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Working Paper N. 20/2014

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Via delle Pandette 9, 50127 Firenze, Italia
www.disei.unifi.it

*Is It just a matter of personality? On the role of life satisfaction in childbearing behavior**

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KEYWORDS: Subjective well-being, fertility by parity, personality traits, GSOEP survey

**We thank seminar participants at 1st SWELLFER Workshop Turin 24-25 September 2013; Wellbeing and public policy conference, Hamilton College (Utica US), 10-12 June 2014; Sustaining quality of life across the globe, the XXII Quality of Life Conference, Berlin 15-18 September 2014; Italian Association of Public Economics, XXVI Annual Conference, Pavia 26 September 2014; Personality Traits and Subjective Well-being in the Life Course, SWELL-FER Workshop, Turin 29 September 2014.*

The paper is also available in Carlo Alberto Notebooks series, n. 363/2014 http://www.carloalberto.org/assets/working-papers/no.363.pdf.

The research leading to these results has received funding from the European Research Council under the European ERC Grant Agreement n. StG-313617 (SWELL-FER: Subjective Well-being and Fertility): PI. Letizia Mencarini http://swellfer.wordpress.com/

Abstract

This paper analyses the role of individual subjective wellbeing (SWB) in conjunction with personality traits (PTs) in childbearing behavior. We use the German Socio Economic Panel to estimate the way satisfaction matters for having a child. We find that SWB positively predicts childbearing, with the effect significant for both genders only for the second child. By controlling that this is not caused by PTs either on SWB or fertility, we assure that the effect of SWB on fertility is not determined by PTs, therefore leaving room for adequate policy measures aimed at raising SWB, which in turn would sustain fertility.

1. INTRODUCTION

A key finding from psychology is that subjective wellbeing is strongly mediated by the respondents' personality (Costa & McCrae, 1980). At the same time, several studies have suggested that personality matters for childbearing behavior (Jokela, Alvergne, Pollet & Lummaa, 2011; Dijkstra & Barelds, 2009; Jokela, Kivimäki, Elovainio & Keltikangas-Järvinen, 2009). Another burgeoning literature is focusing on the way subjective wellbeing (SWB) associates with childbearing (Aassve, Goisis & Sironi, 2012; Billari & Kohler, 2009; Baranowska & Matysiak, 2011; Kohler, Behrman & Skythe, 2005; Margolis & Myrskyla, 2011; Myrskyla & Margolis, 2014). So far there has not been any systematic analysis of the triangular relationship of these three dimensions. This paper tackles this issue head on by using the German Socio Economic Panel Survey, which

contains repeated information about subjective wellbeing, childbearing events and, importantly, measures of respondents' personality.

There are many important reasons for considering this triangular relationship among SWB, personality and fertility behavior. From the demographic side, the key interest lies in fertility trends and differentials and the over-riding concern of late has been that most developed countries are now facing fertility rates well below the replacement rate. These rather dramatic fertility trends, notwithstanding the stark differences across countries, have sparked a very lively debate, not only in terms of policy perspectives, but also for the theoretical understanding of fertility behavior. The new trends have become an unsolved puzzle for existing theories of fertility dynamics, in that they no longer adequately respond to why people still have children in contemporary advanced societies, and also why in some societies fertility is even rebounding, as appears to be the case in both Nordic and Anglo-Saxon countries (Goldstein, Sobotka & Jasilioniene, 2009).

The interest in how fertility behavior links with subjective wellbeing stems from the fact that childbearing in modern societies is very much viewed as part of a series of choices aimed at the self-realization of the individual. As Van de Kaa (1987) pointed out already more than three decades ago, one side of new demographic behavior is that individuals put stronger importance to their own realization and their psychological wellbeing. Consequently demographers have started to give much more emphasis to the way SWB plays a role in how individuals make decisions

about childbearing. The cornerstone in this literature, although not always expressed explicitly, is that individuals' decision-making derives from the quest for happiness, of which children presumably make up an important component. A corollary of this argument is that fertility is higher in those societies where couples derive a higher level of SWB from childbearing.

An important weakness of this literature, however, is the implicit assumption that SWB is a function of childbearing. The analysis is consequently based on regressions where the dependent variable is the standard overall measure of SWB, typically approximated by a ten point scale measure of reported happiness or satisfaction. But this approach appears to have come about more as an empirical bandwagon rather than being derived from strong theoretical arguments. Quite on the contrary, there are compelling arguments for taking the opposite approach: childbearing is a decision that couples make in which their mental wellbeing might very well plays an important role. Intuitively, it would make sense if optimistic and satisfied people feel they are better prepared to start the monumental task of forming a family, in which case the level of satisfaction should be positively related to the likelihood of childbearing. This perspective is convincingly supported empirically from same studies taking a longitudinal perspective: there is almost always a strong anticipation effect when SWB is considered as a function of childbearing event (Myrskylä & Margolis, 2014).

Our analysis is based on the 1984 to 2011 waves of the German Socioeconomic Panel Survey (GSOEP). Other than being a longitudinal

survey of very high quality, the German case serves as a particularly interesting example when considering fertility behavior. Despite being the economic locomotive of Europe, the country also suffers from a long lasting decline in fertility, and with the current Total Fertility Rate (TFR) of less than 1.4 children per woman (Eurostat data for 2011) it is coming close to joining the club of lowest-low fertility countries such as those of the Southern and Eastern Europe (Billari & Kohler, 2004). Our dependent variable is derived from observed childbearing events and we run separate models by child parity. This distinction is critically important and informative about potential policy implications, since low overall fertility is partly driven by high rates of voluntary childlessness and in part by a low progression from the first to the second birth (Frejka 2008). Our measure of SWB is temporally lagged, meaning that is it measured from the wave preceding the childbearing events, thereby reducing the problems of reversed causality. Moreover, surveys are beginning to include more sophisticated information about individuals' personality traits (PTs) and attitudes, and the GSOEP is no exception. We embed PTs into our analysis by using the standard "Big-five" construct (Costa & McCrae, 1980). Therefore, we are able to assess to what extent SWB matters for childbearing but explicitly elaborating on the role played by personality.

2. LITERATURE REVIEW

2.1 Subjective wellbeing and personality traits

There is now an extensive literature suggesting that personality plays a major role for reported subjective wellbeing (e.g. Costa & McCrae, 1980; Diener, 1984; McCrae & Costa, 1991; Myers, 1992; Myers & Diener, 1995; DeNeve & Cooper, 1998). However, the *personality-oriented perspective*, for which personality has the larger impact on SWB (Diener, Suh, Lucas & Smith, 1999) is contrasted with the *event oriented perspective*, where life events introduce permanent changes in SWB (Blanchflower & Oswald 2004 and 2008), independently of PTs. This debate is largely influenced by the multiple distinct variety of personality and SWB constructs.

As for the measurement of personality, there is substantial agreement among personality psychologists on a five-factor structure to account for substantive co-variations in personality descriptions (the so-called Big Five). These five factors are robust to factor analysis techniques, rotating procedures and language. There is also broad agreement about the labeling of the five traits: I "Extroversion" (attitude to being active, being forthcoming and desiring social relationships); II "Agreeableness" (being friendly, warm and sensitive towards others), III "Conscientiousness" (being systematic, goal-oriented and self-disciplined), IV "Neuroticism" (worrying, being nervous and emotionally unstable) and V Intellect (or "Openness" to Experience – being imaginative, creative, curious and unconventional). The Big Five are usually measured using a

self-reported Five Factor Inventory (Costa & McCrae, 1989) and consists of sixty items. With the onset of large household surveys incorporating PTs, there has been a need to reduce the number of items, and both the GSOEP and the BHPS panel surveys operate with 15 items. Though open for debate, there is reasonably strong support about its reliability (Gosling, Rentfrow & Swann, 2003).

The influence of these five dimensions of personality on SWB is investigated by DeNeve & Cooper (1998), distinguishing between the two dimensions of subjective well-being, i.e. the affective (the positive and negative affect and the balance between them) and the cognitive, i.e. the life satisfaction (Hayes & Joseph, 2003). In their meta-analysis, they suggest that "Neuroticism" is the most important predictor of negative affect and life satisfaction, while "Extraversion" and "Agreeableness" are identified as the dimensions with the greatest predictive capacity for positive affect. "Conscientiousness" has also been identified by some authors as a variable related to both dimensions of affect and life satisfaction. Consistently, McCrae & Costa (1991) suggest that "Agreeableness" and "Conscientiousness" may increase the probability of positive experiences in social and achievement situations respectively, and this in turn is directly related to SWB. On the other hand, "Openness" to experience should lead the person to experience both more positive emotional states and more negative ones. The same authors argue that "Extraversion" has an influence on positive affect, while "Neuroticism" influences negative affect. This leads them to assert that these two basic

dimensions of personality lead to positive and negative affect respectively (Costa & McRae, 1980; McCrae & Costa, 1991). Recent studies, where controlling for demographic variables (even simultaneously) has become a standard, confirm the previous results (Bostic & Ptacek, 2001; Gonzalez Gutierrez, Jimenez, Hernandez & Puente, 2005; Hayes & Joseph, 2003).

2.2. Subjective wellbeing and fertility

The empirical literature dealing explicitly with the interplay between SWB and fertility is rather limited, although there is now a strong sense that the relationship between SWB and demographic behavior (and in particular childbearing) deserves attention (Hobcraft, 2006; Billari, 2009) Only very recently have demographers begun to appreciate the potential importance of SWB (Billari, 2009; Billari & Kohler, 2009, Dykstra & Keizer, 2009; Kohler, Behrman & Skytthe, 2005; Margolis & Myrskylä, 2011). The novelty derives in part from the improved availability of individual-level data (including longitudinal data), which is now allowing the development of direct indicators of individuals' SWB.

From a purely theoretical perspective, the effect of SWB on reproductive behavior does not provide unambiguous predictions: higher SWB may predict either higher or lower fertility (Parr, 2010). Since depression and stress, two important negative aspects of lower SWB, have been found to contribute to reduced fecundity, and also trigger miscarriages and still births, they should also reduce subsequent fertility (Zemishlany & Weizman, 2008). On the other hand, fertility may come

about because having a partner contributes to a person's satisfaction with life, which would naturally affect fertility positively if the relationship is a good one (Zimmermann & Easterlin, 2006). However, higher satisfaction may on the contrary lower fertility because of aversion to lifestyle changes. This is typically used as a justification for voluntary childlessness (Mencarini & Tanturri, 2007; Tanturri & Mencarini, 2008).

From an empirical point of view, the few studies which include SWB as a determinant of fertility obtain results that are consistent across gender and seem to support a significant and positive effect of SWB on fertility. For instance, Perelli-Harris (2006) shows that in Russia, SWB is significant and positively related to wanting and having additional children. Using the European Social Survey, Billari (2009) shows that happier people are more likely to intend to have a(nother) child. Parr (2010), using longitudinal data from Australia, finds that life satisfaction is a determinant of fertility and, for both sexes, there is a strong positive relationship between prior satisfaction with life and fertility two years later. These recent results are reinforced by complementary evidence that people who are dissatisfied with life have strikingly low fertility rates.

