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Intergenerational Transmission of Health at Birth from Mothers and Fathers

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ABSTRACT

Intergenerational Transmission of Health at Birth from Mothers and Fathers*

We use a unique data set of linked birth records from Florida to analyze the intergenerational transmission of health at birth by parental gender. We show that *both* paternal and maternal birth weights significantly predict the child's birth weight even after accounting for all genetic and environmental factors that are common and time-invariant within a family. Our estimates reveal that a one standard deviation increase in mother's birth weight (535 grams) translates into a 0.13-0.23 standard deviations increase in child's birth weight (70-123 grams), accounting or not for maternal grandmother fixed effects. On the father's side, we find that a one standard deviation increase in father's birth weight (563 grams) translates into a 0.10-0.14 standard deviations increase in child's birth weight (51-73 grams), accounting or not for maternal grandmother fixed effects. The significant role of both maternal and paternal health at birth in explaining offspring health at birth is confirmed when using alternative metrics: intrauterine growth restriction, being small for gestational age, or being too heavy (i.e., macrosomic).

JEL Classification: J1

Keywords: intergenerational transmission, health capital, birth outcomes, gender

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1 Introduction

Since Barker proposed the fetal origins hypothesis (Barker, 1990, 1995; Currie, 2011), numerous epidemiological studies support his conjecture that fetal undernutrition in middle to late gestation impairs fetal growth. Following this lead, social scientists have demonstrated that early life conditions have long-lasting consequences on adult health and socioeconomic outcomes (Bharadwaj et al., 2018; Black et al., 2007; Case et al., 2005; Almond and Currie, 2011; Currie and Almond, 2011). The motivation for these studies comes from the persuasion that childhood gradients are unjust inequalities as they undermine the principle of equal opportunity and the goal of granting each child a fair start (Deaton, 2013; Currie, 2011).

Most studies analyzing the intergenerational transmission of health capital at birth have focused on the role of maternal health endowments. However, growing evidence suggests that, while very important, the uterine environment may not be the only channel of intergenerational transmission. As suggested by Conley and Bennett (2000) and more recently by Anway et al. (2005) and Kuzawa and Eisenberg (2014), fathers' genetic contribution to health capital at birth may be non-negligible.

The main contribution of this study is to investigate the role of *both* maternal and paternal health at birth in explaining child's health at birth with a *large* sample of *US* data while accounting for *grandmother* fixed effects. We first analyze the role of maternal (resp. paternal) birth weight —without accounting for paternal (resp. maternal) birth weight— in explaining child's birth weight. We then assess the role of both measures of parental health at birth in explaining offspring health at birth. While our main analysis is focused on birth weight, in the Appendix, we use alternative health metrics.

Having information on both parents is crucial for at least two reasons. First, it allows us to understand the *relative* importance of maternal and paternal health at birth in explaining the intergenerational transmission of health at birth, and compare matrilineal and patrilineal channels of transmission. Second, without accounting for the other parent's health at birth, the scope to identify the role of one of the parents' health at birth is potentially limited by the amount of assortative mating among parents. More concretely, previous estimates of the relationship between maternal and child's birth weight may be upwardly biased if individuals who end up being parents tend to have similar birth weights, that is, their birth weights exhibit positive assortativeness. Indeed, earlier studies could only provide bounds on the true effect of mother's birth weight on child birth weight (Currie and Moretti, 2007). Having a large sample is instrumental for our identification strategy to gauge the causal impact of the parent's birth weight, which is based on using grandmother fixed effects. This enables us to account for all genetic and environmental factors that are common and time-invariant within a family (Currie and Moretti, 2007).

We construct a novel data set linking the birth records of the universe of children born in Florida between 1989 and 2014 to the records of their parents born in Florida between 1970 and 1988. Using confidential information on mothers' and fathers' names and exact dates of birth, we match the records of parents to the records of their children creating an intergenerational data set. Following Currie and Moretti (2007), we also match the birth records of mothers (fathers) to the birth records of their sisters (brothers). The records contain information on children's and parents' birth weight as well as parental characteristics such as age, race, education, ethnicity, marital status, and area of residence.

Assuming that our identification strategy is valid, our findings reveal that both mother's and father's birth weight significantly affect offspring's birth weight, regardless of whether we adjust or not for the other parent's birth weight. Thus, we confirm the main result in Currie and Moretti (2007), which suggests that the omitted variable bias implied by not accounting for the other parent's health at birth is negligible. Our estimates reveal that a one standard deviation increase in mother's birth weight (535 grams) translates into a 0.13-0.23 standard deviations increase in child's birth weight (70-123 grams), accounting or not for maternal grandmother fixed effects. On the father's side, we find that a one standard deviation increase in father's birth weight (563 grams) translates into a 0.10-0.14 standard deviations increase in child's birth weight (51-73 grams), accounting or not for maternal grandmother fixed effects.

Our results are not driven by a particular race or gender. In addition, we obtain similar results using alternative metrics of health at birth: a measure of intrauterine growth (IUGR), indicators for being small for gestational age (SGA), low birth weight (LBW, BW<2,500 grams), or macrosomic (BW>4,000 grams).[1]

Our paper contributes to the literature on intergenerational transmission of health at birth across both matrilineal and patrilineal lines.[2] Adverse events during pregnancy may influence the health of future generations through two main non-genomic biological mechanisms. First, early experiences or maternal behaviors during gestation may affect the *"phenotype-to-phenotype"* transmission and consequently the next generation by altering adult metabolism or physiology (Kuzawa and Eisenberg, 2014). In particular, it has been shown that fetal programming may alter the gestational environment and milk composition in daughters (Hinde et al., 2014). This pathway can only occur matrilineally.

Second, environmental effects can be transmitted across generations by epigenetic factors that regulate gene expression and that may be modified by parental experiences and packaged in sperm or egg. Environmental experiences of pregnant women during pregnancy can therefore affect both the in-utero offspring and their gametic cells which will affect the third-generation (Lee, 2014). Thus, through direct *"germ line epigenetic inheritance"*, environmental conditions may have transgenerational effects operating matrilineally and patrileneally (Kuzawa and Eisenberg, 2014). In particular, evidence from animal studies on patrilineal transmission of health shows that early life adverse events may reduce sperm quality and attenuate fertility (Anway et al., 2005).

[1]IUGR is defined as the ratio of birth weight (in grams) to gestation weeks. SGA is defined as a binary variable that equals one if the infant's birth weight is below the 10^{th} percentile for his/her gestation week and gender. The reference sample includes all the non-plural births that occurred in Florida between 1989 and 2014 for the children; and between 1970 and 1988 for the parents.

[2]The development of epigenetics and the growing evidence that environmental conditions alter gene expression in animal studies suggest that parents' prenatal conditions may have long-lasting effects on adult health and socioeconomic outcomes not only of their children but also of their grandchildren (Kuzawa and Eisenberg, 2014; Kuzawa and Bragg, 2012; Harrison and Langley-Evans, 2009; Anway et al., 2005; Drake and Walker, 2004; Jablonka et al., 2005).

Despite the growing evidence on epigenetic transmission of environmental and dietary effects both matrilineally and patrilineally, most of the human studies analyzing the intergenerational transmission of health have so far focused on the relationship between maternal prenatal environment and the birth outcomes of her children. Using administrative records data from Norway, Black et al. (2007) find large effects of maternal birth weight on the birth weight of the first child. Currie and Moretti (2007) provide evidence of intergenerational transmission of birth weight from mothers to their children in California. Royer (2009) exploits birth-weight differences between same sex female twins and finds effects on educational attainment and the birth weight of the next generation. While she finds small effects, she provides evidence of substantial heterogeneity across the birth weight distribution.

Only a handful of previous studies have explored the relative role of the mother and the father in the intergenerational transmission of birth weight (Qian et al., 2017; Conley and Bennett, 2000; Coutinho et al., 1997; Magnus et al., 2001; Kuzawa and Eisenberg, 2012; Mattsson and Rylander, 2013; Qian et al., 2017). Most of these studies come from the epidemiological literature and illustrate the extent of intergenerational correlation in birth outcomes by parental gender. While informative, the majority of them do not identify the impact of parental birth weight *net of* socioeconomic characteristics or genetic and environmental factors that are common and time-invariant within a family. Two notable exceptions are Conley and Bennett (2000) and Qian et al. (2017).

Using PSID data Conley and Bennett (2000) show that paternal low birth weight is significantly associated with the risk of child low birth weight. In particular the authors show that having a low birth weight father raises one's own risk of low birth weight by about 10 times, while having a low birth weight mother raises the risk by about 7 times. Differently from Conley and Bennett (2000) who are able to include maternal grandmother's fixed effects, but not to adjust for paternal grandmother's fixed effects, our large sample allows us to include paternal grandmother's fixed effects when assessing the role of paternal health endowments in the intergenerational transmission of health at birth. Furthermore, we analyze and compare paternal and maternal intergenerational transmission of health at birth using a broader set of metrics.

More recently, Qian et al. (2017) use birth records from Taiwan to study the role of both mothers and fathers in the transmission of birth weight and intrauterine growth restriction (IUGR) using maternal and paternal fixed effects. While they confirm the important role of mothers, their findings suggest that fathers have no role in the intergenerational transmission of birth weight. However, it is not obvious how to extrapolate their findings to the US context. First, while the distributions of child's birth weight appear to be similar in the Florida and Taiwan –with fractions of low birth weight of 0.068 and 0.064, respectively– the distributions of parents' birth weights appear to be different: The fraction of low birth weight mothers is 0.079 in Florida, but only 0.036 in Taiwan; similarly, the fraction of low birth weight fathers is 0.062 in Florida, but only 0.026 in Taiwan.[3] Moreover, the authors acknowledge that they are only able to "observe men who became fathers before the age of 27", and alert that their "paternal sample is relatively young for fathers in Taiwan", so that their null finding on the role of fathers in the intergenerational transmission of health at birth might well be explained by sample selection bias.

The rest of the paper proceeds as follows. Section 2 describes the data. Section 3 explores the role of maternal and paternal birth weight in explaining offspring's birth weight. Section 4 complements our analysis by presenting intergenerational transmission matrices, conducting analysis for different subgroups and using alternative health metrics. Section 5 concludes.

2 Data

We link the birth records of two generations of infants born in Florida between 1970 and 2014.[4] The records of children born between 1989 and 2014 are merged with the records

[3]We compute the fraction of children with low birth weights in Taiwan as the weighted average of children with low birth weights in the maternal (N=280,030) and paternal samples (N=125,078). See Table 2 in Qian et al. (2017).

[4]The records were obtained from the office of Vital Statistics at the Florida Department of Health.

of their parents born between 1970 and 1988 using full names and exact dates of birth as key. Only parents who were born in Florida and had a child in that state between 1989 and 2014 can be matched. 95.1% (94%) of children whose mothers (fathers) were born in Florida between 1970 and 1988 are successfully matched to their maternal (paternal) records.[5] Furthermore, we restrict our baseline analysis to child births that we could link to both paternal and maternal birth records.

