The role of family orientations in shaping the effect of fertility on subjective well-being

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Abstract

This paper aims to investigate whether fertility influences subjective well-being, while taking into account heterogeneity in family attitudes. We define three family orientation groups: Traditional, Mixed and Modern. Applying propensity score matching on longitudinal data (British Household Panels Survey) we show that parents are significantly more satisfied than non-parents, although only in the short-run. This effect is found to be stronger among men than among women. For men, we do not find significant differences across family orientations' groups in how the birth of the first child affects life satisfaction. Among women, only Traditional mothers seem to be more satisfied than their childless counterparts. Women who have a second child are never more satisfied than those who have only one child, regardless of their family orientations. Traditional and Mixed men experience a gain in life satisfaction when they have a second child, but this effect is not found for Modern men.

Keyword: life satisfaction; fertility; family orientations; propensity score matching

Introduction

Recently, there has been a growing recognition of the importance of the link between fertility and subjective well-being (e.g., Billari 2009; Aassve et al., 2012; Margolis and Myrskylä 2011; Myrskylä and Margolis 2014). Such increasing attention to this topic stems from the fact that in contemporary advanced societies, where contraception use is

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widespread, the choice of having children is determined to a great extent by an individual's subjective well-being, present and prospective. As a consequence, the link between fertility and subjective well-being has been identified as the possible missing link to explain fertility trends and differentials across space in advanced societies (Billari 2009).

Existing and on-going research on fertility and subjective well-being clearly shows that their relationship is bidirectional. On the one hand, there are studies pointing out that an individual's subjective well-being may predict fertility behaviour (Parr 2010; Billari 2009). On the other hand, another body of research shows that having children affects an individual's level of subjective well-being (Pouwels 2011; Myrskylä and Margolis 2014). Therefore, we cannot uncover a causal relationship between fertility and subjective well-being, unless reverse causality is addressed. The complexity of the interaction between fertility and subjective well-being rests also with the fact that both dimensions can simultaneously be influenced by third common factors, thereby leading to another source of endogeneity.

The aim of the present paper is two-fold. From a substantive point of view, we aim at developing a theoretical framework able to explain how family orientations shape the effect of fertility on subjective well-being, assessing how variations in attitudes and preferences, and thereby expectations, impact what people gain in terms of life satisfaction from having a child. From a methodological point of view, by using a propensity score matching approach with longitudinal data, we aim at investigating the causal relationship between parenthood and subjective well-being, taking into account potential sources of selection bias or endogeneity. Our focus is on inter-individual differences in subjective well-being due to the birth of a child. Specifically, we aim at answering to the following research question: *Is an individual who has a child more satisfied than his/her counterpart who does not have the child, but has the same socio-economic characteristics and family orientations?* We consider two different transitions, that is, transition to first birth and transition to second birth. This means we compare people who become parents for the first time with those who stay childless, and people who have two children with those who have one child only.

The article is structured as follows. In the next section, we provide a brief overview of existing literature on the fertility and subjective well-being relationship and elaborate on the role of family orientations in shaping the effect of having a child on an individual's life satisfaction. Then, we describe the data and variables we use in the

empirical analysis, while in the method section we explain our analytical strategy. After showing the results we make some concluding remarks and suggest further line for future research.

Background and hypotheses

Existing research has so far shown no consensus on the effect of childbirth on life satisfaction. While some studies seem to imply that in advanced societies children are detrimental to an individual's subjective well-being (SWB), because they reduce marital well-being (McLanahan and Adams 1987), or increase stresses associated to financial responsibility (Zimmerman and Easterlin 2006), other studies emphasize a positive association between childbearing and subjective well-being. The 'value of children' theory (Hoffman and Hoffman 1973; Hoffman and Manis 1979; Friedman et al. 1994), more recently reconceptualised as a special case of the general theory of social production functions (Nauck 2007), envisions having children as instrumental in maximising individual utility as expressed by the combination of physical well-being and social esteem. In this sense, having children, when fertility control is available, positively contributes to individual well-being. Next to this approach, also 'needs theories' stress advantages associated with having children, as parenthood bring emotional rewards (Veenhoven 1996). A positive association between fertility and subjective well-being is as well emphasized by those studies claiming that children help parents enlarge social capital and network (Schoen et al. 1997).

Next to studies focusing either on positive or negative consequences of having children on subjective well-being, there is some research showing that the fertility-subjective well-being relationship varies across cultural and institutional contexts (Aassve et al. 2012; Margolis and Myrskylä 2011), or socio-economic characteristics, such as age, gender, or economic factors (Nelson et al. 2012).

Although these studies provide important insights into the relationship between subjective well-being and fertility, their main shortcoming is that almost all of them adopt a cross-sectional approach. They suffer from the potential bias caused by simultaneity of subjective well-being and childbearing behavior, as well as reverse causality. As a result, they do not identify causal effects.

To overcome this drawback, Kohler et al. (2005) have engaged in a twin study, which shows that becoming a parent contributes positively to parents' happiness. Specifically, the authors find a non-linear effect of children on happiness, especially for

women. Women's happiness increases after the first child, but having higher-order children is not associated with further increases in well-being.

Some recent studies have instead adopted a longitudinal approach, consistently finding that subjective well-being increases in the years around childbearing (right before and right after) and decreases thereafter (Clark et al. 2008; Keizer et al. 2010; Pouwels, 2011; Myrskylä and Margolis 2014; Pollmann-Schult, 2014). Longitudinal analysis has mainly been used for two different research purposes. On the one hand, some studies have examined how specific socio-economic characteristics (e.g., age, gender, education, income, marital status) may shape and moderate the effect of having a child on changes in subjective well-being over time (Myrskylä and Margolis 2014), also focusing on the costs arising from different family contexts (Pollmann-Schult, 2014). On the other hand, this approach has been used to empirically test the 'set-point or dynamic equilibrium theory' (Headley and Wearing 1989), according to which every individual has his/her own baseline level of subjective well-being that is primarily determined by genetic factors and thereby it cannot permanently be modified by life events, such as having a child. Clark et al. (2008) for instance show that the birth of a child can only temporarily change an individual's level of subjective well-being leading to anticipation effects before the event and adaptation effects after childbearing but no enduring effects in the long-run are found.

We aim to extend existing research by estimating differences in subjective well-being between people who experience a childbearing and those who do not. So far, the comparison between parents and childless individuals or between individuals with different parities (e.g., parents with two children versus parents with only one child) have been investigated only using a cross-sectional approach (Aassve et al. 2012). As we mentioned earlier, cross-sectional studies can only show potential associations between different parental statuses and certain levels of subjective well-being. We instead adopt a propensity score matching with longitudinal data, which is described in details in the method section, that allows us to better approximate the causal effect of having a child on subjective well-being.

