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The effect of divorce on depression: A new approach

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1 Introduction

In the 20th century, divorce rates have increased rapidly. At the end of this century, around 45% of all marriages ended in a divorce (Amato, 2010). Although these divorce rates seem to decrease, the number of marital dissolutions are still historically high. Only in the 28 countries of the European Union (EU) 1,892,000 couples divorced in 2015. The divorce rate increased from 0.8 per 1.000 in 1965 to 1.9 in 2016 (EUROSTAT, 2018). The main problem of this is that an increase in marital dissolutions is found to be correlated with negative (mental) health outcomes (Amato, 2010).

However, a problem by estimating the effect of divorce on health outcomes is that there are pre-divorce differences between individuals who divorce and individuals who stay married. Are individuals who divorce more often depressed? Or do individuals who have or had a depression divorce more often? In the literature new approaches, which account for this possible selection bias lead to new insights. These new insights make the existing literature about the effects of divorce hard to interpret since in most of the literature the counterfactual is not sufficiently defined. Therefore the obtained results are subject to selection bias (Frimmel et al., 2016). New research that accounts for this selection bias, about the effect of divorce on mental health is needed therefore. This study will fill this gap in the literature by evaluating the effect of marital dissolution on mental health, firstly by replicating the (potentially endogenous) observational relationships found by earlier studies and secondly by using the Instrumental Variable (IV) method. For this a nationally representative sample of senior-aged US-citizens is used.

The research question of this study is:

What is the effect of divorce on an individual's depression symptoms?

This research is not only socially relevant due to a large number of divorces nowadays,

but it is also relevant since mental health highly influences Quality of Life (QoL) (Welham et al., 2001). Since the government can have little to no influence on individuals' relationships, no policy implications follow from this paper.

Moreover is this research scientifically relevant, since it is the first paper that estimates the effect of divorce on mental health by using econometric methods that imitate as much as possible the counterfactual. Observational studies which evaluated the effect of divorce on depression symptoms exist already. However, these studies didn't have a proper identification strategy. On the other hand Instrumental Variable Regressions have been used to estimate the effect of divorce on different outcomes, but not on depression symptoms. Therefore, this study is the first to use the Instrumental Variable method to evaluate the effect of divorce on depression symptoms.

2 Theory

Marital dissolution is linked to negative health outcomes. More specifically is marital dissolution linked to negative mental health outcomes, whereas different studies find that on average individuals who divorce experience lower mental health outcomes (Anthony and Petronis, 1991; Robert and Aseltine, 1993; Booth and Amato, 1991; Bruce and Kim, 1992; Mastekaasa, 1992; Rodgers, 1996; Wade and Pevalin, 2004; Bierman et al., 2006; Amato, 2010)

2.1 Social causation model

The association between divorcement and mental health is mainly explained by two different models. First the social causation model, according to which divorcement leads to lower mental health. Divorce can be a very stressful experience since it causes a change of habits, feelings of anger and sadness and a decline in disposable

income. This increase in stress due to marital dissolution leads to lower mental health outcomes (Menaghan and Lieberman, 1986; Booth and Amato, 1991; Pearlin et al., 2005). Menaghan and Lieberman (1986) used a sample of inhabitants of Chicago to estimate the effect of divorce on personal welfare and emotional wellbeing over a period of four years. By using regular multiple regressions, they concluded that divorce affects emotional wellbeing not only via a decrease in personal income but also directly affects mental illness. Booth and Amato (1991) used both panel data and multiple regressions as well when they evaluated the effect of divorce on mental distress by using a U.S. national sample. The authors find that pre-divorce differences influence the severity of mental illness after divorce. Interestingly, the authors find that when someone felt disadvantaged during his/her marriage, after divorce mental health can increase for the disadvantaged, while it decreased for the advantaged.

Complementary to the causation model is the social support perspective, which points out the benefits of marriage, like the support of partners to live healthily and the emotional support which partners provide (Gove et al., 1990; Ross et al., 1990; Bierman et al., 2006). When a couple divorces, the loss of these marital benefits, also leads to lower (mental) health outcomes (Amato, 2010). This effect seems especially to be significant for women. Cairney et al. (1999) showed, also by using regular multiple regressions, that divorced mothers had a 12-month prevalence rate of major depressive disorder which was twice as high as married mothers. However, since only inhabitants of Ontario (Canada) are used, the authors acknowledged that the external validity of their study is not strong. Similar results as Cairney et al. (1999) were also obtained by Brown and Moran (1997), who use a Poisson regression to test the effect of marital dissolution on poverty. A limitation of their research is their small sample size (N=404). Different reasons for these findings that women are more affected by marital dissolution than men, are given. McLanahan (1983) explains that this increase in distress is totally due to the

marital dissolution itself. Brown and Moran (1997) however note that especially a loss in disposable income, which is greater for women than men, and a lack of social support lead to depressions in divorced mothers.