The linking across birth records unavoidably leads to selection in the sample, as not all women (men) born between 1970 and 1988 became parents before 2014, many of them had children born in other states, and many had partners not born in Florida. Indeed, out of the original sample of women (men) born between 1970 and 1988, only 45.1% (33.6%) of them were linked to the records of their children. However, only for 19.5% (18.2%) of the original sample of women (men), we were also able to link the records of their children to the birth record of their partners. Following Currie and Moretti (2007), we also link parents to their siblings using the grandmother's full name and date of birth as key.[6] However, only approximately 5% (4.8%) of the original sample of mothers (fathers) have siblings matched to their children in our sample with information on both mothers and fathers. Our baseline analysis is restricted to singleton children with a birth weight between 1,000 and 6,000 grams.[7] After imposing these restrictions, we identify 209,157 (resp. 205,118) maternal (resp. paternal) grandmothers for whom we are able to link the records of their children to those of their grandchildren.

To test for selection bias due to geographic mobility, fertility, mortality, mating patterns and missing information on paternal identity, we check the correlation between birth weight and the probability of being matched to children's and partners' birth records in Table 1. Similarly to Royer (2009), who matched birth records of mothers to their children using administrative records from the California Department of Health, we find no evidence of

[5]For approximately 9% of the children born between 1989 and 2014, information on paternal full name is missing (see Figure A.1). These observations are excluded from the analysis.

[6]We exclude grandmothers with more than 20 grandchildren (see also Currie and Moretti (2007)).

[7]Results are not sensitive to these restrictions.

substantial selection. The correlation between birth weight and the probability of a later observation is minimal for both women and men born in Florida between 1970 and 1989. We find that a 100-gram increase in birth weight has very small effects on the likelihood of being matched to a later observation (columns 1-2): the coefficients (in absolute value) in our case are in the range [0.0003;0.0015] and in Royer's analysis are in the range [0.0013,0.0028].[8] These coefficients are smaller when restricting the analysis to the sample of mothers (fathers) matched with a sister (brother), see columns 3-6. Being born with a low birth weight is associated with a 2% higher likelihood of a later observations for mothers and a 3% higher probability for fathers (columns 1-2). As expected, when focusing on the left tail of the birth weight distribution in the restricted sample, the extent of selection increases (columns 3-6).[9]

The birth records provide information on the child's health at birth, gender and race; parents' age and education; mother's marital status and mail zip code. While in our main analysis we measure health at birth using birth weight, in the Appendix , we also use the following metrics: the logarithm of birth weight, intrauterine growth (IUGR), small for gestational age (SGA), an indicator for low birth weight (=1 if the child's birth weight is below 2,500 grams, 0 otherwise) and an indicator for fetal macrosomia (=1 if the child's birth weight is above 4,000 grams, 0 otherwise).[10]

Descriptive statistics are reported in Table A.1. We can see that the average child birth weight is 3,275 grams (SD = 533), 6.8% of children are born with a low weight, the average mother is about 24.4 years old (SD = 4.9), the average father is about 26.2 years old (SD = 5.2) and 49% of children are girls. The average maternal birth weight is 3,329 grams (SD = 535), with a 7.9% of low birth weight mothers. Among fathers, the average birth weight is 3,366 grams (SD = 563), and 6.3% of them are low birth weight. In Currie and

[8]These coefficients are obtained dividing by 10 the ones in Table 5 of Royer (2009), since she presents the coefficients in terms of 1,000 g and we present the coefficients in terms of 100 g.

[9]In general, matching rates are correlated with race, poverty rate, and parental education with disadvantaged groups more likely to have children at an earlier age (and a higher number of children) and therefore more likely to be matched. However, these differences become small and non-significant when including grandmother fixed effects as most of these characteristics are shared among siblings (results are available upon request).

[10]Macrosomic babies have increased risk of health problems after birth (Nesbitt et al., 1998).

Moretti (2007) the average birth weight and fraction of low birth weight among children (born between 1989 and 2001) are 3,387 grams and 6%, while those among mothers (born between 1970 and 1974) are 3,268 grams and 6.3%. Of course, when comparing these estimates one needs to take into account the different demographic characteristics of two samples coming from two different states. For instance, in our Florida sample there is a much higher share of Blacks than in the California sample used by Currie and Moretti (2007).[11] Moreover, in our sample we have additional cohorts of children (those born after 2001 and until 2014) and mothers (those born after 1974 and until 1988).

3 Intergenerational Transmission of Birth Weight

The intergenerational transmission of birth weight is examined by estimating several versions of the following model:

$$BW^c_{i,j} = \alpha + \beta_m BW^m_{i,j} + \beta_f BW^f_{i,j} + \gamma X_{i,j} + \theta^{gp}_j + e^p_{i,j} \quad (1)$$

where $BW^c_{i,j}$ is the birth weight of the child c, $BW^m_{i,j}$ is the birth weight of the mother, $BW^f_{i,j}$ is the birth weight of the father, $X_{i,j}$ is a vector of control variables (child's gender, maternal age, paternal age, maternal education, paternal education, child's birth order, year of birth fixed effects and county of birth fixed effects) and θ^{gp}_j are grandmother (grandfather) fixed effects. The subindex i refers to a particular sibling (mother or father) within a group of siblings, which we denote by j. In other words, two individuals i and i' have the same grandmother when they share the same j.

In Panel A of Table 2, column 1 reports the raw intergenerational "correlation" coefficient between maternal birth weight (BW) and child's BW, the estimated coefficient on mother's

[11] The share of Africa-Americans in our sample is 31.4%, while in Currie and Moretti (2007) it is 10% (authors' calculation from Table 2 of Currie and Moretti (2007).

BW from estimating regression (1) with mother's BW as the only explanatory variable.[12] A 100 gram-increase in mother's BW is associated with a 24-gram increase in child's BW, very similar to the 20-gram increase found by Currie and Moretti (2007). After including control variables for sociodemographic characteristics and year-of-birth and country-of-birth fixed effects, the coefficient remains relatively stable (column 2). The inclusion of maternal grandmother fixed effects (column 3) increases by more than 9 times the R^2 and reduces the coefficient of maternal BW by 44%. A 100-gram increase in maternal BW results in a 13.5-gram increase in child's BW. This is somehow different from the results presented by Currie and Moretti (2007), who instead found little effect of the inclusion of maternal grandmother fixed effects.

As mentioned above, our analysis focuses on birth records of children that we could match to both their maternal and paternal birth records. However, in the Appendix (Tables A.2 and A.3), we include results using the entire sample of women (men) matched to their children mimicking the analysis of Currie and Moretti (2007) and found a similar pattern.[13] The fact that grandmother fixed-effects matter more may be explained by the different demographic characteristics of the samples. As previously discussed, in our Florida sample there is a much higher fraction of Blacks than in the sample used by Currie and Moretti (2007). Indeed, even Currie and Moretti (2007) find that grandmother fixed effects matter more for Blacks. Again the inclusion of sociodemographic controls does not substantially affect the estimate (column 4). Column 5 illustrates that, when restricting the sample to children born to mothers whose sisters were also matched to the records of their offspring, the coefficient is not statistically different from the one observed in the main sample (column 2).[14]

[12]The coefficient in column 1 is not a correlation coefficient ($\frac{Cov(BW^c,BW^m)}{\sqrt{Var(BW^c)}\sqrt{Var(BW^m)}}$), but a regression coefficient ($\frac{Cov(BW^c,BW^m)}{Var(BW^m)}$). However, since $\sqrt{Var(BW^m)}$ and $\sqrt{Var(BW^c)}$ are estimated at 535 and 533, the distinction between correlation coefficient and regression coefficient in our sample is negligible.

[13]The specification in Tables A.2 and A.3 is slightly different from the specification in Table 2, because in Tables A.2 and A.3 we follow the specification used in Table 2 of Currie and Moretti (2007) for ease of comparison. The results are very similar if we follow the specification in Table 2 of our paper using the entire sample of women (men) matched to their children (results not reported).

[14]We do not have enough observations to conduct a similar analysis using twin fixed effects rather than grandmother or sibling fixed effects. However, Black et al. (2007) use twin fixed effects and find that results

Column 1 in Panel B reports the raw intergenerational "correlation coefficient" between paternal BW and child's BW. A 100 gram-increase in father's BW is associated with a 14-gram increase in child's BW. The coefficient is smaller than the one observed for maternal birth weight (-28%) and robust to the inclusion of control variables for sociodemographic characteristics and year-of-birth and country-of-birth fixed effects (column 2). The inclusion of paternal grandmother fixed effects reduces the coefficient of paternal BW to 10-gram (column 3, Panel B). The coefficient decreases by 28%. Grandmother fixed effects capture a larger fraction of the intergenerational correlation between maternal and child's BW than the one between paternal and child's BW. Again the point estimates are robust to the inclusion of controls (column 2 and 4) and the unconditional coefficient is not substantially different if the sample is restricted to children born to fathers whose brothers were also matched to the records of their offspring (column 5).

In Table 3 we include both maternal and paternal birth weights. Column 1 shows that the estimated coefficients on both maternal and paternal BWs are positive and statistically significant, and that the coefficient on paternal BW (0.13) is about 40% smaller than the coefficient on maternal birth weight (0.23). The test at the bottom of the table rejects the equality of coefficients (p-value=0.0000). Including control variables has little influence on the coefficients (column 2), and we still reject the equality of coefficients. Controlling for maternal grandmother fixed effects reduces the coefficient on maternal birth weight by more than 40%, while the coefficient on paternal birth weight decreases by 27% (column 3). The equality of coefficients is rejected. Column 5 and 6 show that the inclusion of paternal grandmother fixed effects has a much weaker impact on the coefficient of maternal BW which diminishes by 13% with respect to column 1, and we reject the equality of coefficients.

The equality of coefficients on mother's and father's birth weights is rejected across columns, and the evidence reported in the table suggests that role of mother's BW is more important than that of father's BW. We estimate the relative role of mother's to father's BW

are almost identical to the results for the sample of singletons using family fixed effects.

to be between 1.47 (column 4) and 1.92 (column 5). Furthermore, in the specifications with paternal grandmother fixed effects, columns 5 and 6, we cannot reject that the mother's BW effect on child's BW is twice as large as the father's BW effect (p-value=0.684, p-value=0.574).

Given that in very large samples almost any hypothesis of the sort $\beta = 0$ is rejected, we follow the recent approach used by Clarke et al. (2018) –and adopted from Leamer (1978)– and check whether the null hypothesis is rejected when the absolute value of the calculated t statistic exceeds the square root of the logarithm of the sample size. These adjusted critical values are found in the range $[3.48, 3.58]$, and hence we reject that the coefficient on mother's (father's) birth weight equals zero also with these stringent critical values.

