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INTERGENERATIONAL TRANSMISSION OF HEALTH AT BIRTH: FATHERS MATTER TOO!

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ABSTRACT

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 0.13-0.24 standard deviations increase in child's birth weight (70-128 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 0.10-0.15 standard deviations increase in child's birth weight (56-78 grams), accounting or not for paternal 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, being small for gestational age or being too heavy (i.e., macrosomic).

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1 Introduction

Social scientists have demonstrated that early life conditions have long-lasting consequences on adult health and socio-economic outcomes (Almond and Currie, 2011; Bharadwaj et al., 2018; Black et al., 2007; Boardman et al., 2002; Case et al., 2005; Conley and Bennett, 2000a; Currie and Almond, 2011; Garfield et al., 2017; Figlio et al., 2014). The main motivation of this research comes from the fact that childhood gradients are unjust inequalities as they undermine the principle of equal opportunity and a fair start for every child (Deaton, 2013; Currie, 2011). There is also growing evidence that health at birth is crucial not only for the transmission of advantage and disadvantage along the life course, but also across generations (Conti et al., 2018; Drake and Walker, 2004; Fleming et al., 2018; Gluckman et al., 2008; Nyirenda and Byass, 2019).

Most studies analyzing the intergenerational transmission of health capital at birth have focused on the role of maternal health endowments. Yet, some of the channels through which health at birth may be transmitted from mothers to children can also operate patrilineally. We consider four main factors that may affect health at birth from one generation to another: Genetic factors (i.e. maternal and paternal genes); Environmental factors (e.g. maternal socio-economic status, paternal socio-economic status); Maternal health (e.g. obesity); and fetal programming (via phenotype-to-phenotype, matrilineally, or via germ-line epigenetic inheritance through gametes, which can also operate patrilineally).[1]

The few notable studies that examine the role of the father in the intergenerational transmission of birth weight reach mixed conclusions. In a seminal study, Conley and Bennett (2000b) document that both maternal and paternal birth weight are associated with the

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[1] There is growing evidence that fetal programming effects may be transmitted to subsequent generations through non-genomic mechanisms (Kuzawa and Eisenberg, 2014). Adverse effects in utero can be transmitted across generations via physiological alternations that affect the intrauterine environment and induce programming effects in the next generations (phenotype to phenotype transmission), or via the regulation of genetic expression through epigenetic modification that induces changes in the phenotype without affecting the nucleotide sequences of the DNA (germ-line epigenetic inheritance). Exposure of the father to a toxin whilst he was in utero might affect his birth weight and the development of his sperm which in turn may affect the development and intrauterine growth of his future offspring (Smith et al., 2009).

birth weight of the child in survey data from the US, even after adjusting for maternal grandmother fixed effects.[2] This within maternal cousin analysis allows them to control for shared genetic and environmental factors among biological siblings who are mothers.[3] The finding in Conley and Bennett (2000b) contrasts with the one by Qian et al. (2017), who perform a within cousin analysis but find no evidence that paternal birth weight matters for child's birth weight using administrative data from Taiwan. More recently, Gibberd et al. (2019) examine the intergenerational transmission of birth weight for Aboriginal infants born in Western Australia and find that both mother's and father's birth weights matter, with no significant difference between the two. However, they find no significant effects of maternal birth weight on child's birth weight when adjusting for grandmother fixed effects. These disparate findings may be explained, at least partially, by the significant variation in the relative role of genetic, environmental, and fetal programming factors across populations, as highlighted by Gibberd et al. (2019).

To the best of our knowledge, ours is the first paper using a within cousin approach (i.e., accounting for grandmother fixed effects) to analyze differences in the transmission of health at birth from mothers and fathers to offspring *using a large sample of US data*. We first explain how our study fits in the literature and provide a parsimonious decomposition framework to discuss the potential factors behind the maternal and paternal intergenerational correlations of birth weight.

Our framework allows us to interpret both the intergenerational correlations in Australia by Gibberd et al. (2019) —which suggest a limited role for maternal fetal programming— but also the findings in Taiwan by Qian et al. (2017) —which highlight the role of maternal health and phenotype-to-phenotype transmission in explaining the intergenerational transmission of birth weight.

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[2] Conley and Bennett (2000b) use PSID (Panel Study of Income Dynamics) data to show that both maternal and paternal low birth weight indicators are significantly associated with the risk of child low birth weight.

[3] A within maternal (paternal) cousin analysis allows us to account for common genetic and environmental factors that were common between cousins' mothers (fathers) through the inclusion of maternal (paternal) *grandmother* fixed effects.

We then 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. We link the birth records of mothers (fathers) to the birth records of their sisters (brothers). The records contain information on children's and parents' health at birth and gender as well as parental characteristics such as age, education, race, and area of residence.

Our main empirical analysis consists in running linear regressions to assess 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.

The most remarkable findings of our main analysis are two. First, *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. Our estimates reveal that a one standard deviation increase in mother's birth weight (535 grams) translates into a 0.13-0.24 standard deviations increase in child's birth weight (70-128 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 0.10-0.15 standard deviations increase in child's birth weight (56-78 grams), accounting or not for paternal grandmother fixed effects. Second, the estimated intergenerational maternal (paternal) coefficient on birth weight is very similar regardless of whether we control for the father's (mother's) birth weight. This suggests that previous research that did not account for paternal birth weight provided unbiased, albeit perhaps less precise, estimates.

While our main empirical analysis focuses on estimating intergenerational correlation coefficients by means of linear regressions, we conduct an ancillary analysis where we compute intergenerational transition matrices. Our results show that both maternal and paternal birth weights are positively related to child's birth weight, but the relationship is more intense on the lowest and highest quintiles of the birth weight distribution.

We also conduct a supplementary investigation based on alternative metrics of health at birth: the logarithm of birth weight, an indicator for being small for gestational age (birth weight below the 10th percentile for their gestational length and gender), a measure of intrauterine growth (birth weight divided by gestation weeks), a low birth weight indicator (=1 if the child's birth weight is below 2,500 grams, 0 otherwise), an indicator for fetal macrosomia (=1 if the child's birth weight is above 4,000 grams, 0 otherwise), gestational length (in weeks), and prematurity (<37 weeks of gestation).[4]

As mother's and father's birth weights may, at least to some extent, measure the role of different genetic, environmental and fetal programming factors, their relative contribution may vary across demographic groups (Gibberd et al., 2019). To investigate this possibility, we perform a subgroup analysis investigating potential heterogeneous effects across race, socio-economic status, and gender. Finally, we also briefly assess the potential implications of the documented intergenerational transmission of birth weight for long-run offspring socio-economic outcomes.

2 Our study in perspective

2.1 Previous studies

Despite the growing evidence on epigenetic transmission of environmental and dietary effects both matrilineally and patrilineally (Anway et al., 2005; Drake and Walker, 2004; Harrison and Langley-Evans, 2009; Hinde et al., 2014; Jablonka et al., 2005; Kuzawa and Eisenberg, 2014; Kuzawa and Bragg, 2012), most of the human studies analyzing the intergenerational transmission of health at birth have so far focused on the relationship between maternal birth

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[4] Macrosomic babies have an increased risk of health problems after birth (Nesbitt et al., 1998; Mitanchez et al., 2014).

outcomes 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 in California. 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 (Conley and Bennett, 2000b; Coutinho et al., 1997; Kuzawa and Eisenberg, 2012; Lunde et al., 2007; Magnus et al., 2001; Mattsson and Rylander, 2013; Qian et al., 2017; Gibberd et al., 2019). As suggested by Conley and Bennett (2000b), 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. While informative, the majority of these studies do not identify the influence of parental birth weight *net of* socio-demographic characteristics or genetic and environmental factors that are common and time-invariant within a family. Two recent notable exceptions are Qian et al. (2017) and Gibberd et al. (2019).

