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Partners' Happiness Trajectories Surrounding the Birth of a Child: Does Divergence Predict Fertility Intentions, Fertility Behavior, and Risk of Divorce?

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Abstract

In order to understand how people make decisions about having children, demographers have increasingly turned to subjective well-being of parents. At a time when fertility is a matter of choice for most people in the world, subjective well-being can tell us why some choose to have children and why some progress to higher parities. Building on this research, we examine whether parents have similar happiness trajectories surrounding the birth of a child as their partner. Then we examine whether the similarity or difference in happiness trajectories within a couple affects three outcomes of interest- changes in fertility aspirations, fertility behavior, and the risk of divorce. We use two data sets: the German Socio-Economic Panel and British Household Panel Survey to analyze trajectories of well-being for respondents and their partners over a period before, directly after, and as children grow up. Our results may have important implications for explaining low progression to higher order births in these contexts.

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Motivation

Demographers strive to understand how people make decisions about having children and how many to have. At a time when fertility is a matter of choice for most people in the world, the subjective well-being of parents has enormous potential to explain demographic behavior (Hobcraft 2006). A growing body of research has examined how children affect the lives and well-being of parents (Baranowska & Matysiak 2011; Billari 2008; Kohler et al. 2005; Margolis & Myrskyla 2011). For example, Clark and colleagues (2008) analyzed the longitudinal pattern in happiness of parents before and after major life events, one of which was the birth of a child. Using the German Socioeconomic Panel, they find that within a ten-year window with the birth of a child in the middle, the happiness of both men and women tends to increase before and up to birth, and then decrease to the pre-birth levels. In our ongoing work, we show how this pattern differs substantially by gender, education, and income. In this paper, we focus on an understudied component of parental well-being- the well-being of a partner. We examine how similar the happiness trajectories of parents are to each other after the birth of a child. Then we examine whether the similarity or difference in happiness trajectories affects three outcomes of interest to demographers- fertility aspirations, fertility behavior, and the risk of divorce.

We have three hypotheses guiding our research. First, we hypothesize that couples where both partners experience relatively short happiness dips and overall positive trajectory in the long run will have low risk of divorce, high risk of revising fertility tensions upwards, and high chance of progression to next birth. When parents both have low and long happiness dips and minimal upward trajectory afterwards, we hypothesize that they will have a low risk of divorce (since they have a similar trajectory), but also a low risk of revising fertility intentions upwards and a low chance of progression to the next birth. Lastly, when parents have divergent happiness

trajectories after a birth, we expect a high risk of divorce, and a low risk of revising intensions upwards and low chance of progression to a higher parity.

Research Questions

In this paper, we address the following questions:

1) Do partners have similar happiness trajectories before and after the birth of a child?

2) What are the consequences of divergent happiness trajectories for couples? Do divergent happiness trajectories predict changes in fertility intentions, fertility behavior, and divorce?

Data and Method

We analyze changes in parental well-being with two data sets: the German Socio-Economic Panel (SOEP)and the British Household Panel Survey(BHSP). These two studies are longitudinal household-based studies which have been collected for 26 (SOEP) and 18 (BHSP) years. These data sets have four main advantages for our research questions. First, the panel data allow us to examine changes in life satisfaction before and after births. This is an improvement upon prior research which has largely relied upon synthetic cohorts constructed from cross-sectional data. Second, they are household studies which allow the analysis of changes in well-being and other important factors among people and their partners. Third, the samples are large enough in order to study many respondents who experience the events of interest. Lastly, we also observe several other factors that are important to take into account when analyzing why life satisfaction increases and decreases, such as changes in health, marital status, income, and labor force participation.

The German Socio-Economic Panel Study (SOEP; http://www.diw.de/en/soep) is a wide-ranging representative longitudinal study of private households, run by the German Institute for Economic Research (DIW Berlin). Every year nearly 11,000 households and more than 20,000 persons are interviewed. The data provide information on all household members, consisting of Germans living in the Old (West) and New (East) German states, foreigners, and recent immigrants to Germany. The Panel was started in 1984, with the New German states added in 1991. The data contain information on household composition, occupational biographies, employment, earnings, health, and life satisfaction.

