

DISEI - Università degli Studi di Firenze

Working Papers - Economics

Do Rich Parents Enjoy Children Less?

M. Le Moglie, L. Mencarini, C. Rapallini

Working Paper N. 08/2017

DISEI, Università degli Studi di Firenze
Via delle Pandette 9, 50127 Firenze, Italia
www.disei.unifi.it

The findings, interpretations, and conclusions expressed in the working paper series are those of the authors alone. They do not represent the view of Dipartimento di Scienze per l'Economia e l'Impresa, Università degli Studi di Firenze

Do Rich Parents Enjoy Children Less?*

Marco Le Moglie**

Dondena Centre for Research on Social Dynamics and Public Policy &
Department of Management and Technology – Bocconi University
Via Roentgen 1, 20136, Milan,
marco.lemoglie@unibocconi.it

Letizia Mencarini**

Dondena Centre for Research on Social Dynamics and Public Policy &
Department of Management and Technology – Bocconi University
Via Roentgen 1, 20136, Milan, I – 4th floor, office D2 09,
phone +39 02 58363405, mobile phone +39 346 4735885
letizia.mencarini@unibocconi.it

Chiara Rapallini**

University of Florence
Via delle Pandette 21, 50127 Florence, I
chiara.rapallini@unifi.it

*The authors thank for useful comments to previous version of this paper the participants at the following conferences: Economic, Health and Happiness Conference 2016; the European Society of Population Economics Conference 2016; the IAREP-SABE 2016 Conference; the European Population Conference 2016 and the Population Days 2017.

** The authors gratefully acknowledge financial support from the European Research Council under the European ERC Grant Agreement no StG-313617 (SWELL-FER: Subjective Well-being and Fertility, P.I. Letizia Mencarini).

Abstract

We investigate the role of individual labor income as a moderator of parental subjective well-being trajectories before and after the first childbirth in Germany, a very low fertility country. Analyzing German Socioeconomic Panel Survey data, we found that income matters negatively for parental subjective well-being after childbirth, though with important differences by education and gender. In particular, among better educated parents, the richer see the arrival of a child more negatively. These findings contribute to the debate on the relationship between income and fertility adding information on how parents perceive the birth of a child beyond the strict financial cost of childbearing and raising. Results are discussed in terms of preferences among different groups of parents, costs of children, and work and family balance. Results are robust to potential endogeneity between income and childbirth, as well as for alternative measures of income.

Keywords

First child, subjective well-being, individual income, Germany

JEL: J11, J13, D1, I31

1. Introduction

The relationship between income and fertility has long been debated by social scientists, especially by demographers and economists. It is still unclear whether the direct and positive effect of income on fertility overcomes the indirect and negative effect connected to the opportunity costs of parenthood. The debate is both theoretical and empirical. At the heart of this question is the increase in female education (and earnings) over recent decades, and the consequent effect on fertility of this rise. From a theoretical perspective, the Second Demographic Transition paradigm means lower fertility as women obtain higher education and higher wages because, in developed societies, individuals consider family to be less central and to have a stronger focus on their own self-realization. In the Beckerian framework, an increase in women's earnings has ambiguous effects on fertility. It increases disposable income, but it adds to the opportunity costs of children as well. On the empirical side, the evidence is also mixed. At the macro level, most developed countries are characterized by very low fertility. This suggests the negative effect of opportunity costs, even if there are some particularly advanced nations, where the income effect seems to have started to prevail (Luci-Greulich and Thevenon, 2014). This is the case in the Anglo-Saxon and Nordic countries, which are characterized by high female labor force participation, high rates of female tertiary education and relatively higher fertility. In these countries, a positive relationship between income and fertility seems to hold at the micro level as well (e.g. Andersson 2000; Berninger 2013; Hart 2015; Andersson et al. 2014; Tasiran 1995; Vikat 2004).

Acknowledging that the relationship between income and fertility differs from society to society, we consider here Germany. In Germany fertility has been well below replacement level for more than forty years (Population Reference Bureau 2011), standing at around 1.5 children, and the micro-correlation between income and fertility remains negative (Andersson et al. 2014).

We look at the relationship between income and fertility behavior at the micro level by through subjective well-being (henceforth, SWB): i.e. we consider the effect of childbearing on SWB, taking individual labor income as a moderator of this relationship. In this way, we estimate SWB trajectories before and after the birth of the first child by gender, and for different individual income groups. The study of SWB trajectories for these different groups of parents allows us to assess, first, whether parents of different income groups come back to the level of SWB they had in the years preceding the birth of their first child. This is a way to verify the so-called *set-point-hypothesis*, and to see whether it holds for all income levels. Second, studying parental SWB trajectories allows us to compare the SWB of parents with different income levels at different

points in time. We are, therefore, able to establish whether and to what extent men and women associate childbearing with something positive (or negative), across different income levels.

Since individual labor income is strongly interrelated with the level of education, our main hypothesis is that not only individual labor income, but also its interaction with parental education influences parental SWB before and after childbirth. On the one hand, market mechanisms remunerate workers' skills and competences, thus increasing the wages (and opportunity costs) of better educated parents. From the education level of the parents we can infer what investment in human capital they have made. We can also speculate on the expectations that they assign to different life domains. Better educated parents should have more expectations in terms of career, as well as greater access to alternative sources of fulfillment. They are less likely to see their children as a unique source of joy and life meaning. On the other hand, as suggested by Nomaguchi and Brown (2011), the role of education in mediating parental SWB is multifaceted. Education is a proxy for career attitudes, thus reducing the SWB of better educated parents. However, it may mean, too, more resources to cope with the strains of parenthood, in this case favoring higher SWB.

SWB trajectories are good at tracking the relationship between income and fertility because these data convey information on the costs and benefits related to specific life events, that go beyond the strict monetary equivalent and take into account expectations and attitudes as well. Recently there have been several studies focusing on SWB trajectories and childbearing, e.g. Clark et al. (2008), Myrskylä and Margolis (2014) and Matysiak et al. (2016). All these studies stress how the set point hypothesis – i.e. parental happiness returning to pre-birth levels – might only hold in average. Myrskylä and Margolis (2014) investigate the mediating effect of several socio economic indicators, first and foremost, the education of the parents. Matysiak et al. (2016) look at the mediating role of the stress level experienced by parents as they juggle work and family obligations, the work-family conflict. However, none of these studies explores the mediating role of the income on SWB. Nor do they look at how this role changes with education. In our contribution, we go beyond the average effect of the birth of a child on parental SWB. We add income, another dimension in the heterogeneity of the response to having a child among parents. In this way, we attempt to reconcile the literature on SWB with more traditional studies on fertility decline, where earnings are, indeed, taken as key driver.

Finally, we focus on the first child. An investigation into the SWB trajectories for parents with different incomes and education levels should help in clarifying which parents are negatively affected by firstborn children and who decides not to have more. If the first child affects parental SWB – and subsequent parental SWB positively predicts the birth of a second child (Le Moglie et

al. 2015) – the study of the SWB trajectories after the first birth will shed light on why German couples forego the second child. This analysis is crucial, as the decision not to have a second child is the fundamental driver for very low fertility (Frejka 2008).

2. Background

2.1. Income and Fertility

From a theoretical perspective, two prominent views on post-transitional fertility are the Second Demographic Transition (SDT, hereafter) and the New Home Economics (NHE, hereafter). The first predicts lower fertility as women obtain higher education and higher wages, while for the second the picture is multifaceted. According to the SDT, in modern societies, individuals consider family as being less central, they have developed more non-normative demographic behavioral patterns, and they have a stronger focus on their own self-realization (Van De Kaa 1987). Any increase in female education and economic participation are, then, for the SDT, among the indirect causes of fertility decline.

According to the NHE individuals (or couples) maximize life-cycle utility by considering the resources devoted to nurturing children in a context of scarce time and income resources: the decision about the number of children parents have is made in this context. Children enter into the utility function as consumption goods, while time and income are the main arguments of the parental budget constraint. Thus, the direct costs for children are related to the reduction in the disposable income of parents following childbirth. The indirect costs of children are, on the other hand, related to the opportunity costs of the time devoted to childcare. It follows that any increase in parental income, or any reduction in child-raising costs should increase fertility (e.g., the seminal works by Becker 1960; Becker 1981; Becker and Lewis 1973; Cigno 1986; Cigno 1991). A general increase in women's earnings has, however, ambiguous effects on fertility. Any raise in earnings increases disposable income, but it also increases the opportunity cost of children. Moreover, an increase in earnings through the income effect does not necessarily imply an increase in fertility: at least it does not if more resources are devoted to each child, i.e. – in Becker's words – to "the quality" of children, instead of to quantity. Furthermore, the potential effect of an increase in income is complicated through in-kind and in-time transfers. This issue lies at the heart of the vast literature on female (or parental) labor supply with endogenous fertility. With an increase in earnings, the literature suggests, the opportunity costs tend to dominate income effects. As such

the observed increase in women's earnings over time, has been taken as the main driver of the gradual but steady decline in fertility in Western countries.

Concerning the empirical literature on the associations between income and fertility – and not considering all those contributions that investigate the relationship between these two by evaluating income support policies and their effects on fertility – scholars have mainly focused on cross-country comparisons. The most recent literature suggests that the correlation between income and fertility has recently changed from being negative to positive in most developed countries, at least at the macro level (Luci and Thévenon, 2011). Much the same has happened with the relationship between high development and fertility (Myrskylä et al. 2009 and 2011). Countries with high female labor force participation, and high rates of tertiary education, are those with the highest fertility: the prime example being the Anglo-Saxon and Nordic countries. There is, in other words, no longer such strong evidence for high female earnings driving down fertility (e.g. Englehart et al. 2004a; Englehart et al. 2004b; Kogel 2004; Luci-Greulich and Thevenon 2014). Another relevant insight from this literature is that, in the most developed countries, households are typically made up of dual earner couples; as is, indeed, the case in Anglo-Saxon and Nordic countries. Esping-Andersen and Billari (2015) and Aassve et al. (2015) argue that this has important implications for assessing the impact of earnings and income on fertility. For instance, in these societies the Becker framework requires a reformulation, because there is no longer a clear specialization with husbands undertaking market work and wives home production. Instead, partners often contribute equally to household income, while home production activities, such as childcare, can, instead, be outsourced to external actors. Policies supporting maternal employment, then, either directly – via childcare services and with labor market organization – or indirectly – a preference for gender equality in family roles – can start to account for fertility variations (Goldscheider et al., 2015).

The empirical relationship between income and fertility in contemporary Western societies is, thus, far from clear (Silva and Dribe 2010). However, arguments outlined above appear to find some support at the micro level in the most advanced countries. For example, Andersson et al. (2014) found that female income is somewhat positively associated with fertility in Denmark, while the relationship is the opposite in West Germany. Berninger (2013) shows that, in Denmark, women's income has a positive effect on first birth risk. Andersson et al. (2014) confirm this finding, while they find only a weak association between income and the second and third parity. As for Finland, Berninger (2013) does not find any effect; Vikat (2004) reports a positive effect, while Rønsen (2004) claims the contrary. Rønsen (2004) also finds that income has a negative effect on fertility in Norway.

2.2. Childbearing and Parents' Subjective Well-being

Two extreme views characterize the literature on SWB, one prevalent in psychology and the other in economics (Easterlin, 2006). According to the former, the effect of life events and objective conditions on well-being are mediated by psychological processes, in which people adjust to the ups and downs in their life circumstances. The differences in well-being among individuals are, then, a matter of social and biological endowments. Life events may change the level of well-being, but this change is only transitory. In the now-famous metaphor of Brickman and Campbell (1971), each individual is on a *hedonic treadmill* and having children – as well as other life events – has only a temporary effect on happiness. The existence of a *hedonic treadmill* implies that, if people continue to adapt to their life-course circumstances, improvements in income would, for instance, yield no real benefits and worsened financial conditions do not necessarily translate into a lower assessment of well-being. Thus, the so-called *set-point theory* states that every individual is presumed to have a predefined happiness level that he or she returns to over time (Csikszentmihalyi and Jeremy 2003; Kahneman et al 1999; Williams and Thompson 1993). More recently, however, psychologists have recognized that some life events may have lasting effects on SWB, and that among these family and social relationships are the most important (Myers 2000). Changes in family-related domains seem more enduring than in domains related to material living standards (Argyle 2001; Diener et al. 1999; Veenhoven 1993). Indeed, a number of psychological studies (e.g. Sheldon and Lucas 2014) and demo-economic studies (Kohler et al. 2005; Margolis and Myrskylä 2011; Myrskylä and Margolis 2014; Zimmerman and Easterlin 2006) have demonstrated that important life events bring about long-lasting shifts in SWB.

Well-being has been considered by economists to depend on life circumstances. For example, an increase in income necessarily implies a rise in SWB. Only recently has the role played by aspirations and attainments and the distance between these two been acknowledged (Blanchflower and Oswald 2004; Easterlin 1995; Frey and Stutzer 2002; Proto and Rustichini 2015). Today, most psychologists and economists have come to agree that SWB is affected by both life circumstances and psychological processes of aspirations and adaptations.