Qian et al. (2017) find no significant effect of paternal health at birth on child birth outcomes. They use birth records from Taiwan to study the role of both mothers and fathers in the transmission of birth weight and intrauterine growth using maternal and paternal grandmother 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, as acknowledged by the authors, 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".[5]

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[5] Of course, it is not obvious how to extrapolate their findings to our context. While the distributions of child's birth weight appear to be similar in 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

More recently, Gibberd et al. (2019) use administrative health records of Aboriginal infants born in Western Australia, among whom low birth weight is very common. They find positive associations between the offspring birth weight Z-score and both maternal and paternal birth weight Z-scores, regardless of whether they adjust for grandmaternal parity, maternal height, maternal parity and behaviors, or maternal health during pregnancy. However, they do not find different maternal and paternal associations. Moreover, regardless of the set of controls used, when adjusting for grandmother fixed effects, they find no association between the offspring birth weight Z-score and the maternal birth weight Z-score. They conclude that their findings provide little support for maternal fetal programming causing low offspring birth weight.

2.2 Motivation and contribution

Our study is motivated by three reasons: first, the mixed evidence on the patrilineal transmission; second, the data limitations faced by many previous studies; and third, the fact that the relative contribution of genetic factors, environmental factors and fetal programming to birth weight could vary between populations (Gibberd et al., 2019).

We contribute to the existing literature by investigating the role of both maternal and paternal health at birth in explaining child's health at birth with a large sample of US data. 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 to 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 precisely, previous estimates of the relationship between maternal and child's birth weight may be upwardly biased if individuals

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fathers is 0.062 in Florida, but only 0.026 in Taiwan. The fraction of children with low birth weights in Taiwan is computed 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).

who end up being parents tend to have similar birth weights, that is, their birth weights exhibit positive assortative matching. Indeed, earlier studies such as Currie and Moretti (2007) could only provide bounds on the true effect of mother's birth weight on child's birth weight (Currie and Moretti, 2007). Having a *large* sample is instrumental to gauge the impact of the parent's birth weight using grandmother fixed effects, and estimating the impact of parental birth weight on child's birth weight within parental cousin comparisons. This enables us to account for all genetic and environmental factors that are common and time-invariant within a family (Currie and Moretti, 2007).

Before proceeding with our empirical analysis, we present a parsimonious conceptual framework to shed light on what we can learn from a regression analysis of the birth weight of the child on the birth weights of their parents. We consider four main factors that may explain the transmission of health at birth from one generation to another: Genetic factors (i.e. maternal and paternal genes); Environmental factors (e.g. maternal socio-economic status, paternal socio-economic status); Maternal health (e.g. obesity); and fetal programming (via phenotype-to-phenotype, matrilineally, or via germ-line epigenetic inheritance through gametes, which can also operate patrilineally).

The parsimonious decomposition helps us clarify existing claims in the literature. For instance, assuming that fetal programming and maternal health only operate matrilineally, the relationship between paternal and child birth weights reflects primarily the genetic and environmental factors shared with the infant.[6] Hence, in the presence of maternal fetal programming effects, and if genetic and environmental factors shared with the infant are similar across maternal and paternal lines, the maternal-offspring association will be expected to exceed the paternal-offspring association. More generally, adjusting for grandmother fixed effects, socio-demographic characteristics, and maternal health, we should be able to assess the influence of fetal programming in the transmission of birth weight.

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[6] Exposure of the father to a toxin while he was in utero might affect his birth weight and the development of his sperm, which in turn might affect the development and intrauterine growth (low birth weight) of his future offspring (Lawlor et al., 2009b).

3 A parsimonious decomposition framework

We now introduce a conceptual framework to highlight the potential mechanisms behind the transmission of health at birth across generations. It is a parsimonious additive statistical decomposition to shed light on the interpretation of intergenerational regression coefficients, where birth weight can be thought of as being the sum of four potential factors: Genetic factors, G; Environmental factors, E; Maternal health, H; and Fetal programming, P.

For a given type of individual $j = \{c = child, f = father, m = mother\}$ within a family i, their birth weight BW_i^j is given by the sum of genetic factors G_i^j, environmental factors E_i^j, maternal health factors H_i^j, and fetal programming P_i^j, that is:

$$BW_i^j = G_i^j + E_i^j + H_i^j + P_i^j. \tag{1}$$

More specifically, we can think of the following factors for different type of individuals (i.e., children, mothers, and fathers). For $j = child$:

- G reflects mother's and father's genes;
- E captures child's environmental factors during pregnancy (e.g. mother's SES, father's SES, etc.);
- H represents maternal health during pregnancy;
- P contains fetal programming factors (via the health of the child while the child was in utero).

For $j = mother$:

- G reflects maternal grandmother's and maternal grandfather's genes;
- E captures mother's environmental factors when she was in utero (e.g. maternal grandmother' SES, maternal grandfather's SES, etc.);

- H represents maternal grandmother's health during pregnancy;
- P contains fetal programming factors (via the health of the mother while she was in utero).

For $j = father$:

- G reflects paternal grandmother's and paternal grandfather's genes;
- E captures father's environmental factors when he was in utero (e.g. paternal grandmother' SES, paternal grandfather's SES, etc.);
- H represents paternal grandmother's health during pregnancy;
- P contains fetal programming factors (via the health of the father while he was in utero).

Population regressions. To compute the intergenerational correlation coefficients for the mother and the father, we can run two regressions separately, as long as $Cov(BW_i^m, BW_i^f) \approx 0$. The population regression of BW_i^c on BW_i^m gives us:

$$\frac{Cov(BW_i^c, BW_i^m)}{V(BW_i^m)} = \frac{Cov(G_i^c, BW_i^m)}{V(BW_i^m)} + \frac{Cov(E_i^c, BW_i^m)}{V(BW_i^m)} + \frac{Cov(H_i^c, BW_i^m)}{V(BW_i^m)} + \frac{Cov(P_i^c, BW_i^m)}{V(BW_i^m)}, \tag{2}$$

In compact form we can write:

$$\frac{Cov(BW_i^c, BW_i^m)}{V(BW_i^m)} = \sigma_{GB}^{cm} + \sigma_{EB}^{cm} + \sigma_{HB}^{cm} + \sigma_{PB}^{cm}. \tag{3}$$

Similarly, the population regression of BW_i^c on BW_i^f gives us:

$$\frac{Cov(BW_i^c, BW_i^f)}{V(BW_i^f)} = \frac{Cov(G_i^c, BW_i^f)}{V(BW_i^f)} + \frac{Cov(E_i^c, BW_i^f)}{V(BW_i^f)} + \frac{Cov(P_i^c, BW_i^f)}{V(BW_i^f)}, \tag{4}$$

under the assumption that maternal health during pregnancy is uncorrelated with the birth weight of the father, $Cov(H_i^c, BW_i^f) = 0$, and in compact form we write:

$$\frac{Cov(BW_i^c, BW_i^f)}{V(BW_i^f)} = \sigma_{GB}^{cf} + \sigma_{EB}^{cf} + \sigma_{PB}^{cf}. \tag{5}$$

Comparing intergenerational bivariate regression coefficients. If we standardize the variances of parental birth weights, so that $V(BW_i^m) = V(BW_i^f) = 1$, or $V(BW_i^m) \approx V(BW_i^f)$ in practice, the comparison of the covariances is all we need. Suppose that (3) and (5) are both positive, and that

$$\frac{Cov(BW_i^c, BW_i^m)}{V(BW_i^m)} > \frac{Cov(BW_i^c, BW_i^f)}{V(BW_i^f)}. \tag{6}$$

Consider the following two cases:

Case 1. If $\sigma_{GB}^{cm} = \sigma_{GB}^{cf}$ and $\sigma_{EB}^{cm} = \sigma_{EB}^{cf}$, then we conclude that (6) suggests that the combination of both maternal fetal programming and maternal health is more relevant than paternal fetal programming in the transmission of birth weight from parents to children ($\sigma_{PB}^{cm} + \sigma_{HB}^{cm} > \sigma_{PB}^{cf}$).