The British Household Panel Survey (BHPS; http://www.iser.essex.ac.uk/bhps) is conducted by the ESRC UK Longitudinal Studies Centre (ULSC), together with the Institute for Social and Economic Research (ISER) at the University of Essex. The objective of the BHPS is to further understanding of social and economic change at the individual and household level in Britain, and to identify, model, and forecast such changes and their causes and consequences in relation to a range of socio-economic variables. It is an annual survey consisting of a nationally representative sample of about 5,500 households recruited in 1991, containing a total of approximately 10,000 interviewed individuals. Each adult member (aged 16 years and over) of the household is interviewed. The same individuals are re-interviewed in successive waves and, if they leave their original households, all adult members of their new households are also interviewed.

We use survey waves from 1984 to 2009 (SOEP) and from 1991 to 2008 (BHSP). We exclude people from both samples who were born in another country, as they may have different norms about fertility than the native-born population. Since the fixed-effects estimators identify the coefficients from variation within the individual, we exclude all persons who did not have a

child during the follow-up period. Because our focus is on the happiness trajectory from before children to when the children reach adult ages, we further we exclude persons who already had any children at the start of the surveys, limiting our analysis to individuals whom we observe before and after they have a first birth. We further limit our sample to those who were partnered (married or living as married) at the time of a first birth.

Key Variables

We are interested in analyzing whether partners' patterns of happiness predict fertility intentions, future births, and divorce. We analyze fertility intentions with the BHPS only because these questions were not asked in the SOEP. We measure final parity or the birth of another child from variables indicating the birth of a child by first calculating the number of children at each interview by using the birth biography data. A birth is indicated by a change in the number of children. We measure divorce from marital status which is measured at each interview and is categorized into 6 groups: married or living together with a spouse/separated/single/divorced/widowed/other.

Our key predictor is the trajectory parental well-being. In the German sample, respondents were asked annually, "How satisfied are you with your life, all things considered?" Responses range from zero to ten, with zero meaning completely dissatisfied and ten meaning completely satisfied. In the British sample, parental well-being is measured with two questions. The first measures general happiness and is based on the question "Have you recently been feeling reasonably happy, all things considered?", with responses ranging from one to four, with one meaning much less happy than usual and four, more happy than usual. The other question measuring parental well-being in the British sample is based on the question "How dissatisfied or

satisfied are you with your life overall," with answers ranging from one (not satisfied at all) to seven (completely satisfied). The latter life satisfaction question is closer in formulation to the one used in SOEP; however the question is not asked consistently through waves, making longitudinal analysis difficult. The general happiness question in turn is measured consistently through all the BHSP waves. We experimented with these two measures of well-being and found that the results in the British data are very similar independently of whether we use the general happiness or the life satisfaction question. The key difference is the loss in statistical power when the sporadically measured life satisfaction question is used. Therefore we use the general happiness measure in the British data.[1]We rescale this variable in the BHPS to range from zero to ten, the same range as in the SOEP well-being measure, in order to compare the magnitude of the coefficients from our analysis for the two studies. After this transformation, the parental happiness variables had similar distributional characteristics.[2]

We analyze the change in happiness from pre-birth to post-birth and the length of the happiness drop. Then we construct a categorical variable summarizing the similarity of the happiness trajectories of the respondent and their partner.

Other Variables

German SOEP

[1] The differences in the questions on parental well-being, while not ideal, provide external validity to the results. We find the same results in two different countries using two different measures of happiness or life satisfaction. While research on happiness has been criticized for being sensitive to measurement, we find our results to be robust to how the question is framed. Happiness is also correlated with other measures of well-being such as mental health and self-rated health.

[2] The median, mean, and standard deviation of well-being (life satisfaction) in the SOEP are 7.0, 7.1 and 1.7. In BHSP, the median, mean, and standard deviation of well-being (general happiness) are 6.7, 6.8 and 2.1.

Age is calculated as the difference between the interview date and the respondent's date of birth. Income is measured at the household level and refers to pre-tax income in inflation-corrected Euros. Education is measured in years; in the stratified analysis we categorize education into groups 12 or more years/less than 12 years of education. Health is measured using self-rated health with 5 categories: very good/good/satisfactory/poor/bad. Labor force status is measured with four categories: working/unemployed/maternity leave or similar/other.

British BHPS

Age is calculated as the difference between interview date and respondent's date of birth. Income is measured at the household level and refers to pre-tax income in inflation-corrected Pounds. Education is measured with categorical variable indicating whether a person has any college education or not. Health is measured using self-rated health with 5 categories: excellent/good/fair/poor/very poor. Labor force status is measured with four categories: working/unemployed/maternity leave or similar/other.

