_i\alpha + X_i\beta + \varepsilon_i \quad (1)$$

where  $H$  represents the happiness or life satisfaction score;  $C$  represents childbearing behavior, and  $X$  is a vector of other control variables.

One critical issue in estimating the effect of having children on well-being is the self-selection of individuals into being a parent. In other words, if certain people are more likely to be parents and also to report higher happiness scores, then the difference in reported happiness scores between parents and non-parents may be due to unobserved differences in career prospects, health, sociability or other time varying factors. To address these issues, an instrumental variables (IV) approach can be utilized which requires instruments which will impact a person's decision to have (additional) children without affecting his or her subjective well-being directly.

In our study, the instrument set contains five variables. These are as follows: (1) average publicly funded (apf.) family cash benefits per head (ph.); (2) apf. early childhood education and care benefits ph.; (3) apf. other in kind benefits ph. (4) average maternity leave in weeks (iw); (5) average duration of paid maternity and parental leave iw.

The link between public policies and childbearing can be shown by the following equation:

$$C_i = X_i\gamma + Z_i\delta + e_i \quad (2)$$

where  $C$  represents childbearing behavior;  $X$  represents a vector of other control variables, and  $Z$  denotes public policy tools used to support family life.

For our IV estimates to be consistent and valid, three conditions must hold. First, the instruments should be "relevant" for childbearing decision. Secondly, exclusion restrictions must hold. Thirdly, monotonicity should not be violated.

For the first condition, there are several reasons for family life related public policies being a relevant determinant of childbearing. According to the neo-classical theory of fertility, any reduction in the cost of children as a result of public funding or any increase in income as a result of child benefit payments is expected to increase the demand for children (Becker 1981; Cigno 1991). For instance, if women have a strong preference for combining family and work life as suggested by Dex and Joshi (1999), affordable childcare services may improve the reconciliation of work and family life. Thus, childcare subsidies can foster childbearing by lowering the cost of children in terms of labor market opportunities. In the same way, policies such as child benefits, maternity leave, and the duration of paid maternal and parental leave benefits are all expected to have a positive impact on childbearing by lowering the opportunity cost and direct cost of having children or increasing income. A number of studies empirically support the notion that family policies are an effective means by which to increase fertility (Hoem 1990, 1993; Gauthier and Hatzuis 1997; Gauthier 2000; Rindfuss et al. 2007). There are studies, however, that show the ineffectiveness of public policies to induce people to have more children (Gauthier 2007).

It is necessary to ensure that instruments are highly correlated with the variable they instrument for, in this case, have children and the number of children. This is commonly judged by examining an  $F$  test on the instruments in a regression of the endogenous variable on the instruments (the first stage). Bound et al. (1995) suggested that this  $F$ -statistic should be large and statistically significant; as a rule of thumb, Staiger and Stock (1997) suggest that an  $F$ -statistic of less than 10 could signal weak instruments.

Secondly, exclusion restrictions must also hold; instruments should be uncorrelated with the unobserved characteristics that can affect subjective wellbeing. That is, we

need to ensure that these public policies do not directly impact on happiness. If certain countries are more supportive of family life by offering generous benefits, and if those countries are also performing well in terms of the overall happiness of its citizens, we might observe higher happiness scores in those countries, not necessarily because of generous benefits leading higher childbearing, but perhaps rather because of country specific properties. To address this concern, we run country fixed effects specification which requires observing the same country more than once. To take into account the general trend in the increase in public support for family and any changes in the happiness trend in these countries, we run country and year fixed effects models. Yet, even these models assume that public family support programs depend on the country which is fixed over time. But, if the generosity of those programs increases as countries grow richer then the exclusion restrictions, even after including country fixed effects, may not be valid. Therefore, we include the average GDP per capita for each country for each wave as an additional control variable. Moreover, if family support programs are more generous in low fertility countries, our results might capture the effect of having children in low fertility settings. Therefore, we also include the average fertility rate for each country for each wave as a control variable. Furthermore, family policies might affect individual wellbeing through their impact on the labor market status of males and females. Thus, we include average female and male employment and unemployment rate variables as labor market indicators. Lastly, to ensure that our family policies are not capturing the effect of the entire welfare state, we included public health expenditures and public expenditures on all programs for the elderly. As countries alter their family policies over time and we restrict the data to those countries which are surveyed more than once, we were able to run country fixed effects models as well as utilize family policies as instruments.

The monotonicity assumption requires that the public policies supporting family life either have no effect on having children or it influences childbearing in the same direction whenever it does have an impact. In fact, public policies may have heterogeneous effects. Even if the treatment effects are heterogeneous, Angrist and Imbens (1994) indicate that IV estimates indicates “Local Average Treatment Effects” (LATE) in this setting. That is, as long as people do not reduce their planned number of children in response to more generous public policies, IV estimates remain valid.