The effect of childbearing on SWB¹ has only recently received renewed attention. There is still little consensus about the effect of this life event on individuals' SWB, either in terms of the

¹ In this paper, we mainly refer to life satisfaction, but we may cite papers where the focus is on 'happiness'. This is standard practice among social scientists (e.g. Easterlin 2010). Subjective well-being is, in fact, a broad category,

sign or the magnitude, or on the causal direction of the relationship (Kohler and Mencarini 2016). While some studies find a positive association between parenthood and happiness (Aassve et al. 2012; Kohler et al. 2005; Kotowska et al. 2010), other studies have shown that having children has either non-significant or negative effects on SWB (Clark and Oswald 2002; Clark et al. 2008; Frey and Stutzer 2000; McLanahan and Adams 1987; Nomaguchi and Milkie 2003). This inconsistency in findings may result from the fact that the effect of children on SWB depends on characteristics that are not always considered in studies; or that are correctly accounted for only in a longitudinal framework. These characteristics might include the number and age of children (Clark et al. 2008; Kohler et al. 2005; Myrskylä and Margolis 2014); personality traits and the ‘initial’ pre-birth happiness level (Kohler et al. 2005; Myrskylä and Margolis 2014); the stage in the life course of parents (Margolis and Myrskylä 2011); their level of education (Nomaguchi and Brown, 2011); and general context (Aassve et al. 2012; Aassve et al. 2015).

Myrskylä and Margolis (2014) document how the happiness trajectory of parents differs greatly according to age at parenthood, socio-economic status, gender, parity, marital status and context. As with the previous literature employing longitudinal designs (e.g. Clark et al. 2008), their results show a general temporary gain in happiness at the time of birth, with older parents and those with more socio-economic resources having the strongest happiness gains at that point. The relatively greater happiness of older mothers suggests that women who postpone childbearing are more ‘ready’ and less stressed by having children (Gregory 2007). This is possibly because older mothers have more social capital and higher status at work, thus allowing greater financial flexibility and more options for childcare, which can help ease the transition into parenthood. However, more pre-birth education and a higher income may mean higher opportunity costs for childbearing. Therefore, the effect of parenthood on SWB possibly depends on the opportunities for parents to reduce the costs of child-raising. These are also inevitably linked to the macro-characteristics of the country where couples reside, which may have an impact on their assessment of the levels of happiness associated with childbearing. If greater financial resources can reduce necessary parental efforts, the effect of mothers’ education on SWB is multifaceted: something shown by Nomaguchi and Brown (2011). Referring to the US, they find that a college degree (or even higher levels of education) are related to less parenting anxiety. However, at the same time, those with a college degree, have less positive experiences. A successful career, such as those typically associated with third level education, reduces childbearing SWB for mothers. Then,

which involves positive and negative feelings, expressions of happiness, and cognitive judgments about life satisfaction (Diener et al. 1999). These components of subjective well-being often correlate substantially and the terms signifying its various dimensions can be used interchangeably.

better educated mothers find parenthood more demanding generally, likewise, dampening SWB: many better educated mothers suffer, indeed, from role captivity following the birth of a child. Matysiak et al. (2016) argue that there is a key moderating factor that has been overlooked in previous research, namely the work–family conflict. They find that childbearing negatively affects SWB only when parents, mothers in particular, face a substantial work–family conflict. The notion, therefore, of a simple, uniform, and unidirectional relationship between childbearing and life satisfaction is to be rejected.

In summary, then, in the more recent literature on fertility and SWB, there is a consensus that the cost of parenting is perceived in different ways depending on the parents’ socio-economic status, social support, education, gender and country of residence (Aassve et al. 2012; Aassve 2015; Billari and Kohler 2009; Brewster and Rindfuss 2000; Kohler 2012; McDonald 2000; Myrskylä and Margolis 2014; Neyer and Andersson 2008; Umberson et al. 2010).

3. Data and Descriptive Statistics

We use the German Socio-Economic Panel survey (GSOEP), a representative longitudinal study of the German population, which started in 1984 and which is ongoing. It fits of the needs of our work very well, for three reasons. First, the length of the study allows us to follow individuals over a long period. Second, the consistent size of the sample helps us to perform a better and more robust econometric analysis. In this way we avoid all the weaknesses of small samples, especially when we try to specify the effect of income on the parental trajectories of SWB, as well as income-education interactions. Third, the GSOEP contains all the information necessary for constructing the dependent variable: namely, parental trajectories before and after the birth of the first child; individuals’ labor income and household income; not to mention a wide set of controls.

Our attention is focused on individuals – men and women – aged between 20 and 50 who experience the first parity transition during the observation window. Accordingly, those who had their first child before entering the sample are excluded from the analysis, as are those who are still childless when they exit the sample. The final sample consists of 4,818 individuals (2,120 men and 2,698 women) observed, on average, over 15 years. Table 1 provides descriptive statistics of the main estimation sample.

For the dependent variable we use answers to the question: “How satisfied do you feel with your life today?”. Respondents reply on a scale ranging from 0 – “completely dissatisfied” – to 10 – “completely satisfied”, and the information is recorded annually (Table 1). Information about

the date of birth of the first child is taken from the biography data section of the GSOEP and is used – as will be seen in the next section – to model the trajectory of parental SWB both before and after the birth.

The main explanatory variable is the individual's labor income and, in particular, the monthly labor net income, after the deduction of taxes, social security, and unemployment and health insurance (see Table 1). Individual's labor income can be considered the best proxy for the opportunity costs parents face when reducing the time spent in the labor market. Labor income incorporates the intrinsic value of both the present position of the individual in the labor market, but also prior investment in human capital that the individual made in terms of years of education. Our sample includes both unemployed and working people while excluding individuals who declare themselves not to be working. Parents who are on maternity leaves are included in the sample as working people. As far as labor income is concerned, the value declared in the survey is used for working individuals, while we assign a value of 0 to the income received by those who are unemployed.

We also take into consideration equivalent income, so as to establish the effect on parental SWB trajectories at birth of the more comprehensive measure of economic resources and of the household's composition. To do that, we calculate the equivalent net income. We divide the sum of labor income from household members, together with the household income from rent and dividends, by the appropriate coefficient on the equivalence scale, as defined by the OECD, with reference to the composition of each household. Unlike with individual labor income, we take the income of both unemployed and inactive people as if it were 0 (see Table 1).

As for the individuals' education level, we break down parents into two groups, those who have studied more than eleven years, or those who have studied eleven years and less. We chose eleven years of education as a threshold because this helps us separate out parents who have attended – and concluded – secondary school, of whatever type, from those who have not finished secondary school.

Table 1 The GSOEP sample: descriptive statistics

Variable	Women				Men			
	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
SWB (0-10)	7.37		0	10	7.31	1.55	0	10
Marital status								
Married (%)	0.65	0.48	0	1	0.72	0.45	0	1
Divorced, Separated (%)	0.04	0.20	0	1	0.03	0.18	0	1
No partner in the household (%)	0.31	0.46	0	1	0.24	0.43	0	1
Labor force status, years of education, housework								
Unemployed (%)	0.06	0.24	0	1	0.05	0.21	0	1
Employed (%)	0.94	0.24	0	1	0.95	0.21	0	1
Years of education	12.57	2.58	7	18	12.29	2.75	7	18
Housework share (%)	0.77	0.24	0	1	0.31	0.30	0	1
Income and wealth proxy								
Monthly individual labor net income (in €)	914	925	0	10,000	2,341	1,408	0	40,000
Monthly equivalent labor income (in €)	2,169	3,405	0	173,301	2,362	3,233	0	87,480
Share of the household's income (%)	0.47	0.39	0	1	0.80	0.26	0	1
Owner of the dwelling (%)	0.28	0.45	0	1	0.27	0.44	0	1
Other individual characteristics								
Immigrant (%)	0.11	0.31	0	1	0.16	0.37	0	1
Health status (in €)	2.24	0.79	1	5	2.21	0.77	1	5
Age (in years)	29.73	5.01	20	50	32.40	5.52	20	50

From the descriptive analysis, two crucial facts about the situation in Germany emerge. First, richer women tend to have, on average, fewer children *per capita* than poorer ones. Second, richer women tend to have a higher level of SWB than poorer parents, even if the differential is modest.

In Figure 1 we display the average number of children ever born *per* woman, by level of individual female labor income. Women with lower fertility are typically in the higher tertile of individual labor income distribution. Figure 1 also displays the trend of the average number of children ever born *per* woman for those in the 10th decile of the income distribution. This shows that even for the richest parents the income effect does not prevail, and, therefore, there is no basis for claiming a U-shaped relationship between income and fertility. Figure 1 is consistent with previous findings for Germany, where the relationship between female earnings and fertility has been shown to be monotonically negative (Andersson et al. 2014).

Figure 2 displays the trend of the average number of children ever born *per* woman by tertile of equivalent income over the same time span. The general pattern does not change when equivalent income is considered.

In Figure 3 we display the trend of the average level of SWB by gender and tertile of individual income, calculated in each year for those individuals who are observed between T-1 and T-3 after the birth of their first child. The graph shows only very small differences between female and male parents, and all groups of parents are to be found in a quite small range of SWB's variance between 6.9 and 8. By looking at the average SWB of parents in the first tertile with respect to those in the second tertile, we see that in some years the lines are very close and that in

recent years they do, in fact, overlap. The same is true when parents in the second tertile are compared with those in the third. Changes in the trajectories of SWB before and after the birth of the first child are still comparable, this evidence suggests, for different level of individual labor income; that is to say that the distance between their absolute values is not particularly large.



Fig. 1 Number of children per woman (CEB, average number of children ever born, per woman), by tertile of individual labor income from 1985 to 2012, with GSOEP data. Three-term moving average.

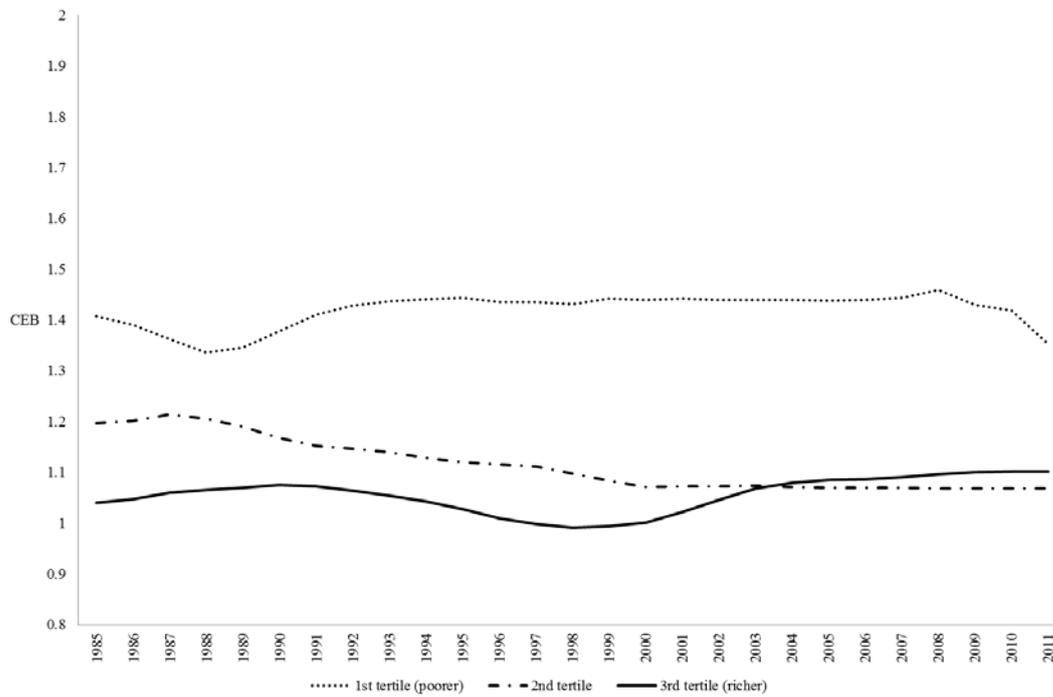


Fig. 2 Number of children per woman (CEB, average number of children ever born, per woman), by tertile of equivalent income from 1985 to 2012, with GSOEP data. Three-term moving average.

