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Does parenthood make happy people happier? A lifecycle analysis using panel quantile regression

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Does Parenthood Make Happy People Happier?

A Lifecycle Analysis Using Panel Quantile Regression

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Quantile Regression

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Evgenia Samoilova and Colin Vance¹

Does Parenthood Make Happy People Happier?

A Lifecycle Analysis Using Panel Quantile Regression

Abstract

Drawing on panel data from Germany, this paper analyzes the correlates of happiness, with an eye toward isolating the role of parenthood over the lifecycle. The analysis couples a panel quantile regression with an empirical specification that captures different phases of parenthood, from the year preceding the birth of a child to the time when all adult children have left the household. Together, these features allow us to formally test for heterogeneity in the association of children with happiness according to the intrinsic happiness of the parent, the age mix of their children, and whether adult children reside at home. While the two years following the birth of the first child is associated with significantly higher happiness, this result fades away with age and with the presence of siblings. Moreover, the relationship between parenthood and happiness is relatively invariant to the parent's intrinsic level of happiness.

JEL Classification: J13, C22

Keywords: Panel quantile regression; subjective well-being; GSOEP; parenthood

June 2015

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1. Introduction

Few human endeavors are simultaneously associated with such profound fulfillment and with such immense responsibility as child bearing. Given the widespread perception that parenthood is important to happiness (Hansen, 2012), it would seem reasonable to surmise that whatever the costs of having children, these are offset by benefits that would make most individuals happier with children than without them. This conclusion, however, is challenged by a large body of empirical research that finds a negative relationship between parenthood and well-being. As summarized in the recent reviews of the literature by Hansen (2012), Stanca (2012), and Blanchflower (2009), international cross-sectional and longitudinal studies converge in their conclusions that children have a predominantly negative effect on life satisfaction, particularly in western countries.

Such findings are surprising not only because they are contrary to most people's beliefs about having children (Easterlin, 2005; Toulemon, 1996), but also because they are at odds with various disciplinary approaches to explaining the motivations underpinning parenthood. In Becker's classical fertility model (Becker, 1981), for example, couples weigh the marginal costs and benefits of each additional child, with the total number determined according to utility maximization. The needs theory of well-being is also predicated on the notion that children positively impact utility by satisfying basic human needs and biological imperatives (Schoen et al., 1997). Still other theories from sociology and evolutionary psychology focus on social rules and expectations, drawing connections between children and life satisfaction via social recognition, esteem, and the maintenance of social cohesion (Caldwell and Caldwell, 1987; Michalos, 1985). While focusing on different channels through which children affect well-being, these theories share the assumption that those who choose to become parents are happier for having done so.

A small pool of studies has recently emerged that starts to reconcile theoretical expectations about parenthood with empirical estimates of the impact of children. These studies suggest that, at the least, the negative relationship found in much of the literature may require qualification. Drawing on data from the World Values Survey from 86 countries, Margolis and Myrskylä (2011) find that a negative association between the number of children and happiness from an OLS regression becomes positive when limiting the sample to particular socio-demographic sub-groups, such as those over 40. Using the British household panel survey and fixed-effects regression, Angeles (2010) also finds evidence for a positive influence of increasing numbers

of children, but, similar to Margolis and Myrskylä (2011), he qualifies that the effect is contingent on the individual's characteristics, most notably marital status. Focusing on adaptation to major events like parenthood using the German Socio-Economic Panel, Clark et al. (2008) find evidence for increased life satisfaction one year before birth and one year after birth. This effect, however, tapers off to statistical insignificance by the time the child reaches five, leading the authors to conclude complete adaptation to the birth of a child. Clark and Georgellis (2010) obtain similar results for the British Household Panel Survey data. Taken together, the above studies suggest that contextual and temporal heterogeneity can fundamentally bear on the identified association between parenthood and happiness.

The present paper contributes to this line of inquiry in two ways. First, we incorporate a heretofore unexplored source of heterogeneity arising from the possibility that the impact of children on happiness depends on how happy the parent is. As the reviews of the literature by Hansen (2012), Stanca (2012) and Blanchflower (2008) indicate, virtually all of the empirical studies on this topic have used some variant of mean regression, thereby effectively assuming that the magnitude of the effect of children is invariant to the individual's intrinsic happiness. We relax this assumption by employing a panel quantile regression approach (Canay, 2011) to analyze 20 years of data from the German Socio-Economic Panel (GSOEP). Beyond controlling for time invariant heterogeneity through the elimination of fixed effects, the panel quantile estimator allows us to explore heterogeneity in the influence of children across different quantiles of the response variable, measured on a 10-point happiness scale. Similar to Binder and Coad's (2011) pioneering application of a cross-sectional quantile estimator to data from the British Household Panel Survey, our analysis reveals that the magnitude of many of the explanatory variables is dependent on the level of happiness, a pattern that is otherwise obscured by a standard mean regression.