Building on Kravdal (2014), we moreover aim to take into account that heterogeneous family orientations may lead to heterogeneous effects of fertility on subjective well-being. People with different family orientations have different values, gender attitudes, preferences towards career and family and in turn expectations about how childbearing can affect their subjective well-being.

According to the 'Prospect theory' (Kahneman and Tversky 1979), individuals who have to make a decision between uncertain alternatives, like having or not having a child, base their choice on the potential gain or loss they expect to receive when the event occurs. This consistently means that the probability for an individual of having a child also depends on the expectations that such individual has towards the impact parenthood has on his or her subjective well-being. As Kravdal (2014) points out, this leads to the problem that the factors shaping the effect of the treatment "having a child" also affect the probability that the treatment take place in the first place. Put in another way, those who expect a higher gain in subjective well-being from the birth of a child will be those who are more likely to actually have a child. In order to address this issue, we match individuals not only on several socio-economic characteristics, but also on family orientations.

With family orientations we refer to two aspects that we believe are the main value-related driving forces influencing both the effect of having a child on an individual's subjective well-being and the actual fertility behavior of that individual. These aspects are gender-role attitudes and preferences towards work and family. As Hakim shows (2000), these latter factors play a significant influence on an individual's fertility behavior. We envision them to play a relevant role also in shaping how the birth of a child affects an individual's subjective well-being. Specifically, we classify individuals in three groups based on their family orientations: Traditional, Mixed and Modern. The categorization we use is inspired by the theoretical work of Hakim (2000, 2003) and the empirical strategy adopted in several studies (e.g., Kan 2007; Sweeting et al 2014).

The traditional group is formed by those men and women who endorse a male-breadwinner model, in which the female partner is supposed to stay at home, not to work and be the main, if not the only, responsible for the housework and childcare activities. The opposite group is the Modern group, which consists of people approving a dual-earner family system and a gender-egalitarian model. People having these family orientations are those who think that both partners in the couple should work and equally contribute to both household income and housework as well as childcare.

In the middle, between the Traditional and the Modern groups, there is a third group of people, where the majority of the population likely rests, who approves an intermediate or mixed family model in which the female partner is not simply a

housewife but likely works (at least part-time), although at the same time she is still the main responsible for the household and childcare activities.

By comparing those who have a child with their counterparts who do not have a child within each of the three groups and for men and women separately, we manage to overcome another problematic issue raised by Kravdal (2014). According to this author, looking at the average effect of having a child on subjective well-being might be misleading because if differences in attitudes, preferences and expectations are substantial the average effect may conceal variations and become meaningless.

In existing literature we can find different indicators, definitions and metrics of subjective well-being, each of which has his own specificities and focus (Diener et al. 1999; Dolan et al. 2007). We decided to focus on life satisfaction as a measure of subjective well-being. The motivation for this rests with the fact that, as some scholars point out (Dolan et al. 2007; Haller and Hadler 2006), life satisfaction is a multidimensional construct, which focuses primarily on the cognitive aspects of subjective well-being, more than emotional ones as does the "happiness" measure. We therefore believe that a life satisfaction measure may be particularly suitable to catch an individual's evaluation of costs and benefits associated to childbearing in the long run.

Previous cross-sectional studies (Aassve et al. 2012; Nelson et al 2012) find that fathers are more often associated with higher level of happiness than mothers. We are interested in testing whether this association finds support in our matching framework. In light of the fact that men and women experience family and work life differently and women usually face a greater work family conflict, experiencing higher costs and stresses associated to childrearing, which may at least partially offset gains in life satisfaction, we envision that *the gain in life satisfaction for fathers compared to non-fathers is bigger than the one for mothers compared to non-mothers (H1).*

We moreover think that differences across the three family orientations' categories that we have identified are more relevant for women than for men. Men may have very different gender role attitudes and therefore expect their female partner to have a different role within and outside the household (e.g., housewife, working mother). They might even be more or less willing to share household and childcare activities with the partner, but, differently from women, they likely do not differ much across the three groups in terms of preferences towards work or family. Put in another way, Traditional, Mixed and Modern men do not have significantly different lifestyles, because they are supposed to work anyways. As a consequence of persistent cultural

gender differences, men usually do not have the option of choosing between family and work. This reasoning leads us to pose the following hypothesis: *Family orientations play a stronger role for women than for men (H2).*

As for women, we do expect great differences across the three family orientations' groups. Specifically, we believe that the number and type of sources of life satisfaction significantly vary across categories. While we expect Traditional women to put very high value to family life and children as the main, if not the only source of life satisfaction, we envision Modern women to have other sources of life satisfaction stemming from the work or career sphere, that might be even more important than having children. As a consequence, the gain in life satisfaction that Traditional women obtain from having a child should be higher than for Modern women. As for Mixed women, we believe that their sources of life satisfaction should be more diversified than for Traditional women, because likely such women also have an active and working life outside the household. However, they might still place a high value to family life, considering having children as still the primary source of life satisfaction. If this is true, this group is the one that may bear the highest costs, deriving from trying to reconcile work and family and balance them. We therefore *expect mothers to be more satisfied than non-mothers among those women who value more a life devoted to family and children*: *first Traditional, then Mixed, finally Modern (H3).*

We also explore whether the effect of fertility on subjective well-being changes by parity. In particular, we estimate the effect of having a first child (versus being childless) and having the second child (versus having only one child). As argued by Billari et al. (2009), we assume that childbearing effects are very different by parity, and imply different expectations and costs.

Data and measurements

Data

We use the British Household Panels Survey (BHPS), an annual panel survey consisting of a nationally representative sample of about 5,500 households recruited in 1991, containing a total of approximately 10,000 interviewed individuals. Individuals are re-interviewed each successive year for 18 years and, if they split-off from original households to form new households, they are followed and all adult members of these households are also interviewed. Similarly, new members joining sample households become eligible for interview and children are interviewed as they reach the age of 16.

The BHPS dataset is very suitable for investigating the relationship between fertility and life satisfaction, because it provides information on several socio-economic characteristics, family orientations, fertility history and subjective well-being measured over time.

Sample

In order to investigate the effect of having a first birth, we selected women and men aged 16 years old or older, who remained childless or had one child during the observation period. We also included in our sample individuals who had more than one child during the observation period, but they were censored two years before the birth of the second child, to avoid any potential anticipation effects of the second child on subjective well-being. We decided to proceed in this way after checking that anticipation effects only appear in the year before the childbearing, and not earlier. After deletion of missing values our working sample consists of 5,278 women and 5,127 men, corresponding to 21,762 and 19,600 persons-year observations, respectively.