Case 2. If $\sigma_{GB}^{cm} = \sigma_{GB}^{cf}$, $\sigma_{EB}^{cm} = \sigma_{EB}^{cf}$, and $\sigma_{HB}^{cm} = 0$, then we conclude that (6) suggests that fetal programming is more relevant matrilineally than patrilineally ($\sigma_{PB}^{cm} > \sigma_{PB}^{cf}$).

Comparing intergenerational multivariate regression coefficients. The population regression of BW_i^c on BW_i^m netting out the influence of G_i^m, E_i^m and H_i^m is given by:

$$\frac{Cov(BW_i^c, \widetilde{BW}_i^m)}{V(\widetilde{BW}_i^m)} = \frac{Cov(G_i^c, \widetilde{BW}_i^m)}{V(\widetilde{BW}_i^m)} + \frac{Cov(E_i^c, \widetilde{BW}_i^m)}{V(\widetilde{BW}_i^m)} + \frac{Cov(H_i^c, \widetilde{BW}_i^m)}{V(\widetilde{BW}_i^m)} + \frac{Cov(P_i^c, \widetilde{BW}_i^m)}{V(\widetilde{BW}_i^m)}. \tag{7}$$

And in compact form:

$$\frac{Cov(BW_i^c, \widetilde{BW}_i^m)}{V(\widetilde{BW}_i^m)} = \sigma_{G\tilde{B}}^{cm} + \sigma_{E\tilde{B}}^{cm} + \sigma_{H\tilde{B}}^{cm} + \sigma_{P\tilde{B}}^{cm}. \tag{8}$$

Similarly, the population regression of BW_i^c on BW_i^f netting out the influence of G_i^f and E_i^f is given by:

$$\frac{Cov(BW_i^c, \widetilde{BW}_i^f)}{V(\widetilde{BW}_i^f)} = \sigma_{G\tilde{B}}^{cf} + \sigma_{E\tilde{B}}^{cf} + \sigma_{P\tilde{B}}^{cf}, \tag{9}$$

under the assumption that maternal health during pregnancy is uncorrelated with the residual birth weight of the father, $Cov(H_i^c, \widetilde{BW}_i^f) = 0$.

Suppose that

$$\frac{Cov(BW_i^c, \widetilde{BW}_i^m)}{V(\widetilde{BW}_i^m)} > \frac{Cov(BW_i^c, \widetilde{BW}_i^f)}{V(\widetilde{BW}_i^f)}. \tag{10}$$

As before, if we standardize the variances of the residual parental birth weights, or they are close to each other, the comparison of the covariances is all we need. Consider the following two cases:

Case 1. If $\sigma_{G\tilde{B}}^{cm} = \sigma_{G\tilde{B}}^{cf}$ and $\sigma_{E\tilde{B}}^{cm} = \sigma_{E\tilde{B}}^{cf}$, then we conclude that (10) suggests that the combination of both maternal fetal programming and maternal health is more relevant than paternal fetal programming in the transmission of birth weight from parents to children ($\sigma_{P\tilde{B}}^{cm} + \sigma_{H\tilde{B}}^{cm} > \sigma_{P\tilde{B}}^{cf}$).

Case 2. If $\sigma_{G\tilde{B}}^{cm} = \sigma_{G\tilde{B}}^{cf}$, $\sigma_{E\tilde{B}}^{cm} = \sigma_{E\tilde{B}}^{cf}$, and $\sigma_{H\tilde{B}}^{cm} = 0$, then we conclude that (10) suggests that fetal programming is more relevant matrilineally than patrilineally ($\sigma_{P\tilde{B}}^{cm} > \sigma_{P\tilde{B}}^{cf}$).

Of course, the validity of the assumptions in each of these cases crucially depends on the distributions of $G_i^c, E_i^c, H_i^c, P_i^c$ with respect to $G_i^m, G_i^f, E_i^m, E_i^f, H_i^m, H_i^f, P_i^m, P_i^f$.

Regressions in practice. When moving to the data, we will run the regressions in two different ways, separately and including both parental health at birth measures, so that we can assess the relevance of assortative mating on parental birth weight. When implementing our analysis, we will observe birth weight for the child, the mother and the father. In addition, we have several proxies for G, E and H, including maternal/paternal grandmother fixed effects, maternal/paternal education, county fixed effects, and pre-pregnancy body mass index (for part of our sample). We will estimate three groups of regressions:

$$BW^c_{i,j,k,l} = \alpha_m + \beta_m BW^m_{i,k} + \gamma_m X_{i,j,k,l} + \theta_k + e^m_{i,j,k,l}, \tag{11}$$

$$BW^c_{i,j,k,l} = \alpha_f + \beta_f BW^f_{j,l} + \gamma_f X_{i,j,k,l} + \theta_l + e^f_{i,j,k,l}, \tag{12}$$

$$BW^c_{i,j,k,l} = \alpha + \beta_m BW^m_{i,k} + \beta_f BW^f_{j,l} + \gamma X_{i,j,k,l} + \theta_k + \theta_l + e_{i,j,k,l}, \tag{13}$$

where $BW^c_{i,j,k,l}$ is the birth weight of child born to mother i and father j and whose maternal and paternal grandmothers are k and l, $BW^m_{i,k}$ is the birth weight of mother i in the group k of sisters who are mothers, $BW^f_{j,l}$ is the birth weight of father j in the group l of fathers who are brothers, $X_{i,j,k,l}$ is a vector of socio-demographic characteristics (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), θ_k is a vector of maternal grandmother fixed effects, θ_l is a vector of paternal grandmother fixed effects, and $e^m_{i,j,k,l}$, $e^f_{i,j,k,l}$ and $e_{i,j,k,l}$ are the regression residuals. In other words, two children are cousins when either their mothers i and i' are sisters, so they share the same k and have the same maternal grandmother, or their fathers j and j' are brothers, so they share the same l and have the same paternal grandmother, or both.

Note that by comparing the birth weights of cousins with shared maternal (paternal) grandmothers, we control for the genetic and environmental factors that are *shared* by their mothers (fathers). These environmental factors may include family socio-economic status, habits or lifestyles, as long as they are common within families. However, they will not include shocks that may affect only some of the children within a family, or parental behaviors that may reinforce or compensate differences in health between their children. After having conditioned on grandmother fixed effects, differences in the birth weights of two parents who are siblings may be due to residual confounding factors —residual variation in genetic G, residual variation in environmental E, residual variation in maternal health H factors— or differences in fetal programming P.[7] While admittedly the proxies for G, E and H are far from perfect, as long as their "signal" is similar for both the maternal and the paternal sides, the comparison of maternal and paternal intergenerational correlation coefficients may shed light on whether (at least) fetal programming is more relevant matrilineally than patrilineally.

4 Data

We link the birth records of two generations of infants born in Florida (FL) between 1970 and 2014. The records of children born between 1989 and 2014 are merged with the records of their parents born between 1970 and 1988 using full names and exact dates of birth as key. Only parents who were born in FL and had a child in that state between 1989 and 2014 can be matched. Furthermore, we restrict our baseline analysis to 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 in FL before 2015. More specifically, we "lose" individuals who did not have a child before 2015, individuals who had a child before 2015 outside of FL, and individuals who had a child in FL before 2015 but their partners (co-parents) were not born in FL. Figure A.1 shows how the parents of the children in our sample are selected from the original sample of the universe of FL birth records for the years 1970-1988. Indeed, out of the original sample of women (men) born between 1970

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[7] More precisely, differences in intrauterine experiences between siblings may affect both their birth weight and the birth weight of their offspring through fetal programming P.

and 1988, only 47% (34%) of them were linked to the records of their children. Additionally, we were able to link the records of their children to the birth records of their partners for 19% (18%) of the original sample of women (men).

Following Currie and Moretti (2007), we also link parents to their siblings using the grandmother's full name and date of birth as key.[8] Only 5% (4.8%) of the original sample of women (men) have same-sex siblings who also gave birth in FL before 2015.[9] 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.