However, as also Parr (2010) underlines, there are important limitations and caveats in the existing studies, which give room for further research. In particular, while surveys contain an array of observable factors, it is not easy to control for unobservable differences in people's preferences regarding children (Margolis & Myrskylä, 2011). The extent to which omitted unobserved characteristics matter for the statistical

relationship between fertility and SWB is certainly not clear. Kohler, Behrman & Skytthe (2005), using twin data to control for unobserved social and genetic differences, find that the effect of parental status in twin-differences estimation is in most cases the same as those results derived from Ordinary Least Squares (OLS) and Hansen (2012, pag. 40) states that despite methodological issues, it seems unlikely that reverse causation or unobserved third factors (e.g. PTs) are accounting for cross-sectional associations between parental status and wellbeing. Nevertheless, Parr (2010) still includes unmeasured personality (referring to Ryff, 1989 and Archontaki, Lewis & Bates, 2013) among the unmeasured variables which may affect both satisfaction with life and fertility.

2.3 Personality traits and fertility

The existing empirical evidence on the relationship between PTs and fertility provides contrasting findings. The results are difficult to compare, not only because sometimes different measures of personality are employed, but also because studies are performed in different countries and societies. Furthermore, the relationship between PTs and fertility may change over time, and different cohorts of population, even in the same country, may give different evidence.

Even if the relationship between number of children and PTs may be studied taking an evolutionary perspective, with the aim to investigate whether personality are associated with key life-history traits (as in Alvergne, Jokela & Lummaa, 2010), here the focus is on controlled fertility

populations, where childbearing is very much a choice and can be controlled through contraception. In this perspective, one of the first studies was performed by Eaves, Martin, Heath, Hewitt & Neale (1990) using Australian data. They find higher completed fertility among women who score high on "Extroversion" and score low on "Neuroticism". Interestingly, they also find higher completed fertility among those scoring low on "Extroversion" and higher for "Neuroticism". Miller (1992) investigates childbearing motivations using a 16-item psychological inventory from Jackson (1984) to assess four different traits, i.e. "Nurturance", "Affiliation", "Autonomy", "Achievement", and here he finds that PTs predict motivation for childbearing differently by gender. These differences have been confirmed by more recent studies. Jokela, Alvergne, Pollet & Lummaa (2011) show that low levels of "Neuroticism", high levels of "Extraversion" and high "Openness" associate with higher with fertility for both genders, whereas high "Agreeableness" and low "Conscientiousness" are associated with higher female fertility. "Agreeableness" together with "Extroversion" is shown to positively predict parenthood among women (Dijkstra & Barelds, 2009). Jokela, Kivimäki, Elovainio & Keltikangas-Järvinen (2009) find that low "Neuroticism" and high "Extraversion" are associated with higher fertility in a 9-year follow-up study on a sample of men and women aged 15–30 years at the base year.

To our knowledge, the only study on the relationship between fertility and PTs based on the GSOEP data set is that by Lundberg (2009),

who finds that personality predicts fertility by age 30, while PTs do not appear to explain fertility history by age 40, thus indicating that personality may matter more for the timing of fertility rather than its completion. In short, the effect of PTs on controlled fertility seems to be gender- and age-specific, and when personality is measured using the Big Five "Extraversion" tends to increase and "Neuroticism" tends to depress fertility.

An interesting line of research argues that the relationship between fertility and personality might change across cohorts. The key idea behind the argument is that the circumstances of childbearing have changed over time, with individuals having a greater freedom to pursue their own fertility interests and childbearing not being anymore a pillar of social control. This has facilitated personality influences on fertility behavior (Briley, Potter, Rentfrow, Gosling, Potter & Tuker-Drob 2014). In particular for women, personality may play a different role when society was characterized by the male bread winner model, where husband and wives specialized in market and household work – respectively, compared to more modern setting of today in which women to a greater extent have to cope with furthering their working career - as well as having children. Following this line of argument, Jokela (2012) finds that "Openness", for both genders, and "Conscientiousness", only for women, are particularly related to lower fertility among later-born cohorts in the US. Building on the idea that in modern dual earner society, childbearing will be less determined by household income, Skirbekk & Blekesaune (2013) using

Norwegian public register data, conclude that the personality-fertility relationship is different for more recently born cohorts who have experienced adult life in a different historical context. In fact, their main results are that "Conscientiousness" is associated with lower fertility for women, "Extraversion" is associated with higher fertility for men, whereas "Openness" and "Neuroticism" in men are associated with having fewer children. They also find that personality relates to fertility differently across cohorts, and that "Neuroticism" is negatively associated with fertility for more recently born male cohorts.

A similar argument can be made for education. Education is probably the most consistent predictor for fertility decline. Yet, educational attainment is also mediated by PTs, which may in turn affect fertility. The massive educational expansion that has taken place over the last four decades, again fuels the idea that the role of PTs on fertility might be different today compared to the 60s and the 70s. The fact that personality affects fertility through education is demonstrated by Tavares (2010). Using the BHPS, she finds that "Agreeableness", "Extraversion" and "Neuroticism" relate to early childbearing, while "Openness" and "Conscientiousness" relate to later childbearing.

3. DATA AND DESCRIPTIVE STATISTICS

The German Socio-Economic Panel (GSOEP)[1] records a wide range of longitudinal information for a consistent representative sample of the German population, and in particular it provides detailed information at the individual level about SWB and PT scores. The availability of multiple observations for each individual over time allows investigation of a relationship that the simple use of cross-sectional data would make chronologically impossible even to identify, mainly because of the natural lag existing between the start of pregnancy and actual birth.

We use the data from 1984 to 2011 and, given our interest in individuals' fertility choices, the sample is restricted to people in the age interval 20-50, resulting in a final general sample of around 265,000 observations over 27 years. Summary statistics for all the variables in the regressions are presented in Table 1.

Our dependent variable of SWB is a binary indicator recording whether a given person has had a child for each year. In the entire panel, the total number of people having a birth is around 4 per cent (10,359 events). For the main explanatory variable, we use the answers to the question: *"How satisfied do you feel with your life today?"* The question allows respondents to reply on a scale ranging from 0 – *"completely*

[1] The data used in this paper was extracted using the Add-On package PanelWhiz for Stata. PanelWhiz (http://www.PanelWhiz.eu) was written by Dr. John P. Haisken-DeNew (john@PanelWhiz.eu). See Hahn and Haisken-DeNew (2013) and Haisken-DeNew and Hahn (2010) for details. The PaneWhiz generated DO file to retrieve the data used here is available from the authors upon request. Any data or computational errors in this paper are our own.

dissatisfied" – to 10 – *"completely satisfied",* and the information is recorded annually. Figure 1 shows the distribution of SWB in the general sample and by gender and age. The first graph on the left of Figure 1 shows that the mean of SWB is around 7 (with standard deviation less than two). The central graph suggests that there are no substantial gender differences in the level of satisfaction. On the contrary, the graph on the right clearly shows a negative age effect taking place, even if very small. SWB only drops by around 0.5 (5% of the entire scale) between the two extremes of the reproductive age interval from 20 to 50 years old.

Table 2 shows the average lagged value (T-1) of SWB for individuals having (or not) a child in the survey year, further disentangled by parity. Looking at the latter, the differences in SWB between having a child or not are evident, both in general and for the first two children, while they are definitely narrower for higher parities.

Regarding the relationship between number of children and satisfaction with life, the rate of births for each level of SWB is graphed in Figure 2, with relevant implications for the purpose of this study, since a clear increasing pattern can be observed at least up to the second child. An increase in the birth rate starting from SWB score 4 is the most pronounced among all parities.

Unlike SWB, the 15-item personality inventory in the GSOEP is only surveyed twice along the entire panel, i.e. in 2005 and 2009. Given the limited number of waves with PT scores available, their stability from 2005 to 2009 has been checked and the individual average of the two actual

measurements has been used for all the waves (see Appendix A for details on checks of stability of PTs).

The main rationale behind this choice relies on the fact that, since we assume PTs to be stable at the individual level (at least during the period considered), averaging the two values allows us to eliminate feasible noise present in the separated waves. The general score for each trait is calculated indirectly by aggregating the answers to a set of questions (three for each trait) and rescaling to a 0-1 range. Although the structure for each answer is fixed with a 7-point Likert scale ranging from 1 – "*The sentence does not apply to me at all*" – to 7 – "*The sentence applies to me perfectly*" – the general meaning of the sentence is not constant, with some questions having a positive sense (e.g. *"I see myself as someone who does a thorough job"*), and others having a negative one (e.g. "*I get nervous easily"*). Clearly, the final score for each trait depends much on how such differences are treated and on the type of aggregation rule employed. Thus, in order to minimize this dependency we decided to make as few assumptions possible in obtaining the general scores, leaving the meaning of the sentences unaltered and simply summing their value (see Warr, Bartram, & Brown (2005) for a complete review of methods for aggregating the scores for each item within a trait in a single index).

As the summaries in Table 1 show, the average scores for "Agreeableness" (0.69) and "Conscientiousness" (0.77) are quite high, while lower ones are registered for "Extroversion" (0.65) "Openness" (0.62) and "Neuroticism" (0.51). Figure 3 shows the distribution of each

score in the general sample, by gender and age. In comparison with SWB, gender differentials in PTs are more evident, with women scoring higher on average than men for "Agreeableness" and "Extroversion", but lower for "Neuroticism". As before, there is a small age effect acting on the PT scores, the sign of which is positive for "Agreeableness" and "Neuroticism" and negative for the others.

4. METHODOLOGY

In order to investigate the effect of SWB on the likelihood of childbearing, given the binary nature of the dependent variable, we fit the following Probit model:

$$Child\_birth_{iT} = \beta_0 + \beta_1 SWB_{i(T-1)} + \beta_2 A_i + \beta_3 C_i + \beta_4 E_i + \beta_5 N_i + \beta_6 O_i + \beta_7 imm_i + \sum_m \beta_m X_{i(T-1)} + \varepsilon_{iT}$$

where the binary dummy *child_birth*, recording whether individual *i* has a child in wave *T*, is regressed on a constant, the SWB level, and several controls.

This model is run separately for the samples of men and women. Furthermore, for each gender a single model is run for each parity to investigate the effect of SWB in explaining the probability of having a first child, a second child etc. Apart from characteristics fixed in time, i.e. PT scores and being an immigrant, all the right-hand side of the equation is lagged by one year because of the natural length of pregnancy. In fact, as the interview date in each wave is not constant at the individual level, all the lagged values are adjusted to take this inconsistency into account. For

each individual, we calculate nine months back from the birth date in wave T and if this falls before that of the interview at T-1 we lag the variable back to T-2.