In terms of magnitudes, our estimates reveal that a one standard deviation increase in mother's birth weight (535 grams) translates into a 0.13-0.23 standard deviations increase in child's birth weight (70-123 grams), accounting or not for maternal grandmother fixed effects. On the father's side, we find that a one standard deviation increase in father's birth weight (563 grams) translates into a 0.10-0.14 standard deviations increase in child's birth weight (51-73 grams), accounting or not for maternal grandmother fixed effects.

All in all, we find evidence that both maternal and paternal birth weights are relevant in explaining children's birth weight, but mother's BW is more relevant than father's BW. Even after including grandmother fixed effects, both mother's and father's birth weights are relevant in explaining children's birth weight.[15]

[15] We also estimated a regression including both maternal and paternal grandmother fixed effects. To conduct this analysis, the sample has to be restricted to children born to mothers and fathers whose siblings were also matched. This restriction severely reduces the sample size and expectedly the standard errors become substantially larger. Nevertheless, the point-estimates suggest that even after including both maternal and paternal grandmother fixed effects, both maternal and paternal birth weights are relevant factors in the child's health production function.

4 Extensions

Intergenerational transition matrices. Our main analysis focuses on estimating one parameter, the intergenerational correlation, by means of linear regressions. While this statistic provides a summary of the degree of intergenerational transmission, it does not tell us anything about the transmission at different points of the joint distribution of parental and child birth weights. Table A.4 reports intergenerational transition matrices using birth weight quintiles. The matrix shows that there is a significant relationship between both maternal and paternal birth weight and child birth weight. Yet, this relationship is highest when focusing on the lowest and highest quintile of birth weight distribution. The χ^2 tests for independence reject the independence of mother's and child's birth weights and the independence of father's and child's birth weights. Similar results are obtained when shifting our attention to *conditional* transition matrices, after netting out the influence of the other parent's birth weight (Table A.5), control variables (Table A.6) and grandmother fixed effects (Table A.7).[16]

Alternative metrics of health at birth. Our main finding that both maternal and paternal health at birth matter in explaining child health at birth is robust to using alternative measures: log of birth weight, intrauterine growth retardation, small for gestational age, and macrosomia. In Tables A.8-A.9 we use the logarithm of birth weight, so that our estimates now capture "intergenerational elasticities". A 1% increase in maternal BW is associated to a 0.10% (resp. 0.17%) increase in child BW, adjusting for maternal (resp. paternal) grandmother fixed effects (columns 3-4, and columns 5-6, Table A.8). In the same columns, we can see that the effect of paternal BW is slightly smaller: 0.080% (resp. 0.085%). As in our main analysis, the coefficient on maternal log BW is more sensitive to the inclusion of grandmother fixed effects. However, once maternal grandmother fixed effects are included in

[16]We run a regression of mother's (resp. father's) on father's (resp. mother's) birth weight, and use the residuals –the part of mother's (resp. father's) birth weight uncorrelated with father's (resp. mother's) birth weight– to generate the quintiles of the conditional mother's (resp. father's) birth weight. We then apply the same procedure adding controls, and adding controls and grandmother fixed effects.

the regressions (columns 3-4), we cannot reject the equality of the coefficients on maternal and paternal log BWs.

Similar patterns are observed when analyzing other health metrics. The only difference is that when using intrauterine growth retardation (IUGR) –defined as the ratio of birth weight (in grams) to gestation weeks– we reject the equality of the coefficients regardless of the inclusion of maternal grandmother fixed effects (Tables A.10–A.11), as was the case for our main analysis using BW. Indeed, except when using IUGR, the patterns of results are very similar for the other health metrics.[17]

When examining the intergenerational correlation in low-birth weight (LBW), we note that the coefficient on maternal LBW becomes non-significant when including grandmother fixed effects (Tables A.14-A.15). On the contrary, we confirm a positive and statistically significant coefficient when analyzing the effect of having a LBW father (Panel B, Table A.14). However, this should be interpreted with caution as it appears to be mostly explained by the lack of variation in low birth weight within groups of siblings when using maternal grandmother fixed effects in our restricted sample of births matched to both maternal and paternal birth records. Increasing the sample size by analyzing the sample of all women we could match to their children, regardless of our ability to match children to their father's records, we indeed find a positive and significant coefficient on both maternal and paternal low birth weight (see Table A.16).

Finally, we examine the extent of intergenerational correlation in high birth weight (Tables A.17–A.18). As mentioned above, being born with a birth weight above 4,000 grams is associated with several health complications. Having a mother born with a birth weight higher than 4,000 grams increases the risk of being macrosomic by 5.5 percentage points, while the effect of the father being born with excessive birth weight increases the risk by 3 percentage points (column 4, Table A.17).

[17] Whenever the outcome variable is based on gestational age, the sample is smaller due to fact that many observations had missing information on gestational age.

Heterogenous intergenerational transmission. We have investigated heterogeneity in the intergenerational transmission of health at birth by gender and race. Tables A.19-A.22 show no systematic differences. In particular, we find no differences between Blacks and Whites in the extent of intergenerational correlation in birth weight and the relative contribution of maternal and paternal birth weight.[18] We also find similar results when estimating regressions separately for boys and girls (Tables A.26-A.27).

Discussion. Overall, we confirm that both mother's and father's health endowments at birth are relevant in explaining children's health at birth, and if anything mother's health at birth tends to be more important. These results also suggest that both phenotype-to-phenotype and germ line epigenetic inheritance mechanisms play an important role in the intergenerational transmission of health at birth. In particular, the evidence that father's birth weight has an independent effect on child's birth weight suggests that shocks to maternal environment may have transgenerational effects through the gametes.

5 Conclusion

We use a unique data set of linked birth records to analyze the intergenerational transmission of health at birth. Our results on the intergenerational transmission of birth weight by gender of the parent provides three main insights. First, paternal birth weight is substantially correlated with child's birth weight: father's birth weight alone explains 2.4% of child's birth weight, about 40% of the explanatory power of mother's birth weight (5.7%). Second, the effect of maternal birth weight is more sensitive to the inclusion of grandmother fixed effects, suggesting that both genetic and non-genetic family backgrounds have a greater role in the intergenerational transmission of birth weight from mothers than from fathers. Third, mother's birth weight is twice as important as father's birth weight, at least in specifications

[18] We have also checked the sensitivity of our estimates to different sample restrictions. Restricting the sample to full-term births or to first-born children does not affect the estimates (see Tables A.23-A.25).

without maternal grandmother fixed effects.

On one hand, our results are consistent with the existence of non-genomic transmission mechanisms of health at birth across generations. In particular, the existence of a significant intergenerational correlation between father's birth weight and child's birth weight is consistent with the growing evidence for transgenerational *"epigenetic inheritance"* (Kuzawa and Eisenberg, 2014). On the other hand, the fact that the correlation is stronger when examining matrilineal transmissions is consistent with matrilineal *"phenotype-to-phenotype transmission"* (Kuzawa and Bragg, 2012). The fact that the coefficient on mother's birth weight does not change when we add father's birth weight to the regression suggests that fathers have an effect that operates through *different* channels than mothers. It also suggests that while previous results examining matrilineal transmission without adjusting for paternal health endowments at birth may be less precise, they are not biased. As long as our identification strategy is valid, our findings suggest that policies aimed at improving children health at birth may yield benefits that trickle down to future generations.

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Table 1: Probability of observation of a later birth as a function of birth weight

	(1)	(2)	(3)	(4)	(5)	(6)
			Probability of being matched			
Sample	Mothers	Fathers	Mothers with sisters	Mothers with sisters	Fathers with brothers	Fathers with brothers
			Panel A			
Birth weight (100 grams)	-0.0015***	-0.0010***	-0.0011***	0.0006***	-0.0010***	0.0003***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
			Panel B			
Low birth weight (BW<2,500 grams)	0.0040***	-0.0063***	0.0107***	-0.0098***	0.0069***	-0.0126***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)
Maternal GM fixed effects				X		
Paternal GM fixed effects						X
Observations	1,162,041	1,219,021	1,162,041	1,162,041	1,219,021	1,219,021
Mean of dep. var.	0.195	0.182	0.0499	0.0499	0.0481	0.0481

Notes - The sample is restricted to parents who were born in Florida between 1970 and 1988 with a birth weight (1000;6000). In columns (1) and (2) the dependent variable is a dummy for being matched with a singleton child born in FL 1989-2014 with birth weight (1000;6000) and his/her other parent - father in column (1) or mother in column (2) - born in FL 1970-1988 with birth weight (1000;6000). In columns (3) and (4) the dependent variable is a dummy for being matched with a singleton child born in FL 1989-2014 with birth weight (1000;6000), his/her father born in FL 1970-1988 with birth weight (1000;6000) and a sister born in FL 1970-1988 with birth weight (1000;6000) who also had a child in Florida (1989-2014). In columns (5) and (6) the dependent variable is a dummy for being matched with a singleton child born in FL 1989-2014 with birth weight (1000;6000), his/her mother born in FL 1970-1988 with birth weight (1000;6000) and a brother born in FL 1970-1988 with birth weight (1000;6000) who also had a child in Florida (1989-2014). In columns (4) and (6) we control for maternal and paternal grandmother fixed effects respectively. Standard errors are reported in parentheses *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 2: Regression of child's birth weight on parents' birth weight

	(1)	(2)	(3)	(4)	(5)
			Panel A Child's birth weight (grams)		
Mother's birth weight (grams)	0.2370***	0.2221***	0.1353***	0.1326***	0.2202***
	(0.002)	(0.002)	(0.010)	(0.012)	(0.004)
Socio-demographic controls		X		X	X
Maternal GM fixed effects			X	X	
Observations	366,722	329,232	366,722	329,232	95,113
			Panel B Child's birth weight (grams)		
Father's birth weight (grams)	0.1451***	0.1290***	0.1027***	0.1050***	0.1334***
	(0.002)	(0.002)	(0.010)	(0.011)	(0.003)
Socio-demographic controls		X		X	X
Paternal GM fixed effects			X	X	
Observations	366,722	329,232	366,722	329,232	102,109

Notes - All estimates are conducted on the sample of children matched to both paternal and maternal birth records. The sample is restricted to singleton children who were born in Florida between 1989 and 2014, and whose mothers and fathers were born in Florida between 1970 and 1988. We exclude children and parents with birth weight below 1,000 grams or above 6,000 grams. Socio-demographic controls include child's gender, maternal and paternal age and education, birth order, year fixed effects, and county fixed effects (for the child's county of birth). In columns (3) and (4) of Panel A (B), we control for maternal (paternal) grandmother fixed effects. In column (5) of Panel A (B), the sample is restricted to children born to mothers (fathers) whose sisters (brothers) were also matched to the records of their offspring. Standard errors in parentheses are clustered at the mother level in Panel A and at the father level in Panel B. *** p<0.01, ** p<0.05, * p<0.1