The second contribution is an empirical specification that includes variables measuring the presence of children of different ages for the entire period between the year preceding the birth of a child to the time after the last child has left the home, thereby providing a comprehensive picture of how the impact of children change over different phases of the lifecycle. In this respect, our study complements Clark et al.'s (2008) analysis of adaptation to life events, including parenthood. A novelty of the present analysis is its more focused look at how different combinations of children of different ages and their coresidence with parents correlate with happiness. Following Easterling's (2003) distinction between the transient impacts of pecuniary

life events on satisfaction and the permanent impacts of non-pecuniary ones, we would expect to see evidence for persistently significant effects irrespective of the children's age mix.

Among our key results, we find evidence for a positive association of children with life satisfaction one year prior to the birth of a child as well as one year after the birth for both women and men. For women, the results indicate a positive association once all children over 18 have moved out, contrasted by a negative association among men. During the years when children are growing up, we find that the happiness of parents is, by and large, not significantly different from that of non-parents. Moreover, the majority of coefficient estimates related to children have magnitudes that are fairly stable over the different quantiles of the dependent variable, suggesting that the influence of children is relatively invariant to the intrinsic happiness level. Substantial heterogeneity is, however, seen for several of the variables indicating adult children as well as for several controls, including income, unemployment, educational attainment, divorce, and separation.

The paper is structured in four sections. The following section describes data from the German Socio-Economic Panel including descriptive statistics on the sample. The model and the results are presented in sections two and three. Section four closes with some final remarks.

2. Methodology

2.1 Data and specification

We use data from the German Socio-Economic Panel (GSOEP), which surveys individuals from about 25,000 households per year. The data covers the years 1984 through 2011, and was extracted with the help of the Stata Add-On package PanelWhiz¹. Individuals younger than 18 are excluded from the sample. We additionally exclude individuals whose complete fertility cannot be observed, designated as those who are 40 or younger when last observed in the data. This threshold is deemed to adequately cover child-bearing years given that most women, about 98% of those in the sample, are 40 or younger when they have a baby.

The dependent variable, an individual's life satisfaction, is measured by the response to the question of "How dissatisfied or satisfied are you with your life, all things considered" and is

¹ PanelWhiz (<http://www.PanelWhiz.eu>) was written by John P. Haisken-DeNew (john@PanelWhiz.eu). See Haisken-DeNew and Hahn (2010) for details. The Panel-Whiz generated DO-file to retrieve the data used here is available upon request. Any data or computational errors in this paper are our own.

recorded in each year of the survey. The responses to this question are represented by an 11 point Likert scale, where 0 means “completely dissatisfied” and 10 is “completely satisfied.” Following the well-known result identified by (Diener and Diener, 1996), the distribution of life satisfaction is positively skewed; 67% of respondents have a score of 7 or more while 9% have a score of 4 or less. Given the tight connection that previous literature has established between gender and the strains and enjoyment of parenting (Scott and Alwin, 1989), the analyses are undertaken separately by sex, with 158,862 person-years observed for women and 148,910 person-years for men.

To explore the influence of various stages of parenthood on happiness, we make use of the panel structure of the data to create a suite of variables that capture the presence, or anticipated presence, of children in people’s lives. Were people to adapt to parenthood, we would expect that any influence on satisfaction from the introduction of a child would eventually dissipate. Because children continually change as they age, however, the utility derived from having children may also change with their age. Moreover, when multiple children are present, utility may be differentially affected according to the age mixes of the children. The experience of having a seven-year old, for example, is likely to differ from having a two-year old, which in turn is likely to vary depending on whether a teenager is also present. To take into account this potentially transitory influence of a child on life satisfaction, we create dummy variables from the recorded information on birth dates to capture different combinations of children of different age ranges. Four of the dummies are designated as 1 if the individual is a parent of at least one child in the following age categories (variable labels in parenthesis): 0-1 years (C1), 2-4 years (C2), 5-12 years (C3), 13-18 years (C4). The remaining dummies are built from the 11 possible combinations of these categories (labeled by concatenating the origin labels). The reference category is a childless individual.

Similar to the work of Clark et al (2008), this specification allows us to undertake straightforward tests of adaptation to children. Under a strong version of the null hypothesis that people adapt to being parents, we would expect that the magnitude of all of the coefficients other than that indicating the first two years after the birth of the first child (C1) would not differ significantly from zero. A weaker version of the hypothesis would allow for a change in happiness whenever a baby enters the household. Under this variant, any of the coefficients capturing age mixes that include a baby would be statistically significant.

Our specification additionally includes three dummy variables capturing longer term influences of children. The first identifies parents for whom all biological children are over 18 and have moved out of the household, the so-called empty nest phase, while the second dummy identifies parents who have children over 18 still living in the household. The third dummy variable identifies parents who have biological children under age 19 but who are not living in the same household. As this latter variable is indicative of families that have split, we expect the coefficient to be negative. The sign of the former two variables is an empirical question. Work from Glenn and McLanahan (1981) using U.S. national surveys finds slightly lower happiness among parents whose children have left home relative to non-parents. By contrast, Dennerstein et al. (2002) find an overall mood improvement among Australian mothers whose children have left the home. Likewise, Hansen et al. (2009) using a cross-sectional Norwegian sample found that empty nest mothers have slightly higher self-esteem as well as life-satisfaction when compared to childless women. Among the few studies of adult children who are still living in the home, Pudrovska (2009) finds decreased psychological well-being for mothers but not fathers.