To limit possible bias due to omitted variables, an extensive control strategy is implemented, trying to control for both individual and household characteristics which may simultaneously affect the probability of having a child and SWB. Among the former, the PT scores play a special role because of their twofold aim. On the one hand, given their relationship with SWB and fertility, known in the literature (see previous Section) and confirmed in our data[2], adding them to the regression solves possible problems of endogeneity due to their omission. On the other hand, each specific combination of them turns out to be almost unique at the individual level[3]; i.e. it implicitly represents a sort of composite individual term capturing unobserved individual fixed heterogeneity as if it were a personal dummy. Some important validations of such a strategy are provided in the literature: Anand, Hunter, Carter, Dowding, Guala & Van Hees (2009) demonstrate the usefulness of PT measures in controlling for unobserved individual heterogeneity in cases in which panel techniques are unavailable, and Boyce (2010) shows within a panel framework that personality measures can account for 20 per cent of such heterogeneity and that adding them to the regression equations decreases the degree of correlation between the remaining unobservable individual

[2]Regression analyses available upon request.
[3]The observations for which this combination is not unique are just 1.1% of the entire sample.

heterogeneity and several feasible independent variables, such as age and gender.

In addition to PT scores, at the individual level we control for age, being an immigrant, total years of education, marital status, number of working hours, professional category, health status and – only in the general specifications – the total number of children a person already has.

The probability of having a child, even though individual-specific, crucially depends on the conditions of the couple and household. Accordingly, the control variables concerning these characteristics are intended to capture effects possibly induced by the specific family situation on the probability of having a child which could be correlated with SWB. More precisely, we control for marital status, for the condition, adequacy and type of property of the dwelling, whether the individual has a cleaning lady, the percentage of housework carried out by the individual, and two relative measures of personal income, one scaled with the OECD equivalence scale by the total number and type – adults or children – of the members of the household, and the other recording the share of the individual income with respect to the total household income.

Finally, the standard errors are adjusted for heteroskedasticity and clustered by individuals in order to account for serial correlation.

5. RESULTS

Among women, the probability of having a child increases for those who declare they are more satisfied with their lives (first column, Table 3). More insights into this first result are given by the models for each parity. The coefficients for both the general case and second child are positive and statistically significant (first and third columns, Table 3). The coefficients for the first and the third child are not significant (second and fourth columns, Table 3), while that for the fourth is negative and significant (fifth columns, Table 3).

The estimations of the same models for men confirm and reinforce this finding. The coefficient of the general model is positive and statistically significant at 5 per cent (first column, Table 4). SWB positively predicts the probability of a second and third child with statistically significant coefficients (third and fourth columns, Table 4), while those for the first and fourth children are not significant (second and fifth columns, Table 4). In short, in the general models SWB positively predicts childbearing for both women and men, while the only parity for which the effect of SWB is positive and significant for both genders is the second child.

In terms of the predicted individual probability of fertility by SWB level and gender, the first relevant difference between men and women is that the effect of SWB on fertility is more relevant for men than for women. The upper graphs in Figures 4 and 5 illustrate average predicted

individual probability of fertility by SWB level, for women and men respectively. The lower graphs in these figures show the average marginal effect of increasing by one (yellow lines), two (green) and three (red) points on the ten-point SWB scale. For both women and men the effect is always positive, apart from the case of the fourth child. As previously underlined, the second child is the only parity statistically significant for both men and women. Furthermore, there is a substantial increase in the predicted probability of having a second child when men pass from seven to ten points on the SWB scale. More precisely, the average marginal effect of three more points in the higher values on the scale – i.e. from seven to ten – is 0.05, which corresponds to an increase of about 73 per cent in the probability of having a second child. Considering the same increase of three points on the SWB scale, among women the largest marginal effect is when they pass from level six to level nine: 0.026, equaling an increase of 65 per cent in the probability of having a second child.

For a one-point increase in SWB and if the average SWB for women is taken into account, the transition from seven to eight increases the probability of having a second child by 8 per cent. For women who put themselves at eight on the SWB scale, a transition to the next level increases the probability of having a second child by about 27 per cent. Similarly, for men the average SWB is seven and a transition to eight may cause an increase in this probability of 23 per cent. The biggest one-point

increase for men is from nine to ten. In this case the probability of having a second child increases by 22 per cent.

An important result of this paper is that we are able to control for the role of PT in the causal relationship of SWB to fertility. Consistent with the existing literature, the results confirm that each PT affects fertility differently according to gender and parity in a multifaceted way. In the general model, "Agreeableness" positively predicts fertility for both women and men, while "Conscientiousness" and "Neuroticism" negatively predict fertility for women. If parity is taken into account, "Agreeableness" positively predicts the first and the second child for men, but the coefficients for other parities are not statistically significant. For women, "Agreeableness" positively predicts a first and third child, but for the second child the sign is negative. The previously-mentioned result that "Conscientiousness" negatively predicts childbearing for women is mainly driven by the relationship verified by the model for the first child, while the coefficients are not significant for the other parities. The score for this PT in men is not significant in predicting fertility in the general model, even though the coefficient in the model for the second child is negative and significant. While not significantly explaining fertility in the general model, "Extroversion" seems to be the trait most diversified by gender. Only the probability of having a fourth child increases for women with a high score in "Extroversion", while for the other children this trait is not significant. As for men, "Extroversion" is never significant. "Neuroticism" is not relevant in explaining male fertility, while for women this trait

positively predicts the birth of the first child. The "Openness" to experiences trait of personality, called also Intellect, is negative and significant in explaining the probability of having the first child for both men and women.

Finally, all the coefficients on the other control variables included in the model show the expected sign, which provides an indirect general validation of the model itself.

6. CONCLUSIONS

In this paper we have tackled the issue of the triangular relationship among fertility with subjective well-being and PTs using suitable data from the German Socio Economic Panel Survey.

We have shown that even if fertility is predicted by both SWB and PTs, the latter do not unequivocally define the behavior in which we are interested. The key finding from our analysis is that subjective wellbeing indeed affects the likelihood of childbearing. Even if the PTs are significant in terms of childbearing decision making, they do not alter the hypothesis that subjective wellbeing increases the likelihood of childbearing. This is an important finding, not least because it suggests that there is room of policy, and that reported variation in SWB associated with childbearing behavior is not only case of differences in PTs. Moreover, our analysis suggests that an increase in SWB may indeed help in increasing fertility.

A further key finding is that the effect of SWB on fertility is only significant for the progression to the second birth. Thus, SWB does not appear to matter for the transition to become a parent, nor parity progressions beyond the second birth and these results appear rather robust. In terms of fertility trends, and especially in the very low fertility setting of Germany, this finding is of great importance. We know that one of the key drivers for low fertility lies in the progression from the first to the second child. The fact that SWB following the first child matters for the progression to the second birth identifies it as a key target for family and fertility policies. We have shown that starting from the average SWB level for both men and women (which stands around seven), a one-point increase in SWB raises the probability of having a second child by 27 per cent for women and 22 per cent for men.

Establishing exactly which policy mix would achieve such an increase is beyond the scope of this paper. The literature points to several key aspects which concerns women's role in the labor market. Other than generosity of social security and more generally labor market conditions, a fruitful direction for further research lies in how the reconciliation between work, family and childbearing relates to subjective wellbeing (Kohler, 2011; Kotowska , Matysiak, Pailhe, Solaz, Styrc & Vignoli, 2010). In particular, further research should put a stronger focus on the drivers of subjective wellbeing for those having had the first child, then to understand how it affects progression to having the second.

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APPENDIX A: STABILITY OF PERSONALITY TRAITS

Psychologists consider several alternative notions of "consistency" when assessing the extent to which PTs are stable. Mean-level consistency reflects whether or not a population of individuals increases or decreases on some trait dimension over time. In contrast, intra-individual consistency assesses changes in the PTs of each individual as he or she ages (Cobb-Clark & Schurer, 2012, page 12). Given the scope of this paper, intra-individual consistency matters for at least two reasons. First, knowing that they are statistically stable supports the choice of imputing the missing waves with a unique value obtained by averaging the values observed from the two waves when PTs are surveyed. Secondly, as control variables, their stability along the individual lifespan means that they can safely be assumed to be exogenous with respect to our dependent variable, addressing in this way concerns about potential reverse effects of having a child. Indeed if they are fixed at the individual level, or rather, differences from one year to another are not statistically different from 0, they can be treated as if they were drawn randomly. The literature has found that personality changes throughout the individual's life, although not linearly. More precisely, the most evident changes happen during adolescence and old age, while the degree of consistency is much higher during middle age (Roberts & Del Vecchio, 2000; Fraley & Roberts, 2004; Caspi & Roberts, 2001; Borghans, Duckworth, Heckman & Ter Weel, 2008; Lucas & Donnellan, 2011; Specht, Egloff & Schmukle,

2013). Therefore, in this Appendix we give evidence of the individual lifespan stability of PTs based on the total GSOEP population (not only on reproductive ages). As mentioned previously, the PT scores are recorded only twice in the entire panel but not all the individuals are surveyed twice at those time points.

The upper part of Figure A.1 shows the quantile distribution of the PT scores against the Gaussian (straight line) to detect feasible non-normalities at the extremes of the distributions, whereas the lower part reproduces a normal probability plot for eventual non-normalities at the centre.

Table A.1 provides an extended version of the summaries for the PT scores, together with the results of a Skewness/Kurtosis test for normality. Both the graphical and numerical analysis suggest the PTs are fairly far away from being normally distributed, mainly because of fat right tails, implying that the use of non-parametric techniques should be preferred to assess their individual stability.

In particular, two kinds of tests are employed, the Wilcoxon matched-pairs signed-rank test and the Sign test of matched pairs, both presented in Table A.2. The null of stability cannot be rejected for three of the five scores, namely "Agreeableness", "Extroversion" and "Neuroticism".

Given the limited number of observations for each person, these results have to be taken with caution. This leads us to also pursue a more indirect strategy to assess the PT score stability: trying to assess their

stability (or better their exogeneity) with respect to some specific important life events which are supposed to have a feasible impact on PT scores. Following the approach of Cobb-Clark & Shurer (2012), individual differences between 2005 and 2009 in each trait are regressed on several dummies recording different types of important events possibly occurring between the two waves. Among them there are events such as having a child (further disentangled by parity), a parent's death, the partner's death, getting married or divorced, transition from employment to unemployment and *vice versa*, and the total sum of both the positive and the negative events, in order to capture their cumulative effect on the PT scores.

As Tables A.3 and A.4 show, almost none of the events taken into account have a significant effect on the PT scores. Furthermore, even if in some cases some events become statistically significant, the R^2s are always very low and in none of the specifications do they ever reach 1 per cent, meaning that the level of variability in the PT score produced by these events is so low that they can be safely taken as exogenous.