Table 3: Regression of child's birth weight on both parents' birth weights

	(1)	(2)	(3)	(4)	(5)	(6)
	Child's birth weight (in grams)					
Mother's birth weight (grams)	0.2281***	0.2163***	0.1344***	0.1312***	0.1909***	0.1911***
	(0.002)	(0.002)	(0.010)	(0.012)	(0.005)	(0.006)
Father's birth weight (grams)	0.1312***	0.1195***	0.0883***	0.0892***	0.0996***	0.1019***
	(0.002)	(0.002)	(0.005)	(0.006)	(0.010)	(0.011)
Socio-demographic controls		X		X		X
Maternal GM fixed effects			X	X		
Paternal GM fixed effects					X	X
Observations	366,722	329,232	366,722	329,232	366,722	329,232
R-squared	0.076	0.105	0.750	0.772	0.716	0.745
Test coeff[Mother BW=Father BW](p-value)	0.0000	0.0000	0.0000	0.00131	0.0000	0.0000

Notes - All estimates are conducted on the sample of children matched to both paternal and maternal birth records. The sample is restricted to singleton children who were born in Florida between 1989 and 2014, and whose mothers and fathers were born in Florida between 1970 and 1988. We exclude children and parents with birth weight below 1,000 grams or above 6,000 grams. Socio-demographic controls include child's gender, maternal and paternal age and education, birth order, year fixed effects, and county fixed effects (for the child's county of birth). In columns (3) and (4) we control for maternal grandmother (GM) fixed effects. In columns (5) and (6) we control for paternal grandmother (GM) fixed effects. Standard errors in parentheses are clustered at the mother level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Appendix A

Table A.1: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Child's birth weight (grams)	366,722	3,275	533.079	1,001	5,953
Log(Child's birth weight)	366,722	8.079	0.180	6.909	8.692
Child is low birth weight (BW<2,500 grams)	366,722	0.068	0.251	0	1
Child's IUGR (birth weight/gestation weeks)	366,572	84.434	12.929	22.915	283.476
Child is high birth weight (BW>4,000 grams)	366,722	0.070	0.255	0	1
Mother's birth weight (grams)	366,722	3,239	534.977	1,003	5,897
Father's birth weight (grams)	366,722	3,366	563.279	1,003	5,982
Log(Mother's birth weight)	366,722	8.068	0.180	6.911	8.682
Log(Father's birth weight)	366,722	8.106	0.183	6.911	8.697
Mother is low birth weight (BW<2,500 grams)	366,722	0.079	0.269	0	1
Father is low birth weight (BW<2,500 grams)	366,722	0.063	0.242	0	1
Mother's IUGR (birth weight/gestation weeks)	330,908	82.327	13.023	23.205	253.556
Father's IUGR (birth weight/gestation weeks)	322,536	85.776	13.558	23.326	234.667
Maternal age	366,722	24.374	4.938	10	44
Paternal age	366,722	26.157	5.198	11	44
Child is female	366,722	0.486	0.500	0	1
Child's birth order	364,370	1.902	1.129	1	16

Notes - The sample is restricted to singleton children who were born in Florida between 1989 and 2014, and whose mothers and fathers were born in Florida between 1970 and 1988. We exclude children and parents with birth weight below 1,000 grams or above 6,000 grams.

Appendix B: Comparison with previous studies

Table A.2: Regression of child's birth weight on mother's birth weight

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				Panel A Child's birth weight (grams)			
Mother's birth weight (grams)	0.233***	0.126***	0.199***	0.131***	0.130***	0.128***	0.128
	(0.001)	(0.004)	(0.001)	(0.004)	(0.005)	(0.005)	(0.000)
				Panel B Child is low birth weight (BW<2,500 grams)			
Mother is low birth weight (BW<2,500 grams)	0.061***	0.023***	0.051***	0.022***	0.022***	0.022***	0.021
	(0.001)	(0.004)	(0.001)	(0.004)	(0.004)	(0.004)	(0.000)
Maternal GM fixed effects		X		X	X	X	X
Mother's race - Child sex and year of birth			X	X	X	X	X
GM county x year			X	X	X	X	X
Poverty in mother's zip code birth					X	X	X
Mother' age and education dummies - Parity						X	X
Mother county fixed effects							X
Observations	1,054,063	1,052,473	1,054,063	1,051,903	978,850	972,035	970,436

Notes - In this table, we do not restrict the sample to children matched to both paternal and maternal birth records. We match children to mothers only. The sample is restricted to singleton children born in Florida between 1989 and 2014 who were successfully linked to the records of their mothers born in Florida between 1970 and 1988. We exclude children and mothers with birth weight below 1,000 grams or above 6,000 grams. Socio-demographic controls include child's gender, maternal and paternal age and education, birth order, year fixed effects, and county fixed effects. Standard errors in parentheses are clustered at the mother level. *** p<0.01, ** p<0.05, * p<0.1

Table A.3: Regression of child's birth weight on father's birth weight

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				Panel A Child's birth weight (grams)			
Father's birth weight (grams)	0.142***	0.102***	0.112***	0.105***	0.105***	0.108***	0.107***
	(0.001)	(0.006)	(0.002)	(0.006)	(0.006)	(0.007)	(0.007)
				Panel B Child is low birth weight (BW<2,500 grams)			
Father is low birth weight (BW<2,500 grams)	0.026***	0.018***	0.018***	0.018***	0.017***	0.016***	0.016***
	(0.002)	(0.005)	(0.002)	(0.005)	(0.005)	(0.006)	(0.006)
Paternal GM fixed effects		X		X	X	X	X
Father's race - Child sex and year of birth			X	X	X	X	X
GM county x year			X	X	X	X	X
Poverty in mother's zip code birth					X	X	X
Father' age and education dummies - Parity						X	X
Father county fixed effects							X
Observations	724,791	723,825	724,791	723,501	665,367	606,655	605,671

Notes - In this table, we do not restrict the sample to children matched to both paternal and maternal birth records. We match children to fathers only. The sample is restricted to singleton children born in Florida between 1989 and 2014 who were successfully linked to the records of their fathers born in Florida between 1970 and 1988. We exclude children and fathers with birth weight below 1,000 grams or above 6,000 grams. Socio-demographic controls include child's gender, maternal and paternal age and education, birth order, year fixed effects, and county fixed effects. Standard errors in parentheses are clustered at the father level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Appendix C: Other Outcomes

Table A.4: Intergenerational transition matrices (unconditional)

	Quintiles of child's birth weight					
Quintiles of mother's birth weight	1	2	3	4	5	Total
1	24,414	17,689	13,535	11,473	8,658	75,769
	32.22	23.35	17.86	15.14	11.43	100
	31.58	23.93	19.48	15.64	11.91	20.66
2	18,145	16,450	13,847	12,765	10,296	71,503
	25.38	23.01	19.37	17.85	14.4	100
	23.47	22.25	19.93	17.4	14.17	19.5
3	15,364	16,100	15,335	15,563	13,778	76,140
	20.18	21.15	20.14	20.44	18.1	100
	19.88	21.78	22.07	21.21	18.96	20.76
4	11,267	13,300	14,064	16,307	16,668	71,606
	15.73	18.57	19.64	22.77	23.28	100
	14.58	17.99	20.24	22.23	22.94	19.53
5	8,111	10,380	12,694	17,254	23,265	71,704
	11.31	14.48	17.7	24.06	32.45	100
	10.49	14.04	18.27	23.52	32.02	19.55
Total	77,301	73,919	69,475	73,362	72,665	366,722
	21.08	20.16	18.94	20	19.81	100
	100	100	100	100	100	100
Pearson chi2(16) = 2.3e+04 Pr = 0.000						

	Quintiles of child's birth weight					
Quintiles of father's birth weight	1	2	3	4	5	Total
1	21,300	17,518	14,704	13,314	10,760	77,596
	27.45	22.58	18.95	17.16	13.87	100
	27.55	23.7	21.16	18.15	14.81	21.16
2	18,162	16,687	14,407	13,984	11,920	75,160
	24.16	22.2	19.17	18.61	15.86	100
	23.5	22.57	20.74	19.06	16.4	20.5
3	15,163	14,980	14,189	14,856	14,083	73,271
	20.69	20.44	19.37	20.28	19.22	100
	19.62	20.27	20.42	20.25	19.38	19.98
4	11,944	12,751	13,090	14,541	15,040	67,366
	17.73	18.93	19.43	21.59	22.33	100
	15.45	17.25	18.84	19.82	20.7	18.37
5	10,732	11,983	13,085	16,667	20,862	73,329
	14.64	16.34	17.84	22.73	28.45	100
	13.88	16.21	18.83	22.72	28.71	20
Total	77,301	73,919	69,475	73,362	72,665	366,722
	21.08	20.16	18.94	20	19.81	100
	100	100	100	100	100	100
Pearson chi2(16) = 1.0e+04 Pr = 0.000						

Notes - The sample is restricted to singleton children born in Florida between 1989 and 2014 who were successfully linked to the records of their mothers and fathers born in Florida between 1970 and 1988.

Table A.5: Intergenerational transition matrices (controlling for the other parent's birth weight)

	Quintiles of child's birth weight					
Quintiles of mother's birth weight	1	2	3	4	5	Total
1	23,341	17,024	13,129	11,230	8,634	73,358
	31.82	23.21	17.9	15.31	11.77	100
2	18,683	16,796	14,201	13,117	10,641	73,438
	25.44	22.87	19.34	17.86	14.49	100
3	14,930	15,556	14,612	14,862	13,319	73,279
	20.37	21.23	19.94	20.28	18.18	100
4	11,822	13,737	14,466	16,550	16,729	73,304
	16.13	18.74	19.73	22.58	22.82	100
5	8,525	10,806	13,067	17,603	23,342	73,343
	11.62	14.73	17.82	24	31.83	100
Total	77,301	73,919	69,475	73,362	72,665	366,722
	21.08	20.16	18.94	20	19.81	100
Pearson chi2(16) = 2.2e+04 Pr = 0.000						

	Quintiles of child's birth weight					
Quintiles of father's birth weight	1	2	3	4	5	Total
1	19,586	16,467	13,927	12,841	10,555	73,376
	26.69	22.44	18.98	17.5	14.38	100
2	17,751	16,176	14,032	13,691	11,689	73,339
	24.2	22.06	19.13	18.67	15.94	100
3	15,481	15,004	14,184	14,700	14,010	73,379
	21.1	20.45	19.33	20.03	19.09	100
4	13,386	14,041	14,138	15,613	16,128	73,306
	18.26	19.15	19.29	21.3	22	100
5	11,097	12,231	13,194	16,517	20,283	73,322
	15.13	16.68	17.99	22.53	27.66	100
Total	77,301	73,919	69,475	73,362	72,665	366,722
	21.08	20.16	18.94	20	19.81	100
Pearson chi2(16) = 8.5e+03 Pr = 0.000						

Notes - The sample is restricted to singleton children born in Florida between 1989 and 2014 who were successfully linked to the records of their mothers and fathers born in Florida between 1970 and 1988. All estimates include control for the other parent's birth weight.