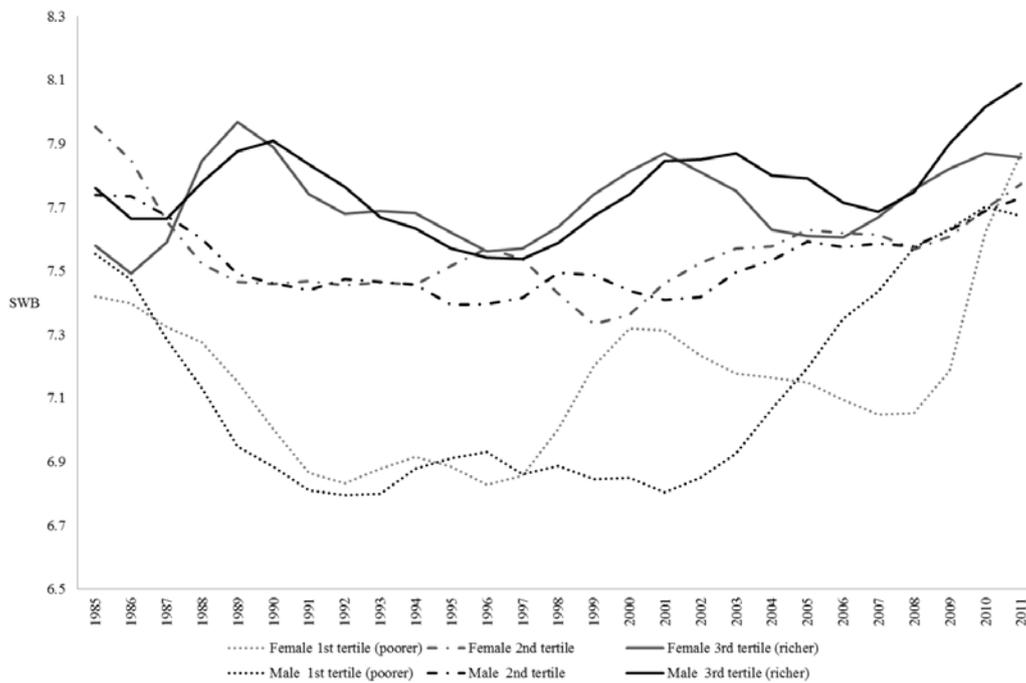


Fig. 3 SWB by gender and tertile of individual income from 1985 to 2012, with GSOEP data. Parents in the three-years preceding the birth of a child. Three-term moving average.

4. Empirical strategy

In order to analyze the effects of the birth of the first child on the parental SWB trajectories, we employ a slightly modified version (Myrskylä and Margolis 2014)² of the approach pioneered by Clark et al (2008). More specifically, we run a set of fixed-effect regressions in which we use dummy variables, recording the position in time of an individual with respect to the birth of his or her first child. In this way, we are able to capture the variation in individual SWB with the birth event and to construct the parental trajectories from three years before the birth to five years afterwards. As with the above-mentioned studies, our analysis assumes the cardinality of SWB³ and compares only individuals who experience the birth of their first child during the observation period. The equation below shows the model employed to estimate the more general specification:

$$SWB_{it} = \beta_0 + \beta_1 B2_{it} + \beta_2 B1_{it} + \beta_3 C_{it} + \beta_4 A1_{it} + \beta_5 A2_{it} + \beta_6 A3_{it} + \beta_7 A4_{it} + \beta_8 A5_{it} + \theta' \mathbf{X}_{it} + \alpha_i + \epsilon_{it} \quad (1)$$

The SWB of individual i at time t is regressed on a set of dummy variables modelling individual trajectories in relation to the birth of the first child, a set of controls, \mathbf{X}_{it} , an individual fixed effect α_i and an error term ϵ_{it} . The dummy B2 – as example – is equal to one if the observation of individual i at time T is between one and two years before the birth event, and 0 otherwise. In the same way, the dummy B1 will be equal to one, if the observation is taken in the year before the birth, and the dummy T is equal to one when the observation corresponds to the year of birth of the first child. Similarly, all the remaining trajectory dummies, from A1 to A5, are equal to one, when the observation of individual i at time T falls from the first year to five years after the birth. As the dummies are mutually exclusive, we use the SWB at three years before the birth as the reference point for a given parent's SWB trajectory. Thus, we exclude the trajectory dummy reaching this value, which is B3. In other words, we implicitly assume that the hedonic treadmill of this trajectory corresponds to the value of individual SWB at three years before the birth of the first child, and that this event does not affect the level of individual SWB as recorded three years before.

² Myrskylä and Margolis (2014) put into a single equation the two equations employed by Clark et al. (2008) to separately estimate the effects of having a child on the individual level of SWB before and after birth. We employ a very similar model to that used by Myrskylä and Margolis (2014), the only differences being in the number and the length of the lags and leads on which the parental trajectory is built.

³ Ferrer-i-Carbonell and Frijters (2004) show that treating life satisfaction as an ordinal versus a cardinal makes little difference.

As all the individual-fixed heterogeneity (observable or not) is absorbed by the individual term α_i , thus the control strategy X_{it} includes all those observable time-varying factors which could still generate heterogeneity in the individual trajectories of parental SWB. These time-varying factors are those which may affect either the level of SWB at each point on the trajectory, or the probability of having the first child in a given year. The control variables X_{it} can be classified into three main groups. The first group includes: the age group the individual belongs to; marital status (having a spouse, having a partner or being single); and a self-assessment of their health condition (on a 5-point scale). In this way, we can check health and reproductive ability and partnership, all crucial for having a child. In the second group of variables there are: parents' years of education; labor force status (employed, unemployed, not working); and partner's housework share. The intention is to capture the characteristics of both paid and unpaid work and the potential conflict between childbearing and work, in the labor market and in the bargaining process between partners. In the last group of control variables, we consider additional information on the overall economic situation of the household. This includes ownership of the dwelling (owner or not), as a proxy for household wealth; equivalent income; and the share of the household's labor income as represented by the individual's labor income. In addition, we control for both multiple births and for whether the individual has a second (or subsequent parity) child during the period of observation. When this is the case, we add a set of dummy variables to control for the entire trajectory of the new parity, as we do with the first child⁴. In order to take spatial and year fixed effects into account we also add a control for the individual's region of residence and for year dummy variables. Finally, the above equation is estimated separately for men and women, and the standard errors account for heteroscedasticity and serial correlation.

Our working hypothesis is, as noted above, that childbearing affects parental SWB according to income. To test this hypothesis, we first assign to each individual a set of dummy-variables containing the tertile of individual labor income, which the parent belongs to, using the lowest one as the reference category. In particular, tertiles are calculated on the average individual labor income from three years before the birth, for the population aged 20-50, and by gender and by wave. The last step is taken to avoid possible biases in the definition of the tertiles induced by endogeneity between income and childbirth. Specifically, we add the interactions of this set of dummies, along with the trajectory dummies, to model (1), as shown here:

$$SWB_{it} = \beta_0 + \beta_1 B2_{it} + \beta_2 B1_{it} + \beta_3 C_{it} + \beta_4 A1_{it} + \beta_5 A2_{it} + \beta_6 A3_{it} + \beta_7 A4_{it} + \beta_8 A5_{it} + \beta_9 2nd\ tertile_{it} + \beta_{10} 3rd\ tertile_{it} + \beta_{11} (B2_{it} * 2nd\ tertile_{it}) + 2(B1_{it} *$$

⁴ Unlike those for the first child, the trajectory dummies for other parities are not mutually exclusive.

$$\begin{aligned}
& 2\text{nd tertile}_{it}) + \beta_{13}(C_{it} * 2\text{nd tertile}_{it}) + \beta_{14}(A1_{it} * 2\text{nd tertile}_{it}) + \beta_{15}(A2_{it} * \\
& 2\text{nd tertile}_{it}) + \beta_{16}(A3_{it} * 2\text{nd tertile}_{it}) + \beta_{17}(A4_{it} * 2\text{nd tertile}_{it}) + \beta_{18}(A5_{it} * \\
& 2\text{nd tertile}_{it}) + \beta_{19}(B2_{it} * 3\text{rd tertile}_{it}) + \beta_{20}(B1_{it} * 3\text{rd tertile}_{it}) + \beta_{21}(C_{it} * 3\text{rd tertile}_{it}) + \\
& \beta_{22}(A1_{it} * 3\text{rd tertile}_{it}) + \beta_{23}(A2_{it} * 3\text{rd tertile}_{it}) + \beta_{24}(A3_{it} * 3\text{rd tertile}_{it}) + \beta_{25}(A4_{it} * \\
& 3\text{rd tertile}_{it}) + \beta_{26}(A5_{it} * 3\text{rd tertile}_{it}) + \theta'X_{it} + \alpha_i + \epsilon_{it} \quad (2)
\end{aligned}$$

According to this functional form, the coefficients from β_1 to β_8 provide us with the individual trajectory of SWB before and after childbirth for people belonging to the first tertile of labour income distribution. The trajectories for those in the second and third tertile are obtained simply by adding to β_1 and β_8 , the coefficients of the interaction term referring to the same point of the trajectory. For instance, the value of the trajectory at T+3, for those who belongs to the second tertile, is given by $\beta_6 + \beta_{16}$, or rather the value of the trajectory at T-2 for the individuals in the third tertile is equal to $\beta_1 + \beta_{11}$. The set of control variable are the same as are included in model (1), with the only difference being that we exclude the equivalent income in order to avoid problem of multi-collinearity with the income dummies for individuals who are single. Yet, standard errors are again robust to heteroschedasticity and serial correlation.

5. Results

5.1. Main analysis

Our investigation has two steps. We, first, test the set-point hypothesis estimating SWB trajectories for men and women, separately and adopting, as a point of reference, their SWB three years before the birth of their first child (see Table 2 and, in Figure 4, the grey dotted lines titled “General”). Second, the set-point hypothesis is tested by estimating the same trajectories for different groups of men and women, defined according to their individual labor income: Table 3 and Figure 4, lines for the first, second and third tertile.

Regarding the first step, our analysis confirms that the SWB of women increases substantially in the year before the event, which is a clear anticipation effect, while this increase is not statistically significant for men (Table 2, columns 2 and 4, and Figure 4). In the year of the birth, we see a similar trend, with only women experiencing a statistically significant increase in SWB (see Table 2 and Figure 4). In the years following the event, the SWB decreases, again differently by gender. Women are not significantly far from their hedonic treadmill, whereas men stay well below the treadmill level up to the fifth year after the birth (Table 2 and Figure 4).

Table 3 presents the estimates of the coefficients of equation by gender (2) for the second step of the analysis. Looking at the specification with controls in column (2), it will be noted that coefficients for women in the second tertile are negative and statistically different from those of first tertile (i.e. the poorer ones) from the year of the birth up to T+2. Richer women experience a decline in SWB that is significantly different from poorer women in three spells: in the year of birth; in the year after; and in the four years after the birth. For men, the coefficients, for those belonging to the second and third tertile of individual labor income distribution, are not statistically different from those within the first tertile (Table 3, column 4). As explained in the methodological section, in order to construct the individual trajectories of SWB for the second and third tertile, their coefficients for each point of the trajectory in Table 3 have to be added to those for the first tertile. Figure 4 shows the results of these calculations, providing the individual trajectories of SWB before and after the birth of the first child for each tertile of individual labor income, by gender. Poorer women show a positive increase in SWB in the year of childbirth and in the year immediately preceding the event. The positive effect in the year before the event is similar for women in the second and third tertile, while the richer also show a significant SWB increase in the year of birth. For women in the second tertile, the effect of childbirth on SWB is negative from T+2 up to T+5. The negative divergence from the hedonic treadmill is also there for richer women starting from T+4. Men, meanwhile, in the second and third tertile, experience a decline in SWB that is significant from T+1 to T+5.

In summary, a comparison among different income groups of women and men reveals three interesting points. First, there is, regardless of income, a positive anticipation of childbirth among women, but not among men. Second, poorer women have a higher level of positive anticipation. Third, richer men and women experience negative effects after childbirth.

Table 2 Trajectories of SWB by gender. Dependent variable: SWB, fixed-effect estimates

	Women				Men			
	(1)		(2)		(3)		(4)	
	Coeff.	s.e.	Coeff.	s.e.	Coeff.	s.e.	Coeff.	s.e.
(T-2) (Ref. Category SWB at T-3)	0.065	0.044	0.102 *	0.053	-0.036	0.045	-0.059	0.054
(T-1)	0.299 ***	0.045	0.279 ***	0.058	0.089 *	0.045	0.077	0.060
(T)	0.415 ***	0.048	0.366 ***	0.074	0.077 *	0.045	0.037	0.066
(T+1)	0.005	0.050	0.015	0.076	-0.096 **	0.046	-0.127 *	0.070
(T+2)	-0.129 ***	0.049	-0.103	0.079	-0.183 ***	0.049	-0.238 ***	0.078
(T+3)	-0.173 ***	0.052	-0.106	0.085	-0.230 ***	0.049	-0.272 ***	0.083
(T+4)	-0.174 ***	0.053	-0.111	0.092	-0.290 ***	0.051	-0.362 ***	0.092
(T+5)	-0.175 ***	0.055	-0.159	0.100	-0.296 ***	0.052	-0.322 ***	0.098
Other births (T-3)			0.296 ***	0.070			0.188 ***	0.071
Other births (T-2)			0.184 **	0.079			0.106	0.076
Other births (T-1)			0.034	0.088			0.143 *	0.083
Other births (T)			0.249 ***	0.095			0.107	0.092
Other births (T+1)			-0.008	0.127			-0.025	0.123
Other births (T+2)			0.347	0.276			0.038	0.265
Other births (T+3)			0.087	0.066			0.100	0.067
Other births (T+4)			-0.002	0.064			0.076	0.059
Other births (T+5)			0.027	0.060			-0.022	0.057
Marital Status (Ref. Category: Married)								
Divorced, Separated			-0.305 **	0.134			-0.564 ***	0.158
No partner in the household			-0.029	0.056			-0.064	0.052
Labor Force Status (Ref. Category: Unemployed)								
Employed			0.434 ***	0.095			0.767 ***	0.109
Years of Education			0.082 **	0.032			0.062 ***	0.023
Health status			-0.371 ***	0.024			-0.392 ***	0.025
Equivalent income			0.000	0.023			0.015	0.023
Share of the household's income			0.012	0.065			0.031	0.078
Owner of the dwelling			0.037	0.049			0.051	0.052
Percentage of housework			-0.017	0.077			-0.146 **	0.064
Age group (Ref. Category: 20-30 y.o.)								
30-40			-0.034	0.048			0.023	0.049
40-50			0.125	0.140			0.087	0.096
Year and regional dummy	NO		YES		NO		YES	
Observations	15004		10515		14470		10,120	
R-squared	0.029		0.087		0.015		0.091	
Number of people	2698		2279		2120		1929	

Notes. *, **, *** indicate significance at 10%, 5% and 1%.