Finally, regarding only the relationship with our dependent variable, Figure A.2 provides the distribution of the individual differences in PT by parity and gender. The absence of a clear pattern among the variables further corroborates the results from the regressions just presented above.

APPENDIX B: VALIDATION AND ROBUSTNESS CHECKS OF THE REGRESSION RESULTS

Several diagnostics tests are performed to check the validity of the estimates presented: the upper part of Table B.1 shows the results of a Lagrange multiplier test to assess the normal distribution of the residuals. The null hypothesis of normality is rejected only for men in the general model and having the first child. In addition, the model specification is checked by looking at the level of significance of both the linear and square predicted value in the Link specification test (Table B.1, second part). If the linear term is not significant it means that the model is completely mis-specified, as it represents the predicted value of the model itself, while if the square predicted value is significant then there may be problems arising from important variables missing or from a general misspecification of the link function. In our case, the linear term is always significant except for the fourth child, while its square is never significant except for the general sample of men. Thus it is fair to consider the model to be correctly specified in general. Furthermore, strong multicollinearity among the independent variables might render the reliability of the estimates. To test for this, we calculate the average inflation factor (VIF) for each specification. The results – in the third part of Table B.1 – indicate no multicollinearity, since the values are safely below the threshold of 10, commonly used in practice. Lastly, in the bottom part of Table B.1 we assess the goodness-of-fit of the data with a Hosmer-

Lemeshow test (1980). The null of good fitness is rejected for both genders in the general specification and for men having a first child. The fact that there are rejections only for the specifications with the biggest sample size indicates they are probably related to the well-known problem of over-rejection with large samples from which all goodness-of-fit tests suffer from (Hosmer, Hosmer, Le Cessie, & Lemeshow, 1997), rather than reflecting to an actual lack of fit. Indeed, with large sample sizes any discrepancy between the model and the data tends to magnify and is likely to show up as statistically significant. Moreover, as Hosmer, Lemeshow, & Klar (1988) suggest, the results of such a test should be taken very cautiously when the proportion of positive outcomes in the sample is less than 10%. In our case, the number of individuals having a birth is well below this threshold, never exceeding 5%.

Given the use of the lagged value for SWB and the extensive controlling strategy undertaken, it is reasonable to consider the estimates to be unbiased. Using SWB at time T-1 strongly decreases the probability that reverse effects arise, and adding controls, both at individual and household levels, reduces bias that might otherwise be generated through omitted variables. At the individual level, the combination of PTs generates an almost unique individual specific control helps accounting for unobserved time-invariant individual heterogeneity. Nevertheless, two key issues still need to be addressed to completely validate a more causal interpretation. First, although remote, there is still the possibility that the idea of having a child within a year (or less) might affect the SWB of a

given individual the year before, especially if it is an actual decision of intent. Second, unobserved heterogeneity may change over time, in which case the PT combination reflecting an individual dummy is not sufficient.

Employing separately the lagged value of SWB at T-2 and the "Neuroticism" score as instruments for SWB[4], we test the exogeneity of this latter using a Wald chi-squared test and a Smith-Blundell test, while to assess the possibility of random unobserved heterogeneity potentially affecting our estimates we fit a Probit model with random effect, and using a Likelihood-Ratio test we check the significance of the random variance component. Table B.2 shows the results of these tests for the general population by gender and by parity. For the first two tests, the null of exogeneity of SWB at T-1 is almost never rejected, with the exception of the general model for men using the lagged value of SWB at T-2, and the first child for women using the "Neuroticism" score. These results rule out problems of endogeneity generally and of feasible reverse effects specifically. This is not the case for the Likelihood-Ratio test, which for the second child is strongly rejected for both genders.

The main implication of this is that the issue of time-variant unobserved heterogeneity is actual and concrete for this parity, and that,

[4] The degree of validity of Neuroticism as an instrument is fairly high, as it is exogenous with respect to having a child it is strongly correlated with SWB, and it is almost never significant in the regressions shown in Tables 3 and 4. Several formal tests regarding both the relevance of the instrument and the exclusion restrictions have been run by fitting an IV model with the Stata command *ivreg2*. The results of these tests are available upon request.

at least in theory, should be taken into account. Thus, in order to quantify the actual size of the effect of this unobserved heterogeneity on our explanatory variable, in Table B.3 we report just the coefficient for SWB from the random effect model employed in the Likelihood-Ratio tests. A quick comparison with the estimates in Tables 3 and 4 (in the main text) makes it clear that, although present, random unobserved heterogeneity only marginally affects the estimates for SWB, both in terms of their size and their degree of significance, providing support for a general causal interpretation of our results.

TABLES

Table 1: Summary statistics

	MEAN	STD. DEV.	MIN	MAX		MEAN	STD. DEV.	MIN	MAX
Child birth	0.04	0.19	0	1	**Occupation (ISCO88-2 digits):**				
Subjective Well Being (SWB)	6.97	1.81	0	10	*Armed forces*	0.01	0.08	0	1
Personality traits scores:					*Legislators, senior officials*	0.05	0.22	0	1
Agreeableness	0.68	0.14	0	0.95	*Professionals*	0.14	0.35	0	1
Consciousness	0.77	0.14	0	1	*Technicians*	0.22	0.41	0	1
Extroversion	0.65	0.15	0.10	1	*Clerks*	0.13	0.34	0	1
Neuroticism	0.51	0.16	0	0.95	*Shop and market sellers*	0.11	0.31	0	1
Openness	0.62	0.16	0	1	*Skilled agricultural*	0.01	0.11	0	1
Women	0.50	0.50	0	1	*Craft and related*	0.18	0.38	0	1
Age	35.45	8.78	20	50	*Plant and machine operator*	0.08	0.27	0	1
Immigrant	0.17	0.38	0	1	*Elementary occupations*	0.07	0.25	0	1
Years of education	11.93	2.52	7	18	**Property of the dwelling:**				
N. of children already have	0.95	1.13	0	12	*Main tenant*	0.50	0.50	0	1
Partner situation					*Home occupant*	0.00	0.02	0	1
No partner in the HH	0.34	0.47	0	1	*Sub-tenant*	0.26	0.44	0	1
Spouse	0.55	0.50	0	1	*Owner of dwelling*	0.23	0.42	0	1
Partner	0.11	0.31	0	1	**Condition of the dwelling:**				
Married last year	0.02	0.16	0	1	*in good condition*	0.60	0.49	0	1
Current health	2.37	0.88	1	5	*partial renovation*	0.32	0.47	0	1
% of total housework	0.24	0.56	0	1	*major renovation*	0.08	0.26	0	1
Working hours (wh):					*ready for demolition*	0.00	0.04	0	1
0 wh	0.24	0.43	0	1	**Size of the dwelling:**				
0<wh<=20	0.09	0.28	0	1	*Much too small*	0.03	0.17	0	1
20<wh<=40	0.36	0.48	0	1	*Bit too small*	0.21	0.40	0	1
40<wh	0.33	0.47	0	1	*Just right*	0.70	0.46	0	1
Employment situation:					*Bit too large*	0.06	0.24	0	1
Full-time employment	0.58	0.49	0	1	*Much too large*	0.01	0.07	0	1
Regular part-time employment	0.12	0.32	0	1	**Having a cleaning lady:**				
Vocational training	0.03	0.17	0	1	*Regularly*	0.04	0.18	0	1
Marginal/irregular employment	0.04	0.20	0	1	*Sometimes*	0.02	0.13	0	1
Not-employed	0.23	0.42	0	1	*No cleaning lady*	0.95	0.23	0	1
Sheltered workshop	0.00	0.03	0	1	**Scaled income**	1,795.48	1,113.94	0	66666
					Share of HH income	0.51	0.38	0	1

Note: The summaries are calculated on the general sample after dropping all the individuals younger than 20 and older than 50.

Table 2: Average SWB at T-1 by having a child or not at time T, by parity.

	General		1st child		2nd child		3rd child		4th child	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
MEN	7.36	7.00	7.38	6.99	7.40	6.98	7.30	7.04	7.05	6.97
WOMEN	7.40	7.03	7.39	7.15	7.46	6.96	7.40	7.03	7.24	6.95

Note: The average values are calculated after dropping all the individuals younger than 20 and older than 50.