Table 1: Life satisfaction between men and women

	Women	Men	t-test
Entire sample	6.972	6.984	-1.734
Childless	6.956	6.925	2.732
Year prior to birth	7.573	7.407	3.611
C1: 0 through 1	7.612	7.444	3.434
C2: 2 through 4	7.283	7.251	0.875
C3: 5 through 12	7.124	7.067	3.091
C4: 13 through 18	6.932	6.884	3.036
All kids>18 moved out	6.998	7.135	-14.682
Any kids<=18 moved out	7.062	7.036	2.207
Any kids>18 in home	6.833	6.866	-1.959

Table 1 presents descriptive statistics that show how life satisfaction differs by gender for people with and without children over select categories. For the entire sample, the mean life satisfaction is – at 6.97 for women and 6.98 for men – statistically indistinguishable between the sexes at the 5% level. Among childless people, life satisfaction is somewhat lower than for the sample as a whole, whereby women in this subcategory have a significantly higher score than men. In the year preceding birth, women are on average 0.17 units happier than men, a positive differential that maintains for each of the subsequent age categories of offspring, albeit statistically insignificant for the 2 to 4 category. Moreover, with the exception of the 14 to 18 year categories, parents of children in each pre-adult age bracket have a higher average life satisfaction than childless individuals. Parents of children who have moved out are also happier on average than the sample as a whole. When the children over 18, men are happier than women, while women are happier than men in cases when children have moved out who are under 19. Although this latter group is indicative of families that have experienced separation, the mean satisfaction for both sexes is nevertheless higher than childless people. Parents of children over 18 who are still living in the household are the only group whose average life satisfaction is less than that of childless individuals. Two conclusions can be drawn from these crude comparisons. First, with the exception of those with adult children in the home, parents have higher life satisfaction on average than childless people. Second, the magnitude of these differences varies in most cases significantly between women and men.

2.2 Estimators

Our point of departure in econometrically estimating the relationship between children and life satisfaction is the specification of a fixed-effects regression:

$$S_{it} = \alpha + \beta' x_{it} + \theta' z_t + \phi_i + e_{it} \quad (1)$$

where S_{it} measures the reported satisfaction of individual i at time t , x is a vector of explanatory variables, z_t is a vector of unit-invariant year fixed effects, ϕ_i is an individual level fixed effect, and e_{it} is a stochastic disturbance term. The coefficients α , β , and θ are a set of parameters and parameter vectors to be estimated. In addition to the binary indicators for biological children, the vector x contains a set of time-varying variables that control for other elements of socioeconomic circumstance. These include a logged measure of after tax income, as well as dummies indicating the individual's marital, employment, and health status. We also include dummies for the individual's age bracket, and dummies indicating whether the individual has a university degree and whether adults other than the spouse are living in the household.

One potentially restrictive feature of the fixed-effect estimation method is its focus on the conditional expectation function, which precludes the ability to estimate differential effects of an explanatory variable at different points in the conditional distribution of the dependent variable. Binder and Coal (2011) elaborate on this issue in the context of happiness research. They note the importance of moving beyond average effects when evaluating the determinants of happiness, thereby allowing for the possibility that some determinants have a heterogeneous effect across individuals depending on their intrinsic happiness. The quantile regression estimator, introduced by Koenker and Bassett (1978), accommodates such heterogeneity by estimating the impact of a regressor at any point in the conditional distribution of the response, not just the conditional mean.

Following the introduction of Koenker and Hallock (2001), the starting point for quantile regression are the unconditional quantiles, obtained by minimizing the sum of asymmetrically weighted residuals with an accordingly chosen constant b :

$$Q_\tau(y) = \min_{b \in \mathbb{R}} \sum \rho_\tau(y_i - b) \quad (2)$$

The weighing scheme $\rho_\tau(\cdot)$ is the absolute value function, which takes on different slopes depending on the sign of the residuals and the quantile of interest.

Moving from the unconditional to the conditional quantiles is achieved by substituting the b by the parametric function $b(x_{it}, \beta)$ and minimizing the following equation using linear optimization:

$$Q_\tau(y) = \min_{\beta \in \mathbb{R}} \sum \rho_\tau(y_i - b(x_{it}, \beta)) \quad (3)$$

with the vector x containing the control variables while β is the corresponding parameter vector. The solution to this minimization problem yields estimates of the impact of the controls at any point in the conditional distribution of the response.

Quantile regression affords several advantages over mean regression: it is more robust to outliers, it avoids assumptions about the parametric distribution of the error process, and the estimates are easy to compute, requiring straightforward linear programming methods. As demonstrated by Canay (2011), an additional advantage, and one which we exploit here, is that it can be readily adapted to panel data. Specifically, Canay (2011) proposes a simple transformation of the data that removes the fixed effects under the assumption that these effects have a uniform impact across all the quantiles. The estimator is comprised of two steps, the first of which calculates the fixed effect from the estimation of equation (1). The next step is to subtract the fixed effect obtained in (1) from the response variable:

$$\hat{y}_{it} = y_{it} - \hat{u}_i \quad (4)$$

Equation (4) yields a dependent variable free of the influence of unobserved heterogeneity. The quantile regression estimator introduced by Koenker and Bassett (1978) can then be applied using the transformed dependent variable in (4) to obtain estimates free of the influence of unobserved, time-invariant heterogeneity.