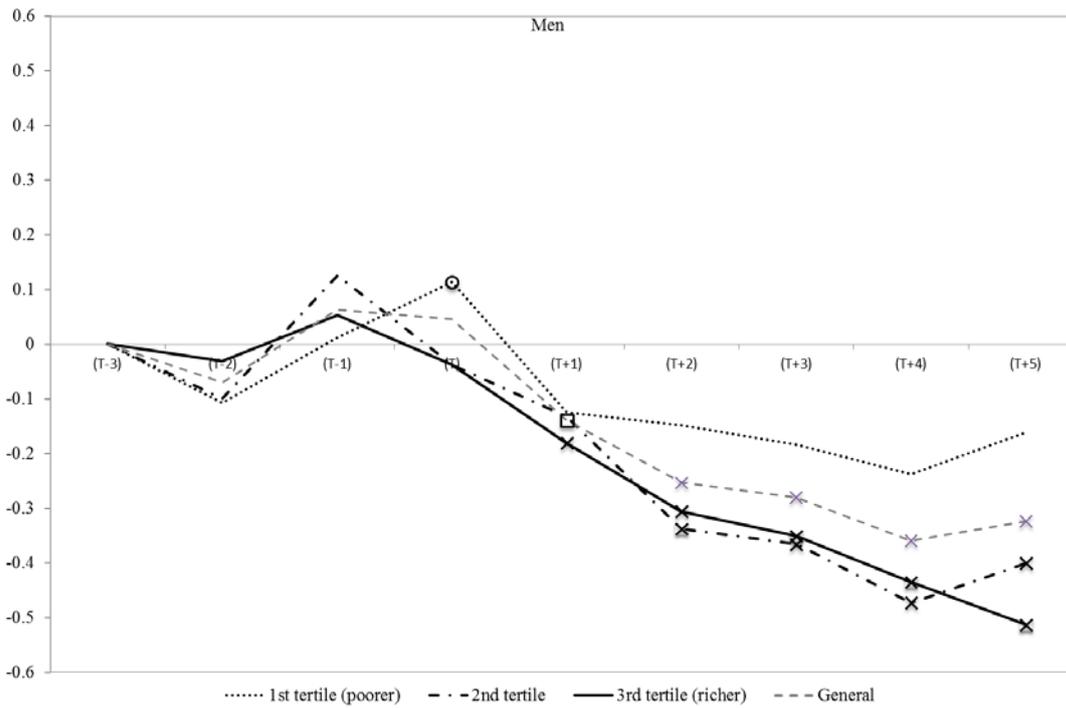
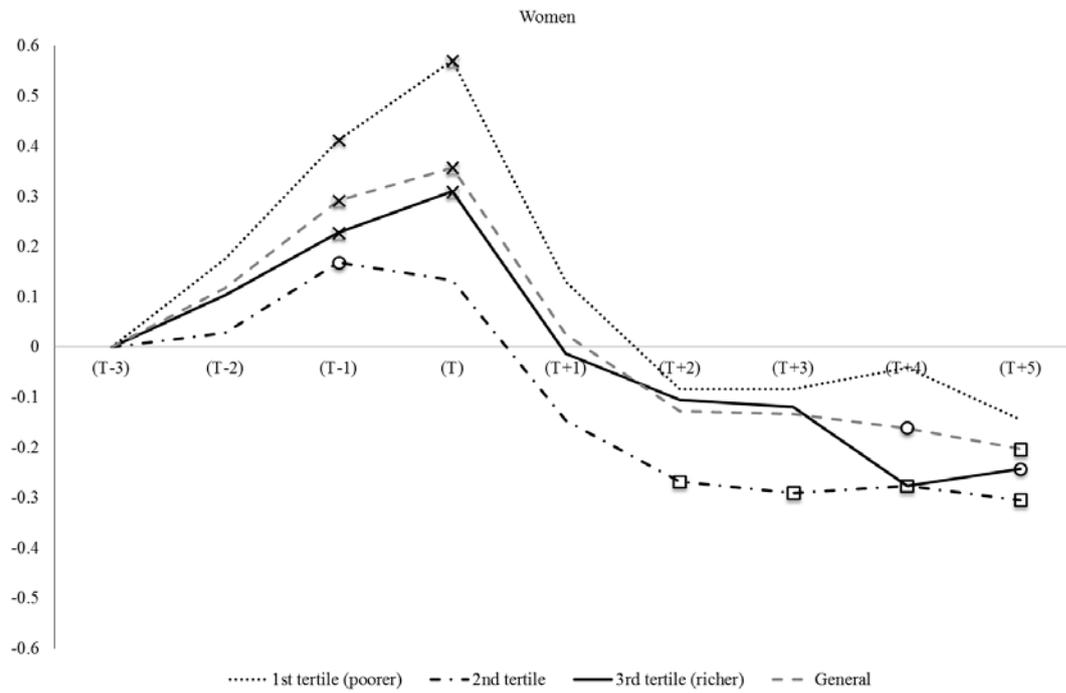


Fig. 4 Women and men's SWB trajectories from 3 years before up to 5 years after the birth of the first child. Fixed-effect estimates. Notes: O, □, X indicate significance at 10%, 5% and 1%.

Table 3 Trajectories of SWB by gender and tertile of individual labor income.
Dependent variable: SWB, fixed-effect estimates

	Women				Men			
	(1)		(2)		(3)		(4)	
	Coeff.	s.e	Coeff.	s.e	Coeff.	s.e	Coeff.	s.e
(T-2) (Ref. Category SWB at T-3)	0.119	0.103	0.170	0.111	-0.106	0.094	-0.108	0.089
(T-1)	0.395 ***	0.106	0.384 ***	0.113	0.085	0.088	0.012	0.089
(T)	0.715 ***	0.109	0.614 ***	0.124	0.163 *	0.090	0.114	0.102
(T+1)	0.286 **	0.113	0.207	0.126	0.012	0.095	-0.124	0.108
(T+2)	0.055	0.113	0.001	0.125	0.020	0.103	-0.149	0.123
(T+3)	0.106	0.117	-0.063	0.135	-0.021	0.102	-0.183	0.127
(T+4)	0.092	0.120	-0.003	0.139	-0.074	0.109	-0.237 *	0.138
(T+5)	0.077	0.133	-0.159	0.148	-0.082	0.110	-0.161	0.143
Second tertile of income distr. (Ref. Category: first tertile)	0.226	0.177	0.189	0.225	0.128	0.169	0.100	0.174
Third tertile of income distr.	0.063	0.239	0.208	0.265	0.253	0.241	0.173	0.232
Second tertile of income distr.*(T-2) (Ref. Category SWB at T-3*second tertile)	-0.156	0.126	-0.200	0.138	0.019	0.124	0.008	0.138
Second tertile of income distr.*(T-1)	-0.206	0.129	-0.201	0.138	0.035	0.119	0.114	0.135
Second tertile of income distr.*(T)	-0.539 ***	0.136	-0.344 **	0.145	-0.186	0.122	-0.151	0.137
Second tertile of income distr.*(T+1)	-0.509 ***	0.141	-0.337 **	0.148	-0.140	0.126	-0.008	0.142
Second tertile of income distr.*(T+2)	-0.369 ***	0.141	-0.294 **	0.146	-0.354 ***	0.135	-0.189	0.154
Second tertile of income distr.*(T+3)	-0.495 ***	0.147	-0.143	0.153	-0.261 *	0.133	-0.183	0.151
Second tertile of income distr.*(T+4)	-0.343 **	0.149	-0.222	0.159	-0.358 **	0.143	-0.236	0.158
Second tertile of income distr.*(T+5)	-0.387 **	0.164	-0.150	0.162	-0.331 **	0.146	-0.239	0.163
Third tertile of income distr.*(T-2) (Ref. Category SWB at T-3*third tertile)	-0.054	0.126	-0.012	0.135	0.166	0.113	0.076	0.119
Third tertile of income distr.*(T-1)	-0.137	0.129	-0.165	0.135	-0.035	0.118	0.041	0.126
Third tertile of income distr.*(T)	-0.327 **	0.136	-0.322 **	0.143	-0.145	0.115	-0.152	0.129
Third tertile of income distr.*(T+1)	-0.307 **	0.141	-0.235	0.146	-0.149	0.121	-0.057	0.135
Third tertile of income distr.*(T+2)	-0.141	0.139	-0.122	0.145	-0.206	0.128	-0.157	0.149
Third tertile of income distr.*(T+3)	-0.205	0.144	-0.153	0.153	-0.269 **	0.130	-0.168	0.151
Third tertile of income distr.*(T+4)	-0.398 ***	0.151	-0.323 **	0.159	-0.296 **	0.136	-0.198	0.158
Third tertile of income distr.*(T+5)	-0.316 **	0.160	-0.142	0.159	-0.360 ***	0.139	-0.352 **	0.162
Other births (T-3)			0.062	0.056			-0.026	0.058
Other births (T-2)			0.037	0.059			0.063	0.058
Other births (T-1)			0.104 *	0.063			0.107	0.069
Other births (T)			0.337 ***	0.066			0.201 ***	0.072
Other births (T+1)			0.248 ***	0.074			0.148 *	0.075
Other births (T+2)			0.166 **	0.081			0.181 **	0.084
Other births (T+3)			0.278 ***	0.091			0.101	0.095
Other births (T+4)			0.170	0.115			0.003	0.122
Other births (T+5)			0.692 **	0.286			0.080	0.235
Marital Status (Ref. Category: Married)								
Divorced, Separated			-0.069	0.054			-0.054	0.054
No partner in the household			-0.187	0.134			-0.495 ***	0.150
Labor Force Status (Ref. Category: Unemployed)								
Employed			0.104 ***	0.038			0.877 ***	0.119
Years of Education			0.057 **	0.025			0.052 **	0.020
Health status			-0.363 ***	0.023			-0.388 ***	0.026
Share of the household's income			-0.057	0.049			0.011	0.077
Owner of the dwelling			0.025	0.047			0.064	0.055
Percentage of housework			0.005	0.073			-0.141 **	0.067
Age group (Ref. Category: 20-30 y.o.)								
30-40			-0.021	0.047			-0.002	0.051
40-50			0.073	0.136			0.079	0.098
Year and regional dummy	NO		YES		NO		YES	
Observations	11143		9983		11772		9460	
R-squared	0.033		0.087		0.019		0.097	
Number of groups	1732		1968		1598		1703	

Notes. *, **, *** indicate significance at 10%, 5% and 1%.

5.2. Robustness check for endogeneity between individual income and childbearing

We re-estimate model (2) by adopting, as alternative measures of individual incomes, income as registered three year before childbearing: in other terms, in calculating the tertiles for each wave, we replace average individual labor income within three years of the birth with the one at T-3.

The aim of this check is to reduce feasible endogeneity between the income and the birth of a child and to test the robustness of our main results with respect to this issue. Actually, in the main analysis, when we calculate the tertile that the individual belongs to in each wave, we use her average income three years before the birth. This has already allowed us to reduce possible endogeneity between income and the childbirth. However, there is still the possibility of an anticipation effect on the income of individuals in the years before the birth. This might still induce endogeneity in our estimates.

The results for this check are presented in Table 4 and Figure 5 and are consistent with those obtained in the main analysis. Adopting a different measure of individual labor income and looking at the set-point hypothesis, in the years following the event neither women nor men give statistically significant differences with respect to SWB, as registered three years before birth. When the differences between groups of parents, broken down by income levels, are taken into account, poorer women are still, in general, happier about having a child in the years before and in the year of the birth. Richer women are still those who enjoy having a child less, and this is especially true in the years following birth. The same is true for men, with the lowest-income men showing a positive anticipatory effect in the year before the birth.

