

DISCUSSION PAPER SERIES

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## ABSTRACT

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### **Fathering Daughters and Personality\***

The big five personality traits develop over a person's lifetime. There is some suggestive evidence that major life events - such as getting married, being fired from a job, and having children - affect personality. However, these associations cannot be interpreted as causal. This is the first paper that studies the causal effect of a life event - the gender of the first-born child - on the big five personality trait scores of fathers. Using yearly longitudinal data (2008 - 2020) I find that having a first-born daughter instead of son increases fathers' extraversion. The gender of the first child also affects labor market outcomes for fathers. Fathers of first-born daughters earn 127 euro more per month (i.e. 6.9% of the average monthly wage). This effect is not driven by changes in the number of hours worked or job switches.

**JEL Classification:** J12, J13, J16, J24

**Keywords:** big five personality traits, human capital, life events, fertility, family structure, labor market outcomes

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# 1 Introduction

The big five personality traits are an important component of human capital (see Almund et al. 2011), and are known to predict economic variables such as labor market success (Fletcher 2013), health (Goodwin and Friedman 2006, Ozer and Benet-Martinez 2006), well-being (Strickhouser et al. 2017), and financial distress (Xu et al. 2015). Personality traits - such as the big five - are known to change over a person's lifetime.<sup>1</sup> There is limited and mostly suggestive evidence that important life events affect personality.<sup>2</sup> All the evidence so far is based on endogenous events such as finding or losing a job, living together with a spouse, or becoming a parent. The issue with analyzing such events is that reverse causality (such as e.g. a personality change that leads the person to find, or get fired from, a job) and omitted variable bias can lead researchers to falsely conclude a causal effect from such events on personality.

This paper is the first to provide causal evidence of the effect of a specific event - the gender of parents' first born child - on fathers' big five personality traits.<sup>3</sup> The idea that children affect their parents is not new. There is a body of literature that studies the effect of the gender of children on behavior of their parents, with most emphasis on fathers. Prominent examples include: congressmen voting more liberally on reproductive rights issues (Washington 2008), voting (Oswald and Powdthavee 2010 and Van Effenterre 2020), gender norms (Shafer and Malhotra 2011 and Borrell-Porta 2019), and CEO behavior such as corporate social responsibility (Cronqvist and Yu 2017) and the gender wage gap (Dahl et al. 2018). The explanations

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<sup>1</sup>See e.g. Roberts and Mroczek (2008) and Specht et al. (2011).

<sup>2</sup>See also Elkins et al. (2017), Bleidorn et al. (2018), and Stillman and Velamuri (2020).

<sup>3</sup>The gender of the first child is considered truly random. For example Zietsch et al. (2020) shows that gender of the first child is unrelated to parents' genetics. Barcellos et al. (2014) find no differences in parental characteristics based on gender of the first child. Finally, with the Dutch LISS panel I will show that also in the sample I use, family and parental characteristics prior to birth are virtually the same for families with first-born sons as compared to first-born daughters.

for the changes in (fathers') behavior are mostly based on strategic decisions favoring women. For example, Oswald and Powdthavee (2010) explain their finding of an increase in left wing voting when having a daughter by an increased demand for (future) public goods that favor women more than men, and Washington (2008) discusses the costs of embarrassment of a visibly pregnant daughter due to a lack of access to an abortion. Since the effects of gender of children in these related papers are stronger for fathers, I focus on fathers as well.

This paper contributes to the literature about effects that children have on their parents. The contribution lies in that it asks the question whether it is not (only) parents' preferences (for gender equality or politics) but (also) their personality that has changed as a consequence of having a daughter instead of son. This distinction is important because personality is known to directly affect important behaviors and outcomes such as health (Goodwin and Friedman 2006, Ozer and Benet-Martinez 2006), labour market performance (Nyhus and Pons 2005, Heckman et al. 2006, Mueller and Plug 2006, Cobb-Clak and Tan 2011, Nandi and Nicoletti 2014, Sackett and Walmsley 2014, Hoeschler and Backes-Gellner 2017, and Wehner et al. 2020), political participation (Gerber et al. 2011), and financial behavior (Xu et al. 2015). In addition, personality traits are distinct from preferences. Given preferences such as time, risk and social preferences, personality helps explain peoples' behaviors. See Becker et al (2012) for a discussion. Therefore studying the impact on personality adds to our understanding of how family impacts parents' behaviors.