Table A.6: Intergenerational transition matrices (controlling for other parent birth weight and socio-demographic controls)

	Quintiles of child's birth weight					
Quintiles of mother's birth weight	1	2	3	4	5	Total
1	19,788	15,082	12,079	10,523	8,375	65,847
	30.05	22.9	18.34	15.98	12.72	100
2	15,967	14,983	12,685	12,181	10,030	65,846
	24.25	22.75	19.26	18.5	15.23	100
3	12,901	13,710	13,187	13,499	12,550	65,847
	19.59	20.82	20.03	20.5	19.06	100
4	10,326	12,125	12,874	14,974	15,547	65,846
	15.68	18.41	19.55	22.74	23.61	100
5	7,705	9,615	11,662	15,783	21,081	65,846
	11.7	14.6	17.71	23.97	32.02	100
Total	66,687	65,515	62,487	66,960	67,583	329,232
	20.26	19.9	18.98	20.34	20.53	100
Pearson chi2(16) = 1.7e+04 Pr = 0.000						

	Quintiles of child's birth weight					
Quintiles of father's birth weight	1	2	3	4	5	Total
1	16,681	14,556	12,646	11,871	10,093	65,847
	25.33	22.11	19.21	18.03	15.33	100
2	14,920	14,224	12,770	12,697	11,235	65,846
	22.66	21.6	19.39	19.28	17.06	100
3	13,330	13,384	12,696	13,408	13,029	65,847
	20.24	20.33	19.28	20.36	19.79	100
4	11,732	12,440	12,573	14,148	14,953	65,846
	17.82	18.89	19.09	21.49	22.71	100
5	10,024	10,911	11,802	14,836	18,273	65,846
	15.22	16.57	17.92	22.53	27.75	100
Total	66,687	65,515	62,487	66,960	67,583	329,232
	20.26	19.9	18.98	20.34	20.53	100
Pearson chi2(16) = 6.3e+03 Pr = 0.000						

Notes - The sample is restricted to singleton children born in Florida between 1989 and 2014 who were successfully linked to the records of their mothers and fathers born in Florida between 1970 and 1988. ll estimate include control for the other parent's birth weight and socio-demographic controls.

Table A.7: Intergenerational transition matrices (Controlling for other parent birth weight, and socio-demographic controls, and grandmother fixed effects)

	Quintiles of child's birth weight					
Quintiles of mother's birth weight	1	2	3	4	5	Total
1	19,788	15,082	12,079	10,523	8,375	65,847
	30.05	22.9	18.34	15.98	12.72	100
2	15,967	14,983	12,685	12,181	10,030	65,846
	24.25	22.75	19.26	18.5	15.23	100
3	12,901	13,710	13,187	13,499	12,550	65,847
	19.59	20.82	20.03	20.5	19.06	100
4	10,326	12,125	12,874	14,974	15,547	65,846
	15.68	18.41	19.55	22.74	23.61	100
5	7,705	9,615	11,662	15,783	21,081	65,846
	11.7	14.6	17.71	23.97	32.02	100
Total	66,687	65,515	62,487	66,960	67,583	329,232
	20.26	19.9	18.98	20.34	20.53	100
Pearson chi2(16) = 1.7e+04 Pr = 0.000						

	Quintiles of child's birth weight					
Quintiles of father's birth weight	1	2	3	4	5	Total
1	16,681	14,556	12,646	11,871	10,093	65,847
	25.33	22.11	19.21	18.03	15.33	100
2	14,920	14,224	12,770	12,697	11,235	65,846
	22.66	21.6	19.39	19.28	17.06	100
3	13,330	13,384	12,696	13,408	13,029	65,847
	20.24	20.33	19.28	20.36	19.79	100
4	11,732	12,440	12,573	14,148	14,953	65,846
	17.82	18.89	19.09	21.49	22.71	100
5	10,024	10,911	11,802	14,836	18,273	65,846
	15.22	16.57	17.92	22.53	27.75	100
Total	66,687	65,515	62,487	66,960	67,583	329,232
	20.26	19.9	18.98	20.34	20.53	100
Pearson chi2(16) = 6.3e+03 Pr = 0.000						

Notes - The sample is restricted to singleton children born in Florida between 1989 and 2014 who were successfully linked to the records of their mothers and fathers born in Florida between 1970 and 1988. All estimates include control for the other parent's birth weight, socio-demographic controls and grandmother fixed effects.

5.1 Log(birth weight)

Table A.8: Regression of child's birth weight on parents' birth weight

	(1)	(2)	(3)	(4)	(5)
			Panel A Child's log(birth weight)		
Mother's log(birth weight)	0.2099***	0.1954***	0.1072***	0.1008***	0.1898***
	(0.0022)	(0.0022)	(0.0108)	(0.0122)	(0.0041)
Socio-demographic controls		X		X	X
Maternal GM fixed effects			X	X	
Observations	366,722	329,232	366,722	329,232	95,113
			Panel B Child's log (birth weight)		
Father's log(birth weight)	0.130***	0.114***	0.087***	0.088***	0.118***
	(0.002)	(0.002)	(0.010)	(0.012)	(0.004)
Socio-demographic controls		X		X	X
Paternal GM fixed effects			X	X	
Observations	366,722	329,232	366,722	329,232	102,109

Notes - All estimates are conducted on the sample of children matched to both paternal and maternal birth records. The sample is restricted to singleton children who were born in Florida between 1989 and 2014, and whose mothers and fathers were born in Florida between 1970 and 1988. We exclude children and parents with birth weight below 1,000 grams or above 6,000 grams. Socio-demographic controls include child's gender, maternal and paternal age and education, birth order, year fixed effects, and county fixed effects (for the child's county of birth). In columns (3) and (4) of Panel A (B), we control for maternal (paternal) grandmother fixed effects. In column (5) of Panel A (B), the sample is restricted to children born to mothers (fathers) whose sisters (brothers) were also matched to the records of their offspring. Standard errors in parentheses are clustered at the mother level in Panel A and at the father level in Panel B. *** p<0.01, ** p<0.05, * p<0.1

Table A.9: Regression of child's birth weight on both parents' birth weights

	(1)	(2)	(3)	(4)	(5)	(6)
	Child's log(birth weight)					
Mother's log(birth weight)	0.203***	0.191***	0.107***	0.100***	0.167***	0.168***
	(0.002)	(0.002)	(0.011)	(0.012)	(0.006)	(0.006)
Father's log(birth weight)	0.118***	0.106***	0.075***	0.076***	0.084***	0.085***
	(0.002)	(0.002)	(0.006)	(0.006)	(0.010)	(0.011)
Socio-demographic controls		X		X		X
Maternal GM fixed effects			X	X		
Paternal GM fixed effects					X	X
Observations	366,722	329,232	366,722	329,232	366,722	329,232
Test coeff[Mother log(BW)=Father log(BW)](p-value)	0.0000	0.0000	0.135	0.562	0.0000	0.0001

Notes - All estimates are conducted on the sample of children matched to both paternal and maternal birth records. The sample is restricted to singleton children who were born in Florida between 1989 and 2014, and whose mothers and fathers were born in Florida between 1970 and 1988. We exclude children and parents with birth weight below 1,000 grams or above 6,000 grams. Socio-demographic controls include child's gender, maternal and paternal age and education, birth order, year fixed effects, and county fixed effects (for the child's county of birth). In columns (3) and (4) we control for maternal grandmother (GM) fixed effects. In columns (5) and (6) we control for paternal grandmother (GM) fixed effects. Standard errors in parentheses are clustered at the mother level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

5.2 Intrauterine growth restriction (IUGR) and Small for Gestational Age (SGA)

Table A.10: Regression of child's IUGR on parents' IUGR

	(1)	(2)	(3)	(4)	(5)
	Panel A Child's IUGR (BW/gestation weeks)				
Mother's IUGR (BW/gestation weeks)	0.2156***	0.2087***	0.1288***	0.1300***	0.2004***
	(0.0022)	(0.0023)	(0.0106)	(0.0122)	(0.0044)
Socio-demographic controls		X		X	X
Maternal GM fixed effects			X	X	
Observations	330,782	297,151	330,782	297,151	85,879
	Panel B Child's iugr (BW/gestation weeks)				
Father's iugr (BW/gestation weeks)	0.1414***	0.1308***	0.0986***	0.0980***	0.1317***
	(0.0020)	(0.0021)	(0.0106)	(0.0117)	(0.0038)
Socio-demographic controls		X		X	X
Paternal GM fixed effects			X	X	
Observations	322,407	289,751	322,407	289,751	89,129

Notes - IUGR is defined as birth weight divided by gestation weeks. In all regressions we exclude children and parents for whom information on gestation weeks is missing. All estimates are conducted on the sample of children matched to both paternal and maternal birth records. The sample is restricted to singleton children who were born in Florida between 1989 and 2014, and whose mothers and fathers were born in Florida between 1970 and 1988. We exclude children and parents with birth weight below 1,000 grams or above 6,000 grams. Socio-demographic controls include child's gender, maternal and paternal age and education, birth order, year fixed effects, and county fixed effects (for the child's county of birth). In columns (3) and (4) of Panel A (B), we control for maternal (paternal) grandmother fixed effects. In column (5) of Panel A (B), the sample is restricted to children born to mothers (fathers) whose sisters (brothers) were also matched to the records of their offspring. Standard errors in parentheses are clustered at the mother level in Panel A and at the father level in Panel B. *** p<0.01, ** p<0.05, * p<0.1

Table A.11: Regression of child's IUGR on both parents' IUGR

	(1)	(2)	(3)	(4)	(5)	(6)
	Child's iugr (BW/gestation weeks)					
Mother's IUGR (BW/gestation weeks)	0.2102***	0.2049***	0.1325***	0.1296***	0.1779***	0.1782***
	(0.0023)	(0.0023)	(0.0117)	(0.0135)	(0.0060)	(0.0070)
Father's IUGR (BW/gestation weeks)	0.1331***	0.1248***	0.0941***	0.0935***	0.0887***	0.0869***
	(0.0020)	(0.0021)	(0.0063)	(0.0073)	(0.0113)	(0.0124)
Socio-demographic controls		X		X		X
Maternal GM fixed effects			X	X		
Paternal GM fixed effects					X	X
Observations	296,579	266,591	296,579	266,591	296,579	266,591
Test coeff[Mother BW=Father BW](p-value)	0	0	0.00384	0.0193	0	1.85e-10