2.2 Health selection model

A second explanation for the correlation between marital dissolutions and mental illness is offered by the health selection model, according to which individuals who divorce and those that stay married are intrinsically different. This means that individuals with low health are more likely to divorce than healthy individuals (Amato, 2010). One of the first proofs for this model was given by Kessler et al. (1998) who evaluated the effect of divorce on mental health by using a sample of US-citizens between 15-54 years old. Their results showed that 47.8% of the individuals who had experienced a psychological disorder before or during their first marriage divorced, while the group with no psychological disorders reported a divorcement rate of 35.9%. This new insight led to new studies wherein the health selection model is emphasized (see e.g. McLanahan et al. (2013)). This evidence for selection make the topic of marital dissolution difficult to approach, since methods must be used that overcome this selection bias (Amato, 2010). Also, studies exist which state that divorce does not affect mental health. However, these studies are a small minority of all studies about divorce (Amato, 2010). An example of such a study is Overbeek et al. (2006) who used logistic regressions on Dutch panel data. They concluded that divorce does not have any negative effect on DSM-III-R disorders.

2.3 Used methodologies

An important note (mostly) regarding studies on which the social causation model is built, is that a substantial part of the empirical studies on the social causation model

make use of cross-sectional data and linear regression. Such regressions can estimate the causal effect of marital dissolution if all relevant endogenous variables are included. However, a problem with these regressions is that it is very difficult to specify and include all relevant variables. Multiple regressions do not account for the possible bias that individuals who stay married are intrinsically different than individuals who divorce (Mastekaasa, 1992; Afifi et al., 2006; Frimmel et al., 2016). This bias is called the omitted variable bias. Some authors used more advanced methods to evaluate different effects of divorce. A method that is used for this is the Fixed Effects method, which is used by Wade and Pevalin (2004) who find that individuals who divorce have lower mental health beforehand. However, after controlling for this selection bias, the authors still find a negative effect of divorce on mental health in the year of marital dissolution. A year after the moment of marital dissolution, the level of mental health seems to be almost equal to the level of mental health in the year before divorce. So Wade and Pevalin (2004) observe a temporary negative effect of divorce on mental health, which lasts for a year. However, also Wade and Pevalin (2004) do not sufficiently define the counterfactual since omitted variables may still play a role. Still, Wade and Pevalin (2004) show us that selection indeed plays a role. On the other hand, the note must be placed that the models do not have to be substitutes of each other but they can be complementary. We have seen this already in the results of Wade and Pevalin (2004), but also Robert and Aseltine (1993) and Hope et al. (1999) controlled for mental health before marriage (selection model) and still found an effect of divorce on mental health (causation model).

Whereas some authors used pre-marriage mental health to control for the possibility of selection, recent studies used more advanced methods (Amato, 2010). McLanahan et al. (2013) did a literature review of the methods that are used mostly to define the effects of divorce (e.g. Instrumental Variable Regression, Individual Fixed Effects Regression

etc.). Some examples of the use of these methods are Zuppann et al. (2012) and Olivo-Villabrille (2018). In the Methodology section this paper will extent on the use of these methods. For now we can conclude that both causation and selection seem to influence the effect of divorce on mental health, whereas women seem to be affected the most. However, Wade and Pevalin (2004) indicate that the effect of divorce on mental health is mostly temporary.

This IV-approach is recently used to estimate several effects of marriage/divorce, e.g. Bellido et al. (2013) used the number of children conceived during first marriage as an IV to evaluate which children stabilize marriage. Frimmel et al. (2016) used sexual integration in fathers' workplaces as an IV to estimate the long-term effects of divorce on childrens outcomes. Lastly, Bedard and Deschenes (2005) used the gender of the firstborn child as an IV to estimate the effect of divorce on the economic status of women.