A final estimation issue relates to the question of causality. Although the inclusion of the fixed effects allows us to effectively follow the same individual through different stages of parenthood and thereby control for those influences that do not vary over time, ascribing a causal interpretation to the impact of parenthood is nevertheless problematic. As Deaton and Stone (2014) point out, one difficulty is that many of the time-varying covariates are potentially bad controls, being themselves a function of the decision to have children. Income, for example, is conceivably affected by the presence of children, as is employment and marital status. The inclusion of these variables could consequently give rise to selection bias, rendering a causal interpretation of the influence of children unwarranted (Angrist and Pischke, 2009, pp. 64–65). There is no straightforward fix to this difficulty. Deaton and Stone (2014) undertake robustness checks by excluding select controls from the model, an exercise we replicated without finding

notable differences in the estimates. While this finding does not establish causality, we can nevertheless test the null hypothesis that controlling for both independent controls (e.g. university degree) and those that may predispose people to become parents (e.g. income), there is no difference in life-satisfaction between those with and without children. It is in this spirit – refraining from claims of causality – that we attempt to interpret the results that follow.

3. Results

To provide a reference point for the quantile fixed-effects models, Table 2 presents the coefficients from standard fixed-effects models estimated separately on the samples for women and men. We include here only the coefficients along with asterisks indicating their significance levels. The statistical precision of these estimates is presented graphically in the discussion of the quantile results.

With respect to the role of children, three main results emerge. First, similar to the results of Clark et al. (2008), the anticipation of a child one year prior to birth as well as the presence of children in the 0 through 1 year old range is associated with a boost in life satisfaction, one whose magnitude is substantially stronger for women. Second, the coefficients on the subsequent age mixes are in almost all cases statistically insignificant. A single exception applies to the variable C1C3C4, indicating a positive association among mothers of at least one child in each of the age ranges 0 through 1, 5 through 12, and 13 through 18. Otherwise, the remaining mixes of children, including those comprised of a baby (0 through 1), have no significant effect for women or men, providing support to the hypothesis that adaptation is complete over the years during which children are growing up. The final notable finding is the higher satisfaction level seen among women whose adult children are no longer living in the home, contrasted by the negative coefficient if the absent children are under 19. No effect of adult children is seen for men. However, as for women, there is evidence of a negative effect of children under 19 who are not living in the home, a pattern we return to below.

With a few exceptions, the remaining control variables, when statistically significant, have signs that are consistent with intuition. The status of being married is associated with higher satisfaction for both men and women, while that of being separated has a significantly negative association for men only. Being divorced has a positive coefficient for both sexes, a somewhat surprising result that contradicts negative associations found in other studies (Angeles, 2010; Lucas, 2005; Stutzer and Frey, 2006), but one that may be picking up a lagged impact. In this

regard, more recent studies from Clark and colleagues (2008; 2010) find that both divorced men and women are significantly more satisfied with their life 4 years after the event in the British panel and 5 years in the German panel data (Clark and Georgellis, 2010; Clark et al., 2008). Age is another variable that does not follow the commonly observed pattern of a U-shape, instead indicating an increase in satisfaction over the 61 to 80 age brackets relative to the base case of 18 to 31 among women, contrasted by an increasingly lower satisfaction in older age brackets among men. The indicators for poor health and either being unemployed or not working all have negative associations, particularly among men. Income has a positive coefficient, one that is of roughly equal magnitude for women and men. Lastly, similar to Stutzer and Frey (2006), we see a negative relationship between the presence of adults other than the spouse and satisfaction for both sexes.

Table 2: Coefficients from a fixed-effects regression

	Women	Men
Year prior to birth	0.182**	0.078*
C1: 0 – 1	0.154**	0.144**
C2: 2 – 4	-0.023	0.021
C3: 5 – 12	-0.007	0.001
C4: 13 – 18	0.028	0.028
C1C2	-0.001	0.015
C1C3	-0.014	0.029
C1C4	0.000	-0.066
C2C3	-0.040	-0.004
C2C4	-0.025	-0.099
C3C4	-0.018	-0.043
C1C2C3	-0.035	-0.026
C1C2C4	0.387	-0.016
C1C3C4	0.340**	0.054
C2C3C4	0.010	-0.068
C1C2C3C4	0.034	-0.481
All kids >18 moved out	0.079*	-0.019
Any kids <=18 moved out	-0.051*	-0.056*
Any kids >18 in home	-0.027	-0.017
Married	0.110**	0.109**
Divorced	0.212**	0.155*
Separated	-0.088	-0.411**
Poor health	-1.080**	-1.099**
Part time	-0.037	-0.068
Not employed	-0.041	-0.189**
Unemployed	-0.439**	-0.584**
Other work status	-0.090**	-0.119**
University degree	0.100	-0.041
ln(Income)	0.296**	0.302**
Age 31-40	0.041	-0.070*
Age 41-50	0.057	-0.127**
Age 51-60	0.091	-0.129**
Age 61-70	0.271**	0.106
Age 71-80	0.210**	-0.068
> age 80	-0.006	-0.358**
Other adults present	-0.078**	-0.093**
Year dummies	Yes	Yes
Number of observations	158862	148910