Figure A.2 shows how the sample of children used in the regressions, where the child is the unit of observation, is selected from the universe of FL birth records for years 1989-2014. Our baseline analysis is restricted to singleton children with a birth weight between 1,000 and 6,000 grams, but our results are not sensitive to these restrictions. We exclude from the analysis 9% of the children born between 1989 and 2014, for whom information on paternal full name is missing (see Figure A.3).

As mentioned above, the linking across birth records unavoidably leads to sample selection: in any study linking birth records using administrative records from a *given* state, it is not possible to link women and men who became parents in *different* states. If men and women who migrate to different states are selected on health status, one may expect our results to disproportionately represent a less healthy group of the population (if stayers are less healthy than migrants, i.e., healthy immigrant effect).[10] Given both the potential

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[8] We exclude grandmothers with more than 20 grandchildren (Currie and Moretti, 2007).

[9] As we match mothers (fathers) with their sisters (brothers) who also gave birth during the period 1989-2014, we identify 478 same-sex twin pairs for mothers, 434 same-sex twin pairs for fathers and 382 opposite-sex twin pairs (mothers who have a male twin who also became a father in the period 1989-2014). Unfortunately, the birth records do not provide information on the zygosity of twins, so we cannot generate heritability estimates by comparing monozygotic versus dizygotic twin differences, or investigate whether heritability has changed over time.

[10] There is a well-developed literature on the so-called healthy immigrant effect, focused on understanding the better health status of immigrants in comparison with natives from their host country (Akresh and Franki, 2008; Giuntella, 2017; Markides and Rote, 2018), but observed also among internal migrants (Halliday and Kimmitt, 2008). Selection effects may operate also through the interaction of socio-economic characteristics and opportunities.

non-random selection and the possibility that the role of genetic factors, environmental factors, and fetal programming varies between populations (Gibberd et al., 2019), a cautious interpretation of our findings is that they speak to the population of successfully matched stayers.

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. Unfortunately, we are not able to separately identify unmatched siblings who moved out of the state from unmatched siblings who did not have children. In Table 1 we fail to find evidence of substantial selection, similarly to Royer (2009), who matched birth records of mothers to their children using administrative records from the California Department of Health. 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 [0.0010,0.0015] and in Royer's analysis are in the range [0.0013,0.0028].[11]

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 low birth weight is associated with a 2% higher likelihood of a later observation for mothers and a 3% lower 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).[12] Nevertheless, as a robustness check, we will re-estimate our main regressions using inverse probability weighting and conduct a Lee (2009) bounds exercise.

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

[12] 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 statistically insignificant when including grandmother fixed effects as most of these characteristics are shared among siblings (results are available upon request).

For our purposes, the birth records provide information on the children's and parents' health at birth and gender, as well as parental characteristics such as age, education, race, and area of residence. 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, small for gestational age (SGA), intrauterine growth (birth weight divided by gestation weeks), an indicator for low birth weight (=1 if the child's birth weight is below 2,500 grams, 0 otherwise), an indicator for fetal macrosomia (=1 if the child's birth weight is above 4,000 grams, 0 otherwise), gestational length (in weeks), and prematurity ($<$ 37 weeks of gestation).[13]

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 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 3,239 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 Moretti (2007), the average birth weight and the 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).[14] 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).

Table A.2 reports the summary statistics for child birth outcomes for the different samples used in the analysis and compares them to the overall sample of children born between

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[13] 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.

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

1989 and 2014 in Florida. If we take the sample with "children matched with fathers and mothers" as the baseline (N=366,722), where the average birth weight (% low birth weight) is 3,275 grams (6.8%), we can immediately see that the largest discrepancy is found with respect to the sample with "children matched with fathers, mothers, maternal cousin and paternal cousin" (N=10,051), where the average birth weight (fraction of low birth weight) is 3,238 grams (7.6%). In Tables A.3-A.4 we investigate the birth outcomes and the socio-demographic characteristics for mothers and fathers across different samples: as the sample decreases and the matching requirements increase, parental birth weights decrease and parental socio-economic status deteriorates (as measured by both grandparents' education and zip code income).

The findings in Tables A.2, A.3 and A.4 suggest that, not only estimates can become less precise by controlling for grandmother fixed effects due to a reduction of the sample size, but they can be somewhat biased due to selection or collider bias (e.g. if both child's birth weight and parental birth weights affect the likelihood of ending up in the sample with "children matched with fathers, mothers, maternal cousin and paternal cousin"). For this reason, as previously noted, we will re-estimate our main regressions using inverse probability weighting and conduct a Lee (2009) bounds exercise.[15]

5 Intergenerational Correlation of Birth Weight

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 BW from estimating regression (11) with mother's BW as the only explanatory variable.[16] A

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[15] It would be interesting to look at differences in grandmother's age at the time of parents' birth, but unfortunately, the "maternal age" variable was populated only sporadically in FL Vital Statistics before 1989. As a result, information on maternal (paternal) grandmother's age is recorded (non-missing) only for 1.5% (1.2%) of children in our main sample. This is a limitation of our data.

[16] 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.

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).[17] Maternal BW explains 5.7% of the variation in child's BW. After including control variables for socio-demographic characteristics, the coefficient remains relatively stable (column 2), and the R^2 increases to 8.9%. The inclusion of maternal grandmother fixed effects (column 3) increases the R^2 by more than 13 times and reduces the coefficient of maternal BW by about 43% with respect to those in column 1. A 100-gram increase in maternal BW results in a 13.5-gram increase in child's BW.

Currie and Moretti (2007) found little effect of the inclusion of maternal grandmother fixed effects, while we find a much larger effect. 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.7 and A.8), we include results using the entire sample of women (men) matched to their children, mimicking the analysis of Currie and Moretti (2007) and finding a similar pattern.[18]

The fact that grandmother fixed effects matter more in our case 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 socio-demographic 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 very similar to the one observed in the main sample (column 2).[19]

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[17] Our maternal-child correlation is very similar to the one found in Norway using administrative data for births in the period 1967-2004 (Lunde et al., 2007): 0.254 with 95% CI [0.249,0.258].

[18] The specification in Tables A.2 and A.3 is slightly different from the specification in Table 2 of our paper, 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).

[19] Columns 1-4 include also children of individuals with no siblings identified or matched in our sample. These observations do not contribute to the identification when using grandmother fixed effects. Column 5 restricts the analysis to children of individuals linked to at least one sibling in our sample.

This suggests that the reduction in the coefficient is explained by the inclusion of maternal grandmother fixed effects rather than by the sample restriction.

Column 1 in Panel B of Table 2 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 15-gram increase in child's BW, and 2.4% of the variation in child's BW is explained by paternal BW.[20] The paternal-offspring association is smaller than the maternal-offspring one and robust to the inclusion of socio-demographic characteristics (column 2). The inclusion of paternal grandmother fixed effects reduces the coefficient of paternal BW by about 30% (column 3): A 100 gram-increase in father's BW is associated with a 10-gram increase in child's BW. Grandmother fixed effects capture a larger fraction of the intergenerational correlation between maternal and child's BW than that between paternal and child's BW. Again, the point estimate on father's BW is similar when including controls (column 4). Finally, restricting our sample to children born to fathers whose brothers were also matched to the records of their offspring (column 5) gives a similar picture to that described in column 2.

While our analysis exploits brother-to-brother and sister-to-sister variation in health at birth, one could also explore sister-to-brother variation. While this would certainly increase the sample size, it would also complicate the interpretation of our findings, both in terms of mechanisms and in terms of sample selection. However, for the sake of completeness, in Figure 3 we report the intergenerational birth weight correlation coefficient obtained using siblings of different gender too.

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). Interestingly enough, the coefficients on both paternal and maternal birth weights in Table 3 are very similar to those obtained when not

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[20] Our paternal-child correlation is very similar to the one found in Norway using administrative data for births in the period 1967-2004 (Lunde et al., 2007): 0.161 with 95% CI [0.157,0.166].

adjusting for the other parent's birth weight, panels A and B in Table 2.[21] The test at the bottom of the table rejects the equality of coefficients (p-value=0.0000).