Table 4 Trajectories of SWB by gender and tertile of individual labor income (T-3)
 Dependent variable: SWB, fixed-effect estimates

	Women		Men	
	(1)		(2)	
	Coeff.	s.e	Coeff.	s.e
(T-2) (Ref. Category SWB at T-3)	0.164	0.110	-0.042	0.105
(T-1)	0.400 ***	0.109	0.207 **	0.105
(T)	0.453 ***	0.127	0.158	0.109
(T+1)	0.151	0.135	-0.003	0.123
(T+2)	-0.026	0.139	-0.058	0.139
(T+3)	-0.087	0.149	-0.134	0.142
(T+4)	-0.119	0.160	-0.140	0.153
(T+5)	-0.130	0.175	0.017	0.165
Second tertile of income distr. (Ref. Category: first tertile of income distr.)	0.040	0.216	0.311	0.204
Third tertile of income distr.	-0.316	0.262	0.376	0.246
Second tertile of income distr.*(T-2) (Ref. Category SWB at T-3*second tertile)	-0.108	0.141	-0.034	0.138
Second tertile of income distr.*(T-1)	-0.250 *	0.138	-0.200	0.137
Second tertile of income distr.*(T)	-0.276 *	0.158	-0.165	0.135
Second tertile of income distr.*(T+1)	-0.241	0.166	-0.191	0.144
Second tertile of income distr.*(T+2)	-0.181	0.165	-0.246	0.160
Second tertile of income distr.*(T+3)	-0.169	0.167	-0.269 *	0.161
Second tertile of income distr.*(T+4)	-0.226	0.175	-0.330 *	0.172
Second tertile of income distr.*(T+5)	-0.017	0.185	-0.506 ***	0.175
Third tertile of income distr.*(T-2) (Ref. Category SWB at T-3*third tertile)	-0.136	0.138	0.030	0.136
Third tertile of income distr.*(T-1)	-0.177	0.138	-0.162	0.141
Third tertile of income distr.*(T)	-0.221	0.155	-0.199	0.138
Third tertile of income distr.*(T+1)	-0.343 **	0.160	-0.127	0.149
Third tertile of income distr.*(T+2)	-0.165	0.165	-0.267	0.164
Third tertile of income distr.*(T+3)	-0.143	0.171	-0.171	0.161
Third tertile of income distr.*(T+4)	-0.209	0.182	-0.286 *	0.167
Third tertile of income distr.*(T+5)	-0.200	0.187	-0.490 ***	0.177
Year and regional dummy	YES		YES	
Observations	7258		6939	
R-squared	0.092		0.095	
Number of groups	1333		1191	

Notes. *, **, *** indicate significance at 10%, 5% and 1%. Controlled for: other births, marital status, employment status, years of education, health status, share of the household's income, percentage of the housework, age groups.

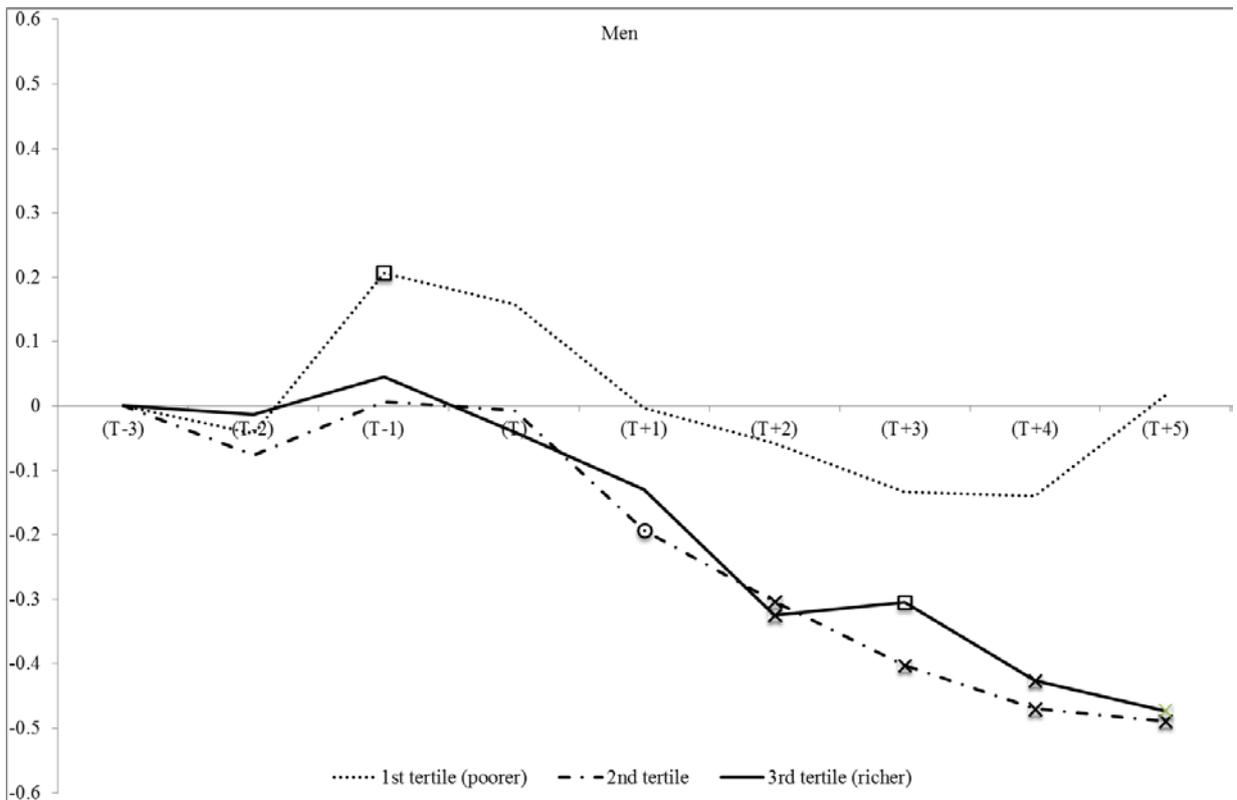
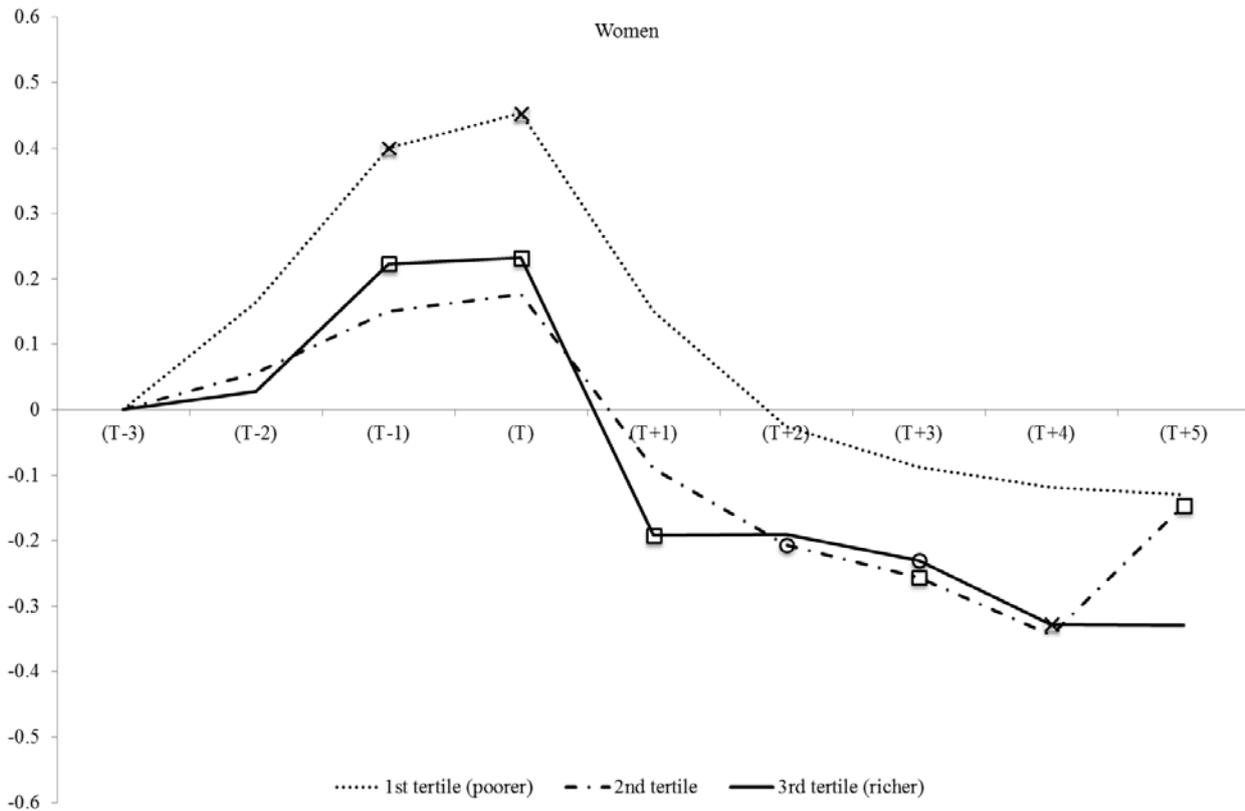


Fig.5 Women and men's SWB trajectories from 3 years before up to 5 years after the birth of the first child distinguished by individual labor income tertile as recorded at T-3 from the birth. Fixed-effect model. Notes: O, □, X indicate significance at 10%, 5% and 1%.

5.3. Equivalent household income

Our analysis can be sensitive to the measurement of income, thus we re-estimate the models with the equivalent income. As already noted, equivalent income is a good proxy for the resources available to an individual, given the household's composition. Besides, here we add to individual labor income other possible sources of income – e.g. rent and shares – as recorded at the household level. As in the previous estimation, the tertile in the distribution is assigned to all the individuals, separately by wave, by gender and according to the income average among the values recorded in the three years before childbirth.

Looking at the trajectories for poorer women, a positive and statistically significant difference with respect to the hedonic treadmill is detectable at T-2, T- 1 and T (Table 5), and this is true for women in the second tertile as well (Figure 6). Richer women show a positive and significant variation with respect to the hedonic treadmill in the year preceding birth and in the year of birth, while in T+2, T+3, T+4 and T+5 the variation is negative and statistically significant. As with the results obtained using the individual's labor income, the positive anticipation effect for poorer women is greater than for richer women with equivalent income. Moreover, similarly to the analysis for an individual's income, the negative effect after birth is stronger for the richer, even if, in this case, it is detectable only in the top tertile of income distribution. Conversely, men seem to experience a negative and statistically significant difference with respect to the treadmill at T+2, T+3 and T+4 (Table 5 and Figure 6).

If we compare the findings for the equivalent income with those from the estimations made on the basis of individual labor income, the negative effect for richer women, is still observable with respect to the poorer. However, men no longer display a significant difference in the trajectory of SWB across tertiles of equivalent income.

Table 5 Trajectories of SWB by gender and tertile of equivalent income
 Dependent variable: SWB, fixed-effect estimates

	Women		Men	
	(1)		(2)	
	Coeff.	s.e	Coeff.	s.e
(T-2) (Ref. Category SWB at T-3)	0.169 *	0.100	-0.038	0.111
(T-1)	0.365 ***	0.104	0.039	0.115
(T)	0.417 ***	0.111	0.176	0.113
(T+1)	0.039	0.120	-0.141	0.122
(T+2)	-0.140	0.118	-0.220 *	0.133
(T+3)	-0.105	0.130	-0.281 **	0.138
(T+4)	-0.068	0.140	-0.384 **	0.152
(T+5)	-0.082	0.151	-0.201	0.158
Second tertile of income distr. (Ref. Category: first tertile of income distr.)	-0.226	0.258	-0.133	0.172
Third tertile of income distr.	-0.144	0.298	-0.088 *	0.231
Second tertile of income distr.*(T-2) (Ref. Category SWB at T-3*second tertile)	-0.071	0.136	-0.074	0.143
Second tertile of income distr.*(T-1)	0.028	0.137	0.099	0.147
Second tertile of income distr.*(T)	-0.092	0.143	-0.209	0.145
Second tertile of income distr.*(T+1)	-0.025	0.150	-0.046	0.151
Second tertile of income distr.*(T+2)	-0.008	0.148	-0.006	0.161
Second tertile of income distr.*(T+3)	-0.054	0.152	0.031	0.161
Second tertile of income distr.*(T+4)	-0.093	0.158	0.140	0.170
Second tertile of income distr.*(T+5)	-0.124	0.163	-0.207	0.173
Third tertile of income distr.*(T-2) (Ref. Category SWB at T-3*third tertile)	-0.084	0.128	-0.026	0.135
Third tertile of income distr.*(T-1)	-0.216 *	0.130	-0.031	0.137
Third tertile of income distr.*(T)	-0.143	0.138	-0.235 *	0.131
Third tertile of income distr.*(T+1)	-0.115	0.142	-0.006	0.138
Third tertile of income distr.*(T+2)	-0.027	0.138	-0.102	0.148
Third tertile of income distr.*(T+3)	-0.095	0.149	-0.078	0.149
Third tertile of income distr.*(T+4)	-0.196	0.156	-0.066	0.159
Third tertile of income distr.*(T+5)	-0.237	0.156	-0.221	0.163
Year and regional dummy	YES		YES	
Observations	10633		9943	
R-squared	0.085		0.096	
Number of groups	2183		1823	

Notes. *, **, *** indicate significance at 10%, 5% and 1%. Controlled for: other births, marital status, employment status, years of education, health status, share of the household's income, percentage of the housework, age groups.