We use the same strategy to identify the sample for the analysis focusing on the comparison between those who have two children and those who have one child only. Therefore, we selected women and men who had one or two children during the observation period, and those who had more than two children were censored two years before having the third child. The final working sample consists of 1,505 women and 2,054 men, corresponding to 4,173 and 6,535 persons-year observations, respectively.

Measurements

Dependent variable

In the BHPS, life satisfaction is measured using the following question: *"How dissatisfied or satisfied are you with your life overall"*, with answers ranging from one (*not satisfied at all*) to seven (*completely satisfied*). Unfortunately, this question was not asked throughout the entire survey. It starts to be measured in wave 6 until the end of the survey (i.e., wave 18), but with a gap in wave 11.

Family orientatations

We measure family orientations using the following 6 items on 5-point scales (from *strongly agree* to *strongly disagree*):

1. A pre-school child is likely to suffer if his or her mother works

2. All in all, family life suffers when the woman has a full time job
3. A woman and her family would all be happier if she goes out to work
4. Both the husband and wife should contribute to the household income
5. Having a full-time job is the best way for a woman to be an independent person
6. A husband's jobs is to earn money; a wife's job is to look after the home and family

These items, that refer to both gender role attitudes and preference towards work and family, are measured in alternating waves in the BHPS. Therefore we imputed missing values based on the measure of the year before.

In order to construct a valid and reliable index measuring individuals' family orientations, we followed the same strategy adopted by Kan (2007), who use the same items in the BHPS dataset to evaluate Hakim's Preference Theory (2000) and by Sweeting et al (2014) that also used the same items and data to measure gender roles attitudes. Specifically, after recoding all of the items in the same direction (i.e. a low score in the answers means traditional orientations), we summated them to obtain a score index, which was found to be reliable (Cronbach's alpha=0.64).

People who scored in the lower quartile were defined as Traditional, those in the upper quartile as Modern, and those in-between were identified as Mixed. This partition of the index, that leaves the Mixed group as the biggest group is in line with Hakim's theory and it is based on an assumption we made, that the majority of the population should have mixed family orientations.

Methods

Approaches used in existing studies

In the present section, we first summarize the main approaches used in previous studies on the effect of fertility on SWB and then we present our approach while highlighting advantages and disadvantages of each method[2].

As anticipated in the background section, the first papers studying the relationship between fertility and SWB have used cross-sectional regression models (e.g., Margolis and Myrskylä 2011; Aassve et al. 2012; Nelson et al. 2012). Although these studies provide important insights into the relationship between happiness and

[2] The recent review by Kravdal (2014) contains further insights on the methodological issues relative to the approaches used in literature. However, our method (propensity score matching) is not covered in this paper because it was not used yet in this body of research.

fertility, their main shortcoming is that a cross-sectional approach suffers from potential bias caused by simultaneity of subjective well-being and fertility and reverse causality. Moreover, in a cross-sectional regression typically most of the covariates are measured at the time of the survey which means that they are themselves affected by fertility decisions taken in the past and this is another source of bias, as it is well-known in the causal inference literature (see e.g., Imbens 2004; Rubin 2005).

Two main empirical approaches have been used to overcome selection and endogeneity bias: twin fixed-effect analysis and panel data models with individual fixed effects.

The first approach, used by Kohler et al. (2005), has the advantage of allowing controlling for unobserved characteristics that are shared by the twins (such as genetic traits and family backgrounds). However, this approach does not address the problem of reverse causality and simultaneity and it exploits within-twin comparisons which may not be easily extended to the general population.

The longitudinal within-individual (or fixed-effect) approach has increasingly been used in several recent studies investigating changes in the pattern of an individual's subjective well-being before and after the birth of a child (Clark at al. 2008; Keizer et al. 2010; Pouwels, 2011; Myrskylä and Margolis 2014; Pollmann-Schult, 2014).

In a fixed effects regression each individual serves as its own control group and the focus is on *within-individual* comparisons i.e., on comparing the SWB after childbearing with SWB before it. The advantage of using individual fixed effects regression is that it allows controlling for unobserved time-invariant characteristics that may influence both fertility and SWB. However, this method is not able to address the bias due to unobserved time-varying characteristics nor to solve reverse causality problems. Dynamic versions of the standard fixed effects regression, where one controls for lagged outcome, can address the problem of reverse causality but suffer from other technical problems and they have not been used in this literature.

Our approach: propensity score matching with longitudinal data

We adopt an alternative methodological approach that is based on propensity score matching. A similar approach was used by Arpino and Aassve (2013), who assess the effect of fertility on economic well-being, and by Wunder and Schwarze (2013), who investigate the effect of partner's death on the other partner's subjective well-being.

Considering how recent these studies are, they might denote a new, increasing interest in using such a method to analyze the effect of life events on well-being (subjective or not).

We use the potential outcome framework (Neyman, 1923; Rubin, 1974) to formalize the statistical issues involved in estimating the effect of fertility on SWB. By adopting a formal framework for causal inference we are able to clearly define what is the estimand of our interest. Moreover, the methodological approach we adopt has several advantages that we highlight in the rest of the section.

The following discussion refers to the estimation of the effect of the first child on SWB but can be easily adapted to the analysis of the effect of the second child. Our treatment variable is a binary indicator, T, that takes value 1 for individuals who had a first child within the observation period and 0 for childless people. SWB, that is our outcome of interest measured at time *t* on the individual *i*, is indicated as Y_{it}.

Under the potential outcome framework, each individual has two potential outcomes: Y_{1it} indicates the SWB that would have resulted if the individual had the first child and Y_{0it} if he/she had stayed childless. Since each individual is only observed in either the treatment or control group, either Y_{1it} or Y_{0it} is observed for each individual and the other quantity (the counterfactual SWB) needs to be estimated. For this purpose we use a matching approach, where for each individual who had a child (in the treatment group) we look for one or more individuals who did not have a child (in the control group) with the most similar characteristics as possible.

Propensity score matching (Rosenbaum and Rubin, 1983) is used to generate such a control group for each treated person. This technique works as a two-step procedure. In the first step, a model is estimated for the probability to experience the treatment (have a first child) as a function of confounding variables. Predicted probabilities (i.e., estimates of the propensity scores) are used to match individuals using a matching algorithm. In fact, Rosenbaum and Rubin, (1983) proved that individuals with similar values of the propensity score have, in expectation, a similar distribution of all of the covariates entering the propensity score. This balancing property of the propensity score allows comparing units on the basis of the univariate propensity score instead of the multivariate set of covariates. In the second step, after the matching has been implemented, the outcomes of treated and matched control units are compared and causal effects are estimated. Being this second step non-parametric, the method is considered a semi-parametric one.