Table 3: Probit regression results on the likelihood of having a child – Women

Dependent variable:	Having a birth	Having the 1st child	Having the 2nd child	Having the 3rd child	Having the 4th child
Subjective Well Being (SWB)	0.0268**	0.0254	0.0642***	0.0413	-0.0903*
	[0.0109]	[0.0162]	[0.0201]	[0.0265]	[0.0464]
Personality traits scores:					
Agreableness	0.372***	0.680***	-0.0368	1.066***	0.45
	[0.135]	[0.193]	[0.235]	[0.359]	[0.683]
Consciousness	-0.327**	-0.421**	-0.303	-0.51	0.266
	[0.145]	[0.204]	[0.281]	[0.395]	[0.964]
Extroversion	0.0174	0.182	-0.289	0.0312	1.300**
	[0.108]	[0.152]	[0.212]	[0.293]	[0.511]
Neuroticism	0.190*	0.297**	0.161	-0.016	0.238
	[0.100]	[0.146]	[0.194]	[0.266]	[0.520]
Openness	-0.0905	-0.313**	0.135	0.171	0.321
	[0.0977]	[0.137]	[0.193]	[0.245]	[0.554]
Age group (ref: 40-50):					
20-30	1.543***	1.811***	1.855***	1.629***	1.427***
	[0.0791]	[0.198]	[0.129]	[0.146]	[0.343]
30-40	1.196***	1.584***	1.277***	0.909***	1.393***
	[0.0721]	[0.196]	[0.121]	[0.125]	[0.244]
Years of education	0.0356***	0.0198*	0.0716***	0.0613***	0.0751*
	[0.00769]	[0.0106]	[0.0148]	[0.0234]	[0.0442]
Partner situation (ref: No partner in the HH):					
Spouse	0.608***	0.893***	0.200**	-0.161	-0.215
	[0.0535]	[0.0671]	[0.0943]	[0.148]	[0.257]
Partner	0.547***	0.642***	0.181*	0.183	0.038
	[0.0473]	[0.0562]	[0.102]	[0.179]	[0.314]
Married year before	0.385***	0.300***	0.123	0.319	0.956***
	[0.0649]	[0.0883]	[0.121]	[0.219]	[0.337]
How many children do you already have	-0.126***				
	[0.0228]				
Current Health	0.0152	0.0181	0.0508	-0.0375	-0.0823
	[0.0207]	[0.0307]	[0.0367]	[0.0538]	[0.0808]
Immigrant	0.0955	0.154*	0.00899	0.128	0.00917
	[0.0600]	[0.0850]	[0.124]	[0.152]	[0.206]
Working hours (ref: 0 wh & 0<wh<=20):					
20<wh<=40	-0.0321	0.427***	-0.242***	-0.169*	-0.365*
	[0.0417]	[0.106]	[0.0725]	[0.0869]	[0.186]
>40 wh	0.021	0.526***	-0.316***	-0.280*	-0.0637
	[0.0511]	[0.111]	[0.0914]	[0.152]	[0.248]
Condition of the dwelling (ref: Major renov & ready for dem.):					
in good condition	-0.052	0.0565	0.0124	-0.444**	0.0377
	[0.0976]	[0.159]	[0.185]	[0.199]	[0.386]
partial renovation	-0.0309	0.00919	0.0788	-0.299	0.0363
	[0.100]	[0.165]	[0.189]	[0.202]	[0.389]
Size of the dwelling (ref: Much too small) :					
bit too small	-0.247**	-0.0911	-0.238	-0.363*	-0.432
	[0.0999]	[0.156]	[0.190]	[0.204]	[0.335]
just right	-0.191*	-0.0687	-0.128	-0.308	-0.0822
	[0.0983]	[0.152]	[0.187]	[0.206]	[0.312]
bit too large	-0.138	-0.0862	0.0558	-0.323	-0.0158
	[0.111]	[0.169]	[0.209]	[0.262]	[0.445]
much too large	0.128	-0.0351	0.368	0.981*	
	[0.295]	[0.371]	[0.581]	[0.507]	
Property of the dwelling (ref: Sub-tenant & Home occupant):					
Main tenant	0.12	-0.0787	0.508**	-0.0633	4.349***
	[0.0904]	[0.106]	[0.220]	[0.431]	[0.449]
Owner of dwelling	0.0869	0.0458	0.508**	-0.157	4.052***
	[0.0983]	[0.125]	[0.225]	[0.435]	[0.466]
Having a cleaning lady (ref: no cleaning lady):					
Sometimes	0.16	0.0957	0.255	0.211	-0.253
	[0.108]	[0.187]	[0.203]	[0.217]	[0.468]
Regularly	-0.000734	-0.0538	-0.0182	0.0113	0.0511
	[0.0805]	[0.133]	[0.150]	[0.202]	[0.352]
% of housework	0.289***	0.247***	0.101	0.205	0.543
	[0.0636]	[0.0892]	[0.126]	[0.189]	[0.457]
Scaled Income	-0.00321	-0.0442	0.0237	-0.163	-0.524**
	[0.0503]	[0.0724]	[0.0849]	[0.136]	[0.255]
Share of the HH's income	0.0992	0.155	0.0721	-0.423**	0.177
	[0.0669]	[0.104]	[0.132]	[0.215]	[0.314]
Constant	-4.768***	-4.581***	-5.617***	-2.889**	-5.786***
	[0.441]	[0.686]	[0.799]	[1.201]	[2.131]
Year dummies	Yes	Yes	Yes	Yes	Yes
Occupational dummies	Yes	Yes	Yes	Yes	Yes
Pseudo R2	0.1513	0.1329	0.1769	0.2125	0.2881
Obs.	34,306	12,119	7,726	10,755	2,882

Note: Standard errors are adjusted for heteroskedasticity and clustered by individuals; t-statistics in parenthesis; ***ρ<0.01, **ρ<0.05, *ρ<0.10

Table 4: Probit estimation results on the likelihood of having a child - Men

Dependent variable:	Having a birth	Having the 1st child	Having the 2nd child	Having the 3rd child	Having the 4th child
Subjective Well Being (SWB)	0.0320***	0.00416	0.0761***	0.0545**	-0.0575
	[0.0108]	[0.0167]	[0.0210]	[0.0251]	[0.0393]
Personality traits scores:					
Agreableness	0.215*	0.305*	0.362*	0.296	0.109
	[0.116]	[0.168]	[0.214]	[0.264]	[0.532]
Consciousness	-0.111	0.0653	-0.665***	-0.277	0.52
	[0.130]	[0.192]	[0.242]	[0.314]	[0.635]
Extroversion	-0.0466	0.264	-0.295	-0.171	0.349
	[0.106]	[0.165]	[0.180]	[0.253]	[0.451]
Neuroticism	0.00754	-0.00722	0.125	0.14	-0.786*
	[0.101]	[0.153]	[0.185]	[0.237]	[0.427]
Openness	-0.137	-0.435***	-0.0153	0.181	-0.386
	[0.106]	[0.166]	[0.183]	[0.230]	[0.455]
Age group (ref: 40-50):					
20-30	1.039***	1.117***	1.292***	1.314***	1.156***
	[0.0546]	[0.108]	[0.0991]	[0.115]	[0.314]
30-40	0.871***	1.078***	1.078***	0.750***	0.939***
	[0.0440]	[0.102]	[0.0817]	[0.0780]	[0.137]
Years of education	0.0159**	-0.00842	0.0655***	0.00894	-0.0238
	[0.00724]	[0.0112]	[0.0134]	[0.0156]	[0.0324]
Partner situation (ref: No partner in the HH):					
Spouse	0.739***	0.896***	0.295**	-0.0266	-0.639
	[0.0627]	[0.0721]	[0.132]	[0.232]	[0.432]
Partner	0.696***	0.684***	0.191	0.304	0.14
	[0.0522]	[0.0606]	[0.139]	[0.242]	[0.426]
Married year before	0.317***	0.300***	0.0297	0.445**	0.0614
	[0.0594]	[0.0893]	[0.0966]	[0.201]	[0.431]
How many children do you already have	-0.0855***				
	[0.0331]				
Current Health	-0.0366*	-0.0449	-0.00469	-0.0513	-0.0196
	[0.0198]	[0.0307]	[0.0358]	[0.0446]	[0.0825]
Immigrant	0.0956*	0.101	0.342***	-0.062	-0.22
	[0.0495]	[0.0855]	[0.0921]	[0.109]	[0.180]
Working hours (ref: 0 wh & 0<wh<=20):					
20<wh<=40	0.0489	0.0485	0.123	-0.469**	0.219
	[0.0917]	[0.122]	[0.238]	[0.239]	[0.443]
>40 wh	0.102	0.0709	0.112	-0.372	0.56
	[0.0924]	[0.123]	[0.238]	[0.236]	[0.436]
Condition of the dwelling (ref: Major renov & ready for dem.):					
good condition	-0.0892	0.164	-0.223	-0.349**	0.103
	[0.0878]	[0.149]	[0.157]	[0.176]	[0.498]
partial renovation	-0.0974	0.0671	-0.182	-0.289	0.104
	[0.0881]	[0.150]	[0.160]	[0.179]	[0.502]
Size of the dwelling (ref: Much too small):					
bit too small	-0.165**	-0.178	-0.173	-0.199	0.525
	[0.0800]	[0.140]	[0.136]	[0.149]	[0.424]
just right	-0.183**	-0.207	-0.164	-0.23	0.591
	[0.0786]	[0.136]	[0.132]	[0.146]	[0.428]
bit too large	-0.124	-0.179	-0.13	-0.13	0.703
	[0.0909]	[0.152]	[0.163]	[0.191]	[0.493]
Much too large	0.27	0.317		0.504	
	[0.241]	[0.323]		[0.514]	
Property of the dwelling (ref: Sub-tenant & Home occupant):					
Main tenant	0.0553	-0.127	0.574**	-0.0951	3.668***
	[0.142]	[0.179]	[0.244]	[0.292]	[0.361]
Owner	0.0132	-0.129	0.587**	-0.137	3.812***
	[0.145]	[0.187]	[0.248]	[0.294]	[0.380]
Having a cleaning lady (ref: no cleaning lady):					
Sometimes	0.0394	-0.171	0.0384	0.235	0.263
	[0.106]	[0.210]	[0.184]	[0.198]	[0.286]
Regularly	-0.0965	-0.264**	-0.0143	-0.0437	-0.343
	[0.0874]	[0.134]	[0.144]	[0.168]	[0.367]
% of houseworkScaled Income	0.0772*	0.188***	-0.0755	-0.107	-0.196
	[0.0454]	[0.0621]	[0.0832]	[0.107]	[0.225]
Share of the HH's income	0.217***	0.241**	0.289**	0.400**	-0.389
	[0.0683]	[0.0976]	[0.136]	[0.167]	[0.307]
Constant	-3.935***	-4.449***	-3.774***	-1.610*	-4.608**
Year dummies	Yes	Yes	Yes	Yes	Yes
Occupational dummies	Yes	Yes	Yes	Yes	Yes
Pseudo R2	0.1222	0.1474	0.1424	0.1355	0.1422
Obs.	34,779	13,669	7,046	10,295	2,730

Note: Standard errors are adjusted for heteroskedasticity and clustered by individuals; t-statistics in parenthesis; ***ρ<0.01, **ρ<0.05, *ρ<0.10

Table A.1: Extended summaries for PT scores and normality test

PTs summary statistics

PTs	Mean	Sd	Min	Max	Skewness	Kurtosis
Agreeableness	0.71	0.15	0.00	1.00	-0.39	2.86
Conscientiousness	0.79	0.14	0.00	1.00	-0.89	3.67
Extraversion	0.64	0.16	0.00	1.00	-0.26	2.84
Neuroticism	0.51	0.18	0.00	1.00	0.10	2.70
Openness	0.61	0.18	0.00	1.00	2.80	2.80

Skewness/Kurtosis tests for Normality[(1)]

			joint	
PTs	Pr(Skewness)	Pr(Kurtosis)	chi2(2)	Prob>chi2
Agreeableness	0.00	0.00	931.13	0.00
Conscientiousness	0.00	0.00	4206.91	0.00
Extraversion	0.00	0.00	467.44	0.00
Neuroticism	0.00	0.00	256.92	0.00
Openness	0.00	0.00	283.45	0.00

[(1)] The test is implemented in Stata by the command *sktest,* which employs a test for normality based on skewness, another based on kurtosis, and then combines the two tests into an overall test statistic. The null H0 for this is that PT scores are normally distributed.