Under these assumptions, IV results yield the local average treatment effect (LATE) for parents who had (additional) children because of the influence of more generous public policies, but would not have (additional) children if the public policy was less generous. In other words, our results cannot show the effect of childbearing on SWB of individuals whose demand for children is too high that they would have children in any setting. Also, our results do not hold for individuals who are certain that they would not have any children regardless of the institutional setting. Yet, our results hold for adaptive women who would be affected by policy signals and, according to Hakim (2003), constitute around 60% of women.

### 3 Data

In this study, we use individual level data from all four waves (1980–1982, 1990–1991, 1999–2001, and 2008–2009) of the European Values Survey (EVS) available at the Leibniz Institute for Social Sciences. The EVS has a representative sample of each

country that participated in the survey. We restrict the sample to countries for which the EVS was conducted twice to run country fixed effects. We restrict the data to OECD countries because there is a comprehensive database concerning those countries' social expenditures which is used for constructing our instruments. Estonia, Latvia and Slovenia are dropped from the sample due to a lack of availability of certain instruments. Canada and the USA are discarded as they did not participate in the 1999 and 2008 surveys. The countries used in our analysis include Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Turkey and the United Kingdom.

The EVS covers a broad range of topics including happiness, life satisfaction and a number of socio-economic status indicators. For our happiness score, we use answers given to the following question: "On the whole, how happy would you say you are?" ranging from 1 "not at all happy" to 4 "very happy". For our life satisfaction score, we use answers provided to the following question: "All things considered, how satisfied are you with your life as a whole these days?" ranging from 1 "dissatisfied" to 10 "satisfied".

While we are aware whether respondents do or do not have children and their number of children, we do not, unfortunately, have information pertaining to the gender and age of the children or whether the children live with parents. What we do have is detailed information about the parents. Therefore, we run the analysis specific to the characteristics of the parents.

As control variables, we use gender, age, the country the respondent lives in, the age of the respondent at the time when her/his full-time education came to an end, marital status (categories: married, living with partner, divorced/separated, widowed, single), employment status (categories: full-time employed, part-time employed, self-employed, retired, house-care, student, unemployed, other employment status), religious affiliation (categories: no religious affiliation, Roman Catholic, Protestant, other Christian, Jewish, Muslim, belonging to Eastern or other Religions), household income group (categories: low income, medium income, high income) For compiling house income groups, country specific annual household income are collected from respondents in each country. Then, this variable is corrected for purchasing power parity and recoded into three categories in the original dataset. We used this income measure as it is the longest available income measure.

As for instruments, family cash benefits, early childhood education benefits, other in kind benefits are available from the OECD Social Expenditure Database. Family cash benefits, early childhood benefits and other in kind benefits are measured per head, at the current PPPs, in US dollars. Therefore, they are comparable across countries. Unfortunately, we do not have any information on the conditions of receiving cash and in kind benefits for each country. Maternity leave, and paid maternity and parental leave are measured in weeks and obtained from the OECD labor statistics. All the instruments are country level macro variables measured annually.

We have information on instruments as early as 1980. To ensure that it is possible for all the individuals in our sample to be affected by our set of instruments, we calculated the average values for each instrument from 1980 until the survey year for each country and for each wave and used those averages as instruments. Those who completed their childbearing in 1980 in each wave have been excluded from the sample as they would not be affected by family policies. This constitutes our sample restriction.

We retain observations for which happiness, all control variables and instruments are non-missing. Under these criteria, a total of 65,044 observations exist.

As for additional control variables, employment and unemployment rates for males and females are also obtained from OECD labor statistics. The GDP per capita and fertility rate for each country are obtained from the World Bank Database. At the same time, total public health expenditures (per head, at current PPPs, in US dollars) and total public expenditures relating to the elderly category (per head, at current PPPs, in US dollars) are obtained from the OECD Social Expenditure Database.

### 3.1 Descriptive Statistics

Descriptive statistics appear in Table 1. Overall, 70% of individuals in our sample have children with the average number of children being 1.61. The average life satisfaction of parents (7.34) are statistically significantly higher in comparison to non-parents (7.21). Similarly, happiness scores of parents (3.13) are statistically significantly higher than that of non-parents (3.10). The difference being statistically significant, but, in terms of magnitude is rather modest. Regarding marital status, employment status, education, income group and religious affiliation, there are stark differences between parents and non-parents. With the exception of those who follow Judaism, Islam and Eastern/other religions, parents statistically differ from non-parents in terms of their marital and employment status, household income, other religious adherence categories and duration of education. In comparison to non-parents, parents are on average older, more likely to be older when they completed their education, be married, divorced/separated and widowed. In terms of employment status, parents are less likely to be full-time employed, student and unemployed but more likely to be part-time or self-employed as well as retired and a house-maker. In terms of income groups, parents are more likely to be in the medium and high income category while non-parents are more likely to be in the low-income category.