Empirical Approach

We measure happiness trajectories in the following way. We assume the cardinality of life satisfaction, similar to the findings of Ferrer-i-Carbonell and Frijters (2004) that assumptions about the ordinality or cardinality of happiness and life satisfaction scores make little difference. This assumption allows using standard linear regression models. In order to analyze changes in life satisfaction over the course of parenthood, we use fixed effects (linear) regression models. This modeling strategy has several advantages. First, it allows us to control for individual-specific, time-invariant unobserved characteristics, such as personality, or whether some people

have an especially sunny or grumpy disposition. In the analysis, we are analyzing changes for an individual over time. In practice, this eliminates the problem of selection into parenthood on happiness. Second, it allows us to observe the pattern in changes in life satisfaction as other factors change, such as employment, marital status, and health. And thirdly, by using a series of dummy variables for time periods, we can examine whether the individual's life satisfaction is higher or lower compared to other points — such as anticipation of an event, or changes after an event. We are interested in the way in which well-being changes around the time of a birth. Last, this method is an improvement on our prior research, as previously we relied on a synthetic cohort in order to look at age differences, rather than analyzing panel data.

Our modeling approach follows that of Clark et al. (2008), with some modifications. We model respondents' life satisfaction at time period t as a function of time to or after a birth, with controls for individual fixed characteristics and a range of time-varying characteristics. The regression equation is:

$$(1)\, H_{it} = \alpha_i + B_{it}^{2-3} + B_{it}^{1} + C_{it} + A_{it}^{1-2} + A_{it}^{3-4} + A_{it}^{5-9} + A_{it}^{10-18} + \sum_{k=1}^{3} \beta_k age_{it}^{k} + T_t + \boldsymbol{\theta}' \mathbf{x}_{it} + \varepsilon_{it}$$

where H_{it} is life satisfaction for individual i at time t, $\in_i$ is the individual level fixed effect; B^{2-3} and B^{1} are indicators capturing the deviation in happiness from the individual baseline 2-3 and 1 year (B) before a child is born, respectively; C is an indicator capturing the deviation in happiness from the baseline the year the (C) child is born; the variables A^k are indicators capturing the deviation in happiness k years (A) after the child is born; age effects are modeled as a cubic function (age, age^2, age^3)[3]; T captures year-specific effects (for example,

[3] In addition to the cubic, we considered alternative age specifications: linear, quadratic, and dummies for each single year of age. The key results were robust across these specifications. We use the cubic specification because that was statistically the best fit.

unification of Germany)[4]; and $\mathbf{x}_{it}$ is a vector for other time varying covariates (health, education, income, marital status, birth of additional children). The omitted category in the time before/after a child is born is 4-5 years before a child is born, thus the coefficients B, C, A represent difference with respect to this baseline level of life satisfaction. On the charts, however, we can compare levels of life satisfaction at various points, not just in relation to the baseline level.

We use the fixed effects specification of model (1) and the full data sets for SOEP and BHSP with no controls for other time-varying covariates ($\mathbf{x}_{it}$) in order to establish the general pattern of happiness before and after a child is born (Figure 1). We then examine how this pattern differs for men and women (Figure 2).

We will explore these gender differences further using within-couple methods, for example by examining the happiness difference (female happiness - male happiness) and examine how this predicts changes in fertility intentions, the birth of another child, and risk of divorce.

Preliminary Results and Next Steps

Sample Characteristics

Characteristics of respondents from the German and British samples are shown in Table 1. Respondents are born between 1945 and 1978 (Germany) and 1945 and 1984 (Britain). They enter the survey at an average age of 23.8 in Germany and 24.4 in Britain. We follow respondents over a long period of time, on average 14.7 years in Germany and 11.7 in Britain,

[4] In order to avoid the APC identification problem (the fixed effects control for cohort, the age variables control for age, and time variables control for time) we use a non-categorical specification for age and we also combine for both the British and the German sample three years for which descriptive statistics suggested no differences in the average levels of well-being.

with average post-birth follow-ups 9.8 and 7.5 years, respectively. The maximum total and post-birth follow-ups are 25 and 21 years in Germany and 17 and 13 years in Britain.[5]

On average, respondents have 1.7 children during the data collection period. The average age at first birth is just over 28 years for both samples. However, three quarters of new parents in the German sample are married at first birth, while only 57 percent in Britain are married. Labor force participation of new parents is similar for the two countries, with 48-60 percent of new parents employed, while about half of women are on maternity leave.