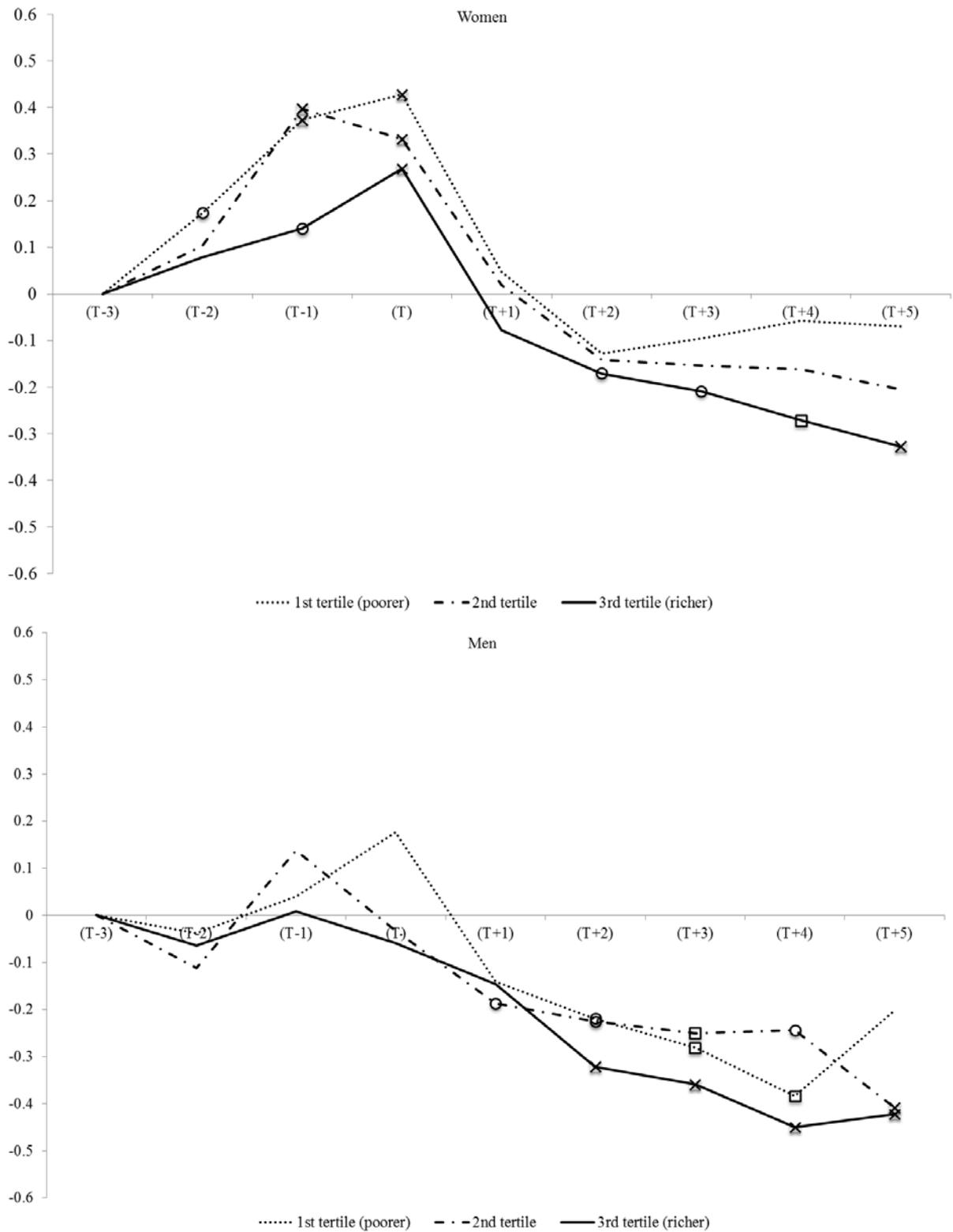


Fig. 6 Women and men's SWB trajectories from 3 years before up to 5 years after the birth of the first child by equivalent income tertile. Fixed-effect model. Notes: O, □, X indicate significance at 10%, 5% and 1%.

5.4. SWB, income and education

Individual labor income and education levels are related to each other in several ways. As already mentioned, the level of education affects income by remunerating the skills and the competences acquired by workers, thus increasing the wages (and opportunity costs) of better educated parents. In addition, income may convey information about the individual's investment in human capital, as well as expectations across different life domains. Consequently, one might expect better educated parents to have higher expectations in terms of career, as well as more access to alternative source of fulfillment: parenthood is not their only source of joy.

Education mediates the parental SWB in a complex way: it is a proxy for a demanding career, thus reducing SWB; but better educated parents might have more resources to cope with the strains of the parenthood. Another consideration is that better educated parents will perhaps have higher investment standards for childbearing and parenting (Nomaguchi and Brown, 2011).

We re-run model (2) for men and women, distinguishing by level of education, with the aim of analyzing how education mediates our results. As noted in Section 2, we consider individuals with eleven, or fewer years of completed education against those with more than eleven years.

As expected, relevant differences emerge between better educated and less educated individuals, regardless of gender. In terms of the set-point hypothesis, less educated individuals do not show any significant difference across tertiles of individual labor distribution. Looking at the upper part of Figure 7 it will be noted that, after an increase in SWB after birth, women's SWB returns to the hedonic treadmill, regardless of the tertile of income distribution. As for men, the bottom part of Figure 7 shows SWB trajectories across tertiles of income distribution, trajectories which almost overlap. These results are further confirmed by looking at columns (2) and (4) on Table 6, which do not show any significant differences in any points on the individual trajectories of SWB, between the second and the first tertile, or between the second and the third.

On the contrary, previous results about the anticipation effect before birth and the validity of the set-point theory are confirmed, for the better educated, both for men and for women. On the one hand, Figure 8 shows that a positive anticipation effect is detectable for women, especially the poorest women, but not for men. On the other, the SWB of both women and men is significantly reduced with respect to its treadmill in the years after the birth. For women this is true for those belonging to both the second (from T+2) and third (from T+4) tertile of income. Among men, meanwhile, the significant negative effect on SWB stands out only for the wealthiest (from T+2).

Table 6 Trajectories of SWB by gender, tertile of individual income and years of education.

Dependent variable: SWB, fixed-effect estimates. Columns (1) and (3) estimates for women and men with more than 11 years of education, (2) and (4) for those with 11 or less years of education.

	Women				Men			
	(1)		(2)		(3)		(4)	
	Coeff.	s.e	Coeff.	s.e	Coeff.	s.e	Coeff.	s.e
(T-2) (Ref. Category SWB at T-3)	0.102	0.111	0.425 *	0.229	0.024	0.143	-0.089	0.185
(T-1)	0.331 ***	0.123	0.606 ***	0.204	0.103	0.143	-0.024	0.212
(T)	0.435 ***	0.131	0.653 ***	0.242	0.218	0.147	0.190	0.195
(T+1)	0.011	0.136	0.322	0.270	0.020	0.152	-0.265	0.225
(T+2)	-0.172	0.138	0.081	0.253	0.001	0.169	-0.456 *	0.234
(T+3)	-0.103	0.151	-0.043	0.283	-0.081	0.180	-0.497 **	0.235
(T+4)	-0.079	0.161	-0.107	0.318	-0.197	0.190	-0.602 **	0.270
(T+5)	-0.154	0.174	-0.053	0.343	0.043	0.201	-0.492 *	0.272
Second tertile of income distr.								
(Ref. Cat.: 1st tertile of income distr.)	-0.295	0.326	0.218	0.445	-0.265	0.225	0.158	0.305
Third tertile of income distr.	-0.211	0.379	0.359	0.519	-0.012	0.250	-0.435	0.497
Second tertile of income distr.*(T-2)								
(Ref. Category SWB at T-3*2nd	-0.060	0.151	-0.117	0.324	-0.041	0.176	-0.170	0.268
Second tertile of income distr.*(T-1)	-0.003	0.155	-0.104	0.317	0.135	0.180	0.045	0.276
Second tertile of income distr.*(T)	-0.130	0.161	-0.154	0.335	-0.066	0.182	-0.488 *	0.261
Second tertile of income distr.*(T+1)	-0.043	0.164	-0.078	0.355	-0.013	0.185	-0.196	0.290
Second tertile of income distr.*(T+2)	0.041	0.167	-0.311	0.339	-0.052	0.199	0.021	0.288
Second tertile of income distr.*(T+3)	-0.066	0.170	-0.106	0.355	0.034	0.210	0.006	0.279
Second tertile of income distr.*(T+4)	-0.046	0.180	-0.229	0.358	0.233	0.209	0.059	0.311
Second tertile of income distr.*(T+5)	-0.015	0.187	-0.342	0.365	-0.195	0.220	-0.171	0.296
Third tertile of income distr.*(T-2)								
(Ref. Category SWB at T-3*3rd	0.019	0.143	-0.504	0.310	-0.026	0.168	-0.153	0.256
Third tertile of income distr.*(T-1)	-0.187	0.153	-0.490 *	0.284	-0.066	0.166	0.000	0.274
Third tertile of income distr.*(T)	-0.117	0.158	-0.350	0.331	-0.240	0.161	-0.281	0.255
Third tertile of income distr.*(T+1)	-0.091	0.159	-0.018	0.361	-0.088	0.163	0.030	0.287
Third tertile of income distr.*(T+2)	-0.014	0.159	0.043	0.348	-0.218	0.178	0.041	0.293
Third tertile of income distr.*(T+3)	-0.097	0.171	-0.166	0.360	-0.191	0.184	0.103	0.285
Third tertile of income distr.*(T+4)	-0.200	0.181	-0.123	0.360	-0.189	0.194	0.224	0.299
Third tertile of income distr.*(T+5)	-0.179	0.182	-0.268	0.377	-0.299	0.201	-0.090	0.309
Year and regional dummy	YES		YES		YES		YES	
Observations	7936		2697		6402		3541	
R-squared	0.085		0.129		0.091		0.124	
Number of groups	1562		743		1151		766	

Notes. *, **, *** indicate significance at 10%, 5% and 1%. Controlled for: other births, marital status, employment status, years of education, health status, share of the household's income, percentage of the housework, age groups.