## 4 Results

Table 2 reports the OLS estimates in which an extensive set of variables and time and country fixed effects are controlled for. Model 1 indicates that the number of children is related to life satisfaction at a 10% significance level. Model 2 suggests that having children is positively and significantly associated with happiness at a 1% significance level. In comparison to model 2, a weaker relationship can be observed in Model 1. In order to ascertain the nature of non-linear relationship, in model 3, the sample is restricted to those who either have no children or only 1 child. In model 4, the sample is restricted to those who have either 1 child or 2 children. In model 5, the sample is restricted to those who have either 2 children or 3 or more children. We observe a positive coefficient in the 3rd and 4th models but the coefficient becomes negative in the last model, although, arguably, not statistically significant at a 5% significance level. Therefore, we conclude that there is a non-linear relationship between children and SWB.

Appendix Table 8 further indicates that our OLS results are similar to ordinary probit model results which are in line with findings of Ferrer-i-Carbonell and Frijters (2004). Secondly, Appendix Tables 9 and 10 shows that the results are sensitive to the set of control variables included in the model, this is suggestive of selection bias for the having children and number of children variables.



**Table 1** Descriptive statistics

	Total	Non-parents	Parents
Have children	0.70 [0.46]		
Number of children	1.61 [1.44]		2.29 [1.19]
Life satisfaction score	7.30 [2.08]	7.21 [2.05]	7.34 [2.10]***
Happiness score	3.12 [0.67]	3.10 [0.66]	3.13 [0.67]***
Female	0.47 [0.50]	0.42 [0.49]	0.49 [0.50]***
Age	42.89 [15.82]	31.59 [13.79]	47.69 [14.08]***
Age completed education cat.	6.51 [2.95]	7.47 [2.64]	6.10 [2.98]***
<i>Marital status</i>			
Married	0.60 [0.49]	0.17 [0.37]	0.79 [0.41]***
Living with partner	0.04 [0.19]	0.06 [0.24]	0.03 [0.16]***
Divorced/separated	0.07 [0.26]	0.04 [0.19]	0.09 [0.29]***
Widowed	0.04 [0.20]	0.01 [0.11]	0.06 [0.23]***
Never married	0.24 [0.43]	0.72 [0.45]	0.04 [0.20]***
<i>Employment status</i>			
Full time	0.47 [0.50]	0.53 [0.50]	0.45 [0.50]***
Part time	0.07 [0.25]	0.06 [0.24]	0.07 [0.26]***
Self-employed	0.07 [0.25]	0.06 [0.23]	0.07 [0.26]***
Retired	0.16 [0.37]	0.06 [0.24]	0.21 [0.40]***
House-maker	0.10 [0.29]	0.02 [0.15]	0.13 [0.33]***
Student	0.05 [0.22]	0.17 [0.37]	0.00 [0.07]***
Unemployed	0.06 [0.24]	0.09 [0.28]	0.05 [0.21]***
Other emp. status	0.02 [0.14]	0.02 [0.13]	0.02 [0.15]***
<i>Income group</i>			
Low income	0.29 [0.45]	0.33 [0.47]	0.27 [0.44]***
Medium income	0.39 [0.49]	0.36 [0.48]	0.41 [0.49]***
High income	0.32 [0.47]	0.31 [0.46]	0.33 [0.47]**
<i>Religious affiliation</i>			
No religion	0.25 [0.43]	0.28 [0.45]	0.24 [0.43]***
Roman Catholic	0.43 [0.49]	0.41 [0.49]	0.44 [0.50]***
Protestant	0.21 [0.41]	0.19 [0.40]	0.22 [0.41]***
Other Christian	0.05 [0.22]	0.06 [0.23]	0.05 [0.21]***
Judaism	0.00 [0.03]	0.00 [0.03]	0.00 [0.04]
Islam	0.05 [0.22]	0.05 [0.21]	0.05 [0.22]
Eastern/other religions	0.01 [0.11]	0.01 [0.12]	0.01 [0.11]
<i>N</i>	65,044	19,385	45,659

The first column provides the sample means and standard deviations in [ ] for the full sample. The remaining columns provide sample means and standard deviations by the parental status

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

#### 4.1 IV Estimation

To treat potential endogeneity bias, we use family policies as instruments for childbearing. Table 3 shows how the value of instruments alter in each wave. All family policies increase over time which generates a high correlation between policies.

**Table 2** Pooled OLS estimates of subjective wellbeing indicators

	(1)	(2)	(3)	(4)	(5)
<i>Panel A: Life satisfaction</i>					
No. of children	0.015* (0.008)				
Have children		0.068* (0.036)	0.062 (0.041)	0.036* (0.020)	-0.030 (0.024)
Restrictions			1st child	2nd child	3rd or more child
R squared	0.143	0.143	0.134	0.140	0.154
N	64,832	64,832	30,381	30,851	34,451
	(1)	(2)	(3)	(4)	(5)
<i>Panel B: Happiness</i>					
No. of children	0.004 (0.003)				
Have children		0.022*** (0.007)	0.017 (0.010)	0.013* (0.007)	-0.005 (0.006)
Restrictions			1st child	2nd child	3rd or more child
R squared	0.158	0.158	0.147	0.159	0.169
N	65,044	65,044	30,480	30,942	34,564