Previous literature has shown that parents' personality may be affected by - the arrival of - their children. For instance Galdiolo and Roskam (2014), Van Scheppingen et al. (2016), and Stillman and Velamuri (2020) find a negative association between becoming a father and extraversion.<sup>4</sup> A plausible explanation for fathers' decrease in the extraversion trait lies in the social investment principle. This principle states that investment in social institutions such as parenthood is embodied in social roles, which leads fathers to an increased focus on family. The decrease in extraversion comes from the

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<sup>4</sup>There are no such effects for mothers.

trade off where fathers start focussing less on themselves and more on their role in the family. See also Roberts et al. (2005) and Galdiolo and Roskam (2014) for a discussion.

Fathers have different interactions with sons than with daughters. This is well documented, and makes it plausible that the impact on fathers' personality also depends on the gender of the child. Fathers spend more time with sons than with daughters, see e.g. Lundberg et al (2007), Yeung et al. (2001), and Mammen (2011). More time with children likely leads to an increased focus on family and therefore we expect (more of) a decrease in extraversion when fathers have a first-born son than when having a first-born daughter.

Using yearly survey data - from the Longitudinal Internet Studies of the Social Sciences (LISS) panel - on parents' big five personality traits and gender and age of their children, I find that fathers' extraversion is higher when they have a first-born daughter, instead of first-born son. The other traits are mostly unaffected.

Next I explore the labor market impact of having a first-born daughter instead of son. Earlier research has shown a persistent correlation between personality and wages. Specifically, extraversion has a positive impact on wages, see also Nyhus and Pons (2005). I therefore test the effect of the gender of the first-born child on monthly wages. I find that having a first-born daughter is associated with a 127 euros higher monthly wage. Interestingly, this effect does not come from job switches. The job switch rate does not differ between fathers of first-born sons and fathers of first-born daughters.

The next section describes the data and empirical strategy. Section 3 provides the results, and the fourth section contains the conclusions.

## **2 Data and Empirical Strategy**

I estimate the effects of having a first-born daughter instead of son on fathers' big five personality traits, using yearly longitudinal survey data (2008 - 2020) from the Longitudinal Internet Studies for the Social sciences (LISS) panel. The LISS panel consists of a representative sample of people from the

Netherlands. Survey respondents answer a wide range of questions regarding personality, family, politics, work, income, and health.

Central to this paper are the big five personality traits. See Table 1 for a brief description of each of the five personality traits. For a more elaborate discussion, see e.g. Almund et al. (2011).

Table 1: Big five personality traits definitions: American Psychology Association

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|                   |   |
|-------------------|---|
| Extraversion      | An orientation of one's interests and energies toward the outer world of people and things, rather than the inner world of subjective experience, characterized by positive affect and sociability. |
| Neuroticism       | A chronic level of emotional instability and proneness to psychological distress.   |
| Agreeableness     | The tendency to act in a cooperative and unselfish manner.  |
| Openness          | The tendency to be open to new aesthetic, cultural, or intellectual experiences.  |
| Conscientiousness | The tendency to be organized, responsible and hardworking.  |

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In each year in the period 2008 - 2020 (with the exception of 2016, in which no survey wave regarding preferences was conducted) the survey participants rated how each of 50 statements reflect them on a five-point scale ranging from very inaccurate to very accurate. The big five statements in the LISS panel are based on the IPIP inventory. See Table A1 for the exact statements that are used in the survey.

The data I use is from an unbalanced panel containing a representative sample of the Dutch working age population with 3,878 fathers and 4,886 mothers from the Netherlands. Table 2 provides some of the descriptive statistics of the sample.