Notes - IUGR is defined as birth weight divided by gestation weeks. In all regressions we exclude children and parents for whom information on gestation weeks is missing. All estimates are conducted on the sample of children matched to both paternal and maternal birth records. The sample is restricted to singleton children who were born in Florida between 1989 and 2014, and whose mothers and fathers were born in Florida between 1970 and 1988. We exclude children and parents with birth weight below 1,000 grams or above 6,000 grams. Socio-demographic controls include child's gender, maternal and paternal age and education, birth order, year fixed effects, and county fixed effects (for the child's county of birth). In columns (3) and (4) we control for maternal grandmother (GM) fixed effects. In columns (5) and (6) we control for paternal grandmother (GM) fixed effects. Standard errors in parentheses are clustered at the mother level. *** p<0.01, ** p<0.05, * p<0.1

Table A.12: Regression of child's SGA on parents' SGA

	(1)	(2)	(3)	(4)	(5)
	Panel A Child is small for gestational age (below 10th percentile)				
Mother is small for gestational age (below 10th percentile)	0.095***	0.088***	0.050***	0.049***	0.096***
	(0.002)	(0.003)	(0.011)	(0.012)	(0.005)
Socio-demographic controls		X		X	X
Maternal GM fixed effects			X	X	
Observations	330,782	297,151	330,782	297,151	85,879
	Panel B Child is small for gestational age (below 10th percentile)				
Father is small for gestational age (below 10th percentile)	0.061***	0.054***	0.043***	0.039***	0.067***
	(0.002)	(0.002)	(0.010)	(0.012)	(0.004)
Socio-demographic controls		X		X	X
Paternal GM fixed effects			X	X	
Observations	322,407	289,751	322,407	289,751	89,129

Notes - SGA is a binary variable that equals one if the infant's birth weight is below the 10th percentile for his/her gestation week and gender. The reference population for calculating SGA for children includes all the non-plural births that occurred in Florida between 1989 and 2014 with birth weight in the interval (1000;6000). The reference population for calculating SGA for parents includes all the non-plural births that occurred in Florida between 1970 and 1988 with birth weight in the interval (1000;6000). All estimates are conducted on the sample of children matched to both paternal and maternal birth records. The sample is restricted to singleton children who were born in Florida between 1989 and 2014, and whose mothers and fathers were born in Florida between 1970 and 1988. We exclude children and parents with birth weight below 1,000 grams or above 6,000 grams. Socio-demographic controls include child's gender, maternal and paternal age and education, birth order, year fixed effects, and county fixed effects (for the child's county of birth). In columns (3) and (4) of Panel A (B), we control for maternal (paternal) grandmother fixed effects. In column (5) of Panel A (B), the sample is restricted to children born to mothers (fathers) whose sisters (brothers) were also matched to the records of their offspring. Standard errors in parentheses are clustered at the mother level in Panel A and at the father level in Panel B. *** p<0.01, ** p<0.05, * p<0.1

Table A.13: Regression of child's SGA on both parents' SGA

	(1)	(2)	(3)	(4)	(5)	(6)
	Child is small for gestational age (below 10th percentile)					
Mother is small for gestational age (below 10th percentile)	0.094***	0.087***	0.052***	0.050***	0.083***	0.080***
	(0.003)	(0.003)	(0.012)	(0.014)	(0.007)	(0.008)
Father is small for gestational age (below 10th percentile)	0.058***	0.053***	0.043***	0.041***	0.043***	0.040***
	(0.002)	(0.002)	(0.008)	(0.009)	(0.012)	(0.013)
Socio-demographic controls		X		X		X
Maternal GM fixed effects			X	X		
Paternal GM fixed effects					X	X
Observations	296,579	266,591	296,579	266,591	296,579	266,591
Test coeff[Mother BW=Father BW](p-value)	0	0	0.519	0.614	0.00383	0.0121

Notes - SGA is a binary variable that equals one if the infant's birth weight is below the 10th percentile for his/her gestation week and gender. The reference population for calculating SGA for children includes all the non-plural births that occurred in Florida between 1989 and 2014 with birth weight in the interval (1000;6000). The reference population for calculating SGA for parents includes all the non-plural births that occurred in Florida between 1970 and 1988 with birth weight in the interval (1000;6000). All estimates are conducted on the sample of children matched to both paternal and maternal birth records. In all regressions we exclude children and parents for whom gestation weeks are missing. The sample is restricted to singleton children who were born in Florida between 1989 and 2014, and whose mothers and fathers were born in Florida between 1970 and 1988. We exclude children and parents with birth weight below 1,000 grams or above 6,000 grams. Socio-demographic controls include child's gender, maternal and paternal age and education, birth order, year fixed effects, and county fixed effects (for the child's county of birth). In columns (3) and (4) we control for maternal grandmother (GM) fixed effects. In columns (5) and (6) we control for paternal grandmother (GM) fixed effects. Standard errors in parentheses are clustered at the mother level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

5.3 Low birth weight

Table A.14: Regression of child's low birth weight on parents' low birth weight

	(1)	(2)	(3)	(4)	(5)
	Panel A Child is low birth weight (BW<2,500 grams)				
Mother is low birth weight (BW<2,500 grams)	0.0617***	0.0542***	0.0077	-0.0045	0.0515***
	(0.0022)	(0.0023)	(0.0091)	(0.0104)	(0.0041)
Socio-demographic controls		X		X	X
Maternal GM fixed effects			X	X	
Observations	366,722	329,232	366,722	329,232	95,113
	Panel B Child is low birth weight (BW<2,500 grams)				
Father is low birth weight (BW<2,500 grams)	0.0270***	0.0214***	0.0250***	0.0240**	0.0248***
	(0.0021)	(0.0022)	(0.0097)	(0.0104)	(0.0039)
Socio-demographic controls		X		X	X
Paternal GM fixed effects			X	X	
Observations	366,722	329,232	366,722	329,232	102,109

Notes - All estimates are conducted on the sample of children matched to both paternal and maternal birth records. The sample is restricted to singleton children who were born in Florida between 1989 and 2014, and whose mothers and fathers were born in Florida between 1970 and 1988. We exclude children and parents with birth weight below 1,000 grams or above 6,000 grams. Socio-demographic controls include child's gender, maternal and paternal age and education, birth order, year fixed effects, and county fixed effects (for the child's county of birth). In columns (3) and (4) of Panel A (B), we control for maternal (paternal) grandmother fixed effects. In column (5) of Panel A (B), the sample is restricted to children born to mothers (fathers) whose sisters (brothers) were also matched to the records of their offspring. Standard errors in parentheses are clustered at the mother level in Panel A and at the father level in Panel B. *** p<0.01, ** p<0.05, * p<0.1

Table A.15: Regression of child's low birth weight on both parents' low birth weight

	(1)	(2)	(3)	(4)	(5)	(6)
	Child is low birth weight (birth weight<2,500 grams)					
Mother is low birth weight (BW<2,500)	0.0613***	0.0540***	0.0078	-0.0044	0.0584***	0.0576***
	(0.0022)	(0.0023)	(0.0091)	(0.0104)	(0.0056)	(0.0065)
Father is low birth weight (BW<2,500)	0.0258***	0.0206***	0.0186***	0.0165**	0.0243**	0.0237**
	(0.0021)	(0.0022)	(0.0065)	(0.0075)	(0.0100)	(0.0108)
Socio-demographic controls		X		X		X
Maternal G.M. F.E.			X	X		
Paternal G.M. F.E.					X	X
Observations	366,722	329,232	366,722	329,232	366,722	329,232
Test coeff[Mother BW=Father BW](p-value)	0	0	0.332	0.105	0.00310	0.00732

Notes - All estimates are conducted on the sample of children matched to both paternal and maternal birth records. The sample is restricted to singleton children who were born in Florida between 1989 and 2014, and whose mothers and fathers were born in Florida between 1970 and 1988. We exclude children and parents with birth weight below 1,000 grams or above 6,000 grams. Socio-demographic controls include child's gender, maternal and paternal age and education, birth order, year fixed effects, and county fixed effects (for the child's county of birth). In columns (3) and (4) we control for maternal grandmother (GM) fixed effects. In columns (5) and (6) we control for paternal grandmother (GM) fixed effects. Standard errors in parentheses are clustered at the mother level. *** p<0.01, ** p<0.05, * p<0.1

Table A.16: Regression of child's low birth weight on parents' low birth weight (large sample)

	(1)	(2)	(3)	(4)	(5)
	Panel A Child is low birth weight (BW<2,500)				
Mother is low birth weight					
(BW<2,500)	0.0608***	0.0565***	0.0228***	0.0220***	0.0513***
	(0.0014)	(0.0014)	(0.0039)	(0.0040)	(0.0023)
Socio-demographic controls		X		X	X
Maternal GM fixed effects			X	X	
Observations	1,054,063	1,042,646	1,054,063	1,042,646	389,248
	Panel B Child is low birth weight (BW<2,500)				
Father is low birth weight					
(BW<2,500)	0.0260***	0.0222***	0.0182***	0.0200***	0.0255***
	(0.0015)	(0.0016)	(0.0054)	(0.0058)	(0.0028)
Socio-demographic controls		X		X	X
Paternal GM fixed effects			X	X	
Observations	724,791	660,905	724,791	660,905	253,684

Notes - In this table, we do not restrict the sample to children matched to both paternal and maternal birth records. We match children to mothers only in Panel A and children to fathers only in Panel B. Panel A: The sample is restricted to singleton children born in Florida between 1989 and 2014 who were successfully linked to the records of their mothers born in Florida between 1970 and 1988. We exclude children and mothers with birth weight below 1,000 grams or above 6,000 grams. Socio-demographic controls include child's gender, maternal and paternal age and education, birth order, year fixed effects, and county fixed effects. Standard errors in parentheses are clustered at the mother level. Panel B: The sample is restricted to singleton children born in Florida between 1989 and 2014 who were successfully linked to the records of their fathers born in Florida between 1970 and 1988. We exclude children and fathers with birth weight below 1,000 grams or above 6,000 grams. Socio-demographic controls include child's gender, maternal and paternal age and education, birth order, year fixed effects, and county fixed effects. Standard errors in parentheses are clustered at the father level. *** p<0.01, ** p<0.05, * p<0.1

5.4 Macrosomic birth

Table A.17: Regression of child's high birth weight on parents' high birth weight

	(1)	(2)	(3)	(4)	(5)
	Panel A Child is high birth weight (BW>4,000 grams)				
Mother is high birth weight (BW>4,000)	0.1070***	0.1055***	0.0525***	0.0559***	0.0988***
	(0.0028)	(0.0029)	(0.0118)	(0.0132)	(0.0057)
Socio-demographic controls		X		X	X
Maternal GM fixed effects			X	X	
Observations	366,722	329,232	366,722	329,232	95,113
	Panel B Child is high birth weight (BW>4,000 grams)				
Father is high birth weight (BW>4,000)	0.0577***	0.0544***	0.0293***	0.0323***	0.0524***
	(0.0018)	(0.0019)	(0.0080)	(0.0090)	(0.0035)
	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)
Socio-demographic controls		X		X	X
Paternal GM fixed effects			X	X	
Observations	366,722	329,232	366,722	329,232	102,109

Notes - The sample is restricted to singleton children who were born in Florida between 1989 and 2014, and whose mothers (fathers) were born in Florida between 1970 and 1988. All estimates are conducted on the sample of children matched to both paternal and maternal birth records. We exclude children and parents with birth weight below 1,000 grams or above 6,000 grams. Socio-demographic controls include child's gender, maternal and paternal age and education, birth order, year fixed effects, and county fixed effects (for the child's county of birth).In column 5 Panel A (B), the sample is restricted to children born to mothers (fathers) whose sisters (brothers) were also matched to the records of their offspring. Standard errors are clustered at the mother level.