Std. errors are robust, clustered at country level and provided in ( ) \*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.10$

All regressions results include baseline controls, sample restrictions, year and country fixed effects

Baseline Controls gender, age, age squared, age of the respondent at which her full-time education ended, marital status (categories: married, living with partner, divorced/separated, widowed, single), employment status (categories: full-time employed, part-time employed, self-employed, retired, doing house-care, student, unemployed, other employment status), religious affiliation (categories: Roman Catholic, Protestant, Other Christian, Jewish, Muslim, belonging to Eastern/Other Religions), income group (categories: low income, medium income, high income)

**Table 3** Average values of instruments in each wave

	Wave 1	Wave 2	Wave 3	Wave 4
Family cash benefits per head (USD)	157.06	208	226.55	309.91
Early childhood education benefits per head (USD)	42.32	55.15	66.42	112.51
Other in kind benefits per head (USD)	19.06	20.88	25.97	41.86
Maternity leave in weeks	15.96	17.03	17.43	17.8
Paid maternity and parental leave in weeks	21.39	42.59	47.46	50.71

Table 4 shows the first stage estimates. In the first two columns the dependent variable is having children, in the last two columns, the dependent variable is the number of children.

All models controls for all baseline control variables, country and time fixed effects. As instruments are available from 1980 onwards, we discarded females who completed their childbearing as a result of age before 1980 and thus would not be affected by these policies in model 2 and 4. The results indicate that public policies are an important determinant of

**Table 4** First stage regressions of have child and # of children

	Have child (1)	No. of children (2)
Average duration of maternity leave in weeks (iw)	0.0217*** (0.0082)	0.0193*** (0.0061)
Average duration of paid maternity and parental leave iw	0.0014 (0.0034)	0.0016 (0.0026)
Apf. family cash benefits per head	0.0004 (0.0003)	0.0001 (0.0002)
Apf. early childhood education expenditures per head	0.0010 (0.0008)	0.0001 (0.0007)
Apf. other in kind benefits per head	0.0006 (0.0017)	0.0024* (0.0013)
F statistic ( $\chi^2$ )	34.78	15.08

Std. errors are robust, clustered at country level and provided in ( ) \*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.10$

All regressions results include baseline controls, year, country fixed effects and sample restrictions

having children. The F statistics presented in the last row of all columns clearly exceed 10 and  $p$  values are sufficiently low; we therefore conclude that we do not have a weak instrument problem for the having children and number of children variables.

We present IV regression results for SWB in Table 5. In line with the OLS results (Table 2) which show a non-linear relationship between children and SWB, the first model in Table 5 does not find any linear effect of children on SWB. According to model 2, having children increases life satisfaction.

As shown in Table 3, all family policies increase over time. This period, however, is also a period in which GDP per capita increases and fertility rates decline. To ensure that our results are not driven by changes in GDP per capita, fertility rates, labor market prospects and other welfare policies in each country, we run country fixed effects specification with additional country-level control variables. We obtain even stronger results in model 3, 4, 5 and 6 compared to model 2 in which we include average the GDP per capita, fertility rate, employment rate, and unemployment rate for both genders, public healthcare expenditures per head and total public expenditure on services for the elderly group, respectively. This is reassuring for the validity of our IV estimates.

We do not find any statistically significant effect of having children on happiness in any of the 6 models.

As for overidentifying restrictions, robust tests of overidentifying restrictions are not available when standard-errors are clustered. But, as our instruments are country-level variables, we always report results which clusters standard errors at country-level. Yet, our results are robust to using different instrument sets (see Table 7) Especially, even when we confine ourselves to using the average maternity leave duration as an instrument, we still find a significant effect of having children on life satisfaction which reassures us that our results are not driven by overidentification of the model.

To determine the extent to which the effect of children varies according to parents' characteristics and time, we treat the interaction term as an endogenous variable as recommended by Wooldridge (2002). Due to the non-linear effect of children on SWB, we did not find any significant relationship when parents' characteristics are interacted with the number of children (unreported, available upon request). In Table 6, the interaction

**Table 5** IV Regression output for SWB

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A: Life satisfaction</i>						
No. of children	0.453 (0.760)					
Have children		0.330* (0.192)	0.416*** (0.159)	0.368** (0.175)	0.493** (0.220)	0.460** (0.187)
Average GDP per capita	–	–	+	–	–	–
Average fertility rate	–	–	–	+	–	–
Average labor market Indic.	–	–	–	–	+	–
Average welfare state Indic.	–	–	–	–	–	+
R squared	0.091	0.142	0.141	0.142	0.142	0.141
N	64,832	64,832	64,832	64,832	59,502	64,832
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel B: Happiness</i>						
No. of children	0.002 (0.224)					
Have children		–0.015 (0.040)	0.000 (0.036)	–0.014 (0.043)	–0.006 (0.039)	–0.004 (0.039)
Average GDP per capita	–	–	+	–	–	–
Average fertility rate	–	–	–	+	–	–
Average labor market Indic.	–	–	–	–	+	–
Average welfare state Indic.	–	–	–	–	–	+
R squared	0.158	0.158	0.158	0.158	0.156	0.158
N	65,044	65,044	65,044	65,044	59,696	65,044
First stage <i>F</i> test	15.08	34.78	26.42	24.95	83.58	58.58
Test of exogeneity ( <i>p</i> value)	0.58	0.17	0.04	0.10	0.08	0.05