Table 2: Descriptive Statistics

| Sample:                              | all parents  | fathers       | mothers       |
|--------------------------------------|--------------|---------------|---------------|
| First-born girls: %                  | 50.4%        | 50.4%         | 50.4%         |
| Number of children: mean (stand.dev) | 2.3 (1.0)    | 2.3 (1.0)     | 2.3 (1.0)     |
| Age: mean (stand.dev)                | 55.8 (14.1)  | 57.4 (13.9)   | 54.4 (14.2)   |
| Household income: mean (stand.dev)   | 3,172 (5417) | 3,201 (4,038) | 3,147 (6,363) |
| Extraversion: mean (stand.dev)       | 3.24 (0.63)  | 3.25 (0.64)   | 3.24 (0.62)   |
| Neuroticism: mean (stand.dev)        | 2.49 (0.68)  | 2.37 (0.65)   | 2.59 (0.68)   |
| Agreeableness: mean (stand.dev)      | 3.89 (0.49)  | 3.72 (0.49)   | 4.03 (0.44)   |
| Openness: mean (stand.dev)           | 3.45 (0.49)  | 3.49 (0.50)   | 3.41 (0.48)   |
| Conscientiousness: mean (stand.dev)  | 3.77 (0.50)  | 3.74 (0.50)   | 3.80 (0.50)   |
| Number of individuals:               | 8,808        | 3,878         | 4,886         |
| Number of observations:              | 31,484       | 14,308        | 17,126        |

The fraction of daughters is roughly 50%, as expected. The age distribution and the number of children show that the sample is relatively old. Fathers are on average slightly older than mothers (57 vs. 54). The high average age of parents implies that during the survey period there is only a limited amount of newly (first) born children. The average gross household income is roughly 3,100 euros, with a lot of variation. The big five personality traits are measured on a 5-point-scale. Table 2 presents the average scores for each trait. Mothers are more neurotic than fathers, and score higher on agreeableness, and the differences in conscientiousness, extraversion and openness to experience are small. These findings are in line with the literature, see e.g. Weisberg et al. (2011).

The panel is quite unbalanced. In 11 years, respondents are on average observed 3.6 times. There are two particular reasons for this. First, our key variables of interest (the big five and the family variables) come from survey waves that are administered at different months of each year. As

a consequence sometimes respondents miss one of the two waves, and are then excluded from the sample for that particular year. Second, my focus is solely on parents. Therefore a fraction of parents enters the sample only in later year.

I estimate the effect of having a first-born daughter instead of son on each of the big five personality traits separately. I conduct confirmatory factor analysis on the 10 statements belonging to each personality trait, and use the predicted value of the latent variable as my personality measure. By using factor analysis I take the correlation between respondents' answers to the statements into account, which decreases measurement error of the latent personality trait. Therefore this approach is preferred over arbitrary alternatives such as taking the mean response to each set of questions for each individual. I estimate the following equation:

$$Personality_{it} = \beta_0 + \beta_1 Daughter1_{it} + \beta_2 C_{it} + \epsilon_{it}.$$

The dependent variable  $Personality_{it}$  is a vector with the five personality characteristics for individual  $i$  in year  $t$ . The vector of coefficients of interest is  $\beta_1$  which shows the effect of having a first-born daughter instead of a first-born son on each of the five personality traits. In some of the regressions I include  $C_{it}$ , a vector of control variables, including age and year fixed effects. Other variables that are typically controlled for, such as household income, the total number of children, whether one has a partner, or even education level, may be affected by the gender of the first child and are therefore not included in my preferred specification. I estimate the above equation using pooled OLS with standard errors clustered at the individual level.<sup>5</sup>

In line with the social investment theory I expect the birth of children to lead fathers to an increased focus on family instead of on themselves, leading to a lower score on extraversion. Since fathers are more involved (time wise) with sons than with daughters, fathers with first-born daughters are more

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<sup>5</sup>As a robustness check I also estimate the same regressions with the additional control variables: household income, education, whether one has a partner, and the number of children.

extravert than fathers of first-born sons. For the other traits there is no predicted difference for fathers of daughter or sons.

For my empirical strategy to work it is essential that the gender of the first-born child is random. Previous literature shows that the child gender is unrelated to parental genes (Zietsch 2020), and that parental characteristics - such as education level and age of marriage - are unrelated to the gender of their children (see Barcellos et al. 2014.) With the LISS data I test whether parental observable characteristics can jointly predict the gender of the parents' first child. Table 3 shows the F-tests of regressions where parental characteristics (i.e. age, education level, income, and whether one has a partner) prior to child birth can predict the gender of parents' first child. The results show no relation between parental characteristics prior to child birth and gender of the first child. This indicates that in this setting the gender of the first child is indeed random.