One of the advantages of this two-step procedure is that, similarly to a randomized experiment, the design phase (first step) is separated from the outcome analysis (second step) and this increases the credibility and objectivity of inference (Rubin 2008). Moreover, a non-parametric analysis of the outcome offers several advantages over a regression modeling approach. First, propensity score matching is not subject to misspecifications of the regression model for the outcome (e.g., nonlinearity issues). When the distribution of covariates in the two groups being compared are very different, regression estimates are not robust because they heavily depend on extrapolation using the specific form of the model (Imbens 2014). Second, in a propensity score matching analysis there is no constraint imposed on the heterogeneity of treatment effects. As pointed out by Kravdal (2014), the effect of fertility on SWB can be highly heterogeneous, i.e., it can be different for different types of individuals. To account for such heterogeneity in a regression model we should know which covariates determine the heterogeneity and in which way. Incorrect specifications can result in biased estimates. Using a nonparametric approach in the outcome analysis, instead, allows for arbitrary heterogeneous effects.

There are several ways for implementing the matching (Caliendo and Kopeinig 2008). As suggested in the treatment effects literature, we experimented with different matching algorithms and different specifications of the propensity score. The method that guaranteed the best balancing of covariates was a radius matching with a caliper equal to one quarter of the standard deviation of the estimated propensity score. As a result, this is the method we selected for our analyses.

Propensity scores were estimated using a logit model with several independent variables that are relevant for the mechanism that leads to childbearing (i.e., the treatment), and for the outcome under study, that is life satisfaction. In the set of matching variables we specifically included: age, gender, marital status, health status and health problems, household income, education, employment status, and all of the 6 items measuring individuals' family orientations, previously defined. Instead of matching on the three identified groups of family orientations (i.e., Traditional, Mixed and Modern), we used all of the 6 items as separate covariates in order to have a finer matching on family orientations.

Exploiting the longitudinal structure of the data, we develop our estimator in a pre–post treatment setting. Specifically, we perform the matching two years before the treatment (i.e., having a first or a second child respectively), and for the identified

treated and control individuals we select all person-year observations that are available in the data set in the following years until the end of the observation period (i.e., wave 18). In this way, we can compare life satisfaction of treated and control units over time, starting from the year after the matching, that is, the year before childbearing. In previous analyses we tried to match individuals also 3, 4 and 5 and years before the treatment, but since we could observe diverging patterns of life satisfaction, due to anticipation effects, only the year before the treatment, we opted for doing the matching two years before childbearing, in order to follow individuals and measure their life satisfaction for a longer period of time after childbearing.

The pre-post treatment design has several advantages (Arpino and Aassve 2013). Using longitudinal data is possible to implement a type of risk-set matching (Li et al. 2001) were we pair individuals who looked similar in observed covariates prior to a specific time at which one individual was treated and the other(s) were not. In this way, covariates are measured before the exposure to the treatment and we avoid adjustment for events subsequent to that moment that could bias the estimates (e.g. Rosenbaum 1984; Imbens 2004). Moreover, we can also assess if there is an anticipation effect of childbearing on life satisfaction, that is, if people that planned a childbearing anticipate its effect in terms of life satisfaction.

A second advantage is that the lagged value of the outcome variable can be included in the set of matching covariates. This is important because previous studies showed that people with higher levels of SWB are more likely to decide to have a child (Billari 2009). This reversed causality problem would bias our estimates if not taken into account. Our estimator is similar to the so-called difference-in-difference matching estimator (Athey and Imbens 2006) and it is able to control for time-invariant unobserved confounders (such as genetic factors or personal traits that could be correlated with our outcomes of interest, that is, life satisfaction). For practical reasons, instead of matching on the same question used for the outcome definition (life satisfaction) we matched on happiness[3]. As said before, life satisfaction was measured in the BHPS only starting from the sixth wave so, matching on happiness would have

[3] The question about happiness is as follows: *Have you recently been feeling reasonably happy, all things considered?*". Responses range from one (*much less happy than usual*) to four (*more happy than usual*). As already highlighted by Myrskylä and Margolis 2014, happiness and life satisfaction are highly correlated and offer consistent results.

implied losing one entire wave of observations with a conspicuous decrease in the sample size of the treatment groups. Therefore, we match individuals starting from wave 5 and we are able to compare the SWB of treated and control individuals until the child of treated individuals is 11 years old.

The parameter we aim at estimating is the so-called Average Treatment Effect on the Treated (ATT; Imbens 2004). The ATT can be interpreted in our context as the estimated average difference between the observed level of life satisfaction for treated individuals (those that within the observation time span gave birth to a child, that in our analyses can be the first or the second child) and the level of life satisfaction they would have had if they did not give birth to that child.

As we have already said, we are interested in investigating differences in life satisfaction between parents and non-parents as well as those who have a second child and those who have one only child not only around the birth of the child, but also in the longer term. In principle, we can calculate ATTs considering life-satisfaction in each year starting from the childbirth year, until when the child is 11 years old. However, since the number of treated units dramatically decreases over time (see Table A1, in Appendix), we investigate potential gains or losses in life satisfaction after childbirth not year by year, but measuring the ATT over longer periods of time. Specifically, we focus on life satisfaction measured over the entire period of observation (starting from the year after the matching is performed, that is one year before the potential childbearing, until the end of the period of observation); life satisfaction only before the treatment (i.e., in the year before childbearing); life satisfaction since the birth of the child. Furthermore, we specifically aim to study whether life satisfaction may vary according to the different childrearing phases. To do so, we segmented the period over which we observe life satisfaction after the birth of a child, according to the kid's age. We specifically look at life satisfaction when the kid is between 0 and 3 years old and life satisfaction when the kid is between 4 and 11 years old.

Table 1 and 2 show the described time period we focus on in our analysis, also reporting the average level of life satisfaction and the relative sample size of both the treated and the control group.

As we mentioned earlier, because the aim of our study is to uncover whether gender and family orientations play a relevant roles in shaping the effect of childbearing on life satisfaction, we run separate analysis by gender. Then, for women and men separately, we also run different analyses for the three family orientations' groups. We performed

the matching within each sub-group, every time checking that the balancing of covariates was satisfactory.

As a measure of balance for the variables used for the matching, we used the percent standardized bias, that for each covariate is defined as the standardized difference between the means of that variable in the treatment and control group (Rosenbaum and Rubin 1985). Values above 10% are considered unacceptable (Normand et al. 2001). Table A.2 in the appendix reports the balance of independent variables across treated and control units, i.e., we report for each variable the mean in the treatment and control group and their standardized difference before and after matching. This table refers to the first analysis we conducted where we estimated the effect of the first child on the whole sample. The balance of independent variables for the other analyses is similar but not reported for brevity. Table 3 shows that before matching substantial imbalance existed between covariates. Matching was highly satisfactory as balanced improved considerably. After matching none of the covariates showed a bias higher than 4%.