Including socio-demographic controls has little influence on the coefficients (column 2), and we still reject the equality of coefficients. Adjusting for maternal grandmother fixed effects reduces the coefficient on maternal birth weight by more than 40% and the coefficient on paternal birth weight decreases by approximately 20% (column 3). The equality of coefficients is rejected. Similar results are obtained when adjusting for both socio-demographic controls and maternal grandmother fixed effects (column 4). Columns 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 18% 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, regardless of the inclusion of maternal or paternal grandmother fixed effects, 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 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).

According to our parsimonious decomposition framework, the finding that the maternal-

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[21] Assortative mating on birth weight is not very substantial as one can infer from the fact that the estimated coefficients on mother's (resp. father's) birth weight barely change when adding father's (resp. mother's) birth weight. Indeed, regressing mother's birth weight on father's birth weight we obtain an estimated coefficient of 0.06 (se=0.002). However, it is worth noting that conditional on the mother being born with low birth weight, the father not being low birth weight decreases the likelihood of a child being low birth weight by 25%, from 16% if both are low birth weight to 12% if only the mother is low birth weight (see Table A.9).

Adding control variables (mother's and father's age, mother's and father's education, year of birth fixed effects, mother's county of birth fixed effects), the coefficient decreases to 0.04 (se=0.002). If we add father's same-sex sibling fixed effects, the coefficient decreases even further and is not statistically significant, 0.02 (se=0.026). If instead of father's same-sex sibling fixed effects we add mother's same-sex sibling fixed effects, the coefficient decreases from 0.04 to 0.005 (se=0.006). The interaction of mother's and father's birth weights (LBW) has no statistically significant effects on child's birth weight (LBW). Giuntella et al. (2019) offer a structurally motivated same-sex sibling fixed effects linear model analysis of assortative mating on human capital broadly considered, including education but also birth weight.

offspring association exceeds the paternal-offspring association is consistent with: (1) the combination of both maternal fetal programming and maternal health being more relevant than paternal fetal programming in the transmission of birth weight from parents to their children, (2) fetal programming being more relevant matrilineally than patrilineally, or (3) fetal programming operating only matrilineally.

Visualization of findings and double grandmother fixed effects. Figure 1 shows the sensitivity of the estimated intergenerational correlation coefficients of birth weight for the mother and the father to the inclusion of different sets of controls and grandmother fixed effects. Three key findings emerge from our analysis even after controlling for maternal (N=55,749) or paternal (N=56,531) grandmother fixed effects:

1. Both maternal and paternal birth weights are relevant in explaining children's birth weight.

2. Mother's birth weight is, if anything, more relevant than father's birth weight in explaining children's birth weight.

3. Fetal programming effects cannot be discarded as judged by the maternal-offspring association exceeding the paternal-offspring association.

However, once we include both maternal and paternal (N=10,051) grandmother fixed effects, the estimated intergenerational correlation coefficients are very imprecisely estimated (0.17 (se=0.10) for the mother, 0.25 (se=0.13) for the father), and they are not statistically different from each other (p-value=0.54).

Misattributed paternity. We acknowledge that the estimate of the paternal birth weight coefficient may suffer from attenuation bias due to the fact that we do not know whether the fathers are the biological ones. While estimates of non-paternity in the general population range from 1% to as high as 20% (Nitsch and Mishra, 2009), recent studies suggest that the rates of misattributed paternity may be lower than thought (Larmuseau et al., 2016) ranging between 0.7% and 2%. Assuming that the true coefficients on mother's and father's BW were both 0.23 (resp. 0.13), a Monte Carlo simulation exercise suggests that the misattributed paternity should be between 65% and 70% (resp. 60% and 65%) to obtain point estimates of 0.23 and 0.13 (resp. 0.13 and 0.09) for mother's and father's BW coefficients. Results are available upon request.

Statistical significance. We assess the robustness of our statistical inference following two different approaches. First, we cluster standard errors at the parent-level to control for correlated parental shocks which may affect the birth weights of children born to the same parent: a) clustering at the mother level when only maternal birth weight is included in the regression; b) at the father level when only paternal birth weight is included; and c) at the mother level when the birth weights of both parents are included.[22] Figure 2 illustrates the sensitivity of the significance of our results to alternative levels of clustering (i.e., mother, grandmother, hospital-year, and hospital level). Second, 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. (2019) —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.

Size of the estimates. 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 (70-128 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 0.10-0.15 standard deviations increase in child's birth weight (56-78 grams), accounting or not for paternal grandmother fixed effects.

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[22] Clustering at the grandmother-level yields substantially identical results (Tables A.5 and A.6): at the maternal grandmother-level when only maternal birth weight is included in the regression; at the paternal grandmother-level when only paternal birth weight is included; and at the maternal grandmother-level when the birth weights of both parents are included.

Sample selection concerns. To partially address sample selection concerns, we re-estimated our main regressions using inverse probability weighting. In the first stage, we estimated the probability that a woman (man) born in FL between 1970 and 1988 is matched with a child born in FL between 1989 and 2014. Results are very similar to our baseline estimates (Table A.10). Furthermore, we also provide a Lee (2009) bounds exercise by assigning the 95th percentile and 5th percentile of the birth weight distribution to non-linked observations, obtaining somewhat smaller point estimates (0.06-0.08) for the specification with grandmother fixed effects (Table A.11). Finally, restricting the analysis to first-born children —ruling out the concern that we may be over-weighting low birth weight families, if low birth weight parents have a larger number of children— we find similar findings.[23]

6 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.12 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 the birth weight distribution. The χ^2 statistics 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.13), control variables (Table A.14) and grandmother fixed effects (Table A.15).[24]

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[23] Results are available upon request.

[24] 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

Alternative metrics of health at birth. Our main finding that both maternal and paternal health at birth matter in explaining child's health at birth is robust to using alternative measures: log of birth weight, small for gestational age (SGA), intrauterine growth, and an indicator for macrosomia. In Tables A.16-A.17 we use the logarithm of birth weight, so that our estimates now capture intergenerational *elasticities*. Table A.17 shows that 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 4 and 6). In the same columns, we can see that the effect of paternal BW is slightly smaller: 0.076% (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 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, such as SGA (Tables A.18–A.19). The only difference is that when using a measure of intrauterine growth restriction (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.20–A.21), as was the case for our main analysis using BW.[25] Examining directly the intergenerational correlation in the likelihood of being born premature (<37 weeks of gestation) and on gestational length (in weeks), we find a positive correlation between parents and children, with a larger coefficient for mothers (Tables A.22-A.25). While this correlation is only partially explained by socio-demographic controls, it becomes very small and statistically insignificant when including grandmother fixed effects, suggesting that the raw correlation reflects genetic or environmental factors that are constant within a family but not fully accounted for by the socio-demographic characteristics. This is also consistent with the fact that, when focusing on full-term births (Table A.26-A.27), the co-

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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.

[25] 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.

efficients capturing the intergenerational correlation in the birth weight are similar to our baseline estimates.

When examining the intergenerational correlation in low birth weight (LBW), we note that the coefficient on maternal LBW becomes small and statistically insignificant with the inclusion of grandmother fixed effects (Tables A.28-A.29). However, this should be interpreted with caution: 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).[26] On the contrary, we confirm a positive and statistically significant coefficient when analyzing the effect of having a LBW father.

Finally, we examine the extent of intergenerational correlation in high birth weight (Tables A.31–A.32). 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 5.6 percentage points, while the effect of the father being born with excessive birth weight increases the risk by 4.2 percentage points (column 4, Table A.32).[27]

Heterogeneous intergenerational transmission by race, socio-economic status and gender. Building on previous findings on the intergenerational transmission of low birth weight by race (Conley and Bennett, 2000b; Currie and Moretti, 2007), we first investigate whether the transmission of health at birth varies between Blacks and Whites. Second, we

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[26] 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.30).