Table A.2: Non-parametric tests for the stability of PTs from 2005 to 2009

Wilcoxon matched-pairs signed-ranks test - Simple Sum

PTs		z	Prob > |z|
Agreeableness	Ho: score 2005 = score 2009	0.81	0.42
Conscientiousness		-4.90	0.00
Extraversion		-1.17	0.24
Neuroticism		1.30	0.19
Openness		4.63	0.00

Sign test of matched pairs - Simple Sum

PTs		Ha<0_ Pr(T < t)	Ha!=0_ Pr(|T| > |t|)	Ha>0_ Pr(T > t)
Agreeableness	Ho: median (PT_Score 2005 - PT_Score 2009) = 0	0.63	0.76	0.38
Conscientiousness		1.00	0.00	0.00
Extraversion		0.27	0.54	0.74
Neuroticism		0.90	0.20	0.10
Openness		1.00	0.00	0.00

Table A.3: OLS of individual differences in PTs from 2005 to 2009 on life events – General population

	MEN						WOMEN				
	Diff A	Diff C	Diff E	Diff N	Diff O		Diff A	Diff C	Diff E	Diff N	Diff O
Father's death	0.00907	0.00271	-0.00748	-0.0304	0.0618	Father's death	-0.0157	-0.0219	-0.0863	0.0135	-0.0411
	[0.0417]	[0.0371]	[0.0462]	[0.0401]	[0.0471]		[0.0468]	[0.0447]	[0.0528]	[0.0489]	[0.0561]
Mother's death	0.0423	0.0105	-0.0141	-0.0382	0.0269	Mother's death	0.00796	-0.0205	-0.0753	-0.0188	-0.0868
	[0.0362]	[0.0353]	[0.0448]	[0.0399]	[0.0473]		[0.0472]	[0.0431]	[0.0526]	[0.0492]	[0.0575]
Partner's death	0.0184	0.0458	0.00804	-0.0579	-0.0161	Partner's death	0.00746	-0.0644	-0.0619	0.0309	-0.0294
	[0.0433]	[0.054]	[0.0515]	[0.0519]	[0.0643]		[0.048]	[0.0458]	[0.0542]	[0.057]	[0.0567]
Divorced	0.0304	0.0177	0.00174	-0.0319	0.0599	Divorced	0.0403	0.000153	-0.0739	-0.0222	-0.0111
	[0.0396]	[0.0386]	[0.0476]	[0.0395]	[0.0508]		[0.0473]	[0.0448]	[0.0548]	[0.0509]	[0.0577]
Married year before	0.031	0.0183	0.000173	0.00156	0.0247	Married year before	-0.0125	0.0102	-0.0155	0.0386	0.0063
	[0.0231]	[0.0204]	[0.026]	[0.0244]	[0.0268]		[0.0211]	[0.0208]	[0.0246]	[0.0238]	[0.0288]
Having at least one birth in 2005-2009	0.0161	0.0188	0.00635	-0.0237	0.0254	Having at least one birth in 2005-2009	0.0108	0.023	-0.00391	0.00856	0.0156
	[0.0171]	[0.0181]	[0.0191]	[0.0195]	[0.0201]		[0.0158]	[0.0159]	[0.0168]	[0.0191]	[0.0185]
Moving at least once from unemp to emp in 2005-2009	0.00572	0.0206	-0.003	-0.0453**	0.0132	Moving at least once from unemp to emp in 2005-2009	0.00595	0.0227	-0.014	-0.00986	0.0168
	[0.016]	[0.0174]	[0.0185]	[0.0189]	[0.0193]		[0.0155]	[0.0151]	[0.0169]	[0.0179]	[0.018]
Moving at least once from emp to unemp in 2005-2009	0.0421	0.00749	-0.00371	-0.0214	0.0414	Moving at least once from emp to unemp in 2005-2009	-0.0182	-0.035	-0.0672	0.0128	-0.0263
	[0.0357]	[0.0343]	[0.0447]	[0.0382]	[0.045]		[0.046]	[0.0424]	[0.0523]	[0.0479]	[0.0554]
Sum of negative events	-0.0335	-0.0167	0.000184	0.0273	-0.0402	Sum of negative events	0.00448	0.0168	0.0737	-0.00225	0.0203
	[0.0328]	[0.0319]	[0.0426]	[0.0348]	[0.0423]		[0.0439]	[0.0406]	[0.0506]	[0.0456]	[0.0532]
Sum of positive events	-0.0232*	-0.0131	-0.00332	0.0221	-0.0168	Sum of positive events	-0.0125	-0.0159	0.0118	-0.0117	-0.017
	[0.0123]	[0.0149]	[0.0154]	[0.0153]	[0.0159]		[0.0122]	[0.0124]	[0.0134]	[0.0146]	[0.0145]
Constant	-0.0187***	-0.0139***	-0.0152***	-0.0161***	-0.0251***	Constant	-0.0205***	-0.0121***	-0.0158***	-0.0150***	-0.0232***
	[0.00192]	[0.00176]	[0.0019]	[0.00211]	[0.00215]		[0.00176]	[0.00164]	[0.00177]	[0.00206]	[0.00207]
Observations	7,090	7,085	7,088	7,089	7,081	Observations	7,881	7,874	7,876	7,874	7,869
R-squared	0.002	0.001	0	0.001	0.001	R-squared	0.002	0.002	0.001	0.001	0.002

(t-statistics in parenthesis; ***ρ<0.01, **ρ<0.05, *ρ<0.10)

Table A.4: OLS of the individual differences on PTs from 2005 to 2009 on life events – by parity

	MEN						WOMEN				
	Diff A	Diff C	Diff E	Diff N	Diff O		Diff A	Diff C	Diff E	Diff N	Diff O
Father's death	0.0112	0.00233	-0.0103	-0.032	0.0604	Father's death	-0.0152	-0.0201	-0.0893*	0.0103	-0.04
	[0.0417]	[0.037]	[0.0461]	[0.0404]	[0.047]		[0.0469]	[0.0447]	[0.0534]	[0.0491]	[0.0564]
Mother's death	0.0446	0.01	-0.0166	-0.0399	0.0256	Mother's death	0.00849	-0.0188	-0.0775	-0.0206	-0.0856
	[0.0362	[0.0352]	[0.0447]	[0.0402]	[0.0472]		[0.0472]	[0.0431]	[0.0531]	[0.0494]	[0.0578]
Partner's death	0.0205	0.0453	0.00514	-0.0595	-0.0175	Partner's death	0.00795	-0.0628	-0.0643	0.0288	-0.0284
	[0.0433]	[0.0539]	[0.0515]	[0.0521]	[0.0642		[0.048]	[0.0458]	[0.0547]	[0.0571]	[0.0569]
Divorced	0.0324	0.0158	-0.00276	-0.0329	0.0585	Divorced	0.0411	0.00275	-0.0775	-0.0265	-0.00972
	[0.0396]	[0.0386]	[0.0476]	[0.0398]	[0.0508]		[0.0473]	[0.0448]	[0.0552]	[0.0512]	[0.0581]
Married year before	0.0181	0.0225	0.00524	0.0117	0.0305	Married year before	0.0145	0.00369	-0.00601	0.0462**	0.00119
	[0.0235]	[0.0198]	[0.0245]	[0.0245]	[0.027]		[0.0211]	[0.0204]	[0.0232]	[0.0227]	[0.028]
Having a first child in 2005-2009	0.00536	0.0167	0.00728	-0.0104	0.0314	Having a first child in 2005-2009	0.00764	0.0186	-0.0131	-0.00371	0.00598
	[0.0167]	[0.0167]	[0.0166]	[0.018]	[0.0205]		[0.0152]	[0.0145]	[0.0141]	[0.0161]	[0.0156]
Having a second child in 2005-2009	-0.00498	0.022	-0.0111	-0.00351	0.0308	Having a second child in 2005-2009	0.00835	0.0143	0.00419	0.0248	0.000159
	[0.0195]	[0.0189]	[0.0177]	[0.019]	[0.0202]		[0.0164]	[0.0176]	[0.017]	[0.0189]	[0.0188]
Having a third child in 2005-2009	-0.0109	0.0187	0.0402*	-0.00766	0.0534**	Having a third child in 2005-2009	0.00913	0.0158	0.0171	0.00779	0.0134
	[0.0233]	[0.0201]	[0.0234]	[0.0216]	[0.0257]		[0.0183]	[0.0183]	[0.0187]	[0.0216]	[0.0197]
Having a fourth child in 2005-2009	0.0236	0.0687**	0.0324	-0.0358	0.0126	Having a fourth child in 2005-2009	0.00619	0.00536	0.0355	0.0631**	0.0285
	[0.0273]	[0.0276]	[0.0364]	[0.037]	[0.0345]		[0.025]	[0.0246]	[0.0243]	[0.0295]	[0.0272]
Moving at least once from unemp to emp in 2005-2009	-0.00703	0.023	0.00148	-0.0345**	0.0195	Moving at least once from unemp to emp in 2005-2009	0.00368	0.0163	-0.0067	-0.00468	0.0111
	[0.016]	[0.016]	[0.0161]	[0.0168]	[0.0186]		[0.0144]	[0.014]	[0.0147]	[0.0156]	[0.0157]
Moving at least once from emp to unemp in 2005-2009	0.0438	0.00735	-0.00668	-0.0227	0.0405	Moving at least once from emp to unemp in 2005-2009	-0.0178	-0.0335	-0.0696	0.0105	-0.0254
	[0.0357]	[0.0342]	[0.0446]	[0.0385]	[0.0449]		[0.046]	[0.0424]	[0.0529]	[0.0481]	[0.0557]
Sum of negative events	-0.0357	-0.0163	0.00305	0.029	-0.0388	Sum of negative events	0.00393	0.0151	0.0761	-0.000183	0.019
	[0.0329]	[0.0318]	[0.0425]	[0.0351]	[0.0421]		[0.0439]	[0.0406]	[0.0512]	[0.0457]	[0.0534]
Sum of positive events	-0.0107	-0.0157	-0.00733	0.0114	-0.0231	Sum of positive events	-0.0103	-0.00975	0.00527	-0.0161	-0.0114
	[0.0123]	[0.0133]	[0.0126]	[0.0127]	[0.0151]		[0.0107]	[0.0112]	[0.0107]	[0.0117]	[0.0114]
Constant	-0.0186***	-0.0139***	-0.0152***	-0.0162***	-0.0252***	Constant	-0.0205***	-0.0121***	-0.0158***	-0.0150***	-0.0231***
	[0.00192]	[0.00176]	[0.00189]	[0.00211]	[0.00215]		[0.00176]	[0.00164]	[0.00177]	[0.00206]	[0.00207]
Observations	7,090	7,085	7,088	7,089	7,081	Observations	7,881	7,874	7,876	7,874	7,869
R-squared	0.002	0.001	0.002	0.001	0.002	R-squared	0.002	0.002	0.002	0.002	0.002

(t-statistics in parenthesis; ***ρ<0.01, **ρ<0.05, *ρ<0.10)

Table B.1: Diagnostics

	General		1st child		2nd child		3rd child		4th child	
	F	M	F	M	F	M	F	M	F	M
Lagrange Multiplier test for normality [(1)]										
Chi2	4.38	14.60	1.57	10.5	4.23	0.48	0.74	1.71	1.10	4.94
Prob>Chi2	0.11	0.00	0.46	0.00	0.12	0.78	0.69	0.43	0.58	0.09
Specification link test[(2)]										
z -hat	7.40	7.16	4.82	5.38	2.96	4.54	2.27	1.52	0.81	0.03
P>|z| -hat	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.13	0.42	0.98
z -hatsqr	1.03	2.73	0.85	1.56	-1.11	0.06	-0.76	-1.22	-0.98	-1.31
P>|z| -hatsqr	0.31	0.00	0.40	0.119	0.27	0.95	-0.70	0.22	0.33	0.19
VIF (mean)	3.39	3.80	3.57	3.39	3.51	4.19	4.21	6.15	3.79	5.13
Goodness of fit test[(3)]										
Hosmer-Lemeshow chi2(8)	27.95	30.45	15.38	36.11	4.82	9.67	5.86	4.73	1.46	4.47
Prob>Chi2	0.00	0.00	0.05	0.00	0.78	0.29	0.66	0.79	0.99	0.81

[(1)] The test is implemented in Stata by the command *skprobit*. The null H0 is that the residuals are normally distributed.
[(2)] The test is implemented in Stata by the command *linktest*. [(3)] The test is implemented in Stata by the command *estat gof*. The null H0 is that the model has a good fitness.