** significant at 1% level; * significant at 5% level

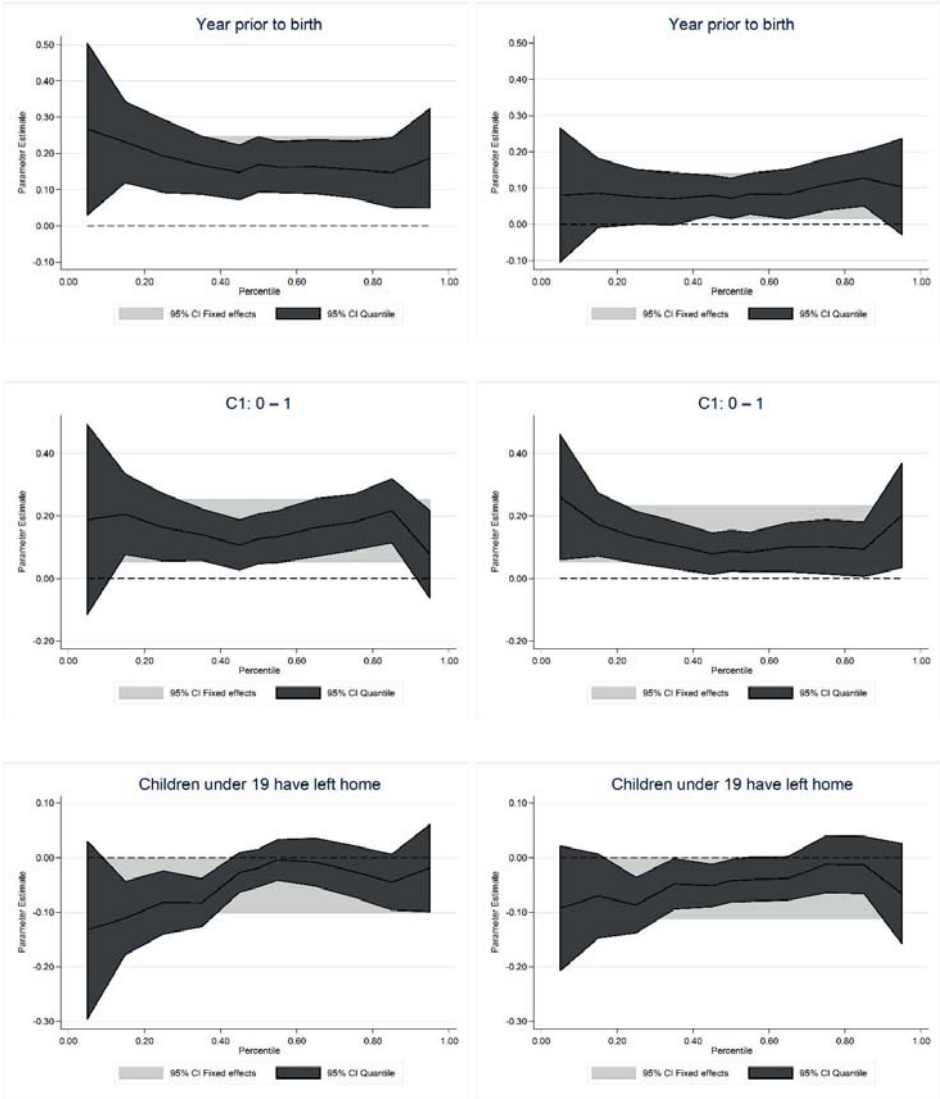
To explore whether the associations between the modeled covariates and happiness vary according to the intrinsic happiness level, Figure 1 presents a graphical depiction of bootstrapped 95% confidence intervals from the application of the panel quantile regression. The figure also includes the confidence intervals corresponding to the standard fixed-effects estimates as a basis for comparison. With regard to the coefficients on the variables indicating children under 19, the quantile estimates are largely in line with those of the standard fixed effects. A positive and statistically significant association in the year preceding birth and in the two years thereafter is seen for both men and women over most of the quantiles. For the subsequent age mixes of children, however, the confidence intervals overlap with or lie closely above or below zero. These results are broadly supportive of the stronger version of the adaption hypothesis: beyond the first baby, parents of pre-adult children are no more or less happy than non-parents.

To gauge the degree of heterogeneity in the estimates, Table 3 presents F-tests for the equivalence of the coefficients in the 15th and 85th quantiles. Among men, none of these tests are statistically significant for the indicators of children under 19. Somewhat more variation is seen among women, with four of the F-tests being statistically significant. Nevertheless, as noted above, most of the corresponding coefficients have confidence intervals that overlap zero for the entire range of quantiles, the one exception being the coefficient of C2C3. Taken together, these results provide little support for the idea that the association between pre-adult children and happiness depends on how happy the parent is.