[27] It is worth noting that being born with high birth weight is associated with maternal diabetes, which is in turn associated with obesity. Unfortunately, we only have limited information on pre-pregnancy body mass index (BMI) and we lack detailed information on maternal health and maternal behaviors during pregnancy for the period studied. For example, information on infant breastfeeding, maternal hypertension, diabetes, and gestational diabetes is available in FL Vital Statistics starting from 2004; information on mother's smoking before and during pregnancy is available starting from 2011 (these variables were not released to us under the current data use agreement with the Florida Department of Health). Reassuringly, controlling for pre-pregnancy BMI does not affect the intergenerational coefficients for mother's and father's birth weights. Results are available upon request.

analyze heterogeneity by socio-economic status (namely, grandmother's education and zip code income). Finally, and motivated by evidence on gender-specific maternal-offspring birth weight associations (Ncube et al., 2017), we also investigate heterogeneity in intergenerational transmission by gender of the child.

As documented by numerous studies, Blacks have lower average birth weight than Whites. In our data the prevalence of low birth weight among children of Black parents is 9.9%, which is more than double the low birth weight prevalence among children of White parents, 4.6%. The picture in grams is that children born to White parents weigh on average 250 grams more than children born to Black parents (3,373 vs 3,129 grams). A crucial question is whether a different degree of intergenerational transmission of health at birth by race might help explain the racial disparity in health at birth.

To examine whether the effects of maternal and paternal birth weights on child's birth weight are different for Blacks and Whites, we restrict the sample to children born to Black parents or White parents.[28] We examine intergenerational transmission in both birth weight and low birth weight, so that we can compare our findings to those from previous studies (Conley and Bennett, 2000b; Currie and Moretti, 2007). Tables A.33-A.36 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.

In Tables A.37-A.38 and A.39-A.40 we assess the heterogeneity in intergenerational correlation in birth weight by grandmother's education and zip code income. Overall, if anything, we observe a larger correlation among individuals from low-educated and poorer backgrounds, although the differences are not large.

Finally, we turn to our heterogeneity analysis by gender of the child. For the continuous measure of grams, Table A.41, we find that the effect of mother's birth weight is not statistically different for boys and girls across all specifications. A richer picture emerges for the

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[28] In the US in the year 2009, among recently married couples (≤ 4 years), where both spouses are aged 23-50, the fraction of both partners being White or Black is about 98% (Chiappori et al., 2016).

effect of father's birth weight: this seems to be larger for girls than for boys, depending on the specification. The difference is statistically significant except when maternal grandmother fixed effects are included (columns 3 and 4) or when paternal grandmother fixed effects and socio-demographic controls are included at the same time (column 6).

For low birth weight, Table A.42, our results reveal that a LBW mother is more likely to have a LBW girl than a LBW boy, and the difference is statistically significant across all specifications. This result is consistent with previous findings by Qian et al. (2017). Although they find no differences in the maternal intergenerational transmission of LBW by gender of the child, they estimate a larger maternal intergenerational transmission of intrauterine growth restriction for girls than for boys. Interestingly, we find a similar effect for fathers: a LBW father is more likely to have a LBW girl than a LBW boy.

Effects on long-term socio-economic outcomes. In order to assess the consequences of intergenerational transmission of health at birth on socio-economic status inequality, we have explored the effects of birth weight on income and education measures. In Table A.43 we estimate the association between mother's (father's) birth weight and the median family income in the zip code at the time of the birth of the child. While the relationship is positive, the magnitude is rather small. Even when not accounting for grandmother fixed effects, a 100-gram increase in the birth weight of the parent would be associated with a $5-increase in the median family income in the zip code at the time of the birth. This is a 10% of the estimated effect by Black et al. (2007) using individual income data, and about 20% of the estimated effect found by Currie and Moretti (2007) using zip code income level data. Similar small effects are found when replacing median family income in the zip code at the time of the birth of the child with education measured at the individual level (i.e. having completed at least some years of college).[29] Taken altogether, these results suggest that the transmission of health at birth from parents to their children is unlikely to be the main responsible for socio-economic status inequality (in education or income) of their offspring.

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[29] Results are available upon request.

7 Discussion of our findings

Does the health at birth of both parents matter for their offspring health at birth? We find strong evidence of intergenerational transmission of health at birth from both parents to their offspring. This finding is robust across all measures used in this study, from birth weight (in grams) to small-for-gestational age (birth weight below the 10th percentile for their gestational length and gender). Moreover, this pattern is robust to adjusting for grandmother fixed effects, except for the measures of prematurity (<37 weeks of gestation), gestational length (in weeks), and low birth weight (below 2,500 grams).

Our finding that maternal health at birth is a relevant predictor of children's health at birth, even after adjusting for grandmother fixed effects, is consistent with the work by Currie and Moretti (2007) in California. Regarding the transmission of health at birth from fathers to children, our estimates are consistent with previous research by Conley and Bennett (2000b) using US survey data, and compatible with the estimates by Qian et al. (2017) in Taiwan, who report a 95% confidence interval for the paternal transmission coefficient of low birth weight status of $[-0.056, 0.031]$, including our equivalent point estimate (0.024) as reported in our Appendix.[30]

Does the health at birth of one parent matters more than the other? We find some evidence that the intergenerational transmission of health at birth is stronger matrilineally than patrilineally, at least as judged by our findings using birth weight and a measure of intrauterine growth restriction (birth weight divided by weeks of gestation). Using alternative measures (logarithm of birth weight, small-for-gestational-age, low birth weight or high birth weight), we cannot reject that the maternal and paternal intergenerational coefficients are the same.

Both our findings that maternal and paternal health at birth matter for offspring health at birth, and that maternal is, if anything, a stronger predictor than paternal health, differ from

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[30] See Amrhein et al. (2019).

Gibberd et al. (2019), who study Aboriginal infants born in Western Australia. These authors find positive associations between the offspring birth weight Z-score and both maternal and paternal birth weight Z-scores, regardless of whether they adjust for grandmaternal parity, maternal height, maternal parity and behaviors, or maternal health during pregnancy. However, they do not find different maternal and paternal associations. Moreover, regardless of the controls used, when adjusting for grandmother fixed effects, they find no association between the offspring birth weight Z-score and the maternal birth weight Z-score.

Does fetal programming explain our findings? Our parsimonious statistical decomposition (genetic, environmental, maternal health, and fetal programming) helps us in assessing whether *the observed higher intergenerational coefficient for mothers than fathers* supports the existence of fetal programming factors in explaining the intergenerational transmission of health at birth. The fact that the maternal intergenerational coefficient in Gibberd et al. (2019) is positive, statistically significant, and very similar accounting or not for maternal health (i.e. height, maternal parity and behaviors, and maternal health during pregnancy) is reassuring for our interpretation of fetal programming rather than capturing residual variation (e.g. maternal health factors). Such interpretation is reinforced by the finding that controlling for pre-pregnancy body mass index does not substantially affect our estimated intergenerational correlation in birth weight. However, both Gibberd et al. (2019)'s similar paternal and maternal coefficients and the zero maternal coefficient when adjusting for maternal grandmother fixed effects, does not provide support for fetal programming factors. While it is difficult to find an explanation for the differences between ours and Gibberd et al. (2019)'s findings, one possibility is that different mechanisms (including fetal programming) operate differently across different populations and environments.

What about confounders? As in any observational study, there is a role for confounding factors. The estimated positive association between maternal and offspring birth weights, net out of maternal grandmother fixed effects and socio-demographic controls, suggests that different uterine and environmental conditions between sisters may affect the birth weight of their offspring through maternal fetal programming, residual differences in genetic, environmental, or maternal health factors, not fully captured by maternal grandmother fixed effects, socio-demographic controls, or pre-pregnancy body mass index.