Table B.2: Robustness tests

	General		1st child		2nd child		3rd child		4th child	
	F	M	F	M	F	M	F	M	F	M
Wald test of exogeneity[(1)]										
SWB(T-2): chi2(1)	0.03	1.88	0.18	0.01	2.10	0.79	0.15	1.03	0.50	0.84
SWB(T-2): Prob>chi2	0.86	0.17	0.67	0.92	0.15	0.38	0.70	0.31	0.48	0.36
Neuroticism: chi2(1)	1.18	0.21	0.81	0.21	0.46	0.22	0.01	0.06	0.10	0.10
Neuroticism:Prob>chi2	0.28	0.65	0.37	0.65	0.50	0.64	0.92	0.80	0.76	0.76
Smith-Blundell test of exogeneity[(2)]										
SWB(T-2): chi2(1)	1.59	6.11	0.48	0.15	3.25	1.81	0.13	3.34	1.20	1.60
SWB(T-2): P-value	0.21	0.01	0.49	0.70	0.07	0.18	0.71	0.07	0.27	0.21
Neuroticism: SB stat.	3.93	0.00	4.70	0.00	0.76	0.55	0.00	0.43	0.17	3.19
Neuroticism: P-value	0.05	0.93	0.03	0.95	0.39	0.46	0.95	0.51	0.68	0.07
Likelihood-Ratio test[(3)]										
chibar2(01)	0.00	11.63	0.00	0.00	6.87	7.57	0.00	0.92	0.00	1.44
Prob>=chibar2	0.49	0.00	1.00	1.00	0.00	0.00	0.50	0.17	1.00	0.12

[(1)] The test is implemented in Stata by fitting a simple IV model with the command i*vreg2*. The null H0 is that SWB is an exogenous regressor.
[(2)] The test is implemented in Stata by the command *probexog*. The null H0 is that SWB is an exogenous regressor.
[(3)] The test is implemented in Stata by fitting a Random Probit model with the command *xtprobit*. The null H0 is that there is no unobserved heterogeneity.

Table B.3: Probit Random Effect estimation results for SWB

	WOMEN					MEN				
	General	1st child	2nd child	3rd child	4th child	Genera	1st child	2nd child	3rd child	4th child
SWB	0.0252**	0.0202	0.0714***	0.0402	-0.0941*	0.0330**	0.00632	0.0760***	0.0581**	-0.0515
	[0.0106]	[0.0151]	[0.0233]	[0.0296]	[0.0526]	[0.0108]	[0.0164]	[0.0210]	[0.0269]	[0.0489]
Obs.	34,666	12,248	7,810	10,851	2,934	36,552	14,707	7,377	10,557	3,033
N. of groups	6,625	2,718	1,860	2,232	646	6,549	3,245	1,790	2,042	620

(t-statistics in parenthesis; ***ρ<0.01, **ρ<0.05, *ρ<0.10)

FIGURES

Figure 1: Distribution of SWB among the population, by gender and age

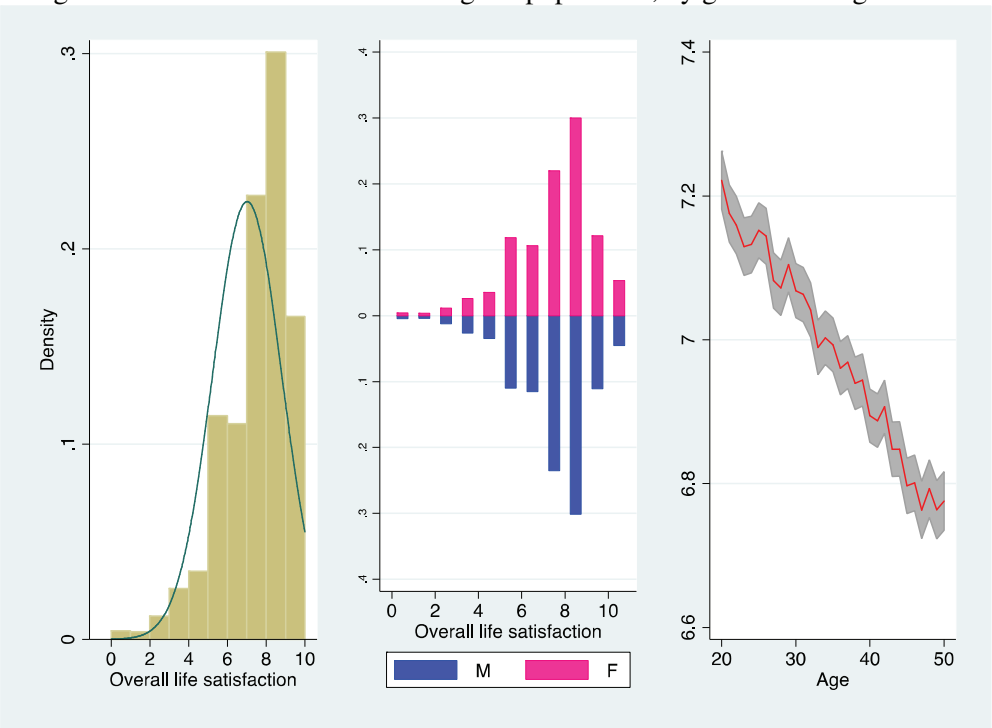
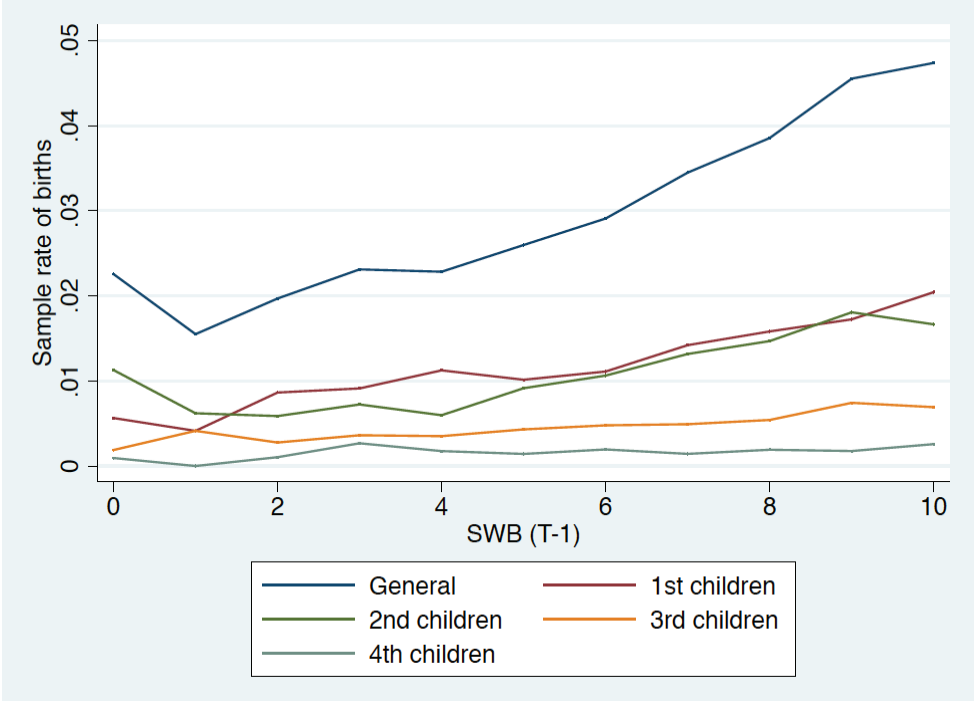


Figure 2: Sample birth rate by SWB



Note: The rates are calculated as the frequency of births over the total number of individuals for each SWB scale point.