Table 3: Test for randomness of gender of the first-born child

|  |             |         |         |
|--|-------------|---------|---------|
| Sample: parents 1 year before child birth        | Full, N=505 | Fathers | Mothers |
| F-test   | 0.71        | 0.90    | 0.81    |
| Sample: parents first 2 years before child birth | Full, N=878 | Fathers | Mothers |
| F-test   | 0.27        | 0.42    | 0.82    |

F-test to test whether respondent characteristics jointly explain the gender of the first-born child. Respondent characteristics: age, income, education level, and whether the respondent has a partner.

My preferred empirical specification in equation 1 differs slightly from some of the related literature. Washington (2008) and Oswald and Powdthavee (2010) for instance estimate the number of daughters linearly and control for the number of children. An important assumption is that families with a first born daughter instead of son do not start to differ after the first child is born. Washington (2008) and Oswald and Powdthavee (2010) check for a gender stopping rule, by comparing the distribution of the total number of children of parents with a first-born daughter versus son. After not finding evidence of a gender stopping rule, these papers (implicitly) conclude that

there are no differences in families with first born boys vs. girls given the total number of children. However, Dahl and Moretti (2008) find that mothers of first-born daughter are less likely to marry, more likely to get divorced, and fathers are less likely to obtain custody of first-born daughters as compared to sons.<sup>6</sup> In other words, the stability of families differs dependent on the gender of the first child. Since this effect is not fully captured by the number of children, I prefer to estimate the effect of a first-born daughter instead of son, in order to be more certain of a causal effect of child gender on fathers' personality.<sup>7</sup>

In addition, I check for a gender stopping rule in the LISS data set, see Table A2. While I find that the probability to have at least two children is not dependent on the gender of the first-born, I do see that parents with two children of the same gender are more likely to have a third child. This indicates that in our data there seems to be a gender stopping rule. This implies that the fraction of daughters which may be endogenous to personality, and following the approach of Washington (2008) and Oswald and Powdthavee (2010) can lead to a biased estimate.

Since I pool the data, I am implicitly giving more weight to individuals that are observed in more waves. Therefore, as a robustness check I reweigh the sample in order to give every respondent the same weight. This does not effect the results and even makes the key results a bit stronger.

## 3 Results

### 3.1 Children and Parental Personality

I estimate the effect of having a first-born daughter on the big five personality traits using equation 1 for the full sample of parents without any control variables, and then separately for fathers and mothers. Panel A of Table 4

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<sup>6</sup>In addition, using Dutch data Kabátek and Ribar (2021) find that parents of first-born daughters are more frequently divorced as compared to parents of first-born sons.

<sup>7</sup>A second reason for why controlling for the number of children is problematic, is that whether parents have another child, depends on the personality of the first-born, see Jokela (2010).

shows the results for each of the personality traits for all parents. Columns 1 - 5 measure the effect of the gender of the first child on personality traits. Column 1 shows that parents of a first-born daughter are more extravert. The effect is a significant 2.2% of a standard deviation.

Column 2 shows that parents with first-born daughter also score somewhat higher (1.6% of a standard deviation) on neuroticism, although this difference is not statistically significant. The other three personality traits are unaffected. The estimates in the last three columns can rule out effect sizes of roughly 2%, and hence can be considered as quite precisely estimated null effects.

Since earlier research - such as Washington 2008, Oswald and Powdthavee 2010, and Borrel-Porta 2019 - has shown that fathers change their attitudes and behaviors much more when having a daughter (instead of son) than mothers, my main focus in this study is on fathers. The regressions in Panel B of Table 4 show the effects on the full sample of fathers. Column 1 shows that fathers of daughters are more extravert. The effect is 4.3% of a standard deviation ( $p=0.017$ ), and almost twice as much as for the sample of mothers and fathers combined.<sup>8</sup> Also the effect on neuroticism is roughly twice as large as for the full sample, a sizeable 3.3%, but still insignificant. The effect on the other traits (agreeableness, openness, and conscientiousness) is also for the sample of fathers a precisely estimated zero. To put the size of the effects into perspective it is useful to compare these findings with the estimates in the related literature. Stillman and Velamuri (2020) comes closest to this paper. They use fixed effects regressions in order to estimate the effect of the birth of a child (but not the gender of the child) on the big five scores of parents. For fathers they find changes in the standard deviation of about 2% to 5%, with a 2.5% decrease in extraversion for fathers.