Similarly, we still find a significant association between paternal and offspring birth weights after adjusting for paternal grandmother fixed effects and socio-demographic controls. Once again, this finding suggests that different uterine and environmental conditions between brothers may affect the birth weight of their offspring through paternal fetal programming, residual differences in genetic, or environmental factors, not fully captured by paternal grandmother fixed effects or socio-demographic controls.

If the role of residual differences is similar for both mothers and fathers, we expect that a maternal-offspring association higher than a paternal-offspring association reflects the higher importance of maternal over paternal fetal programming. If, in addition, fetal programming via the father, while plausible, is less likely (Lawlor et al., 2009a), or negligible, then the difference between maternal and paternal associations will just capture maternal fetal programming effects.

We also find that the coefficient on maternal birth weight drops more with the inclusion of maternal grandmother fixed effects than the coefficient on paternal birth weight when including paternal grandmother fixed effects. One possibility is that maternal (paternal) grandmother fixed effects capture family-specific health behaviors and parenting styles better for mothers than fathers.

What are the implications for inequality and wellbeing? As long as our identification strategy is valid, our findings suggest that policies aimed at improving children's health at birth may increase the health capital at birth of future generations. Admittedly, our estimated effects are small, albeit precisely estimated. A 10% increase in birth weight of both parents would result in an increase of (at most) 2.5% in the generation of children.

The implications for the future human capital of these children appear to be rather small, both in terms of expected future education and income. First, if we use the estimates of Figlio et al. (2014), the intergenerational transmission birth weight effect would result in a 0.0125% SD increase in test scores. Second, if we use the estimates of Black et al. (2007), the documented intergenerational transmission birth weight increase would translate into a 0.25% increase in income. Finally, with our data, the largest estimate of a 100-gram increase in birth weight is $5 (0.05% of the median income in 1970), which is much smaller than the $27 effect found by Currie and Moretti (2007).

While the expected intergenerational effects on education and income appear to be really small, based on the available evidence documenting the extent of intergenerational correlation in health (Bencsik et al., 2021; Halliday et al., 2021, 2020), and the effects of health at birth (including birth weight) on adult health and mortality (Conti et al., 2020; Risnes et al., 2011), we cannot discard that the intergenerational transmission of health at birth translates into inequalities in adult health.

8 Conclusion

We use a unique data set of linked birth records in Florida to analyze the intergenerational transmission of health at birth. Our results on the intergenerational transmission of birth weight by gender of the parent provide four main insights. First, we find strong evidence that the health at birth of both parents predicts the health at birth of their offspring. Paternal birth weight is substantially correlated with the child's birth weight: the father's birth weight alone explains 2.4% of the child's birth weight, about 40% of the explanatory power of the mother's birth weight (5.7%). Second, the intergenerational coefficient 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. One possibility is that grandmother fixed effects capture family-specific health behaviors and parenting styles better for mothers than fathers. Third, while we find some evidence consistent with maternal fetal programming effects, we cannot discard the presence of confounding factors due to residual differences in genetic, environmental, and maternal health factors, or even gene-environmental factors. Finally, while our estimates suggest that the intergenerational transmission of birth weight is expected to have rather small effects on the offspring educational attainment and their future income, we cannot rule that the documented intergenerational transmission of health at birth may have implications for health in the long run.

Compliance with Ethical Standards:

Conflict of Interest: The authors declare that they have no conflict of interest.

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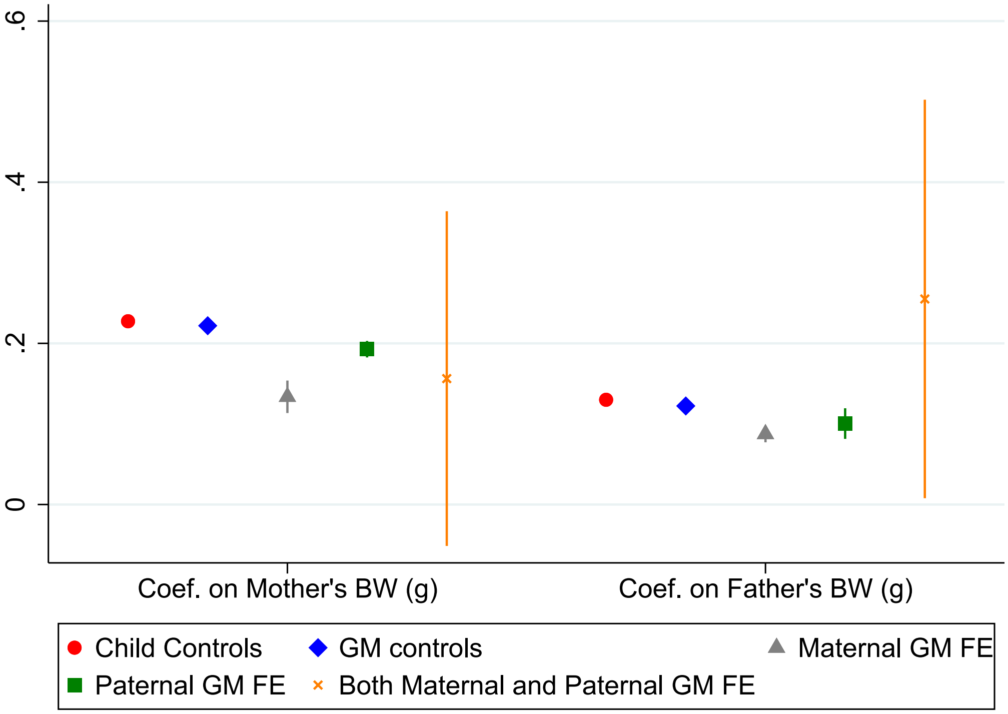
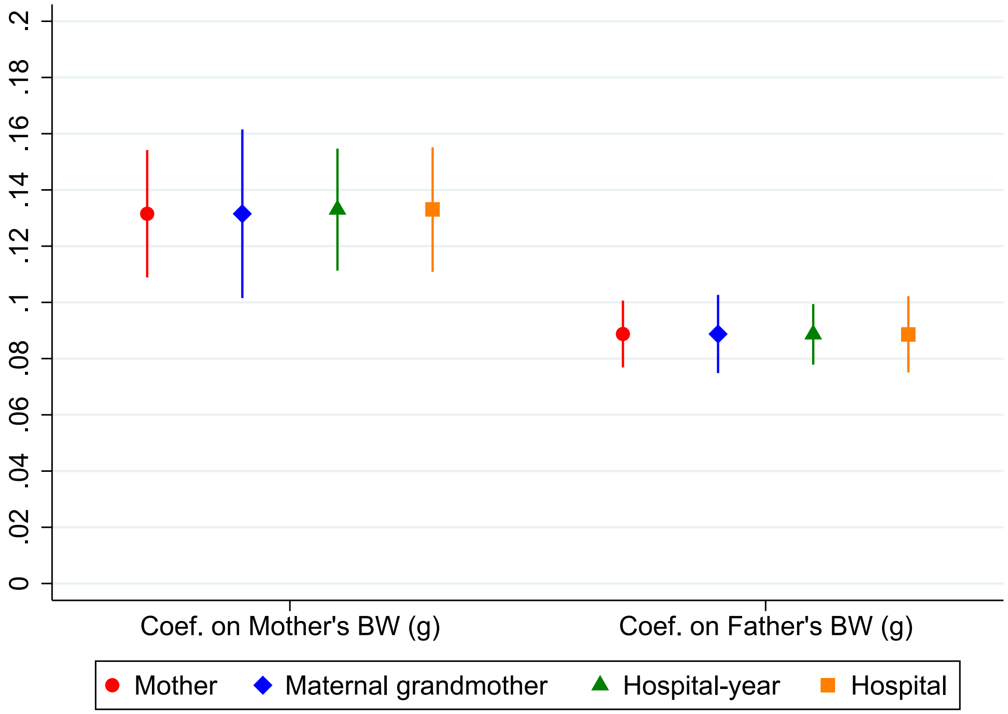
Figure 1: Association between child's birth weight and parents' birth weight