Table A.18: Regression of child's high birth weight on both parents' high birth weight

	(1)	(2)	(3)	(4)	(5)	(6)
	Child is high birth weight (birth weight>4,000 grams)					
Mother is high birth weight (BW>4,000)	0.1058***	0.1047***	0.0526***	0.0559***	0.0739***	0.0749***
	(0.0028)	(0.0029)	(0.0117)	(0.0132)	(0.0065)	(0.0075)
Father is high birth weight (BW>4,000)	0.0563***	0.0534***	0.0419***	0.0420***	0.0286***	0.0316***
	(0.0018)	(0.0019)	(0.0055)	(0.0064)	(0.0082)	(0.0092)
Socio-demographic controls		X		X		X
Maternal G.M. F.E.			X	X		
Paternal G.M. F.E.					X	X
Observations	366,722	329,232	366,722	329,232	366,722	329,232
Test coeff[Mother BW=Father BW](p-value)	0.0000	0.0000	0.189	0.113	0.00835	0.0344

Notes - The sample is restricted to singleton children who were born in Florida between 1989 and 2014, and whose mothers (fathers) were born in Florida between 1970 and 1988. All estimates are conducted on the sample of children matched to both paternal and maternal birth records. We exclude children and parents with birth weight below 1,000 grams or above 6,000 grams. Socio-demographic controls include child's gender, maternal and paternal age and education, birth order, year fixed effects, and county fixed effects (for the child's county of birth). Standard errors are clustered at the mother level.

Appendix D: Heterogeneity by Race

Whites

Table A.19: Regression of child's birth weight on parents' birth weight (Whites)

	(1)	(2)	(3)	(4)	(5)
			Panel A Child's birth weight (grams)		
Mother's birth weight (grams)	0.2040***	0.1994***	0.1237***	0.1300***	0.1943***
	(0.0027)	(0.0027)	(0.0167)	(0.0169)	(0.0058)
Socio-demographic controls		X		X	X
Maternal GM fixed effects			X	X	
Observations	202,659	199,827	202,659	199,827	43,794
			Panel B Child's birth weight (grams)		
Father's birth weight (grams)	0.1137***	0.1076***	0.1017***	0.1078***	0.1051***
	(0.0025)	(0.0025)	(0.0164)	(0.0166)	(0.0053)
Socio-demographic controls		X		X	X
Paternal GM fixed effects			X	X	
Observations	202,659	199,827	202,659	199,827	44,157

Notes - The sample is restricted to children whose mothers and fathers are both White. All estimates are conducted on the sample of children matched to both paternal and maternal birth records. The sample is restricted to singleton children who were born in Florida between 1989 and 2014, and whose mothers and fathers were born in Florida between 1970 and 1988. We exclude children and parents with birth weight below 1,000 grams or above 6,000 grams. Socio-demographic controls include child's gender, maternal and paternal age and education, birth order, year fixed effects, and county fixed effects (for the child's county of birth). In columns (3) and (4) of Panel A (B), we control for maternal (paternal) grandmother fixed effects. In column (5) of Panel A (B), the sample is restricted to children born to mothers (fathers) whose sisters (brothers) were also matched to the records of their offspring. Standard errors in parentheses are clustered at the mother level in Panel A and at the father level in Panel B. *** p<0.01, ** p<0.05, * p<0.1

Table A.20: Regression of child's birth weight on both parents' birth weights (Whites)

	(1)	(2)	(3)	(4)	(5)	(6)
	Child's birth weight (in grams)					
Mother's birth weight (grams)	0.2014***	0.1976***	0.1228***	0.1287***	0.1743***	0.1752***
	(0.0027)	(0.0026)	(0.0166)	(0.0169)	(0.0093)	(0.0094)
Father's birth weight (grams)	0.1095***	0.1046***	0.0917***	0.0926***	0.1013***	0.1073***
	(0.0023)	(0.0023)	(0.0086)	(0.0087)	(0.0124)	(0.0126)
Socio-demographic controls		X		X		X
Maternal GM fixed effects			X	X		
Paternal GM fixed effects					X	X
Observations	202,659	199,827	202,659	199,827	202,659	199,827
Test coeff [Mother BW=Father BW](p-value)	0.0000	0.0000	0.0970	0.0581	0.0000	0.0000

Notes - The sample is restricted to children whose mothers and fathers are both White. All estimates are conducted on the sample of children matched to both paternal and maternal birth records. The sample is restricted to singleton children who were born in Florida between 1989 and 2014, and whose mothers and fathers were born in Florida between 1970 and 1988. We exclude children and parents with birth weight below 1,000 grams or above 6,000 grams. Socio-demographic controls include child's gender, maternal and paternal age and education, birth order, year fixed effects, and county fixed effects (for the child's county of birth). In columns (3) and (4) we control for maternal grandmother (GM) fixed effects. In columns (5) and (6) we control for paternal grandmother (GM) fixed effects. Standard errors in parentheses are clustered at the mother level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Blacks

Table A.21: Regression of child's birth weight on parents' birth weight (Blacks)

	(1)	(2)	(3)	(4)	(5)
			Panel A Child's birth weight (grams)		
Mother's birth weight (grams)	0.1896***	0.1882***	0.1221***	0.1188***	0.1901***
	(0.004)	(0.004)	(0.018)	(0.019)	(0.006)
Socio-demographic controls		X		X	X
Maternal GM fixed effects			X	X	
Observations	115,131	109,469	115,131	109,469	45,974
			Panel B Child's birth weight (grams)		
Father's birth weight (grams)	0.0941***	0.0913***	0.1061***	0.1039***	0.0987***
	(0.003)	(0.003)	(0.017)	(0.017)	(0.005)
Socio-demographic controls		X		X	X
Paternal GM fixed effects			X	X	
Observations	115,131	109,469	115,131	109,469	51,721

Notes - The sample is restricted to children whose mothers and fathers are both Black. All estimates are conducted on the sample of children matched to both paternal and maternal birth records. The sample is restricted to singleton children who were born in Florida between 1989 and 2014, and whose mothers and fathers were born in Florida between 1970 and 1988. We exclude children and parents with birth weight below 1,000 grams or above 6,000 grams. Socio-demographic controls include child's gender, maternal and paternal age and education, birth order, year fixed effects, and county fixed effects (for the child's county of birth). In columns (3) and (4) of Panel A (B), we control for maternal (paternal) grandmother fixed effects. In column (5) of Panel A (B), the sample is restricted to children born to mothers (fathers) whose sisters (brothers) were also matched to the records of their offspring. Standard errors in parentheses are clustered at the mother level in Panel A and at the father level in Panel B. *** p<0.01, ** p<0.05, * p<0.1

Table A.22: Regression of child's birth weight on both parents' birth weights (Blacks)

	(1)	(2)	(3)	(4)	(5)	(6)
	Child's birth weight (in grams)					
Mother's birth weight (grams)	0.1882***	0.1869***	0.1220***	0.1184***	0.1943***	0.1945***
	(0.004)	(0.004)	(0.018)	(0.019)	(0.009)	(0.009)
Father's birth weight (grams)	0.0914***	0.0889***	0.0831***	0.0816***	0.1026***	0.1005***
	(0.003)	(0.003)	(0.009)	(0.009)	(0.016)	(0.017)
Socio-demographic controls		X		X		X
Maternal GM fixed effects			X	X		
Paternal GM fixed effects					X	X
Observations	115,131	109,469	115,131	109,469	115,131	109,469
Test coeff [Mother BW=Father BW](p-value)	0.0000	0.0000	0.0477	0.0764	0.0000	0.0000

Notes - The sample is restricted to children whose mothers and fathers are both Black. All estimates are conducted on the sample of children matched to both paternal and maternal birth records. The sample is restricted to singleton children who were born in Florida between 1989 and 2014, and whose mothers and fathers were born in Florida between 1970 and 1988. We exclude children and parents with birth weight below 1,000 grams or above 6,000 grams. Socio-demographic controls include child's gender, maternal and paternal age and education, birth order, year fixed effects, and county fixed effects (for the child's county of birth). In columns (3) and (4) we control for maternal grandmother (GM) fixed effects. In columns (5) and (6) we control for paternal grandmother (GM) fixed effects. Standard errors in parentheses are clustered at the mother level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Appendix E: Sample Restrictions

Table A.23: Regression of child's birth weight on parents' birth weight (full-term births)

	(1)	(2)	(3)	(4)	(5)
			Panel A Child's birth weight (grams)		
Mother's birth weight (grams)	0.2195***	0.2086***	0.1419***	0.1473***	0.2114***
	(0.0019)	(0.0020)	(0.0104)	(0.0116)	(0.0037)
Socio-demographic controls		X		X	X
Maternal GM fixed effects			X	X	
Observations	306,425	276,235	306,425	276,235	78,617
			Panel B Child's birth weight (grams)		
Father's birth weight (grams)	0.1441***	0.1307***	0.1077***	0.1157***	0.1326***
	(0.0018)	(0.0018)	(0.0101)	(0.0114)	(0.0033)
Socio-demographic controls		X		X	X
Paternal GM fixed effects			X	X	
Observations	306,425	276,235	306,425	276,235	84,254

Notes - The sample is restricted to children born with gestational length between 37 and 42 weeks. In all regressions we exclude children for whom information on gestation weeks is missing. All estimates are conducted on the sample of children matched to both paternal and maternal birth records. The sample is restricted to singleton children who were born in Florida between 1989 and 2014, and whose mothers and fathers were born in Florida between 1970 and 1988. We exclude children and parents with birth weight below 1,000 grams or above 6,000 grams. Socio-demographic controls include child's gender, maternal and paternal age and education, birth order, year fixed effects, and county fixed effects (for the child's county of birth). In columns (3) and (4) of Panel A (B), we control for maternal (paternal) grandmother fixed effects. In column (5) of Panel A (B), the sample is restricted to children born to mothers (fathers) whose sisters (brothers) were also matched to the records of their offspring. Standard errors in parentheses are clustered at the mother level in Panel A and at the father level in Panel B. *** p<0.01, ** p<0.05, * p<0.1