Finally, Panel C of Table 4 shows the effect on the sample of mothers. As expected these are all zero and quite precisely estimated. I can rule out effects of 2% to 4% for each personality trait.

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<sup>8</sup>The effect on extraversion survives a correction for multiple hypotheses testing. For instance, the Romano-Wolf multiple hypothesis correction procedure gives a p-value of 0.03 when including all of the five outcomes.

Table 4: The effect of a first-born daughter on parents

|  | Extraversion       | Neuroticism      | Agreeableness     | Openness         | Conscientiousness |
|--|--------------------|------------------|-------------------|------------------|-------------------|
| Panel A: all parents N=8,808, N*T=31,484 |                    |                  |                   |                  |                   |
| First-born daughter OLS                  | 0.022*<br>(0.012)  | 0.016<br>(0.016) | 0.004<br>(0.011)  | 0.010<br>(0.010) | -0.005<br>(0.006) |
| Panel B: fathers N=3,878, N*T=14,308     |                    |                  |                   |                  |                   |
| First-born daughter OLS                  | 0.043**<br>(0.018) | 0.033<br>(0.023) | 0.009<br>(0.016)  | 0.010<br>(0.014) | -0.011<br>(0.009) |
| Panel C: mothers N=4,886 N*T=17,126      |                    |                  |                   |                  |                   |
| First-born daughter OLS                  | 0.005<br>(0.015)   | 0.001<br>(0.022) | -0.001<br>(0.012) | 0.009<br>(0.013) | 0.000<br>(0.008)  |

These coefficients are based on a pooled OLS regression and the standard errors (in parentheses) are clustered at the individual level. \*, \*\*, \*\*\* indicate significance at the 0.10, 0.05, and 0.01 level respectively. No control variables used.

In Table 5 I test the robustness of the finding that a first-born daughter increases' fathers' extraversion as compared to having a first-born son. In Panel A I add year dummies (for the year the survey was conducted) and a flexible age specification with three polynomials. Panel B adds also time varying controls variables (specifically: education level, income, and whether one has a partner). Panel C weights the observations based on the number of times the father is observed in the data. The reason to correct for the number of times a father is observed in the data is that fathers who are in the sample period the entire time have older children. Table 5 shows that all the results are very robust to the specification. The effect of having a first-born daughter remains 4%. The effect on neuroticism is somewhat smaller but insignificant, and the effect on the other traits is a precisely estimated null.

Table 5: The effect of a first-born daughter on fathers' personality: robustness to different specifications

|  | Extraversion | Neuroticism | Agreeableness | Openness | Conscientiousness |
|--|--------------|-------------|---------------|----------|-------------------|
| Panel A: fathers N=3,878, N*T=14,308               |              |             |               |          |                   |
| First-born daughter OLS:                           | 0.042**      | 0.036       | 0.007         | 0.011    | -0.011            |
| Control var: age, year                             | (0.018)      | (0.023)     | (0.016)       | (0.014)  | (0.009)           |
| Panel B: fathers N=3,878, N*T=14,308               |              |             |               |          |                   |
| First-born daughter OLS:                           | 0.043**      | 0.036       | 0.006         | 0.006    | -0.011            |
| Control var: age, years, and time varying controls | (0.018)      | (0.023)     | (0.016)       | (0.013)  | (0.009)           |
| Panel C: fathers N=3,878, N*T=14,308               |              |             |               |          |                   |
| First-born daughter weighted OLS:                  | 0.044**      | 0.033       | 0.007         | 0.007    | -0.011            |
| Control var: age, years, and time varying controls | (0.018)      | (0.023)     | (0.016)       | (0.013)  | (0.009)           |

These coefficients are based on a pooled OLS regression and the standard errors (in parentheses) are clustered at the individual level. \*, \*\*, \*\*\* indicate significance at the 0.10, 0.05, and 0.01 level respectively.

## 3.2 Family Composition

One potential concern with the analysis so far may be that the effect of the gender of the first child may be influenced by the gender of later children. For example, if fathers' personality is affected by all their children, then the effect of the first-born child may in fact also depend on the gender mix of later siblings. Therefore I run several robustness checks. First I estimate the effect of gender composition of the first two children, see table 6. Row one shows the effect of having first a daughter and then a son (as compared to two daughters).