Figure 1: Quantile regression for the selected children variables. Vertical axes show coefficients of the respective independent variables, and horizontal axes represent quantiles of the dependent variables. The error bars correspond to 95 % confidence interval.

Women

Men



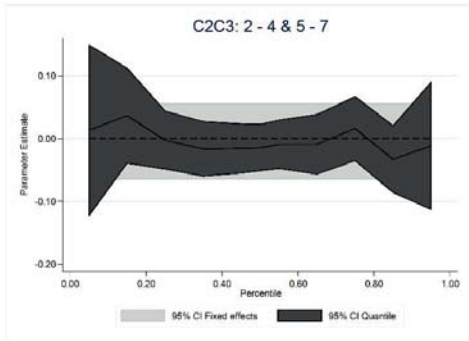
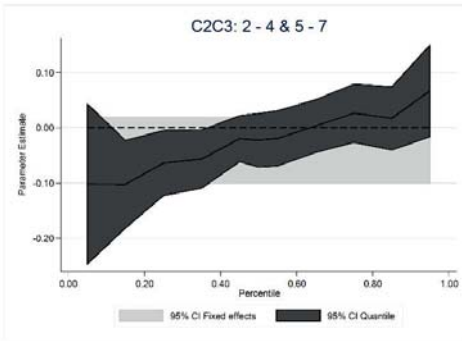
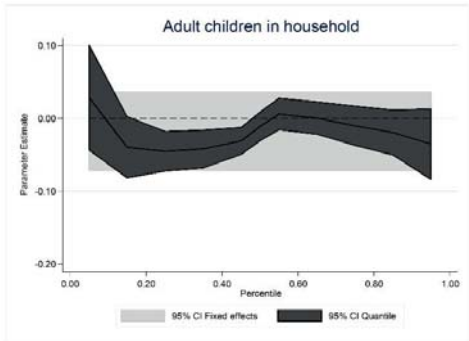
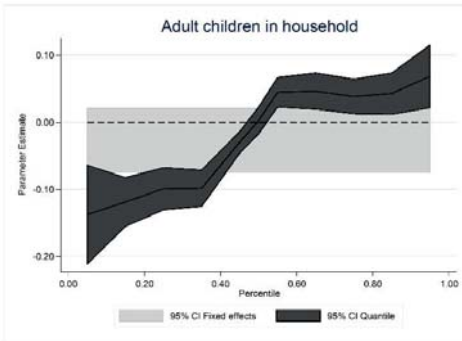
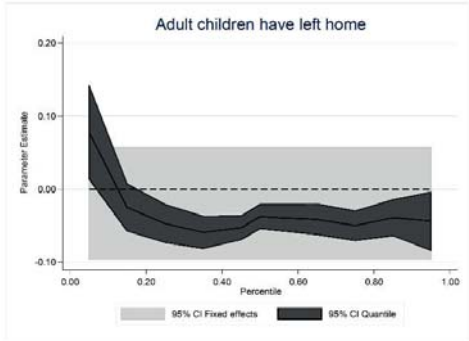
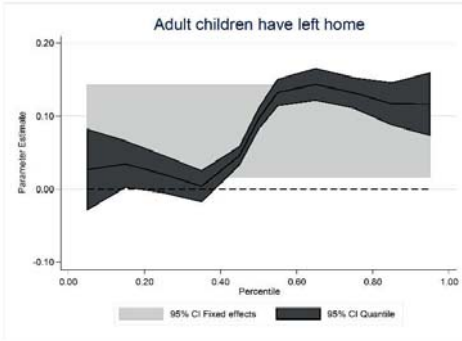


Table 3: F-tests for the equivalence of the coefficients in the 15th and 85th deciles

	Women	Men
Year prior to birth	1.37	0.54
C1: 0 – 1	0.02	1.88
C2: 2 – 4	0.98	0.17
C3: 5 – 12	0	0
C4: 13 – 18	0.92	0.43
C1C2	0.04	2.84
C1C3	4.07*	0.09
C1C4	0.2	0.61
C2C3	7.24**	2.65
C2C4	0.84	0.04
C3C4	1.07	1.46
C1C2C3	5.91*	0.85
C1C2C4	0.02	0
C1C3C4	20.6	1.27
C2C3C4	3.96*	0.42
C1C2C3C4	2.38	0.16
All kids >18 moved out	18.07**	0.55
Any kids <=18 moved out	2.95	1.77
Any kids >18 in home	58.01**	0.7
Married	0.77	0.54
Divorced	27.84**	22.49**
Separated	22.61**	43.78**
Poor health	1457.64**	1768.08**
Part time	19.2**	0.09
Not employed	9.46**	32.78**
Unemployed	108.8**	184.35**
Other work status	4.2*	6.34*
University degree	31.83**	150.49**
ln(Income)	774.14**	464.39**
Age 31-40	25.62**	4.89*
Age 41-50	38.04**	7.65**
Age 51-60	26.46**	6.08*
Age 61-70	45.31**	45.56**
Age 71-80	23.96**	16.86**
> age 80	1.84	0.76
Other adults present	5.59*	22.75**