Results

ATT estimates from propensity score matching are reported in tables 3 to 8. Table 3, 4, and 5 report results concerning the effect of the first child, that is those in which the treatment is the birth of the first child, and thereby the comparison is between parents of one child and childless individuals. As shown in Table 3, we observe that, looking at the whole sample, parents seem to be more satisfied than non-parents, but the gain in life satisfaction deriving from parenthood seems to be short-termed. Parents seem to have a higher life satisfaction than childless individuals only until the child is 3 years old. Afterwards no positive effect is found. Previous research show similar results (Clark et al. 2008). In line with our first hypothesis, fathers seem to have a higher gain in life satisfaction than non-fathers, compared to the one of mothers versus non-mothers. Mothers show a strong positive effect on life satisfaction the year before the birth of the first child. Then, the gain in life satisfaction during the first three years after childbearing gets very small and, although not significant, the effect of parenthood on life satisfaction for mothers seems to become even negative when the child is 4 years old or older. Fathers instead always show a significant gain in life satisfaction compared

to non-fathers but, as in the total sample, the positive effect becomes statistically not significant when the child is 3 years old.

We now need to uncover whether the average effects on life satisfaction for men and women that we have just described conceal variations that somehow balance them out (Kravdal 2014). We therefore need to compare parents and non-parents within each of three family orientation groups. Table 4 shows the results for women only by family orientations. We found that the gain in life satisfaction that we find in the total sample of women is only driven by the high gain of the Traditional mothers compared to their childless counterparts, in line to what we hypothesize. While Modern mothers do not show any positive effect, neither before nor after childbearing, Mixed mothers show a significant and positive anticipation effects before having the first child, but no effects are found after the treatment. Actually the effect is negative, but not significant when the child is 4 years old or older. These findings seem to support our reasoning according to which Mixed women are those who bear higher costs compared to women in the other family orientations' groups. The fact that these mothers have a rather high, positive anticipation effect but no gain in life satisfaction after the birth of the child might indeed be due to the fact that high costs, such as time costs (Pollmann-Schult 2014) and difficulties in balancing work and family life, may offset a higher satisfaction coming from parenthood. Put in another way, Mixed mothers might experience a great mismatch between their expectations and their actual outcomes in terms of life satisfaction after the birth of the first child. On the other hand, Modern women, who seem to never experience a gain in life satisfaction, not even before childbearing, might have other relevant sources of life satisfaction, likely coming from the work and career sphere, which overall reduce the relative role played on life satisfaction by parenthood. In other terms, the subjective well-being of Modern mothers is not affected by the birth of a child, because the factors in their "utility function" are various and the change in only one of those (i.e., having a child) might not have a significant impact on their life satisfaction.

Table 5 shows the results for men by family orientations' group. It is clear that there are no substantial differences in terms of effects on life satisfaction for the three groups under study. Fathers seem always more satisfied than non-fathers, before and after childbearing, regardless of their family orientations. This is in line with our second hypothesis. We believe that differences across categories of family orientations are less relevant for men than for women, because the attitudinal aspect related to the

preferences towards work or family is less applicable for men than for women. Men may have very different gender role attitudes, but likely not very different lifestyles, because they are supposed to work anyways. As a consequence of persistent cultural gender differences, they usually do not have the option of choosing between staying at home and go to work.

Tables 7, 8 and 9 report results regarding the effect of having a second child. These findings stem from the comparison between those who have two children and those who only have one child. Table 6 shows that, looking at the entire sample, people who have a second child seem to gain further in life satisfaction compared to those who have one child only. The positive effect, differently from the first child, seems to last also in the long run, even when the second child is between 4 and 11 years old. It is very interesting to see that this positive effect that we observe in the total sample is entirely due to gain in life satisfaction experienced by fathers. Mothers do not show any effect, it does not matter which family orientations they have, as Table 7 reports. This finding seems to be in line with previous research (Myrskylä and Margolis 2014), which shows that the second child has a much weaker effect on life satisfaction. Table 8 instead reports results for men by family orientations' group. We observe that Traditional and Mixed fathers have a positive and enduring effect on life satisfaction due to the birth of their second child, whereas Modern fathers have a similar trend in life satisfaction to the one of Mixed mothers with the birth of the first child. They experience an increase in life satisfaction the year before the childbearing, but then they do not have any gain after the birth of the child. We believe this might be due to the fact this category of men are those who experience higher costs compared to men in the other two groups, because they are likely willing to share with the female partner household and childcare tasks. As a consequence, since costs increase with the number of children, they might start feeling, with the arrival of the second child, the burden of reconciling work and family life and time constraints.

Conclusions

The aim of the present paper was twofold. First, we aimed at extending existing literature on fertility and subjective well-being by studying how heterogeneous family orientations for men and women can differently shape the effect of having a child on an individual's life satisfaction. Our second contribution is at the methodological level. We used a propensity score matching approach with longitudinal data to investigate how the

birth of the first or second child impacts an individual's subjective well-being. This method allows us to approximate the causal effect of fertility on life satisfaction by comparing individuals with different number of children but who had with very similar socio-economic characteristics and family orientations before the childbearing events.

Inspired by the Preference Theory of Hakim (2000), we categorized individuals in three groups based on their family orientations: Traditional, Mixed, and Modern.

In comparing life satisfaction of individuals who had one child (or two children) with the one of those who did not (or had only one child), we found significant differences between men and women and across different family orientations' groups.

Overall we found that individuals who had the first (or second) child are more satisfied than those who stayed childless (or had one child only). Focusing on the first child, two interesting results were found. First, the gain in life satisfaction for fathers compared to non-fathers is bigger than the one experienced by mothers compared to non-mothers. Second, only Traditional mothers seem to be more satisfied than their childless counterparts. It was however interesting to observe that, while Modern mothers never experience a gain in life satisfaction, Mixed mothers seem more satisfied than Mixed non-mothers the year before the birth of the first child, but then they do not have a gain in life satisfaction after childbearing. We think this is due to the high costs this group of women has to bear (as they likely work and are the main responsible for the family care) with the arrival of a child. On the other hand, we did not see any relevant difference across the three family orientations' groups among men: fathers always seem more satisfied than non-fathers.