Table 6: The effect of gender composition of children on fathers

| All fathers with at least two children<br>N=3,164, N*T=11,815 | Extraversion        | Neuroticism         | Agreeableness     | Openness          | Conscientiousness |
|---|---------------------|---------------------|-------------------|-------------------|-------------------|
| girl-boy  | -0.003<br>(0.027)   | -0.013<br>(0.036)   | 0.008<br>(0.023)  | 0.008<br>(0.021)  | 0.004<br>(0.015)  |
| boy-girl  | -0.054**<br>(0.027) | -0.020<br>(0.036)   | -0.012<br>(0.024) | -0.008<br>(0.021) | 0.011<br>(0.015)  |
| boy-boy   | -0.037<br>(0.028)   | -0.079**<br>(0.036) | 0.000<br>(0.025)  | 0.001<br>(0.021)  | 0.022<br>(0.014)  |

Baseline: girl-girl

These coefficients are based on a pooled OLS regression and the standard errors (in parentheses) are clustered at the individual level. \*, \*\*, \*\*\* indicate significance at the 0.10, 0.05, and 0.01 level respectively. The sample consists of fathers with at least 2 children. In all regressions we use the control variables: age, age<sup>2</sup>, age<sup>3</sup>, ln(household income), education level, whether one has a partner, the total number of children, and year dummies.

I find precisely estimated null effects, implying that the gender of the second child does not influence the effect of the first child's gender on fathers' personality. The second and third row give coefficients that are a lot larger, and some of them significant. The lack of significance may come from the smaller sample size. Note that this sample only consists of parents with at least two children. In addition, I estimate the effect of the gender of the first-born child using the gender of the second-born as a control variable. I find that the main results (the increase in extraversion) remains. Finally, I check whether the gender of the second-born child affects fathers personality, by estimating the effect of the second-born child, conditional on the the gender of the first child. I don't find any effect of the gender of the second-born

child on fathers' personality. This suggests that the gender of the first child is important, independent of the gender of later children. An explanation for this may be that once fathers increased their focus on family (after the arrival of the first child), this focus remains and therefore the difference in personality stays the same.

### **3.3 Impact on Wages**

There is by now a large literature that has estimated associations between the big five personality traits and labor market performance, see in particular Nyhus and Pons (2005), Fetcher (2013), Elkins et al. (2017), Flinn et al. (2018), and Flinn et al. (2020). This literature generally finds that extraversion is associated with higher wages. I estimate the effect of gender of the first-born child on wages by estimating a standard mincer equation - including experience and education - and a gender of the first child dummy.

Table 7 shows that fathers with a first-born daughter earn more than fathers of first-born sons. The difference is 127 euros per month, which is marginally significant and equals 6.9% of the average wage. When including control variables the difference goes down to 110 euros and becomes marginally insignificant ( $p=0.118$  and  $p=0.111$ ). This finding is in line with Cronqvist and Yu (2017) and Dahl et al. (2011) who show that fathers of daughters behave differently on the work floor than fathers of sons. Interestingly, the higher wage does not come from the number of hours worked (column 2), nor does it come from more frequent job switching.

Table 7: The effect of a first-born daughter on fathers' wages

|                                       | Net income | Number of hours | Job switch |
|---------------------------------------|------------|-----------------|------------|
| Panel A: fathers N=3,878, N*T=14,308  |            |                 |            |
| First-born daughter OLS:              | 127.40*    | -0.015          | -0.002     |
| no control var                        | (71.42)    | (0.314)         | (0.008)    |
| Panel B: fathers N=3,878, N*T=14,308  |            |                 |            |
| First-born daughter OLS:              | 108.11     | -0.022          | -0.004     |
| Control var: experience and schooling | (69.12)    | (0.399)         | (0.008)    |
| Panel C: fathers N=3,878, N*T=14,308  |            |                 |            |
| First-born daughter weighted OLS:     | 112.20     | -0.021          | -0.004     |
| Control var: experience and schooling | (70.32)    | (0.299)         | (0.008)    |

These coefficients are based on a pooled OLS regression and the standard errors (in parentheses) are clustered at the individual level. \*, \*\*, \*\*\* indicate significance at the 0.10, 0.05, and 0.01 level respectively. The mean (and standard deviation) of the dependent variables are: 1835.09 (3065.20), 36.15 (8.03), and 0.094, ((0.291) respectively.