Table A.24: Regression of child's birth weight on both parents' birth weights (full-term births)

	(1)	(2)	(3)	(4)	(5)	(6)
	Child's birth weight (grams)					
Mother's birth weight (grams)	0.2108***	0.2028***	0.1413***	0.1461***	0.1743***	0.1766***
	(0.0019)	(0.0019)	(0.0102)	(0.0114)	(0.0054)	(0.0062)
Father's birth weight (grams)	0.1316***	0.1219***	0.0974***	0.0965***	0.1047***	0.1125***
	(0.0017)	(0.0018)	(0.0055)	(0.0063)	(0.0099)	(0.0111)
Socio-demographic controls		X		X		X
Maternal GM fixed effects			X	X		
Paternal GM fixed effects					X	X
Observations	306,425	276,235	306,425	276,235	306,425	276,235
Test coeff[Mother log(bwg)=Father log (bwg)](p-value)	0.0000	0.0000	0.0002	0.000163	0.0000	0.0000

Notes - The sample is restricted to children born with gestational length between 37 and 42 weeks. In all regressions we exclude children for whom information on gestation weeks is missing. All estimates are conducted on the sample of children matched to both paternal and maternal birth records. The sample is restricted to singleton children who were born in Florida between 1989 and 2014, and whose mothers and fathers were born in Florida between 1970 and 1988. We exclude children and parents with birth weight below 1,000 grams or above 6,000 grams. Socio-demographic controls include child's gender, maternal and paternal age and education, birth order, year fixed effects, and county fixed effects (for the child's county of birth). In columns (3) and (4) we control for maternal grandmother (GM) fixed effects. In columns (5) and (6) we control for paternal grandmother (GM) fixed effects. Standard errors in parentheses are clustered at the mother level. *** p<0.01, ** p<0.05, * p<0.1

Table A.25: Regression of child's birth weight on parents' birth weight (first-born children)

	(1)	(2)	(3)	(4)	(5)
			Panel A Child's birth weight (grams)		
Mother's birth weight (grams)	0.2375***	0.2245***	0.1340**	0.1373**	0.2202***
	(0.0025)	(0.0026)	(0.0547)	(0.0648)	(0.0032)
Socio-demographic controls		X		X	X
Maternal GM fixed effects			X	X	
Observations	167,880	150,383	167,880	150,383	95,113
			Panel B Child's birth weight (grams)		
Father's birth weight (grams)	0.1360***	0.1218***	0.0980***	0.1036**	0.1334***
	(0.0021)	(0.0022)	(0.0360)	(0.0438)	(0.0030)
Socio-demographic controls		X		X	X
Paternal GM fixed effects			X	X	
Observations	213,648	189,952	213,648	189,952	102,109

Notes - All estimates are conducted on the sample of children matched to both paternal and maternal birth records. In Panel A, we restrict the sample to children who were the first live birth of their mothers. In Panel B, we restrict the sample to children who were the first-born children to their fathers in our data set. The sample is restricted to singleton children who were born in Florida between 1989 and 2014, and whose mothers and fathers were born in Florida between 1970 and 1988. We exclude children and parents with birth weight below 1,000 grams or above 6,000 grams. Socio-demographic controls include child's gender, maternal and paternal age and education, birth order, year fixed effects, and county fixed effects (for the child's county of birth). In columns (3) and (4) of Panel A (B), we control for maternal (paternal) grandmother fixed effects. In column (5) of Panel A (B), the sample is restricted to children born to mothers (fathers) whose sisters (brothers) were also matched to the records of their offspring. Standard errors in parentheses are clustered at the mother level in Panel A and at the father level in Panel B. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table A.26: Regression of child's birth weight on parents' birth weight (male children)

	(1)	(2)	(3)	(4)	(5)
			Panel A Child's birth weight (grams)		
Mother's birth weight (grams)	0.2393***	0.2240***	0.1353***	0.1333***	0.2228***
	(0.0026)	(0.0027)	(0.0202)	(0.0227)	(0.0050)
Socio-demographic controls		X		X	X
Maternal GM fixed effects			X	X	
Observations	188,326	169,406	188,326	169,406	48,609
			Panel B Child's birth weight (grams)		
Father's birth weight (grams)	0.1406***	0.1245***	0.1024***	0.1033***	0.1306***
	(0.0025)	(0.0026)	(0.0192)	(0.0221)	(0.0047)
Socio-demographic controls		X		X	X
Paternal GM fixed effects			X	X	
Observations	188,326	169,406	188,326	169,406	52,235

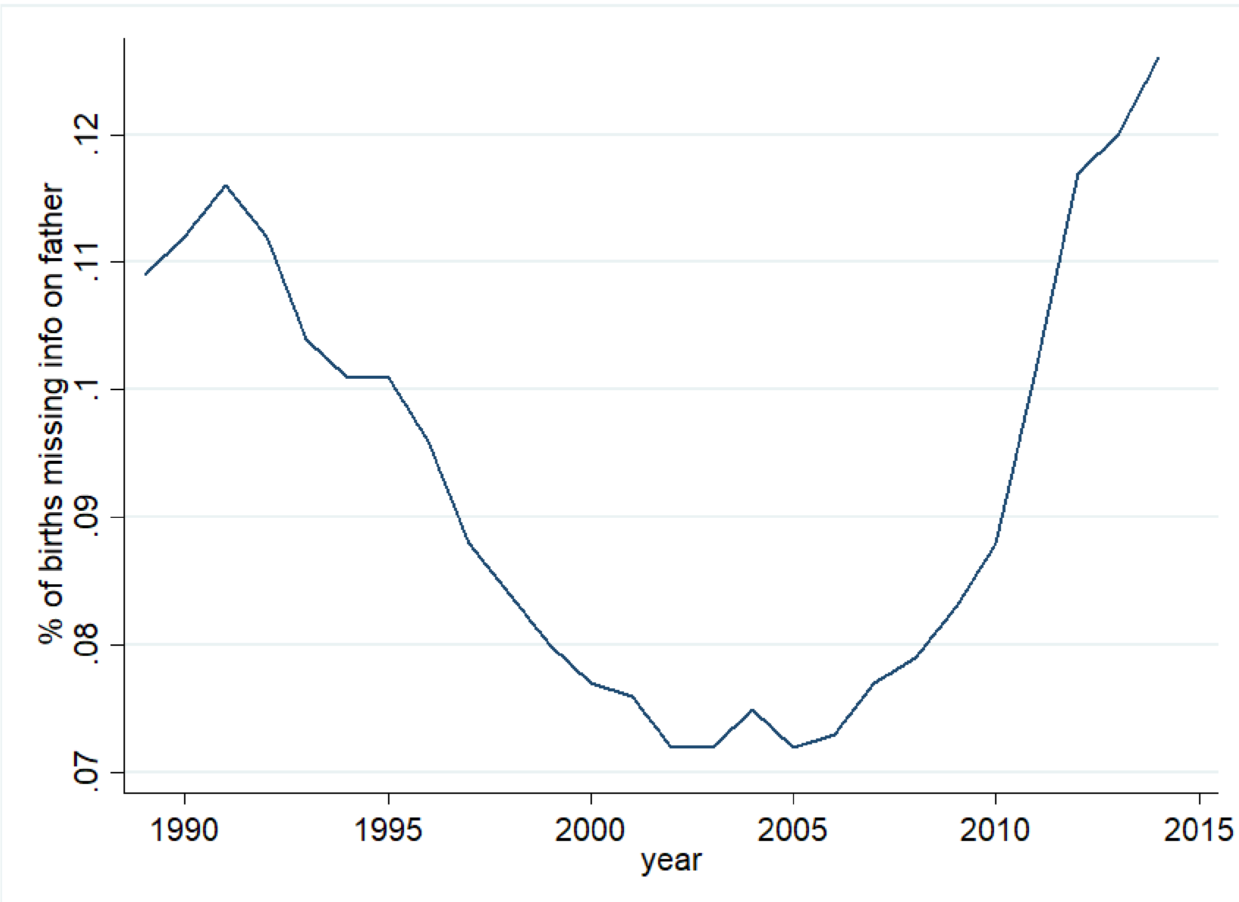
Notes - All estimates are conducted on the sample of children matched to both paternal and maternal birth records. The sample is restricted to male singleton children who were born in Florida between 1989 and 2014, and whose mothers and fathers were born in Florida between 1970 and 1988. We exclude children and parents with birth weight below 1,000 grams or above 6,000 grams. Socio-demographic controls include child's gender, maternal and paternal age and education, birth order, year fixed effects, and county fixed effects (for the child's county of birth). In columns (3) and (4) of Panel A (B), we control for maternal (paternal) grandmother fixed effects. In column (5) of Panel A (B), the sample is restricted to children born to mothers (fathers) whose sisters (brothers) were also matched to the records of their offspring. Standard errors in parentheses are clustered at the mother level in Panel A and at the father level in Panel B. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table A.27: Regression of child's birth weight on parents' birth weight (female children)

	(1)	(2)	(3)	(4)	(5)
			Panel A		
Dependent Variable:			Child's birth weight (grams)		
Mother's birth weight (grams)	0.2351***	0.2201***	0.1318***	0.1234***	0.2174***
	(0.0026)	(0.0027)	(0.0208)	(0.0239)	(0.0051)
Socio-demographic controls		X		X	X
Maternal GM fixed effects			X	X	
Observations	178,396	159,826	178,396	159,826	46,504
			Panel B		
			Child's birth weight (grams)		
Father's birth weight (grams)	0.1498***	0.1337***	0.0921***	0.1004***	0.1363***
	(0.0024)	(0.0026)	(0.0186)	(0.0213)	(0.0046)
Socio-demographic controls		X		X	X
Paternal GM fixed effects			X	X	
Observations	178,396	159,826	178,396	159,826	49,874

Notes - All estimates are conducted on the sample of children matched to both paternal and maternal birth records. The sample is restricted to female singleton children who were born in Florida between 1989 and 2014, and whose mothers and fathers were born in Florida between 1970 and 1988. We exclude children and parents with birth weight below 1,000 grams or above 6,000 grams. Socio-demographic controls include child's gender, maternal and paternal age and education, birth order, year fixed effects, and county fixed effects (for the child's county of birth). In columns (3) and (4) of Panel A (B), we control for maternal (paternal) grandmother fixed effects. In column (5) of Panel A (B), the sample is restricted to children born to mothers (fathers) whose sisters (brothers) were also matched to the records of their offspring. Standard errors in parentheses are clustered at the mother level in Panel A and at the father level in Panel B. *** p<0.01, ** p<0.05, * p<0.1

Figure A.1: Fraction of children missing information on paternal name



Notes - Data are drawn from the Natality Detail data (1989-2015).