As far as the second child is concerned, we found that only fathers are more satisfied than non-fathers (i.e., fathers of only one child), whereas no gain in life satisfaction is observed for mothers compared to non-mothers (i.e., mothers of one child only), regardless of the their family orientations. Results showed that, while Traditional and Mixed fathers are more satisfied than their non-fathers counterparts, Modern fathers, similarly to Mixed mothers with the first child, experience a gain in life satisfaction before the birth of the second child but not afterwards. We believe this is due to the fact that this category of men is the one who is more willing to help with housework and childcare activities and therefore these fathers might feel higher costs and stresses associated with the arrival of a second child.

We are aware that our study suffers from some limitations. First of all, although we have a long period of observation, that is 13 years, we cannot exclude that those

individuals that we consider childless or with only one child might have had a child after the window of observation. This would not bias our results by any means but we are aware that we cannot have a full fertility history for all of the individuals in our sample. Second, unfortunately we are not able to distinguish between direct and indirect consequences of the treatment (i.e., having a child) on an individual's well-being. For instance, we cannot know whether the fact that we find parents more satisfied that non-parents is a direct consequence of the birth of the child or it is due to the fact that non-parents never found the right partner to form a family. Moreover, we are aware that it would have been interesting to also include actual behavioral information for example on the household division of tasks, but since we use the individual as our unit of analysis this was not possible. At the time of the matching, several individuals were not in a stable relationship yet and for those this information was of course not available. We hope further research focus also on couple and include, maybe together with family orientations, also behavioral measures of gender roles and lifestyle. Finally, although we could take unobserved factors into account by using longitudinal data and matching individuals based on their previous life satisfaction, we are aware that, with observational data, causal inference is always difficult and subject to many possible sources of bias.

We believe our study contributed to the existing literature on the relationship between fertility and subjective well-being in that we integrated the important role of family orientations and explained why and how heterogeneity in gender attitudes and lifestyle preferences can lead to heterogeneous effects of having a child on an individual's life satisfaction. Moreover, we made use of a method, the propensity score matching, that has never been used to study this topic. We explained the relevant advantages that this method has compared to the ones already used in literature, and we hope that further research on this topic could make further use of such a technique. Finally, by using the propensity score matching and by taking heterogeneous family orientations into account we think we were able to overcome a potential source of bias that Kravdal (2014) has recently pointed out as characterizing existing literature on the topic. With our approach, we can control for the fact that individuals with different family orientations and therefore different expectations towards the effect of having a child on their own subjective well-being might be more or less willing to have a child in the first place, and therefore might have different probabilities to engage in the treatment.

References

Aassve, A., Goisis, A., & Sironi, M. (2012). Happiness and Childbearing across Europe. *Social Indicator Research*, *108* (1), 65-86.

Athey, S, & Imbens, G. W. (2006) Identification and inference in nonlinear difference-in-differences models. *Econometrica*, *74* (2), 431–497

Arpino, B. & Aassve, A. (2013). Estimating the causal effect of fertility on economic wellbeing: data requirements, identifying assumptions and estimation methods. *Empirical Economics, 44*, 355–385.

Bell, D. E. (1982). Regret in decision making under uncertainty. *Operations Research, 30*, 961-981.

Billari, F. C. (2009). The Happiness Commonality: Fertility Decision in Low-Fertility Settings. In UNECE (Ed.), *How Generations and Gender Shape Demographic Change* (pp. 7-38). New York and Geneva: United Nations.

Billari, F. C., Philipov, D., & Testa, M. (2009). Attitudes, norms and perceived behavioural control: explaining fertility intentions in Bulgaria. *European Journal of Population 25* (4), 439-465.

Caliendo, M., & Kopeinig, S. (2008). Some practical guidance for the implementation of propensity score matching, *Journal of Economic Surveys, 22* (1), 31-72.

Clark, A. E., Diener, E., Georgellis, Y. & Lucas, R.E. (2008). Lags and leads in life satisfaction: A test of the baseline hypothesis. *The Economic Journal, 118*, F222–F243.

Diener E., Suh, E. M., Lucas, R. E., & Smith, H. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin, 125*, 276-302.

Dolan P., Peasgood, T., & White, M. (2007). Do we really know what makes us happy? A review of the economic literature on the factors associated with subjective well-being, *Journal of Economic Psychology*, 29, 94-122.

Friedman, D., Hechter, M., & Kanazawa, S. (1994). A theory of the value of children. *Demography, 31*, 375–401.

Hakim, C. (2000). *Work-Lifestyle Choices in the 21st Century*. Oxford: Oxford University Press.

Hakim, C. (2003). A New Approach to Explaining Fertility Patterns: Preference Theory. *Population and Development Review 29*, 349–74.

Haller, M., & Hadler, M. (2006). How social relations and structures can produce happiness and unhappiness: an international comparative analysis. *Social Indicators Research,75,* 169-216.

Headey, B., & Wearing, A. (1989). Personality, life events, and subjective well-being: Toward a dynamic equilibrium model. *Journal of Personality and Social Psychology*, *57*, 731–739.

Hoffman, L. W., & Hoffman, M. L. (1973). The value of children to parents. In J. T. Fawcett (Ed.), *Psychological perspectives on population* (pp. 19-76). New York: Basic Books.

Hoffman, L. W., & Manis, J. D. (1979). The Value of Children in the United States: A New Approach to the Study of Fertility. *Journal of Marriage and the Family*, *41*(3), 583-596.

Kan, M. Y. (2007). Work Orientation and Wives' Employment Careers An Evaluation of Hakim's Preference Theory. *Work and Occupations*, *34*(4), 430-462.

Kahneman, D., and Tversky, A. (1979). Prospect Theory: An Analysis of Decision Under Risk, *Econometrica*, *47*(2), 263-291.

Keizer, R., Dykstra, P.A., & Poortman, A.R. (2010). The transition to parenthood and well-being: The impact of partner status and work hour transitions. *Journal of Family Psychology*, *4*, 429-438

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.

Kravdal, O. (2014). The Estimation of Fertility Effects on Happiness: Even More Difficult than Usually Acknowledged. *Euroepan Journal of Population.* DOI 10.1007/s10680-013-9310-9.

Imbens, G.W. (2004) Nonparametric estimation of average treatment effetcs under exogeneity: A review. *The Review of Economics and Statistics, 86*,4–29.

Imbens, G.W. (2014). Matching Methods in Practice: Three Examples (No. w19959). National Bureau of Economic Research.

Li, Y.F.P., Propert, K.J., & Rosenbaum, P.R. (2001). Balanced risk set matching. *Journal of the American Statistical Association*, *96*, 870-882.

Loomes, G., & Sugden R. (1982). Regret theory: an alternative theory of rational choice under uncertainty, *Economic Journal, 92*, 805-824.

Margolis, R., & Myrskyla M. (2011). A Global Perspective on Happiness and Fertility. *Population and Development Review, 37*(1), 29-56.