At first interview, parents' levels of life satisfaction are on average high, around seven on a scale of zero to ten. Life satisfaction is higher, on average, at the time of the first child's birth, and then decreases a bit at the last interview.

Figure 1 presents the happiness trajectories of parents. Our results suggest that having kids is worth doing. Parents are very happy while pregnant and immediately after the child is born; when the child is one to four years old happiness drops to the level it was four to five years before the child was born; and then stabilizes (German data) or potentially starts to increase (British data). Thus we find no evidence that parental well-being would decrease after a child is born to levels preceding the children, but we find strong evidence that well-being is elevated when people are planning and waiting for the child, and in the year when the child is born. These results are robust across the two contexts and for the two happiness measures in the BHPS.

In other preliminary analysis, we explore whether the happiness trajectories of parents differ by the gender of the parent. In Figure 2, we see the same *overall* happiness trajectory for women and men, with two main differences. First, in both Britain and Germany, women seem to

[5] In the regressions we estimate the deviation in happiness from the pre-birth baseline level 1-2, 3-4, 5-9 and 10-18 years after the first child is born. In the German data then the post-birth follow-up is truncated to 18 years, and in the British data the category "10-18 years after" refers to 10-13 years.

get more excited about the birth of a child, with happiness levels peaking to higher levels for women in the year before the birth. However, women also have steeper drops in happiness between the year of the birth and the year afterward. In the long run, the differences between men and women are small. The gender differences in the happiness patterns before and right after a child is born may be because women are more often the primary caregiver when children are very young, may be taking time off work, and may be sleep-deprived and socially isolated. We will test these mechanisms for the gender difference in our future work.

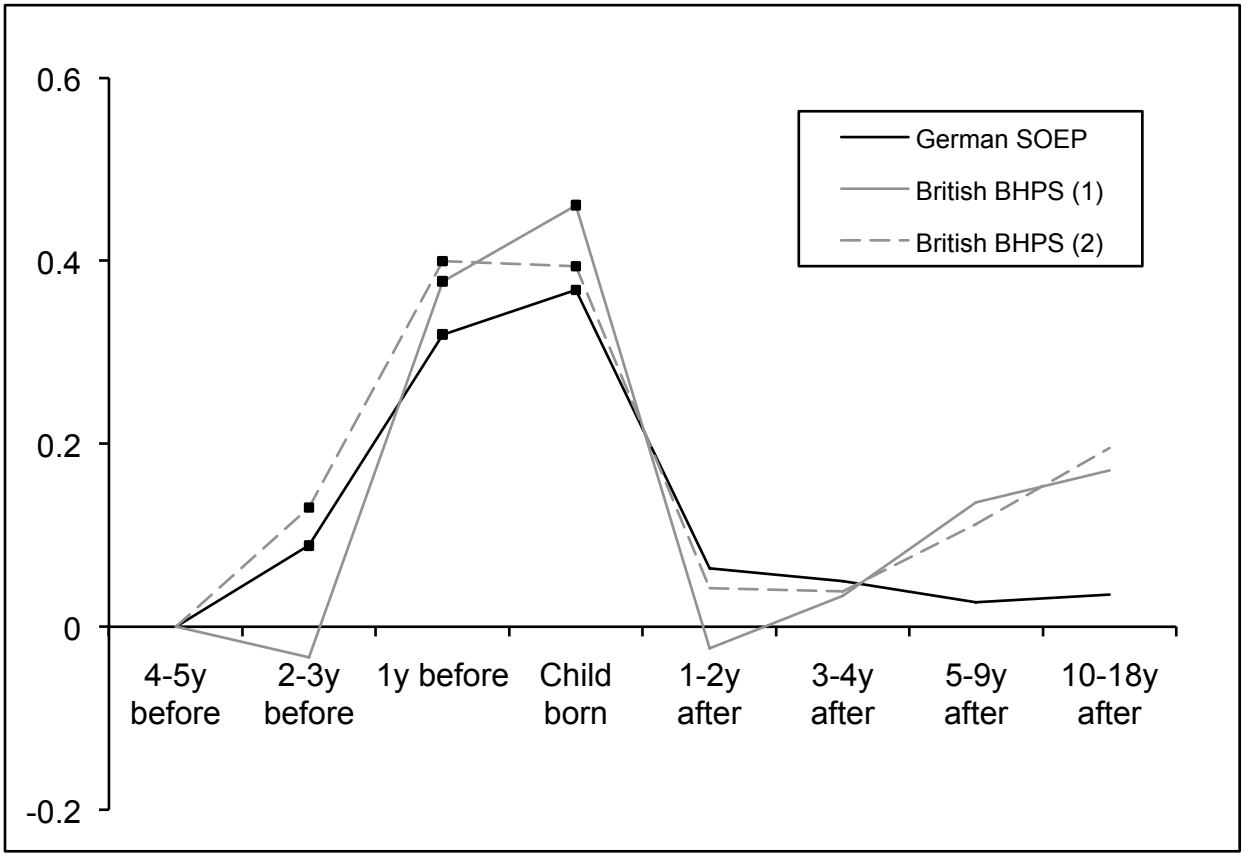
We also analyzed whether happiness trajectories of parents differ by the eventual number of children (1 vs. 2) and find that on average, parents who are the most disappointed and experience the lowest happiness drops after childbirth are the least likely to go on to have more children. Over the next several months, we will finish our analysis of partners' similarities in happiness trajectories and whether these predict fertility intentions, behavior, and risk of divorce. We will certainly have results before the European Population Conference rolls around in summer 2012.