The IV which will be used in this research is the gender of the firstborn child, which is also used by Bedard and Deschenes (2005). With regard to the first assumption, the use of the gender of the firstborn child as an IV seems reliable, since several studies showed that marriage is indeed influenced by the gender of the firstborn. Morgan et al. (1988)) found a decrease of 9% in divorce risk for couples with a boy as their firstborn. For this results the authors used a data set containing U.S. citizens that were born between approximately 1920 and 1945. Also Teachman and Schollaert (1989) used a data set containing U.S. citizens. Although their respondents were younger (birth year: 1935-1950 approximately), the authors still find that mothers of a boy are more likely to be married at any point in time. Katzev et al. (1994) used data about U.S. mothers with an average birth year of 1953. They concluded that the risk on marital dissolution decreased when a family contained at least one boy as a child. Similar results are also found by Dahl and Moretti (2004), who use U.S. Census Data (birth year: 1930-1970) These

findings are replicated by Bedard and Deschenes (2005) who found in their first stage an F-statistic of 46.1, which easily passes the earlier mentioned rule of thumb. For this they used the U.S. Census Public-Use Micro Samples with women born between 1940 and 1960. This result was also found by these authors in two other data sets. A possible reason for this increase in divorce risk would then be the sex preferences of the parents (Todesco, 2010).

3 Methodology

In this research, several variables will be used. Firstly a variable that represents mental health is needed. Radloff (1977) constructed the so-called Centre for Epidemiologic Studies Depression (CES-D) scale which measures depressive symptoms an individual has. The questionnaire which belongs to the CES-D scale depressive moods, feelings of guilt inferiority, helplessness and despair, loss of appetite, sleep disorders and psychomotor retardation (slowing down of thought and physical movements). Each of these facets of the CES-D scale also has its own score, whereas the CES-D scale is the sum of all these scores. The maximum score which can be obtained is 8. This score is e.g. also used by Umberson and Williams (1993) who assess the mental health of divorced fathers.
The RAND HRS Longitudinal data set provides an CES-D score for all individuals per wave.The CESD-score measured in 1994 will be used since the average time between the interview and the year of divorce is the lowest for this year. As a dependent variable a dummy that indicates whether someone ever divorced will be used. The children used are all biological children.

Two methods will be used in this paper: the replication of other studies by using an Ordinary Least Squares (OLS) analysis and the use of the IV-method.

3.1 OLS analysis

Firstly, the OLS analysis will be used to replicate the results of Bierman et al. (2006) by using the Rand HRS data. As shown in the Literature Review Bierman et al. (2006) found a negative effect of divorce on mental health. The used multiple linear regression is in the form:

$$Y_i = \alpha + \beta \times X_i + \pi \times \psi_i + \epsilon_i \tag{1}$$

Here Y_i is a variable that represents the CES-D score of individual i, whereas X_i is a dummy variable which indicates whether individual i has divorced. ψ_i is a vector of the following control variables: remarried (a dummy which indicates whether individual i is/has been remarried after the registered divorce), gender, age (in 1994), race, education (in years), age at first birth, kids in household and income. These control variables are also used by Bierman et al. (2006). However, they included the control variables widowed and never married as well. Since the data set used for this paper does not contain participants who are widowed and all people have been married these variables cannot be included.

3.2 Instrumental Variable

As mentioned in the Introduction, one of the main problems of regular multiple regressions is that the counterfactual is not sufficiently defined. Due to the intrinsic differences between individuals who stay married and individuals who divorce, it is almost impossible to make a fair comparison with an, in this field widely used, OLS analysis. Therefore in this paper the Instrumental Variable method is used. An IV-approach can overcome the correlation between the variable of interest and the error term, by isolating the variation of the variable of interest which is uncorrelated with the error term.

For an IV-estimation, three regressions are used.

The first stage is in the form:

$$T_i = \alpha + \beta \times Z_i + \pi \times \psi_i + \epsilon_i \tag{2}$$

Here T_i is a variable that represents if individual i is divorced, whereas Z_i represents the gender of the firstborn of individual i. α represents the constant term. ψ_i is a vector of control variables, such as gender, age, education (in years), age at first birth, the squares of the last three and interactions between age and education and age at first birth and education. These control variables are also used by Bedard and Deschenes (2005).

The reduced form is in the form:

$$Y_i = \omega + \chi \times Z_i + \phi \times \psi_i + \mu_i \tag{3}$$

Here Y_i represents the CES-D score, that represents mental health, of individual i. Z_i and ψ_i are the same as specified at the first stage regression. ω is the constant term.

The effect of divorce on mental health is then:

$$p = \frac{\chi}{\beta} \tag{4}$$

To obtain reliable standard errors the Two-Stage Least Squares (2SLS) Regression Analysis is used.