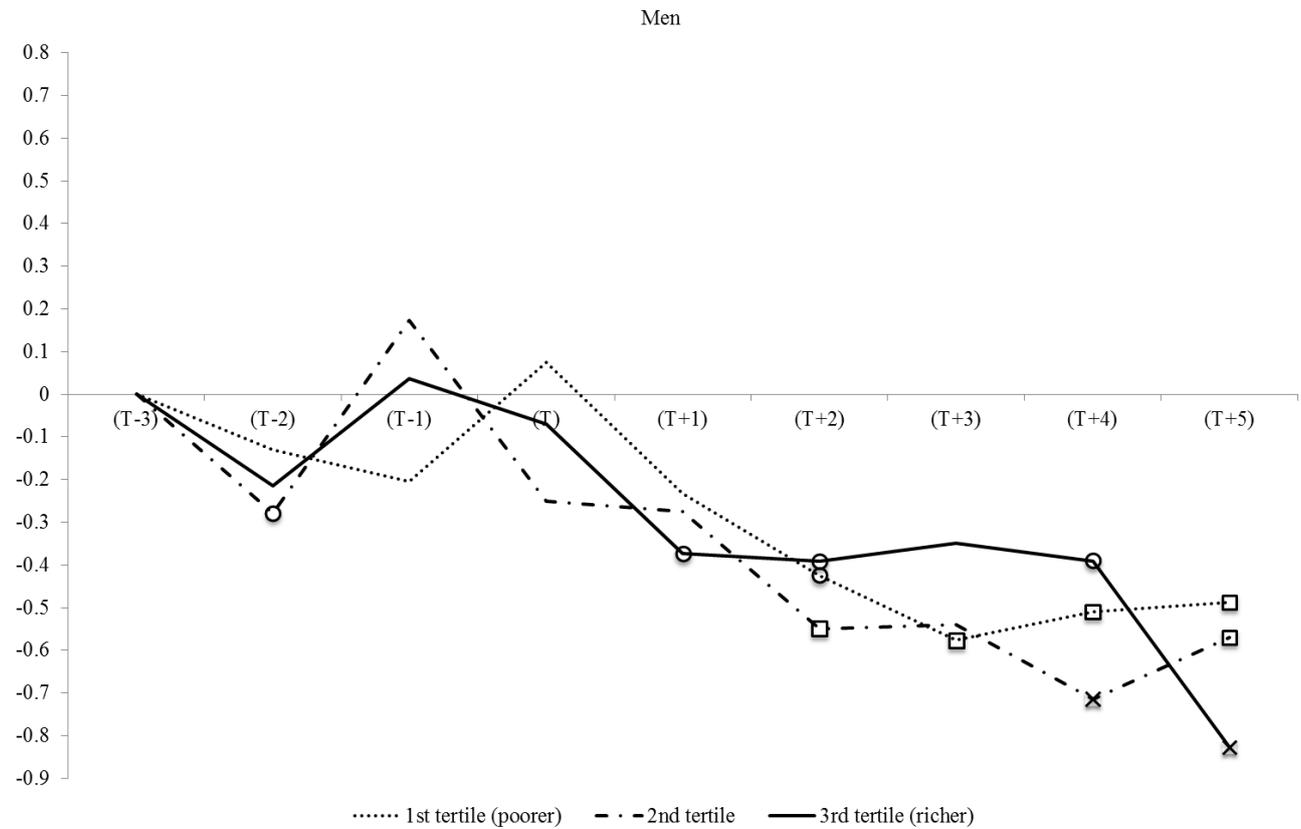
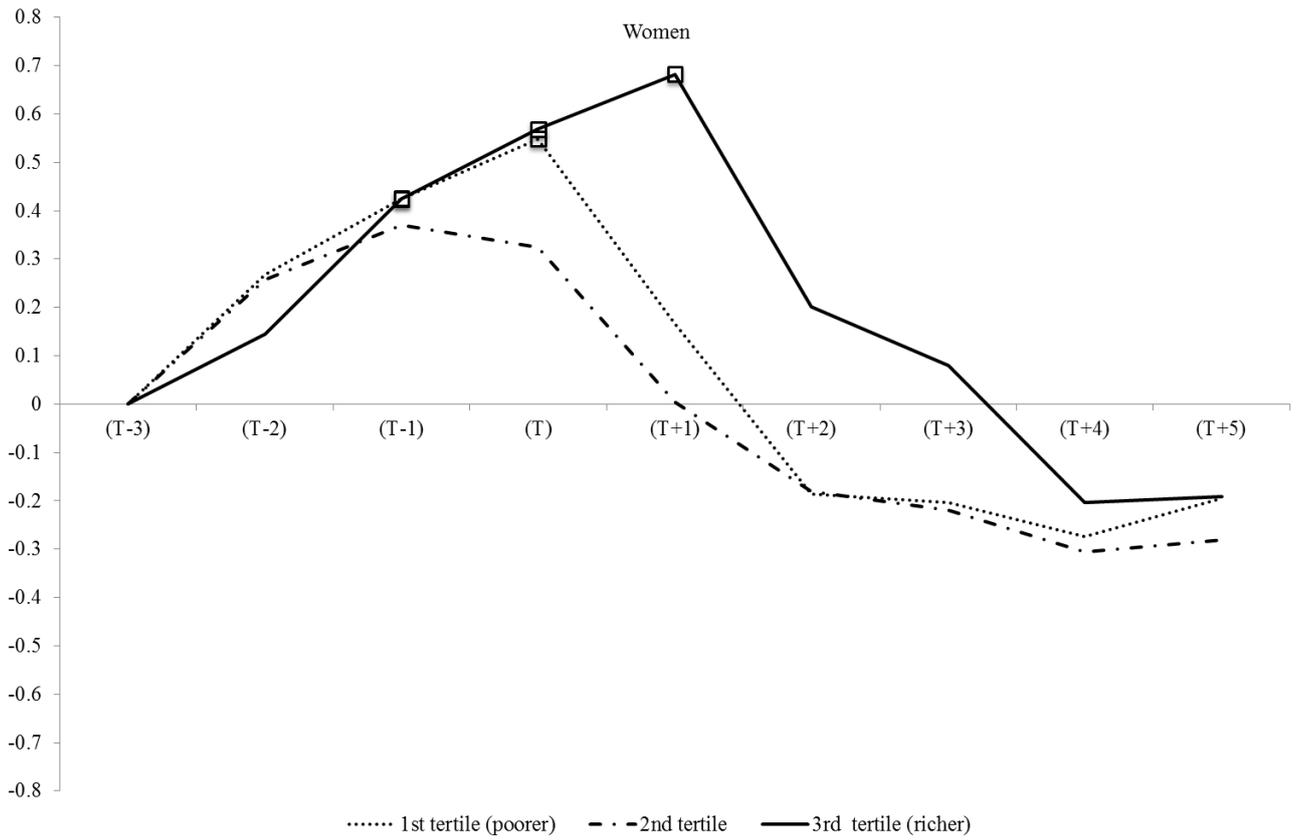


Fig. 7. Women and men's SWB trajectories from 3 years before up to 5 years after the birth of the first child by individual income tertile. Parents with 11 years of education or less. Fixed-effect model. Notes: O, □, X indicate significance at 10%, 5% and 1%.

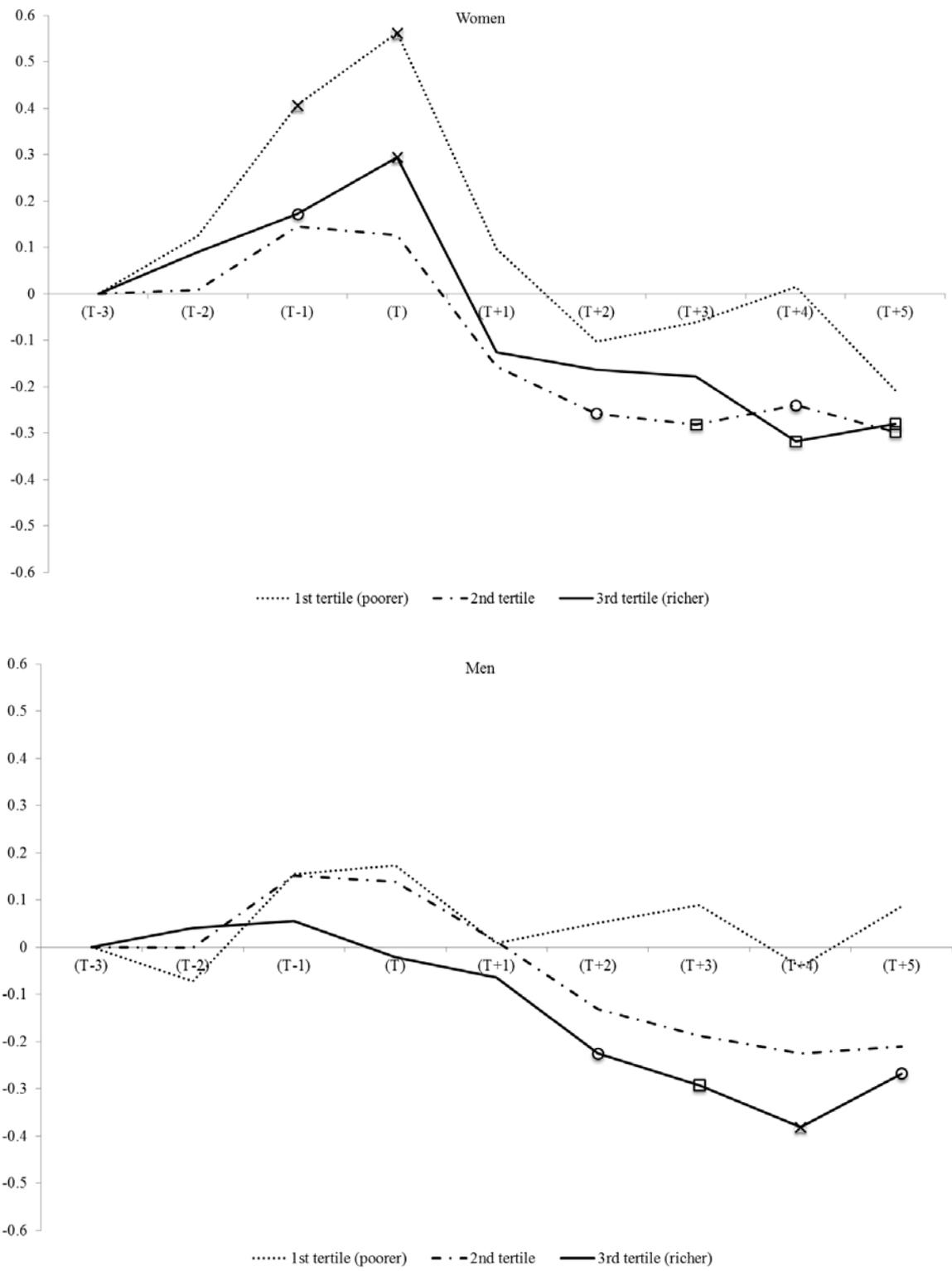


Fig. 8. Women and men’s SWB trajectories from 3 years before up to 5 years after the birth of the first child by individual income tertile. Parents with more than 11 years of education. Fixed-effect model. Notes: O, □, X indicate significance at 10%, 5% and 1%.

6. Conclusion

In this paper we have studied the empirical relationship between fertility and income in Germany, using SWB. Our investigation, separated by gender, is based on the estimation of parental SWB trajectories before and after the birth of the first child. We show important differences in the effect of childbirth on individual SWB trajectories according to the income of parents and this effect interacts with their level of education. Our study contributes the crucial finding that income does negatively matter for enjoying the birth of a first child, this evidence being mainly ascribable to better educated parents.

In particular, women diverge positively from their SWB hedonic treadmill (i.e. the level of SWB reported three years before the childbearing event) in the year immediately before childbirth, revealing a clear anticipatory effect. Moreover, the differences by level of income are substantial, with the anticipatory effect for low-income mothers being about twice as large as for women in middle and high-income groups. When education is considered, among the less educated mothers the anticipation effect is greater for the wealthier; while the opposite is true among better educated women. For men we do not see any significant anticipation effect, regardless of their level of income and education.

As for the period following the childbearing event, we find a standard decline of SWB consistent with many other recent studies. Among more educated women, the decline of SWB after birth is significant for both those in the second and the third tertile of individual income, falling below the set-point level. The same dynamic is present for more educated men, and has an even higher statistical significance. Among parents belonging to the low-income and better educated group the validity of the set-point hypothesis seems, instead, to be proved, regardless of gender. Certainly, their SWB in the years after the birth of their first child is not significantly different from its pre-birth level. On the contrary, less educated parents do not show any significant differences across level of individual labor income. Less educated women positively deviate from their treadmill with the birth, while they permanently come back to the treadmill in the years afterwards, regardless of income level. Less educated men do not show any anticipatory effect for the birth and negatively deviate from their treadmill in the years following on, regardless of their level of income.

When considering these results, we need to acknowledge that SWB conveys information that goes beyond the strict monetary costs and benefits related to specific life events. SWB allows, unlike the neoclassical economic approach, an understanding of the psychological consequences of life events, even if they have primarily an economic facet. The social comparison and contextual

environment, as well as habituation, attitudes and aspirations should be taken into account in studying the interplay between fertility, SWB and income. Hence, these factors can help interpret our results. The evidence of the non-monetary consequences of the birth of the first child on the SWB of mothers and fathers (with different levels of income) is our contribution to the literature on the relationship between these three variables. Adopting the Beckerian framework, we would have tested whether mothers and fathers, with different incomes, had different preferences for childbearing, assuming that the number of children they actually have maximizes their utility. Alternately, we might have quantified – for given preferences – the strict monetary consequences of childbearing. The SWB estimation gives, instead, in the years before and after childbirth, a good deal of information that incorporates the aspirations and adaptation processes experienced by different income level parents. This approach is, however, limited by the difficulty of disentangling the role played by each of these factors and that of parental preferences: there we can only speculate.

On one hand, for lower income parents a child may impose a lower loss in forgone earnings and the net increase in SWB may be stronger, assuming that a child produces feelings of well-being for the parent. On the other, low-income parents may have more limited dimensions or sources of well-being than their higher income peers. Assuming that these higher income men and women care more about their careers, and more generally have a broader set of SWB dimensions, then the presence of a child, may dominate their lives less. Thus, low-income parents possibly give more weight to parenthood compared to high-income ones, and, therefore, the opportunity costs argument ceases to matter.

With these points in mind, our results can be attributed to differences in preferences among groups of parents. High-income individuals care more about their careers, or have a broader set of sources for their SWB dimensions, in so far as they have different preferences in comparison with low-income parents. This is a plausible explanation for the differences that we have found in SWB anticipation and adaptation. In particular, women in the lowest tertile of the income distribution, and those with a lower level of education, potentially consider maternity as a crucial self-realization goal, while the same is not necessarily true for the richer and the better educated.

Alternatively, our results may be explained by the difficulties in reconciling work and family after childbirth and these differences are not, of course, solely about money. This aspect might play an important role in reducing parental SWB in the childbirth period for the better educated parents in the upper part of labor income distribution. In fact, these parents should more easily conciliate the demands of work and family, if these demands are solved by finding and paying for childcare. Reconciliation may be difficult not least because parents, and especially

better educated women with a high labor income have likely invested more in human capital, in comparison with those with a lower income or lower levels of education. As a consequence, the smaller increase in SWB at childbirth, and the drop in the SWB experienced by high income women following that event, can be imputable, among other things, to the limits placed on career opportunities. In psychological terms, the loss in SWB may, instead, be due to the intrinsic difficulties in playing the double role of mother and worker, and here better educated mothers may find parenting more demanding (Nomaguchi and Brown 2011).