## 4 Conclusion

In this paper I studied the impact of family formation on personality traits. Particularly, I study how the gender of the first-born child impacts parents' personality. I find that fathers with first-born daughters score higher on the extraversion trait as compared to fathers with first-born sons. This finding is in line with the social investment principle, that states that when becoming a fathers, men start focussing more on family instead of on themselves. Since fathers spend more time with sons than with daughters, the family focus is stronger for fathers with sons and therefore they score lower on extraversion.

This paper relates to a small but growing literature that is concerned with the question how life events impact personality. Different from most other effects found in the literature (from events such as: buying a house, getting fired from a job, or getting children) the effects found in this paper can be interpreted as causal. Further, this study contributes to a literature that shows the impact of the gender of children on fathers. These papers show that fathers' attitudes and behaviors are affected by the gender of their children, I add a change in personality.

Finally, I study the impact of gender of the first child on fathers' labor market outcomes. I find that fathers of first-born daughters earn higher wages. This is in line with earlier findings that being more extravert is related to higher wages.

This research helps us to better understand how family formation impacts fathers' personality and labor market outcomes. Future research could increase our understanding of the relation between family formation and personality by studying other events. For example the causal effect of having children on personality (using for instance the outcomes of IVF treatments as in Lundborg et al. 2017), or the effect of losing a family member (due to an unexpected timing of death).

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## 5 Appendix

**Table A1:** Big five questions per trait

|                   |  |
|-------------------|--|
| Extraversion      | Am the life of the party<br>Don't talk a lot<br>Feel comfortable around people.<br>Keep in the background. (reversed)<br>Start conversations.<br>Have little to say. (reversed)<br>Talk to a lot of different people at parties.<br>Don't like to draw attention to myself. (reversed)<br>Don't mind being the center of attention.<br>Am quiet around strangers. (reversed) |
| Neuroticism       | Get stressed out easily.<br>Am relaxed most of the time (reversed)<br>Worry about things.<br>Seldom feel blue (reversed)<br>Am easily disturbed.<br>Get upset easily.<br>Change my mood a lot.<br>Have frequent mood swings.<br>Get irritated easily<br>Often feel blue.   |
| Agreeableness     | Feel little concern for others. (reversed)<br>Am interested in people.<br>Insult people (reversed)<br>Sympathize with others' feelings.<br>Am not interested in other people's problems. (reversed)<br>Have a soft heart.<br>Am not really interested in others. (reversed)<br>Take time out for others.<br>Feel others' emotions.<br>Make people feel at ease.              |
| Openness          | Have a rich vocabulary<br>Have difficulty understanding abstract ideas.(reversed)<br>Have a vivid imagination.<br>Am not interested in abstract ideas. (reversed)<br>Have excellent ideas.<br>Do not have a good imagination. (reversed)<br>Am quick to understand things<br>Use difficult words.<br>Spend time reflecting on things.<br>Am full of ideas.                   |
| Conscientiousness | Am always prepared.<br>Leave my belongings around. (reversed)<br>Pay attention to details<br>Make a mess of things. (reversed)<br>Get chores done right away.<br>Often forget to put things back in their proper place. (reversed)<br>Like order.<br>Shirk my duties. (reversed)<br>Follow a schedule.<br>Am exacting in my work.  |

Participants are asked to how accurately each statement describes them. Answer categories are on a 5-point-scale. Specifically, the categories are: "very inaccurate", moderately accurate, "neither inaccurate nor accurate", "moderately accurate", and very accurate.

Table A2: Test for the gender stopping rule

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| Pr(number of children)   | at least 2        | at least 3          |
|--------------------------|-------------------|---------------------|
| First child girl         | -0.020<br>(0.015) |                     |
| First two children girls |                   | 0.059**<br>(0.025)  |
| First two children boys  |                   | 0.076***<br>(0.025) |

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OLS regression, standard errors in parenthesis and clustered at the individual level. Gender stopping rule, no controls variables included.