An IV-estimation is based on three assumptions. Firstly, the IV must have a causal effect on the variable of interest (divorce). To check this assumption, a rule of thumb is that the F-statistic of the first stage (regression of instrumental variable on the variable of interest) must be larger than 10, as proposed by Bound et al. (1995). Secondly, the IV must be uncorrelated with any other determinant of the independent variable (mental health). A possibility to verify this assumption is the Sargan test. For the Sargan test two Instrumental Variables are needed, while one must be valid. Also, the Sargan test relies on homogenous treatment effects. Especially the first condition is a problem since the data set contains only one IV that is specified by the literature. Therefore this assumption cannot be verified unless the instrument is truly randomly allocated. Since the gender of a firstborn child is as good as randomly allocated in a population of ever-married mothers, there seems to be no threat that the IV is correlated with any determinant of mental health (Bedard and Deschenes, 2005). This can be tested by evaluating the correlation between mental health and other pre-determined factors. Thirdly, the Instrumental Variable is only allowed to influence the independent variable (mental health) via the variable of interest (divorce). Again, since the error term is not observed, this assumption cannot be verified.

4 Sample

The main data set which is used for this research is the RAND HRS Longitudinal File 2014 (V3). This representative data set contains US-citizens of senior age. The data set is mostly used for Health and Retirement Studies (HRS), which causes the relatively high average age of the respondents. This data is also used in other studies that estimate specific effects of divorce, e.g. Dupre et al. (2015) and Hung and Knapp (2018).

The RAND HRS Longitudinal data set is a user-friendly file that contains twelve waves

of data that are collected by the American National Institute of Aging (NIA). The first wave was in 1992, whereas after this year respondents were re-interviewed in the next wave. The waves were gathered bi-annually from 1992 through 2014. All respondents were at an age of 51-61 during the first wave they were interviewed. New respondents, after 1992, were added in 1998, 2004 and 2010. This led to more variation in age, since the new respondents where at an age of 51-61 at the moment when they were first interviewed. The RAND HRS Longitudinal data set is a general data set that covers the most important data of each wave. To obtain the marital history and the gender of an individual's firstborn child, also the HRS Life History File and the RAND HRS Family Data Files are used. The first one is a general data set which covers a large range of measures about an individual's history, whereas the variables of our interest are related to marital history. The RAND HRS Family Data contains information about an individual's children for each of the waves. After merging the different HRS data sets only respondents where used who were ever married, were not widow at the time of the interview and had at least one biological child in the data set. The used data set for the first stage of the IV contained 19,864 respondents. The difference in sample size is due to the fact that the OLS analysis uses more variables and therefore contains more missing observations. This sample size is compared to other studies about marriage/divorce, who also use an IV, bigger than, e.g. Dupre et al. (2015) (N = 15,827) and Olivo-Villabrille (2018) (N = 4,519). The used data set for the OLS estimations contained 9,750 respondents, which is larger than the data set Bierman et al. (2006) used (N = 3,032).

Table 1 presents the key characteristics of the used data set:

Table 1: Characteristics

Variable	# Observations	Average	Minimum	Maximum
Female	21,697	51.8%	0	1
Education (years)	21,638	12.1	0	17
Age (years)	21,697	55.9	20	104
Ever divorced	21,697	40.8%	0	1
# Divorces	11,046	0.3	0	4
Age at first birth (years)	21,554	24.3	15	79
CES-D score (points)	10,175	1.3	0	8
Age of first child (years)	21,554	31.7	0	79
# Children born	20,748	3.4	1	35
Household income($)	11,046	4,600	0	3,000,000
Firstborn female gender	21,689	49,5%	0	1
Currently divorced	11,046	6,7%	0	1
Currently divorced	11,046	86,7%	0	1

Table 1: Descriptive statics of the used sample. The CES-D scale is a scale that represents a respondents mental health (Radloff, 1977). People who are not divorced or married have a registered partnership or they are separated. All observations are made in 1994.

5 Results

In this section first the endogenous effect of divorce on depression symptoms will be estimated and secondly the assumptions of the IV will be verified. If these assumptions hold, the results of the IV will be presented.