McLanahan, S., & Adams, J. (1987). Parenthood and Psychological Well-Being. *Annual Review of Sociology, 13*, 237-257.

Myrskylä, M., & Margolis, R. (2014). Happiness: before and after the kids. *Demography*, forthcoming.

Nauck, B. (2007). Value of Children and the Framing of Fertility: Results from a Cross-cultural Comparative Survey in 10 Societies. *European Sociological Review, 23*(5), 615-629.

Nelson, S.K., Kushlev, K., English, T., Dunn, E.W., & Lyubomirsky, S. (2012). In defense of parenthood : Children are associated with more joy than misery. *Psyhcological Science*, *24*(1), 3-10.

Neyman, J. [1990(1923)] On the application of probability theory to agricultural experiments: essay on principles, section 9. Translated in *Stat Sci, 5*(4), 465–480

Normand S.T., Landrum M.B., & Guadagnoli, E. et al. (2001) Validating recommendations for coronary angiography following acute myocardial infarction in the elderly: a matched analysis using propensity scores. *Journal of Clinical Epidemiology*; *54*:387–398.

Parr, N. (2010). Satisfaction with Life as an Antecedent of Fertility: Partner + Happiness = Children? *Demographic Research*. *22*(21), 635-661.

Pollmann-Shult M. (2014). Parenthood and Life Satisfaction: Why Don't Children Make People Happy?. *Journal of Marriage and Family, 76*, 319–336.

Pouwels, B. J. (2011). *Work, family, and happiness: essays on interdependencies within families, life events, and time allocation decisions.* PhD Dissertation, Utrecht University.

Rosenbaum, P.R. (1984). The consequences of adjustment for a concomitant variable that has been affected by the treatment. *J R Stat Soc Ser A, 147*, 656–666.

Rosenbaum, P.R. & Rubin, D.B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika, 70*(1), 41–55.

Rosenbaum, P.R., & Rubin, D.B. (1985). Constructing a control group using multivariate matched sampling methods that incorporate the propensity score. *American Statistician, 3*,33–38.

Rubin D.B. (1974) Estimating causal effects of treatments in randomized and nonrandomized studies. *Journal of Education Psychology, 66*, 688–701.

Rubin, D.B. (2005). Causal inference using potential outcomes. *Journal of the American Statistical Association*, *100*(469).

Rubin, D.B. (2008). For objective causal inference, design trumps analysis. *The Annals of Applied Statistics*, 808-840.

Schoen, R., Kim, Y., Nathanson, C., Fields, J., & Astone, N.M. (1997). Why Do Americans Want Children?. *Population and Development Review, 23*(2), 333-358.

Sweeting, H., Bhaskar, A., Benzeval, M., Popham, F., & Hunt, K. (2014). Changing gender roles and attitudes and their implications for well-being around the new millennium. *Social psychiatry and psychiatric epidemiology*, 49(5), 791-809.

Veenhoven R. (1996). Developments in satisfaction research. *Social Indicators Research, 20,* 333-354.

Wunder, C. & Schwarze, J. (2013). Is Posner right? An empirical test of the Posner argument for transferring health spending from old women to old men, *Journal of Happiness Studies.* DOI 10.1007/s10902-013-9473-4

Zimmermann, A. & Easterlin, R. A. (2006). Happily ever after? cohabitation, marriage, divorce and happiness in Germany. *Population and Development Review, 32,* 511–528.

Tables

Table 1. Life satisfaction and sample sample sizes for the analysis on the effect of the first child, over different periods of time

Time	Control			Treated		
	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
Entire period	30,597	5.14	0.97	1,612	5.40	0.92
Before childbirth	24,136	5.17	1.17	1,203	5.48	1.12
After childbirth	25,416	5.13	0.97	1,556	5.37	0.98
Child 0-3	25,259	5.13	1.02	1,555	5.37	1.00
Child 4-11	12,335	5.09	0.97	365	5.16	1.00

Table 2. Life satisfaction and sample sample sizes for the analysis on the effect of the second child, over different periods of time

Time	Control			Treated		
	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
Entire period	7,482	4.98	1.07	1,481	5.27	0.88
Before childbirth	5,898	5.02	1.26	1,059	5.37	1.10
After childbirth	6,317	4.96	1.08	1,441	5.26	0.91
Child 0-3	6,311	4.98	1.11	1,439	5.27	0.94
Child 4-11	3,412	4.93	1.13	736	5.14	0.91

Table 3. Average treatment effect among the treated (ATT) on life satisfaction from propensity score matching considering as treatment the birth of the first child. Analysis on the entire sample and by gender.

Time	Effect of first childbirth					
	Total sample		Women		Men	
	ATT	S.E.	ATT	S.E.	ATT	S.E.
Entire period	0.206***	0.025	0.118**	0.036	0.260***	0.034
Before childbearing	0.253***	0.035	0.157**	0.051	0.313***	0.047
After childbearing	0.190***	0.027	0.094*	0.040	0.247***	0.037
When kid is 0-3	0.195***	0.028	0.101*	0.041	0.247***	0.038
When kid is 4-11	0.038	0.055	-0.047	0.079	0.104	0.075

* p-value < 0.05; ** p-value < 0.01; *** p-value < 0.001.

Table 4. Average treatment effect among the treated (ATT) on life satisfaction from propensity score matching considering as treatment the birth of the first child. Analysis only on women, by family orientations.

Time	Effect of first childbirth on women					
	Traditional		Mixed		Modern	
	ATT	S.E.	ATT	S.E.	ATT	S.E.
Entire period	0.347***	0.085	0.086	0.045	0.072	0.086
Before childbearing	0.282*	0.118	0.144*	0.061	0.117	0.134
After childbearing	0.369***	0.093	0.064	0.049	0.024	0.093
When kid is 0-3	0.413***	0.095	0.070	0.051	0.019	0.096
When kid is 4-11	0.066	0.277	-0.058	0.094	0.032	0.157

* p-value < 0.05; ** p-value < 0.01; *** p-value < 0.001.

Table 5. Average treatment effect among the treated (ATT) on life satisfaction from propensity score matching considering as treatment the birth of the first child. Analysis only on men, by family orientations.

Time	Effect of first childbirth on men					
	Traditional		Mixed		Modern	
	ATT	S.E.	ATT	S.E.	ATT	S.E.
Entire period	0.289***	0.084	0.238***	0.041	0.323***	0.092
Before childbearing	0.213*	0.096	0.296***	0.060	0.430***	0.122
After childbearing	0.284**	0.096	0.239***	0.043	0.227*	0.102
When kid is 0-3	0.270**	0.095	0.225***	0.045	0.275**	0.103
When kid is 4-11	0.064	0.184	0.075	0.088	0.240	0.220

* p-value < 0.05; ** p-value < 0.01; *** p-value < 0.001.