** significant at 1% level; * significant at 5% level

More pronounced discrepancies by quantile are revealed with regard to the associations with adult children, at least among women. For example, the coefficient corresponding to adult children having left the home is positive for women and becomes significantly larger between the 15th and 85th quantiles, while it is negative and of relatively homogeneous magnitude for

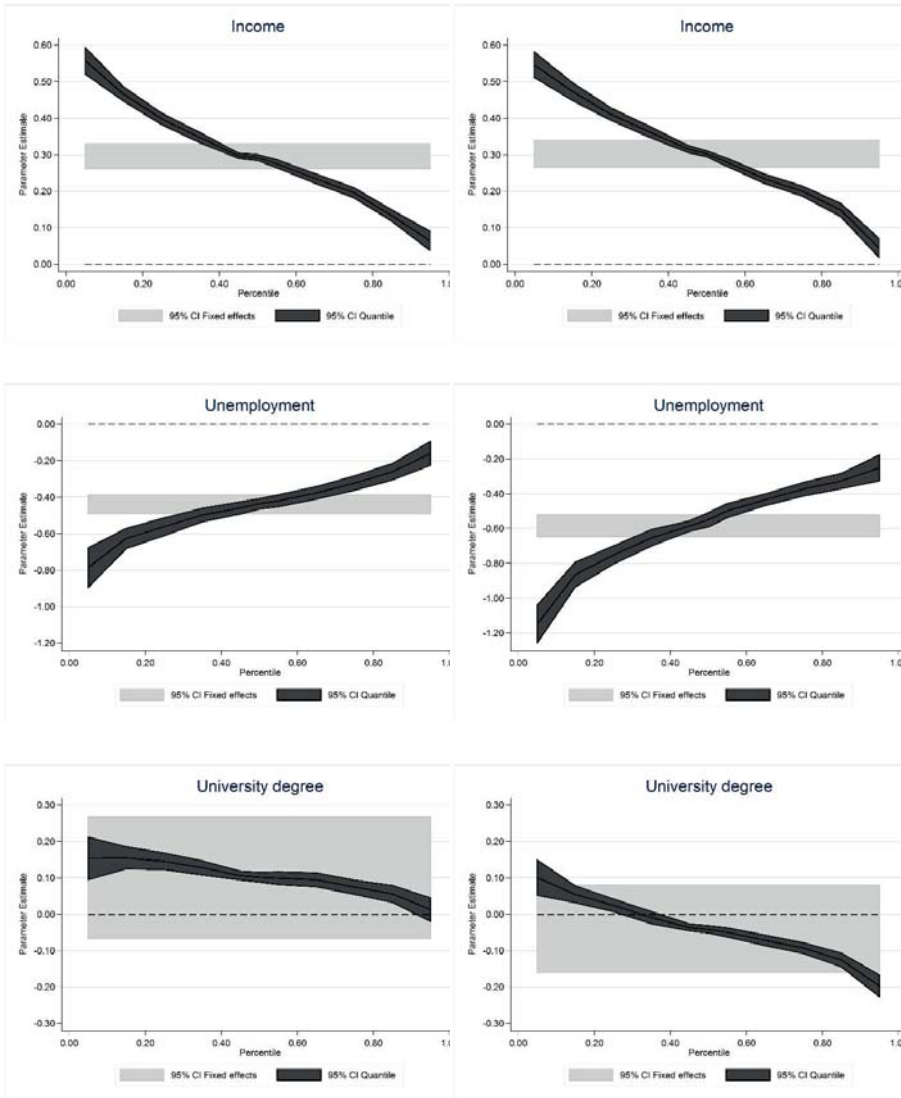
men. While the findings lend support to the previous results on the small positive effect of empty nest for women (Dennerstein et al., 2002; Hansen et al., 2009), they run counter to the evidence of no consequences of the empty nest phase for fathers (Hansen et al., 2009). For the case of adult children still living in the home, there is a negative association among women whose satisfaction lies below the median quantile, partially corroborating the finding of Pudrovska using US data (2009). However, beyond the median quantile a sign reversal is seen: happier women register a slightly higher level of happiness when adult children are present. Among men, the statistically significant coefficients are uniformly negative and limited to the range falling between the 20th and 50th quantiles.