5.1 OLS analysis

The results of the replication of the study of Bierman et al. (2006) are obtained by using a linear regression. Bierman et al. (2006) found a negative relationship between divorce and mental health. The results of the replication of Bierman et al. (2006) are presented in Table 2

Table 2: The results of the OLS analysis on the *CES-D score*

CES-D score	Coefficient (Std. error)
Divorce	0.187 (0.051)***
Remarried	-0.047 (0.078)
Female	0.189 (0.052)***
Education years	-0.103 (0.009)***
Age	-0.007 (0.004)*
Age at first birth	0.004 (0.005)
# Children born	0.037 (0.016)**
Race (0 = White)	
Black/African American	0.235 (0.074)***
Other	0.297 (0.152)*
Income	-0.105 (0.023)**
Constant	3.074 (0.414)***

Table 2: The used sample is defined as in Table 1. The effect of white race is included in the constant term. The logarithm of income is included. The standard errors are reported in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

The results of the regular multiple regression show a significant association between divorce and the CES-D score. Since the effect is positive, a divorce goes hand in hand with an average increase of 0.272 of the CES-D score. This means that ever-divorced parents on average have more depressive symptoms. However, since the maximum CES-D score is 8, an increase of approximately 0.25 is relatively low. So, the obtained results are positive and significant but have a small magnitude.

5.2 Instrumental Variable

Firstly, the assumptions of the Instrumental Variable method will be verified. To check whether the instrument has a strong causal effect on the variable of interest, a linear probability model (regression 2) is used. This model provides us with the following results:

Table 3: First stage linear probability model on *Ever divorced*

Ever divorced	Coefficient (Std. error)
Firstborn girl	0.001 (0.006)
Respondent female	-0.038 (0.006)***
(A) Age	-0.007 (0.000)***
(B) Age at first birth	-0.012 (0.001)***
(C) Education years	0.005 (0.001)***
A-Squared	-0.000 (0.000)***
B-Squared	0.001 (0.000)***
C-Squared	-0.000 (0.000)***
A x C	-0.000 (0.000)***
B x C	-0.001 (0.000)***
Constant	0.913 (0.029)***
F-statistic of Firstborn girl	0.058

Table 3: The used sample contains 19,864 observations. The f-statistic is obtained by taking the square of the t-statistic. The interaction terms are demeaned. Heteroskedasticity-robust standard errors are between parentheses. * p < 0.1; ** p < 0.05; *** p < 0.01.

Since the F-statistic of the independent variable *Firstborn Girl* is lower than 10, the first assumption of an IV-regression does not hold. As the results show, the gender of the respondent also has a significant effect. Therefore the first stage is replicated by stratifying the model by respondent sex (see Appendix, Table 5). Another robustness check is done by only using firstborn children who are younger than 19 (see Appendix, Table 6. However, in all cases the F-statistic is lower than 10 and therefore the first assumption does not hold. According to the second assumption, the instrument should be uncorrelated with the error term. This assumption can only be falsified by checking whether their is correlation between the instrument and other pre-divorce determined factors that influence the outcome. The results of these test are presented in 4:

Table 4: Differences in means by firstborn gender

	Firstborn Boy	Firstborn Girl	
Variable	Mean (Std. error)	Mean (Std. error)	Difference(Std. error)
Age	56.383 (0.116)	56.346 (0.118)	0.037 (0.165)
Age at first birth	24.298 (0.045)	24.224 (0.045)	0.073 (0.063)
Education years	12.042 (0.028)	11.965 (0.028)	0.078 (0.040)**

Table 4: The used sample is defined as in Table 1. The differences are estimated by t-tests. The standard errors are reported in parentheses. * p < 0.1; ** p < 0.05; *** p < 0.01.

Where Bedard and Deschenes (2005) only found insignificant results, Table 4 shows that respondents who have a boy as their first child have significantly studied longer. Education years can be included in the IV-estimations as a control variable. However, it seems now likely that the instrument is influenced by other unobserved variables as well. This is a threat to the independence assumption.

Since assumption one and two of the IV-method are violated and assumption three cannot be verified, the IV-method is not suitable in this research. The full Instrumental Variable model will therefore not be estimated.

Wade and Pevalin (2004) indicated that the effect of divorce on mental health is mostly temporary. However, the data about this, provided by the HRS was small, whereas there were 81 observations of respondents who divorced between 1984-1994. Due to this lack of data, no time-variables are used in the regressions.

6 Discussion and Conclusion

The research question of this paper was defined as:

What are the effects of divorce on an individual's depression symptoms?

To answer this research question, two methods are used. In order to replicate the results of Bierman et al. (2006) an OLS analysis is used. The obtained results of these models are similar to the results of Bierman et al. (2006) and show a positive relationship between divorce and depressive symptoms. People who are divorced have on average a higher CES-D score. However, the obtained results had a small magnitude, which is also in line of the results of Bierman et al. (2006). Other similarities are that women are more depressed than men and people with more education years have less distress than people with fewer education years. The obtained results in this paper do not only stick to the paper of Bierman et al. (2006) but also to most other studies which were reviewed in the literature section of this paper. Therefore the obtained results have a high external validity. However, since it is likely that not all relevant control variables are included the results are likely to be subject to the omitted variable bias.