Figure 3: Distribution of PTs among the population, by gender and age

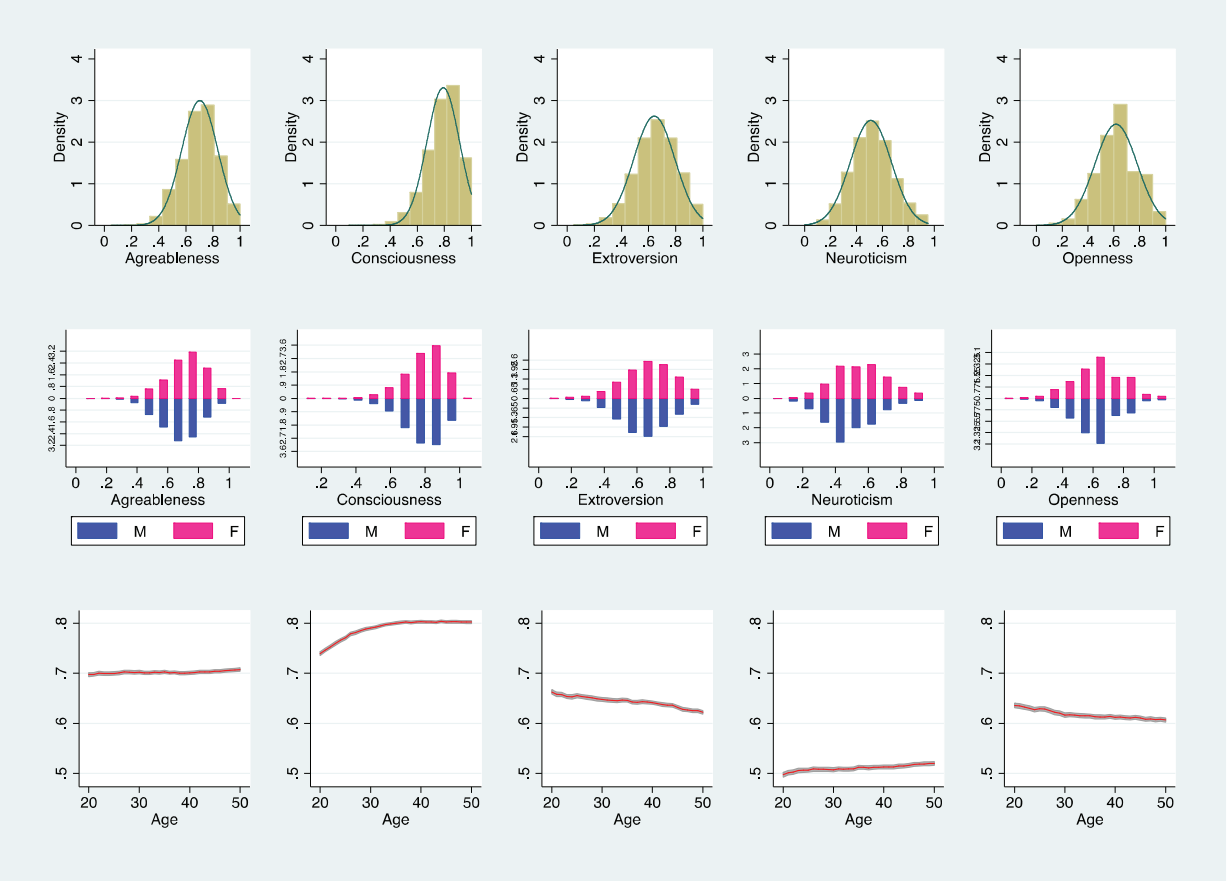
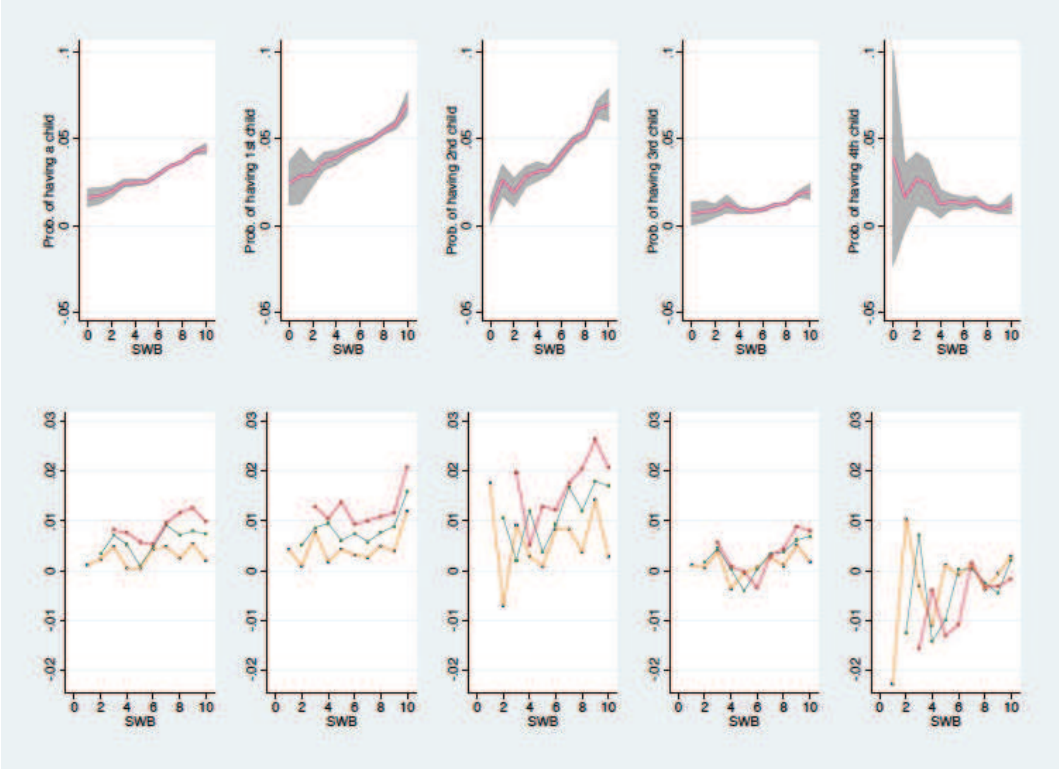
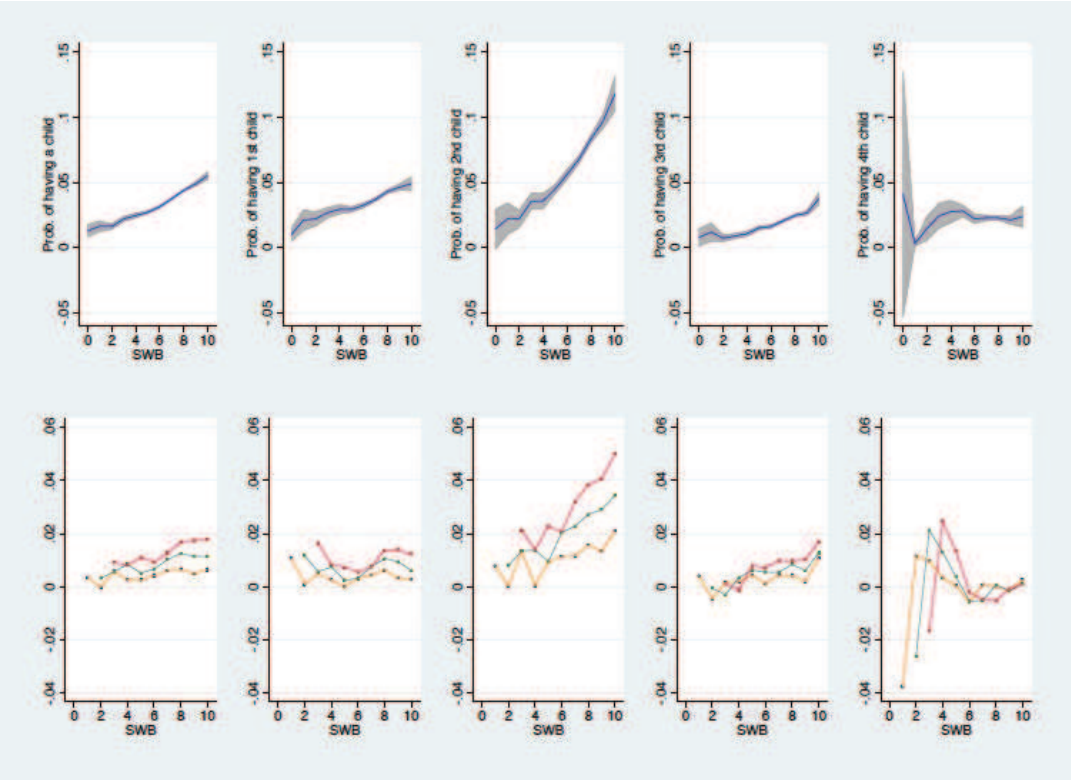


Figure 4: Predicted probabilities of having a child and Average Marginal effect by SWB (Δ=1,2,3) – Women



Note: Grey areas in the upper part of the Figure represent the 95% confidence intervals of the average predicted probabilities for each SWB scale point.

Figure 5: Predicted probabilities of having a child and Average Marginal effect by SWB (Δ=1,2,3) – Men



Note: Grey areas in the Upper part of the Figure represent the 95% confidence intervals of the average predicted probabilities for each SWB scale point

Figure A.1: Standardized normal probability plots (upper part) and quantiles of each PT score plotted against the quantiles of a normal distribution (bottom part)

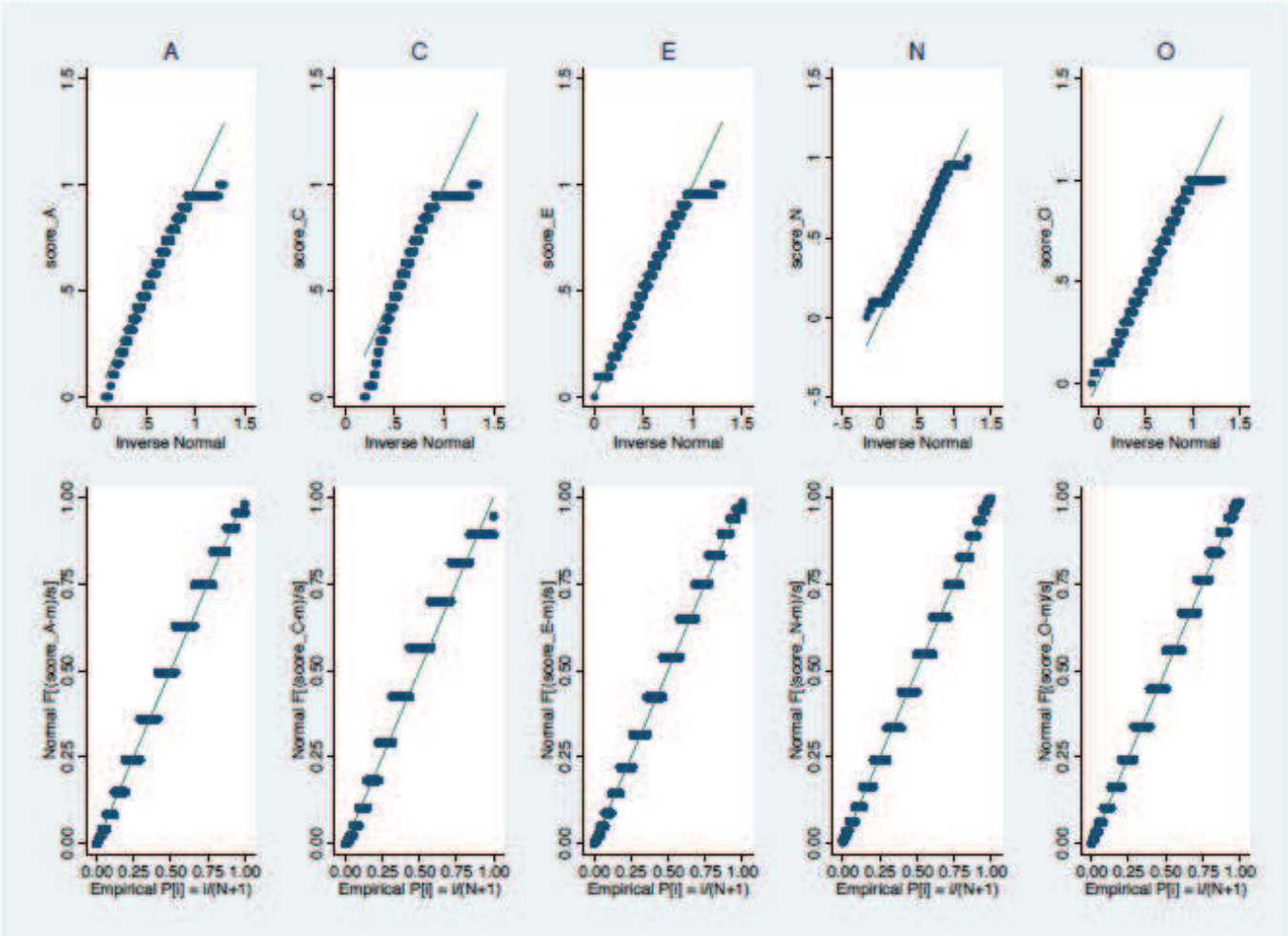


Figure A.2: Distribution of the individual differences in PT scores from 2005 to 2009 by gender and having a birth, and by parity