Std. errors are robust, clustered at country level and provided in ( ) \*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.10$

All regressions results include baseline controls, year and country fixed effects and sample restrictions. Labor market indicators are the employment and unemployment rates for both males and females. Welfare state indicators are the public expenditure on healthcare per head and total public expenditure on services old-age services

between having children and various parental characteristics are reported. Firstly, in Panel A we determine whether women's experience of parenthood is different from men as suggested by LaRossa and LaRossa (1981) and Cowan et al. (1985). Although the coefficient of the interaction term is negative for happiness and positive for life satisfaction, we did not find any statistically significant difference between men and women.

In panel B, we investigate how parents' age change the effect of having kids on SWB as the emotional and financial toll of raising children can be higher when children are young, but when parents are elderly, having children might even become a source of help for minor errands and emotional support. Although, in our set of countries which possess developed social security systems, the majority of the elderly are not dependent on their children financially, but still children are often thought to provide social and emotional support (Evenson and Simon 2005; Bures et al. 2009). Our results indicate that having children has a

**Table 6** IV Regression results

	Life satisfaction	Happiness
<i>A. Gender</i>		
Having children	0.3065* (0.1856)	-0.0118 (0.0401)
Female * have children	0.0710 (0.0551)	-0.0105 (0.0135)
<i>B. Age</i>		
Having children	0.3974** (0.1840)	-0.0075 (0.0421)
Age < 24 * have children	-0.0276 (0.1131)	-0.0208 (0.0329)
Age > 50 * have children	0.1107** (0.0442)	0.0139 (0.0124)
<i>C. Marital status</i>		
Having children	0.8269* (0.4927)	0.1001 (0.1344)
Never married parent * have children	-0.8805* (0.4707)	-0.2459* (0.1381)
Two parent household * have children	-0.6724* (0.3883)	-0.1418 (0.1517)
<i>D. Employment status</i>		
Having children	0.7115*** (0.2335)	0.0491 (0.0534)
Full time * have children	-0.3608*** (0.1212)	-0.0643* (0.0353)
Part time * have children	0.0530 (0.1333)	0.0254 (0.0462)
Self-employed * have children	-0.2823** (0.1202)	-0.0054 (0.0439)
Student * have children	-0.2939* (0.1667)	-0.0324 (0.0572)
Unemployed * have children	-0.2967*** (0.1011)	-0.0479 (0.0504)
<i>E. Time</i>		
Have child	0.6458*** (0.1695)	0.0805** (0.0398)
4th wave (2008–2009) * have child	-0.3754*** (0.1212)	-0.1357*** (0.0292)
3rd wave (1999–2001) * have child	-0.2976*** (0.0976)	-0.0796** (0.0337)
2nd wave (1990–1991) * have child	-0.3988*** (0.0792)	-0.1135*** (0.0239)

Std. errors are robust, clustered at country level and provided in ( ) \*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.10$

All regressions results include baseline controls, year and country fixed effects and sample restrictions

**Table 7** Sensitivity analysis results for the effect of having children on SWB

	(1)	(2)	(3)
<i>Panel A: Life satisfaction</i>			
Have children	0.3800** (0.1486)	0.4158** (0.1859)	0.2563 (0.1602)
	(1)	(2)	(3)
<i>Panel B: Happiness</i>			
Have children	-0.0126 (0.0392)	-0.0286 (0.0410)	-0.0228 (0.0346)
First stage <i>F</i> test	7.65	22.49	12.33
Instruments	Maternity leave	Labor market rel. family policies	Family policies for all

Std. errors are robust, clustered at country level and provided in ( ) \*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.10$

All regressions results include baseline controls, year and country fixed effects and sample restrictions

particularly positive effect on life satisfaction when parents are older than 50<sup>1</sup> years old. We did not find that having children particularly affects young parents (parents' age < 24).<sup>2</sup> This may be a result of the small sample size of individuals who had children before the age of 24.

In Panel C, we determine whether the impact of having children is dependent on marital status. Two person households may be easier as they can share costs. Raising children, however, may be potentially contentious when parents have different parenting styles. We categorize married and cohabiting individuals as two parent households. Single parents are those who have had children but have never been married. The baseline is parents who are separated, divorced or widowed. Similar to Nomaguchi and Milkie (2003)'s findings, the happiness and life satisfaction effect of having children is lower for single parents. At the same time, we found that having children reduces two parent households' life satisfaction particularly. Our finding is meaningful as the arrival of a child often leaves less leisure time for the couple, and increases conflict over the division of housework and childcare.