Table 1. Sample characteristics. SOEP: German Socio-Economic Panel waves 1984-2009; BHPS: British Household Panel Survey waves 1991-2008.

	SOEP			BHPS		
Demographic characteristics	Total	Men	Women	Total	Men	Women
Number of respondents (%)	4660	1973 (42%)	2687 (58%)	3112	1476 (47%)	1636 (53%)
Age at entry to the survey (mean)	23.8	25.4	22.6	24.4	26.1	22.9
Year of birth (mean)	1969.0	1967.6	1969.9	1971.7	1967.0	1973.3
Total years of follow-up (mean)	14.7	15.9	13.8	11.7	11.6	11.7
Years of follow-up since 1st birth (mean)	9.8	11.1	9.2	7.5	7.4	7.5
Total number of children (mean)	1.69	1.71	1.68	1.69	1.68	1.70
Characteristics when the 1st child is born						
Age, years	28.18	30.20	26.70	28.32	29.96	26.83
Health*	2.09	2.10	2.08	2.00	1.92	2.07
Married	75%	77%	73%	57%	61%	54%
Labor Force Status: Employed/Unemp/Maternity leave	48/4/30%	90/5/1%	16/3/52%	60/7/29%	87/9/1%	36/5/55%
Income**	39656.5	41162.2	38546.3	30664.4	30928.9	30425.5
Education: SOEP years (mean), BHPS some college or university (%)	12.4	12.6	12.3	40%	37%	42%
Happiness (life satisfaction in SOEP, general happiness in BHSP)***						
-first interview	7.53	7.49	7.55	7.00	7.09	6.92
-when the 1st child is born	7.56	7.48	7.62	7.22	7.17	7.27
-last interview	6.94	6.88	6.98	6.62	6.65	6.60

*Measured on a scale from 1 (Excellent) to 5 (Poor)
**SOEP: Income is measured at the household level and refers to pre-tax income in inflation-corrected Euro. BHPS: Income is measured at the household level and refers to pre-tax income in inflation-corrected Pounds.
***Scale both in SOEP and BHPS from 0 (Poor) to 10 (Excellent)