Table 6. Average treatment effect among the treated (ATT) on life satisfaction from propensity score matching considering as treatment the birth of the second child. Analysis on the entire sample and by gender.

Time	Effect of second childbirth					
	Total sample		Women		Men	
	ATT	S.E.	ATT	S.E.	ATT	S.E.
Entire period	0.161***	0.028	0.070	0.040	0.232***	0.039
Before childbearing	0.203***	0.040	0.102	0.058	0.279***	0.054
After childbearing	0.171***	0.030	0.070	0.042	0.237***	0.042
When kid is 0-3	0.162***	0.031	0.076	0.044	0.214***	0.043
When kid is 4-11	0.102*	0.042	-0.003	0.064	0.182**	0.056

* p-value < 0.05; ** p-value < 0.01; *** p-value < 0.001.

Table 7. Average treatment effect among the treated (ATT) on life satisfaction from propensity score matching considering as treatment the birth of the second child. Analysis only on women, by family orientations.

Time	Effect of second childbirth on women					
	Traditional		Mixed		Modern	
	ATT	S.E.	ATT	S.E.	ATT	S.E.
Entire period	0.124	0.091	0.062	0.051	0.130	0.121
Before childbearing	0.167	0.132	0.123	0.075	0.025	0.153
After childbearing	0.070	0.088	0.069	0.054	0.168	0.134
When kid is 0-3	0.054	0.093	0.095	0.057	0.163	0.128
When kid is 4-11	-0.064	0.138	-0.080	0.078	0.327	0.224

* p-value < 0.05; ** p-value < 0.01; *** p-value < 0.001.

Table 8. Average treatment effect among the treated (ATT) on life satisfaction from propensity score matching considering as treatment the birth of the second child. Analysis only on men, by family orientations.

Time	Effect of second childbirth on men					
	Traditional		Mixed		Modern	
	ATT	S.E.	ATT	S.E.	ATT	S.E.
Entire period	0.217*	0.092	0.242***	0.048	0.124	0.105
Before childbearing	0.214	0.116	0.273***	0.070	0.283*	0.129
After childbearing	0.323**	0.101	0.260***	0.051	0.053	0.115
When kid is 0-3	0.257*	0.107	0.247***	0.052	0.048	0.120
When kid is 4-11	0.332**	0.121	0.170*	0.068	-0.069	0.157

* p-value < 0.05; ** p-value < 0.01; *** p-value < 0.001.

Appendix A

Table A1. Life satisfaction and sample sample sizes year by year for the analysis on the effect of the first child on life satisfaction.

Year	Control			Treated		
	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
-1	24,136	5.17	1.17	1,203	5.48	1.12
0	20,139	5.15	1.16	1,294	5.51	1.10
1	17,587	5.13	1.15	975	5.26	1.16
2	15,124	5.11	1.15	641	5.12	1.12
3	13,254	5.09	1.16	476	5.14	1.15
4	10,992	5.09	1.14	342	5.12	1.16
5	8,972	5.09	1.13	253	5.15	1.11
6	7,165	5.08	1.12	199	5.14	1.02
7	5,764	5.08	1.12	166	5.04	1.19
8	4,546	5.10	1.12	124	5.08	1.19
9	4,222	5.09	1.13	120	5.19	1.00
10	3,418	5.08	1.13	104	5.10	1.15
11	2,698	5.06	1.13	76	5.24	1.13

Table A.2. Balance of independent variables before and after matching; pooled sample for the analysis of the effect of the first child.

Variable	Sample	Mean			Variable	Sample	Mean		
		Treated	Control	% bias			Treated	Control	% bias
Gender	Unmatched	0.57	0.47	19.20	Edu ISCED 3	Unmatched	0.41	0.49	-14.70
	Matched	0.57	0.57	**-1.10**		Matched	0.41	0.41	**0.00**
Age	Unmatched	27.33	25.40	30.20	Edu ISCED 4	Unmatched	0.10	0.09	5.20
	Matched	27.33	27.33	**0.00**		Matched	0.10	0.11	**-2.10**
Age squared	Unmatched	778.91	695.01	23.60	Edu ISCED 5	Unmatched	0.02	0.04	-10.80
	Matched	778.91	778.37	**0.20**		Matched	0.02	0.02	**0.00**
Happiness	Unmatched	3.06	3.06	0.70	Employed	Unmatched	0.87	0.65	53.90
	Matched	3.06	3.06	**0.40**		Matched	0.87	0.87	**0.10**
Single	Unmatched	0.27	0.71	-99.20	Unemployed	Unmatched	0.06	0.06	-2.80
	Matched	0.27	0.28	**-1.80**		Matched	0.06	0.06	**-0.70**
Married	Unmatched	0.45	0.11	80.30	Other LFS	Unmatched	0.07	0.29	-58.60
	Matched	0.45	0.45	**-0.10**		Matched	0.07	0.07	**0.30**
Cohabiting	Unmatched	0.27	0.16	28.10	Item 1 attitudes	Unmatched	2.80	2.90	-10.90
	Matched	0.27	0.26	**2.20**		Matched	2.80	2.79	**0.70**
Separated	Unmatched	0.01	0.02	-3.10	Item 2 attitudes	Unmatched	3.42	3.48	-6.30
	Matched	0.01	0.01	**-0.50**		Matched	3.42	3.42	**0.40**
Health status	Unmatched	1.99	1.99	0.70	Item 3 attitudes	Unmatched	3.07	3.05	3.60
	Matched	1.99	2.01	**-2.10**		Matched	3.07	3.06	**1.00**
Health probl	Unmatched	0.45	0.41	7.60	Item 4 attitudes	Unmatched	2.40	2.32	10.10
	Matched	0.45	0.46	**-2.00**		Matched	2.40	2.38	**2.80**
Income	Unmatched	2832.00	3012.60	-9.60	Item 5 attitudes	Unmatched	2.78	2.74	4.30
	Matched	2832.00	2819.10	**0.70**		Matched	2.78	2.77	**1.00**
Edu ISCED 1	Unmatched	0.21	0.17	10.90	Item 6 attitudes	Unmatched	3.98	3.99	-1.30
	Matched	0.21	0.22	**-2.60**		Matched	3.98	3.98	**-0.10**
Edu ISCED 2	Unmatched	0.25	0.21	8.00					
	Matched	0.25	0.23	**3.90**					

Note: the table reports the mean of each covariate in the treated and contol group (third and fourth coloumn, respectively) and the percent standardised difference between the two (fifth coloumn) before and after matching.