Previous literature on the subject is shown to support our findings. Delpiano and Simonson (2012) found that having children increases the likelihood of divorce while Grossbard and Mukhopadhyay (2013) study suggests that having children reduces spousal love. Nomaguchi and Milkie (2003) conclude that married mothers have more marital conflict than their childless counterparts. Twenge et al. (2003) also found less marital satisfaction among parents compared to non-parents.

In panel D, we include the interaction of employment categories with having children to ascertain whether children are particularly detrimental for certain employment categories. Child raising can be very demanding for full-time workers and those who are self-employed whereas part-time workers find it easier to balance their work-life and family. Students can have role-conflicts when they become parents. Also, children may prove an obstacle for unemployed parents from conducting effective job searches. Retired individuals and house-makers may find more enjoyment in having children as they may have more free time to devote to their children. The reference category is retired, house-maker and

<sup>1</sup> The results are robust to different age thresholds such as parents older than 55, 60 and 65 years old.

<sup>2</sup> The results are robust to different age thresholds such as parents younger than 23, 22, 21 and 20 years old.

people with other employment status. In comparison to the reference category, being a full-time employed parent reduces both life satisfaction and happiness.

Panel E determines how the happiness effect of having children changes over time. The reference category is first wave (1981–1982). We find that children's positive effect on SWB erodes over time. This finding is consistent with the reduction in fertility rates over time in Europe and suggests that the life satisfaction increasing effect of children is largely driven by earlier waves. Moreover, Appendix Table 11 shows that our estimates in Table 6 are robust by the inclusion of the average GDP per capita and fertility rate as additional control variables.

## 4.2 Robustness Checks

In Table 7, we check the sensitivity of our baseline results to different sets of instruments. Firstly, we use only the duration of maternity leave as an instrument, as it is the most significant family policy explaining the childbearing decision in the first-stage (see Table 3). Secondly, we use only the instruments that affects those in the labor market. These instruments are duration of maternity leave, duration of paid maternity and parental leave. Thirdly, we restrict our instruments to only cash and in kind benefits for families. The results are stronger than our baseline results but slightly less precise in the 3rd models as 82%<sup>3</sup> of our sample has or has had some relationship with the labor market. These are also reassuring for the validity of the IV results.

## 5 Discussion and Conclusion

In this study, we examine how the extent to which having additional children affects SWB. To identify causality, we use instrumental variables estimation. We use five public policies as instruments for having (additional) children since theoretically public policies have the potential to exogenously lower the cost of having children and thus foster childbearing. Firstly, we demonstrate that having children increases parents' life satisfaction, which is in line with the findings of Kohler et al. (2005) and Myrskylä and Margolis (2014).

Our results reveal that having children is more rewarding in terms of life satisfaction than happiness. In the literature, some researchers (e.g. Blanchflower and Oswald 2004; Easterlin 2005) argue that life satisfaction and happiness are very similar constructs. However, Diener and Fujita (1995) and Lucas et al. (1996) show that life satisfaction and happiness share at most a 50% common variance. Similarly, Haller and Hadler (2006) indicate that these concepts can have different relationships with basic demographic variables. There are researchers who state that life satisfaction reflects more of a cognitive assessment of one's life in terms of the degree of one's achievements to his or her own aspirations and that happiness is more of a positive emotion (Diener 1984; Haybron 2007). We find a negative coefficient (although not statistically significant) for the effect of having children on happiness which suggests that happiness is more negatively affected by the stress and burdens of raising children in line with the assessments of Campell et al. (1976) and Hansen (2012). In line with our findings, parents reported that an important reason for having children is to obtain a more meaningful

<sup>3</sup> 43% (full time)+7% (part-time)+6% (self-employed)+21% (retired)+5% (unemployed).

life, affiliation and competence (Hoffman and Hoffman 1973; Friedman et al. 1994). At the same time, the difference in loss of statistical significance can be partially caused by the fact that the life satisfaction score (10 point Likert scale) is more precisely measured than the happiness score (4 point Likert scale).

Our finding that having children raises individuals' cognitive evaluation of their life (life satisfaction) but fails to significantly affect their positive emotions (happiness) may be somehow related to the cultural norms of having children. Life satisfaction is affected by the fulfillment of personal goals and expectations as well as social expectations (Schimmack et al. 2002) whereas happiness is predominantly affected by spontaneous, immediate everyday experiences (Kahneman et al. 2004). As the strong social expectations for parenthood remain, even in developed countries (See McQuillan et al. (2007) and Fig. 1,2 in this study), the effect of having children on life satisfaction is plausible.

Although the OLS results report a positive relationship between happiness and having children, the findings from IV strategy do not report that happiness effects of having children. This perhaps implies that innately happier people are more likely to have children, which supports the findings of Le Moglie et al. (2015) and Cetre et al. (2016). On the contrary, however, having children may even reduce happiness for single and full time working parents.

To put the coefficients into context—about 0.32–0.41 points in life satisfaction, we can compare them to the associations between life satisfaction and other better-known variables. For example, the difference between women and men in life satisfaction is 0.07 units in our IV estimates. Thus, we can say that having children is an important component of life satisfaction.