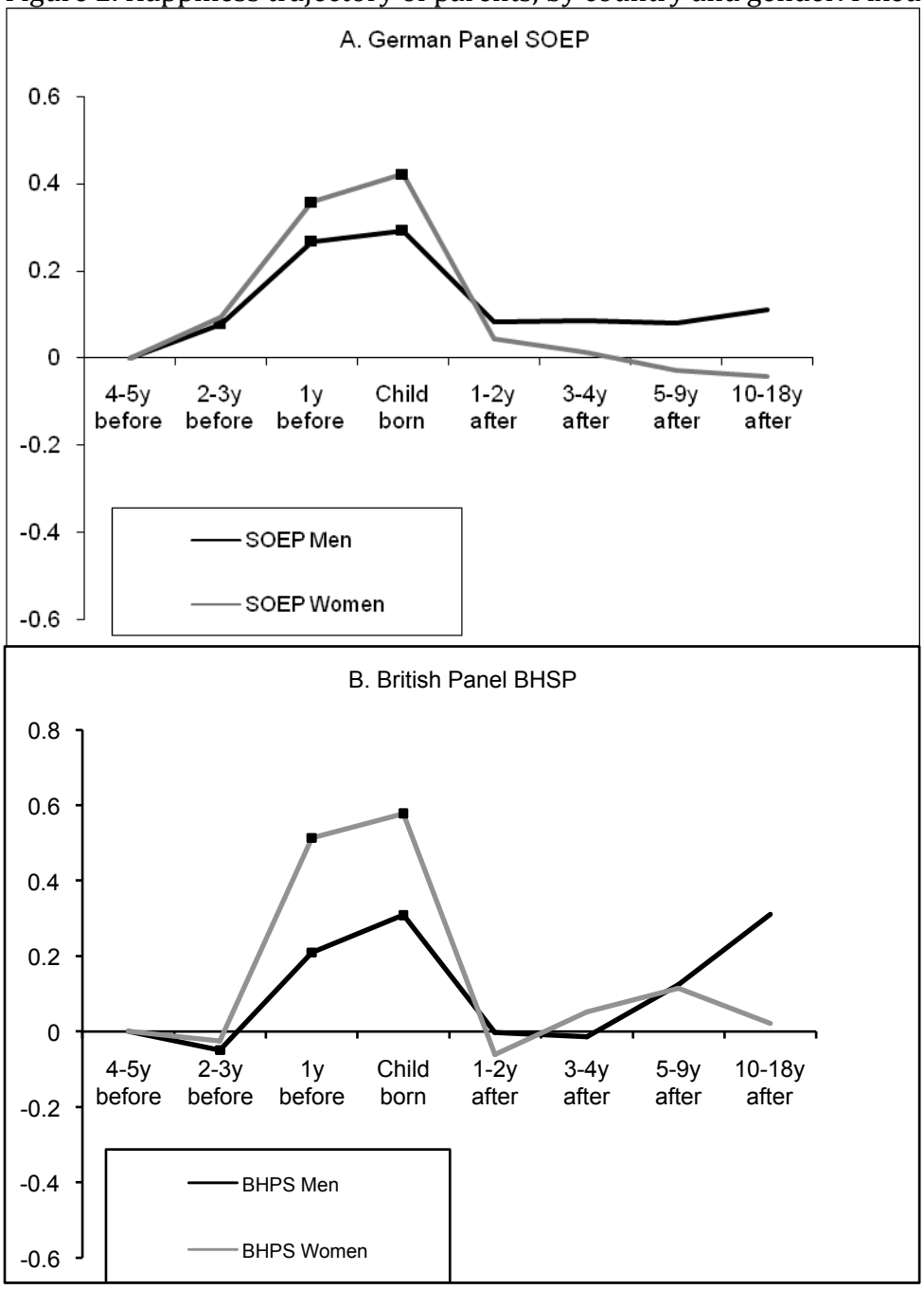
Figure 1. Happiness trajectory of parents before and after the birth. Fixed effects regressions. BHPS (1) and BHPS (2) refer to different definitions of happiness; see the footnote.



Notes

1. Dots are significant at .05 level. Shallow dots are significant at .10 level.
2. BHSP is the British Household Panel Study and the GSOEP is the German Socio-Economic Panel. BHPS (1) uses the general happiness measure as the response variable; BHPS (2) uses the life satisfaction measure as the response variable. See section Data for details.
3. Standard errors estimated using robust methods which account for the clustering of data within individuals.
4. Coefficients estimated using fixed effects model with controls for age, age squared, age cubed,period effects (year dummy variables).
5. The happiness pattern in similar with respect to the 2nd and 3rd child as it is to the first child.
6. For BHPS "10-18y after" should be interpreted as "10-14y after" since 14 years is the maximum post-birth follow-up.

Figure 2. Happiness trajectory of parents, by country and gender. Fixed effects regressions.



Notes

1. Dots are significant at .05 level. Shallow dots are significant at .10 level.
2. BHSP is the British Household Panel Study and the GSOEP is the German Socio-Economic Panel.
3. Standard errors estimated using robust methods which account for the clustering of data within individuals.
4. Coefficients estimated using fixed effects model with controls for age, age squared, age cubed,period effects (year dummy variables).
5. Controlling for time-varying marital status, labor force status, health or income, or for the birth or the second or third child does not change on the overall pattern shown above. In addition, the happiness pattern with respect to the 2nd and 3rd child is similar to that of the first child.
6. For BHPS "10-18y after" should be interpreted as "10-14y after" since 14 years is the maximum post-birth follow-up.

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