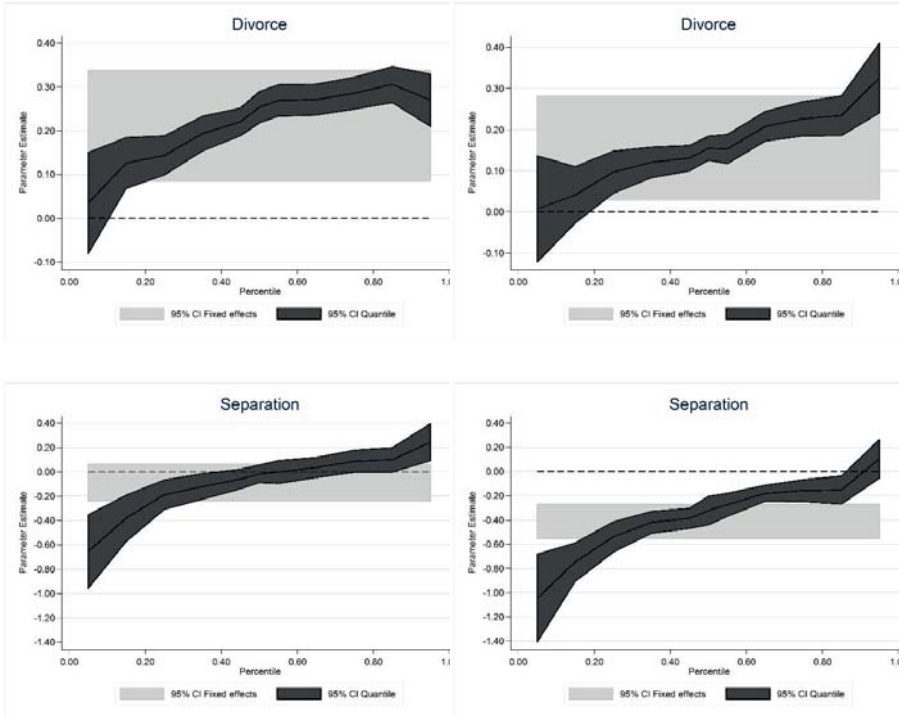
Additional evidence for heterogeneity in the correlates of happiness is seen for several of the control variables (Figure 2). Particularly noteworthy are the patterns for income and a university degree. As in Binder and Coad's study using British data (2011), both sets of estimates indicate a steady decrease in the size of the coefficients over higher quantiles. The sign on income is positive and significant over the entire range but decreases from a magnitude of 0.47 to 0.13 for women and from 0.47 to 0.15 for men, about a 70% drop for both sexes between the 15th and 85th quantiles. Among men, the sign of the coefficient indicating a university degree switches signs – from positive to negative – over the higher quantiles. A similar, but mirrored pattern, is seen for the coefficients indicating the presence of other adults in the home, unemployment, divorce and separation: for both sexes, the negative association is notably weaker (if not becoming positive) among intrinsically more satisfied individuals.

Figure 2: Quantile regression for the selected control variables. Vertical axes show coefficients of the respective independent variables, and horizontal axes represent quantiles of the dependent variables. The error bars correspond to 95 % confidence interval.

Women

Men





4. Conclusion

Drawing on panel data spanning 20 years in Germany, this paper has econometrically estimated covariates of life satisfaction, with an eye toward isolating variation in the role of parenthood over the family lifecycle. The analysis has two main distinguishing features: the application a panel quantile regression combined with an empirical specification that includes dummy variables capturing the age composition of biological children. Together, these features allow us to formally test for heterogeneity in the association of children with happiness according to both the intrinsic happiness of the parent and the age mix of their children. Beyond this, the model includes indicators for the year prior to the birth and the period after the children reach adulthood, with the latter distinguishing between whether some still live at home or have all moved out. Three main conclusions emerge from the analysis.

First, notwithstanding descriptive evidence that parents are somewhat happier than non-parents, the econometric results point to an overall insignificant association between pre-adult children and happiness for both women and men. While the year prior to any birth and the time from

babyhood to the end of the second year of the first child is associated with higher happiness, this result fades away with age and with the presence of siblings. The positive boost associated with the presence of a baby thus appears to be a one-time phenomenon that only applies to the first child. Contrasting with much of the existing literature, the preponderance of evidence presented here does not support the idea that people with children are less happy than childless individuals.

Second, there are notable discrepancies between women and men in the estimates pertaining to adult children. Women register higher happiness when all adult children have left the household, while men are less happy. The pattern is more complex when adult children still reside in the home: the association is negative among women below the 50% quantile and positive above it. A less pronounced negative association is also seen for men below the 50% quantile. These results point to the different psychological challenges and rewards that women and men face during various stages in their roles as parents (Nomaguchi and Milkie, 2003). While the exact channels are difficult to identify, they highlight the possibility that earlier experiences bear on well-being even after children have moved out or reach adulthood (Umberson et al., 2010).

Third, the analysis uncovers scant evidence for the proposition that the influence of pre-adult children on happiness depends on the happiness of the parent. Compared with several of the control variables, such as income and marital status, the parenthood variables have relatively uniform effects across the distribution of happiness scores. Gilbert's comment on parenthood and well-being may provide some insight into this result: "the compulsion to care for our children was long ago written into our DNA, so we toil and sweat, lose sleep and hair, play nurse, housekeeper, chauffeur and cook, and we do all that because nature just won't have it any other way" (Gilbert, 2006). Given that parenthood is more fundamental to our nature than more culture specific events such as marriage or divorce, it might be that the mechanism behind the parenthood experiences are less prone to be affected by personality differences or intrinsic happiness.

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