Overall, our results are in tandem with the old-age support argument that having children brings utility to parents, particularly parents who are more advanced in years. Our results indicate that parents are compensated for their investment in children at an old age. This is in line with the findings of Pinqart and Sørensen (2000) and Hilleras et al. (2001). Although Kruk (2014) found that having a third child as a result of twin births increases the probability of poor mental health for women, the same effect could not be found when the first two children were the same sex. On the contrary, they found that having the second child as a result of a twin birth in the first pregnancy reduces the likelihood of using antidepressant drugs by 6 percentage points for women. However, while our results demonstrate the effect of expected and desired children, Kruk's results show the effect of unexpected and possibly unwanted children.

We also find that the happiness and life satisfaction effect of having children has been substantially diluted over time which can explain the drop in fertility rates in Europe. Therefore, we can argue that the positive effect of having children on life satisfaction is largely driven by earlier waves.

In the literature, there are empirical findings that demonstrate the effectiveness and ineffectiveness of family policies in order to increase fertility rates (Gauthier 2007). Our results show that family policies are more persuasive in inducing people to go into parenthood rather than increasing their number of children.

One limitation of our study is related to instrumental variables estimation. The IV methodology yields results which are only valid for the narrow population of compliers and cannot be generalized to the whole population. In our study, the results are valid for parents who had children induced by the generosity of family benefits and these individuals would not have (additional) children if the family benefits of their country were less generous. As only some individuals are motivated to have additional children due to these policies, our results cannot be generalizable to the entire European population.

Nevertheless, the main theme of this study—that having children increases the life satisfaction for at least some people—, could have policy implications for fostering childbearing.



A number of studies show that people are poor at predicting future well-being effects of particularly novel events such as having an additional child (Gilbert et al. 2002; Loewenstein et al. 2003). Therefore, there could be room to more effectively promote childbearing to those who are unaware of this. Yet, when we combine the diluted life satisfaction effect of having children with family policies being more effective for inducing people to parenthood rather than having more children, we predict that family policies will no longer be an effective means by which to bring fertility rates back to a positive level.

## Appendix

See Tables 8, 9, 10 and 11.

**Table 8** Oprobit estimates of subjective wellbeing indicators

	(1)	(2)	(3)	(4)	(5)
<i>Panel A: Life satisfaction</i>					
No. of children	0.011*** (0.004)				
Have children		0.030 (0.019)	0.024 (0.022)	0.019* (0.011)	-0.003 (0.013)
Baseline controls	+	+	+	+	+
Time fixed effects	+	+	+	+	+
Country fixed effects	+	+	+	+	+
Restrictions	All	All	1st child	2nd child	3rd or more child
R squared	0.035	0.035	0.032	0.035	0.038
N	64,832	64,832	30,381	30,851	34,451
	(1)	(2)	(3)	(4)	(5)
<i>Panel B: Happiness</i>					
No. of children	0.008 (0.005)				
Have children		0.038*** (0.014)	0.027 (0.019)	0.023 (0.014)	-0.002 (0.012)
Baseline controls	+	+	+	+	+
Time fixed effects	+	+	+	+	+
Country fixed effects	+	+	+	+	+
Restrictions	All	All	1st child	2nd child	3rd or more child
R squared	0.087	0.087	0.082	0.090	0.093
N	65,044	65,044	30,480	30,942	34,564

Std. errors are robust, clustered at country level and provided in ( ) \*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.10$

All regressions results include baseline controls, sample restrictions, year and country fixed effects

Baseline controls: gender, age, age squared, age of the respondent at which her full-time education ended, marital status (categories: married, living with partner, divorced/separated, widowed, single), employment status (categories: full-time employed, part-time employed, self-employed, retired, doing house-care, student, unemployed, other employment status), religious affiliation (categories: Roman Catholic, Protestant, other Christian, Jewish, Muslim, Eastern/other Religions), income group (categories: low income, medium income and high income)

**Table 9** Pooled OLS estimates of subjective wellbeing indicators

	(1)	(2)	(3)	(4)
<i>Panel A: Life satisfaction</i>				
No. of children	0.024 (0.026)	0.033* (0.017)	0.037** (0.015)	0.015* (0.008)
Baseline controls		+	+	+
Time fixed effects			+	+
Country fixed effects				+
R squared	0.000	0.091	0.101	0.143
N	64,832	64,832	64,832	64,832
	(1)	(2)	(3)	(4)
<i>Panel B: Happiness</i>				
No. of children	0.006 (0.008)	0.016** (0.007)	0.017** (0.006)	0.004 (0.003)
Baseline controls		+	+	+
Time fixed effects			+	+
Country fixed effects				+
R squared	0.000	0.079	0.092	0.158
N	65,044	65,044	65,044	65,044

Std. errors are robust, clustered at country level and provided in ( ) \*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.10$