To overcome this bias, the second method which is used in this paper is the IV method. However, since the assumptions of this method were not satisfied, no results were obtained. As in the used data set no correlation between divorce and the gender of a firstborn was found, the first stage of Bedard and Deschenes (2005) could not be replicated. This is surprising since Morgan et al. (1988) find a significant effect of a firstborn childs gender on the risk of divorce, by using similar data with regard to nationality and age. Since only Morgan et al. (1988) and Bedard and Deschenes (2005) focus on the relation between the gender of a firstborn child and the risk of marital dissolution (other studies focus not only on firstborn children), both Andersson and Woldemicael (2001) and Todesco (2010) suggest that Morgan et al. (1988) found a false-positive variation. This can explain why in this study no significant effect of the gender of the firstborn child on the probability of divorce is found. Differences between this study and the study of Bedard and Deschenes (2005) can also be explanations for the different results in the first stage. Bedard and Deschenes (2005) excluded respondents

whose oldest child is 18 or older, whereas the average age of children in this research is 32 years. However, as the robustness check, presented in Table 6 shows, also when respondents whose oldest child is older than 18 were excluded, the obtained results were still insignificant. Also, Bedard and Deschenes (2005) cannot distinguish between biological and non-biological (adopted, stepchildren etc.), whereas in this study only biological children are used. Another explanation for the found insignificance can be selection bias. Since the HRS Family Data set (containing information about firstborn children) was smaller than the HRS Longitudinal Data set (containing information about the respondents), the HRS Family Data set can contain a group of children which isn't representative. If selection indeed plays a role and more firstborn boys are included than firstborn girls, the results will be indeed insignificant. As seen in Table 1, indeed more boys reacted than girls, although the difference is not large. All in all this selection bias seems to partly influence the results as well.

If the assumptions of the IV would hold, these results would have a high internal validity. However, the external validity would be low since it only measures the Local Average Treatment Effect (LATE). This means that only the effect of divorce on depression scale is measured for people who were not divorced if their firstborn would have another gender. Another problem in this paper is a lack of data about the time between the interview and the date of divorce. New research should focus on a small bandwidth of time between the date of divorce and the date of the interview, since the literature indicates that divorce has a temporary effect (Wade and Pevalin, 2004). All in all, new research is needed to evaluate the effect of divorce on mental health or more specifically depressions. New studies should focus on IV-estimations as well since the IV can distinguish between causation and selection.

A Appendix

Table 5: First stage linear probability model on *Ever divorced* with only men and only women

	Men	Women
Ever divorced	Coefficient (Std. error)	Coefficient (Std. error)
Firstborn Girl	-0.001 (0.008)	0.004 (0.008)
(A) Age	-0.007 (0.00)***	-0.006 (0.003)***
(B) Age at first birth	-0.011 (0.001)***	-0.014 (0.001)***
(C) Education years	0.003 (0.002)*	0.008 (0.002)***
A-Squared	-0.000 (0.000)***	-0.000 (0.000)***
B-Squared	0.001 (0.000)***	0.001 (0.000)***
C-Squared	-0.001 (0.000)***	0.000 (0.000)***
A x C	-0.000 (0.000)***	-0.000 (0.000)***
B x C	-0.001 (0.000)***	-0.001 (0.000)***
Constant	0.881 (0.040)***	0.836 (0.034)***

Table 5: The used sample contains 19,864 observations. The interaction terms are demeaned. Heteroskedasticity-robust standard errors are between parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table 6: First stage linear probability model on *Ever divorced* with only firstborn children younger than 19

Ever divorced	Coefficient (Std. error))
Firstborn Girl	0.003 (0.015)
(A) Age	-0.018 (0.007)**
(B) Age at first birth	-0.010 (0.003)***
(C) Education years	0.002 (0.011)
A-Squared	-0.001 (0.000)***
B-Squared	0.001 (0.000)***
C-Squared	-0.003 (0.000)***
A x C	-0.000 (0.001)
B x C	-0.001 (0.001)***
Constant	1.489 (0.352)***

Table 6: The used sample contains 19,864 observations. The interaction terms are demeaned. Heteroskedasticity-robust standard errors are between parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

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