Finally, our findings give further insights into why, in a country like Germany, the relationship between income and fertility remains negative at the micro level. The effect that we have found on SWB is certainly linked with Germany's welfare system, typically classified as "Christian democratic or conservative" (Esping-Andersen 1990). German welfare offers a medium level of decommodification and permits a high degree of social stratification. More specifically, Germany is a country where family policies have, until very recently, favored the single-earner family model, and there was little effort to support full-time maternal employment (Kreyenfel and Andersson 2014). Child care for children under three years of age is limited and until 2007 parental leave regulations offered parents a job-protected leave for an extended period, though with allowances which bore no relation to their wages. Moreover, the tax system still discourages female labor participation. In this respect, the present paper gives indirect support to those studies showing how different countries with different institutional frameworks have quite various SWB-fertility relationships, with different levels of intensity. In some countries parents' attempts to combine work and family life, and, therefore, to enjoy childbirth, are impeded; in other countries they are, instead, facilitated.

References

- Aassve, A., Goisis, A., & Sironi, M. (2012). Happiness and childbearing across Europe. *Social Indicators Research*, 108 (1), 65-86.
- Aassve, A., Mencarini, L., & Sironi, M. (2015). Institutional change, happiness and fertility, *European Sociological Review*, 31 (6), 749-765.
- Andersson, G. (2000): The impact of labour-force participation on childbearing behavior: Pro-cyclical fertility in Sweden during the 1980s and the 1990s. *European Journal of Population*, 16, 293-333.
- Andersson, G., Kreyenfeld, M., & Mika, T. (2014). Welfare state context, female labour-market attachment and childbearing in Germany and Denmark, *Journal of Population Research*, 31, 287–316.
- Argyle, M. (2001). *The Psychology of Happiness*. London: Routledge, 2nd ed.
- Baranowska, A. (2010). Family formation and subjective well-being. A literature overview". *Working Papers, n. 5, ISID, Institute of Statistics and Demography, Warsaw School of Economics*.
- Becker, G. S., & Lewis, H.G. (1973). *Quarterly journal of economics*, 103(1), 1-25.
- Becker, G.S. (1960). An economic analysis of fertility. *Demographic and economic change in developed countries*. Columbia University Press, 209-240.
- Becker, G. S. (1981). Altruism in the Family and Selfishness in the Market Place. *Economica*, 1-15.
- Berninger, I. (2013). Women's income and childbearing in context: First births in Denmark and Finland. *Acta Sociologica*, 56(2), 97-115.
- Billari, F.C., & Kohler H.-P. (2009). Fertility and happiness in the XXI century: Institutions, preferences, and their interactions. Paper presented at the XXVI IUSSP International Population Conference in Marrakech, Morocco, 27 September-2 October, 2009.
- Blanchflower, D.G., & Oswald, A.J. (2004). Well-being over time in Britain and the USA. *Journal of public economics*, 88(7), 1359-1386.
- Brewster, K.L., & Rindfuss, R.R. (2000). Fertility and women's employment in industrialized nations. *Annual review of sociology*, 271-296.
- Brickman, P., & Campbell, D.T. "Hedonic Relativism and Planning the Good Society. *Adaptation Level Theory: A Symposium (Academic Press, New York)*. 1971.
- Cigno, A. (1986). Fertility and the tax-benefit system: A reconsideration of the theory of family taxation. *The Economic Journal*, 1035-1051.
- Cigno, A. (1991). *Economics of the family*, Clarendon Press,
- Clark, A.E., & Oswald, A.J. (1994). Unhappiness and unemployment. *The Economic Journal*, 648-659.
- Clark, A.E., & Oswald, A.J. (2002). A simple statistical method for measuring how life events affect happiness. *International Journal of Epidemiology*, 31 (6), 1139-1144.
- Clark, A.E., Diener, E.D., Georgellis, Y., & Lucas, R.E. (2008). Lags and leads in life satisfaction: A test of the baseline hypothesis. *The Economic Journal*, 118 (529), 222–243.
- Csikszentmihalyi, M., & Hunter, J. (2003). Happiness in everyday life: The uses of experience sampling. *Journal of Happiness Studies*, 4 (2), 185-199.

- Di Tella, R., Haisken-De New, J., & MacCulloch, R. (2010). Happiness adaptation to income and to status in an individual panel. *Journal of Economic Behavior & Organization*, 76 (3), 834-852.
- Diener, E., Suh, E.M., Lucas, R.E., & Smith, H. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin*, 125, 276-302.
- Duesenberry, J. S. (1949). *Income, Savings and the Theory of Consumer Behavior*. Cambridge, MA: Harvard University Press.
- Easterlin, R.A. (1974). Does economic growth improve the human lot? Some empirical evidence. *Nations and households in economic growth*, 89, 89-125.
- Easterlin, R.A. (1995). Will Raising the Incomes of All Increase the Happiness of All? *Journal of Economic Behaviour and Organization*, 27(1), 35-48.
- Easterlin, R.A. (2006). Life cycle happiness and its sources. Intersections of psychology, economics, and demography, *Journal of Economic Psychology*, 27, 463-482.
- Engelhart H, Kogel T, Prskawetz A. (2004). Fertility and women's employment reconsidered: a macro-level time-series analysis for developed countries, 1960 – 2000. *Population Studies*, 58, 109-120.
- Engelhardt, H. & Prskawetz, A. (2004). On the changing correlation between fertility and female employment over space and time. *European Journal of Population* 20: 35-62.
- Engelhardt, H., T. Kögel, & Prskawetz, A. (2004). Fertility and women's employment reconsidered: A macro-level time-series analysis for developed countries, 1960-2000. *Population Studies* 58(1): 109-120.
- Esping-Andersen, G. (1990). *The three worlds of welfare capitalism*, Cambridge, Polity Press.
- Esping-Andersen, G., & Billari, F.C. (2015). Re-theorizing Family Demographics. *Population and Development Review*, 41 (1), 1-31.
- Ferrer-i-Carbonell, A., & Frijters, P. (2004). How Important is Methodology for the estimates of the determinants of Happiness? *The Economic Journal*, 114 (497), 641-659.
- Frejka, T. (2008). Overview Chapter 2: Parity distribution and completed family size in Europe Incipient decline of the two-child family model. *Demographic research*, 19 (14), 47-72.
- Frey, B.S., & Stutzer, A. (2002). *Happiness and Economics*, Princeton: Princeton University Press.
- Frey, B.S., & Stutzer, A. (2000). Happiness, economy and institutions. *The Economic Journal*, 110 (466), 918-938.
- Goldscheider, F., Bernhardt, E., & Lappegård, T. (2015). The gender revolution: A framework for understanding changing family and demographic behavior. *Population and Development Review*, 41(2), 207-239.
- Gregory, E. (2007). *Ready: Why women are embracing the new later motherhood*. New York, NY: Basic Books.
- Hart, R.K. (2015). Earnings and first birth probability among Norwegian men and women 1995-2010. *Demographic Research*, 33, 1067-1104.
- Kahneman, D., Diener, E., & Schwarz, N. (1999) eds. *Well-being: Foundations of hedonic psychology*. Russell Sage Foundation.
- Kögel, T. (2004). Did the association between fertility and female employment within OECD countries really change its sign? *Journal of Population Economics* 17(1): 45-65.

- Kohler, H-P. (2012). Do children bring happiness and purpose in life? *Whither the Child? Causes and Consequences of Low Fertility*, (eds.) Eric Kaufman and W. Bradford Wilcox, pp. 47–75. Boulder & London: Paradigm.
- Kohler, H-P., Behrman, J.R., & Skytthe, A. (2005) Partner+ Children= Happiness? The Effects of Partnerships and Fertility on Well-Being. *Population and Development Review*, 31 (3), 407-445.
- Kohler, H-P., & Mencarini, L., (2016), “The Parenthood Happiness Puzzle: An Introduction to Special Issue”, *European Journal of Population*, 32 (3), 327-338.
- Kotowska, I.E., Matysiak, A., Pailhe A., Solaz, A., Styrac M., Vignoli, D. (2010), Family and work, Second European Quality of Life Survey, Eurofond (The European Foundation for the Improvement of Living Conditions), Dublin.
- Kreyenfeld, M.; Andersson, G. (2014) Socioeconomic differences in the unemployment and fertility nexus: evidence from Denmark and Germany, *Advances in Life Course Research*, 21, 59-73.
- Le Moglie, M., Mencarini, L., & Rapallini, C. (2015). Is it just a matter of personality? On the role of subjective well-being in childbearing behavior. *Journal of Economic Behavior & Organization*, 117, 453-475.
- Luci, A., & O. Thévenon. "Does Economic Development Explain the Fertility Re bound in OECD countries." *Population and Societies* 481.1 (2011): 4.
- Luci-Greulich, A., & Thévenon, O. (2014). Does economic advancement ‘cause’ a re-increase in fertility? An empirical analysis for OECD countries (1960–2007). *European Journal of Population*, 30 (2), 187-221.
- Margolis, R., & Myrskylä, M. (2011). A global perspective on happiness and fertility. *Population and Development Review*, 37(1), 29-56.
- Matysiak, A., Mencarini, L., & Vignoli, D. (2016). Work–Family Conflict Moderates the Relationship Between Childbearing and Subjective Well-Being, *European Journal of Population*, 32 (3), 355-379.
- McDonald, P. (2000). Gender equity in theories of fertility transition. *Population and Development Review*, 26 (3), 427-439.
- McLanahan, S., & Adams, J. (1987). Parenthood and psychological well-being. *Annual review of sociology*: 237-257.
- Modigliani, F. (1949). Fluctuations in the Saving-Income Ratio: A Problem in Economic Forecasting. *Conference on Research in Income and Wealth*. New York.
- Myers, D.G. (2000), The funds, friends, and faith of happy people. *American Psychologist*, 55, 56-67.
- Myrskylä, M., & Margolis, R. (2014). Happiness: Before and after the kids. *Demography*, 51(5), 276-347.
- Myrskylä, M., Kohler, H-P., & Billari, F. (2009). Advances in development reverse fertility declines. *Nature* 460.7256, 741-743.
- Myrskylä, M., Kohler, H-P., & Billari, F. (2011). High development and fertility: fertility at older reproductive ages and gender equality explain the positive link, *Penn Population Studies Center WP*
- Neyer, G., & Andersson, G. (2008). Consequences of family policies on childbearing behavior: effects or artifacts?. *Population and Development Review*: 699-724.

- Nomaguchi, K.M., & Milkie, M.A. (2003). Costs and rewards of children: The effects of becoming a parent on adults' lives. *Journal of marriage and family*, 65 (2), 356-374.
- Oswald, A.J. (1997). Happiness and economic performance. *The Economic Journal*, 107 (445), 1815-1831.
- Pollack, R.A. (1970). Habit Formation and Dynamic Demand Functions. *Journal of Political Economy*, 78(4), 745-763.
- Proto, E., & Rustichini, A. (2015). Life satisfaction, income and personality. *Journal of Economic Psychology*, (48), 17–32.
- Rønsen, M. (2004). Fertility and public policies - Evidence from Norway and Finland. *Demographic Research*, 10, 143-170.
- Sheldon, K. M., & Lucas, R. E. (Eds.). (2014). *Stability of happiness: Theories and evidence on whether happiness can change*. Elsevier.
- Silva, E., & Dribe, M. (2010). Income and Fertility – What is the Relationship and how has it changed since 1970? A Longitudinal Register-based Study of Sweden”, *mimeo*.
- Stevenson, B., & Wolfers, J. (2008). Economic growth and subjective well-being: Reassessing the Easterlin paradox. *National Bureau of Economic Research*, No. w14282.
- Tasiran, A. (1995). *Fertility Dynamics: Spacing and Timing of Births in Sweden and the United States*. Amsterdam: Elsevier, 1995.
- Umberson, D., Crosnoe, R., & Reczek, C. (2010). Social relationships and health behavior across the life course. *Annual review of sociology*, 36, 139.
- Van de Kaa, D. J. (1987). Europe's second demographic transition. *Population bulletin*, 42: 1-59.
- Van Praag, B., Goedhart, T., & Kapteyn, A. (1980). The Poverty Line--A Pilot Survey in Europe. *The Review of Economics and Statistics*, 461-465.
- Veenhoven, R. (1993). *Happiness in nations: Subjective appreciation of life in 56 nations 1946-1992* RISBO, Erasmus University Rotterdam, The Netherlands.
- Vikat, A. (2004). Women's Labor Force Attachment and Childbearing in Finland. *Demographic Research Special Collection*, 3 (8), 177-212.
- Williams, D.E., & Thompson J.K. (1993). Biology and Behavior: A Set-Point Hypothesis of Psychological Functioning. *Behavior Modification*, 17 (1), 43-57.