All results include sample restrictions

Baseline controls: gender, age, age squared, age of the respondent at which her full-time education ended, marital status (categories: married, living with partner, divorced/separated, widowed, single), employment status (categories: full-time employed, part-time employed, self-employed, retired, doing house-care, student, unemployed, other employment status), religious affiliation (categories: Roman Catholic, Protestant, other Christian, Jewish, Muslim, Eastern/other Religions), income group (categories: low income, medium income, high income)

**Table 10** Pooled OLS estimates of subjective wellbeing indicators

	(1)	(2)	(3)	(4)
<i>Panel A: Life satisfaction</i>				
Have children	0.133** (0.062)	0.078 (0.050)	0.074 (0.049)	0.068* (0.036)
Baseline controls		+	+	+
Time fixed effects			+	+
Country fixed effects				+
R squared	0.001	0.091	0.101	0.143
N	64,832	64,832	64,832	64,832
	(1)	(2)	(3)	(4)
<i>Panel B: Happiness</i>				
Have children	0.036* (0.020)	0.036** (0.017)	0.034** (0.015)	0.022*** (0.007)
Baseline controls		+	+	+
Time fixed effects			+	+

**Table 10** (continued)

	(1)	(2)	(3)	(4)
Country fixed effects				+
R squared	0.001	0.079	0.092	0.158
N	65,044	65,044	65,044	65,044

Std. errors are robust, clustered at country level and provided in ( ) \*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.10$

All results include sample restrictions

Baseline controls: gender, age, age squared, age of the respondent at which her full-time education ended, marital status (categories: married, living with partner, divorced/separated, widowed, single), employment status (categories: full-time employed, part-time employed, self-employed, retired, doing house-care, student, unemployed, other employment status), religious affiliation (categories: Roman Catholic, Protestant, other Christian, Jewish, Muslim, Eastern/other Religions), income group (categories: low income, medium income, high income)

**Table 11** IV Regression results

	Life satisfaction	Life satisfaction	Happiness	Happiness
<i>A. Gender</i>				
Having children	0.3901** (0.1515)	0.3440** (0.1683)	0.0036 (0.0360)	-0.0100 (0.0431)
Female * have children	0.0773 (0.0560)	0.0718 (0.0555)	-0.0096 (0.0136)	-0.0107 (0.0135)
<i>B. Age</i>				
Having children	0.4928*** (0.1497)	0.4379*** (0.1681)	0.0097 (0.0374)	-0.0056 (0.0446)
Age < 24 * have children	0.0001 (0.1071)	-0.0164 (0.1135)	-0.0173 (0.0329)	-0.0203 (0.0334)
Age > 50 * have children	0.1186*** (0.0450)	0.1140** (0.0442)	0.0155 (0.0120)	0.0141 (0.0121)
<i>C. Marital status</i>				
Having children	0.9591** (0.3791)	0.8465** (0.3823)	0.0979 (0.1286)	0.0740 (0.1244)
Single parent * have children	-0.7725** (0.3788)	-0.7078* (0.3750)	-0.1877 (0.1233)	-0.1756 (0.1209)
Two parent household * have children	-0.5381 (0.3367)	-0.4596 (0.3330)	-0.0730 (0.1437)	-0.0611 (0.1426)
<i>E. Employment status</i>				
Having children	0.8197*** (0.2176)	0.7444*** (0.2006)	0.0690 (0.0520)	0.0505 (0.0540)
Full time * have children	-0.3785*** (0.1252)	-0.3558*** (0.1189)	-0.0677* (0.0359)	-0.0642* (0.0354)
Part time * have children	0.0392 (0.1386)	0.0592 (0.1323)	0.0224 (0.0465)	0.0257 (0.0466)
Self-employed * have children	-0.3013** (0.1227)	-0.2826** (0.1172)	-0.0085 (0.0440)	-0.0053 (0.0433)
Student * have children	-0.3003* (0.1679)	-0.2899* (0.1662)	-0.0330 (0.0569)	-0.0324 (0.0573)
Unemployed * have children	-0.3173*** (0.1051)	-0.3008*** (0.1003)	-0.0524 (0.0497)	-0.0486 (0.0502)

Table 11 (continued)

	Life satisfaction	Life satisfaction	Happiness	Happiness
<i>F. Time</i>				
Have child	0.7377*** (0.1555)	0.6691*** (0.1634)	0.0972** (0.0418)	0.0819* (0.0449)
4th wave (2008–2009) * have child	-0.3745*** (0.1209)	-0.3597*** (0.1206)	-0.1351*** (0.0289)	-0.1358*** (0.0294)
3rd wave (1999–2001) * have child	-0.2962*** (0.0962)	-0.2804*** (0.0946)	-0.0786** (0.0330)	-0.0794** (0.0337)
2nd wave (1990–1991) * have child	-0.4038*** (0.0812)	-0.3887*** (0.0797)	-0.1144*** (0.0236)	-0.1142*** (0.0238)
GDP per capita	+	-	+	-
Fertility rate	-	+	-	+

Std. errors are robust, clustered at country level and provided in ( ) \*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.10$

All regressions results include baseline controls, sample restrictions, year and country fixed effects

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