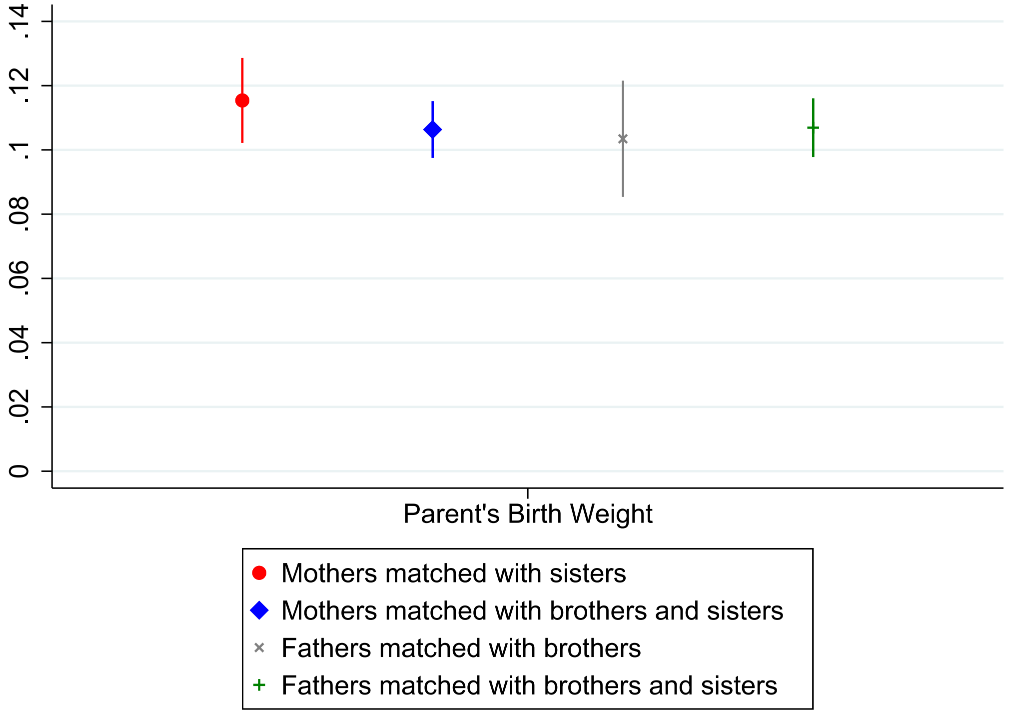
Notes - The figure reports point-estimates and confidence intervals for matrilineal and patrilineal intergenerational associations in birth weight, when mother's birth weight and father's birth weight are both included in the regression as covariates. Child controls include child's sex, year o birth and birth order. GM controls include maternal grandmother education, entered as binary indicator for having a high school diploma or GED and a binary indicator for having completed at least some college (high school dropout is the omitted category); an indicator for maternal grandmother's mail zip code being in the bottom quartile of the distribution of median family income; the same variables for paternal grandmother's education and low income zip code. Maternal (Paternal) GM FE refer to the inclusion of maternal (paternal) grandmother fixed effects.

Figure 2: Association between child's birth weight and parents' birth weight, alternative clustering



Notes - The figure reports point-estimates and confidence intervals for matrilineal and patrilineal intergenerational associations in birth weight adjusting for clustering at four different levels: the mother, the maternal grandmother, the hospital-year and hospital. All regressions include maternal grandmother fixed effects as well as the following control variables: child's sex, year of birth and birth order; mother's and father's age and education.

Figure 3: Association between child's birth weight and parents' birth weight, siblings of different gender



Notes - The figure reports point-estimates and confidence intervals for matrilineal and patrilineal intergenerational associations in birth weight. When mothers are matched with sisters, the regression includes maternal grandmother fixed effects that control for time-invariant factors that are common for mothers who are sisters; when mothers are matched with brothers and sisters, the maternal grandmother fixed effects are created across siblings of different sex and control for time-invariant factors that are common across parents who are siblings (of either gender). When fathers are matched with brothers, the regression includes paternal grandmother fixed effects that control for time-invariant factors that are common for fathers who are brothers; when fathers are matched with brothers and sisters, the paternal grandmother fixed effects are created across siblings of different sex and control for time-invariant factors that are common across parents who are siblings (of either gender).

Table 1: Probability of Observing a Later Birth as a Function of Birth Weight

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Probability of being matched with a later birth					
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 (GM) 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		
Dependent variable:			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
# of maternal grandmothers			209,157	193,647	
R-squared	0.057	0.089	0.749	0.771	0.091
			Panel B		
Dependent variable:			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
# of paternal grandmothers			205,118	190,884	
R-squared	0.024	0.059	0.710	0.740	0.059

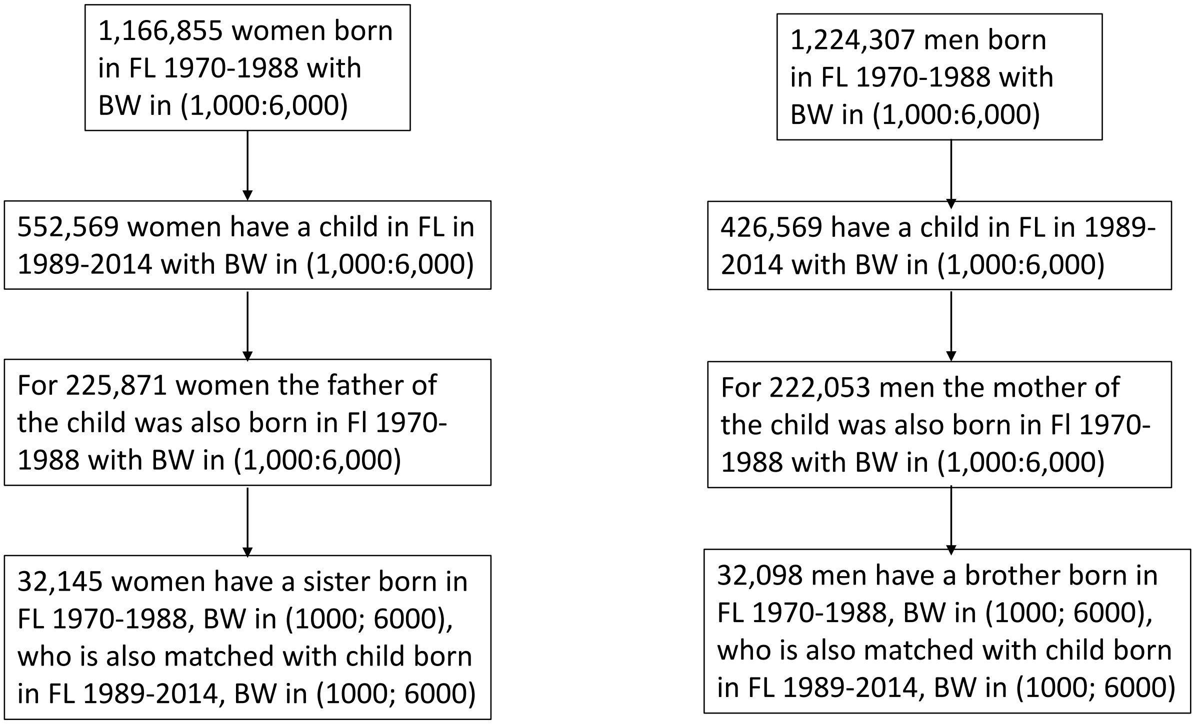
Notes - All estimates are conducted on the sample of children matched to both paternal and maternal birth records. The sample is restricted to singleton children who were born in Florida between 1989 and 2014, and whose mothers and fathers were born in Florida between 1970 and 1988. We exclude children 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)
Dependent variable:	Child's birth weight (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
# of paternal grandmothers					205,118	190,884
# of maternal grandmothers			209,157	193,647		
R-squared	0.076	0.105	0.750	0.772	0.716	0.745
Test coeff [Mother's BW=Father's BW](p-value)	0.0000	0.0000	0.0000	0.00131	0.0000	0.0000

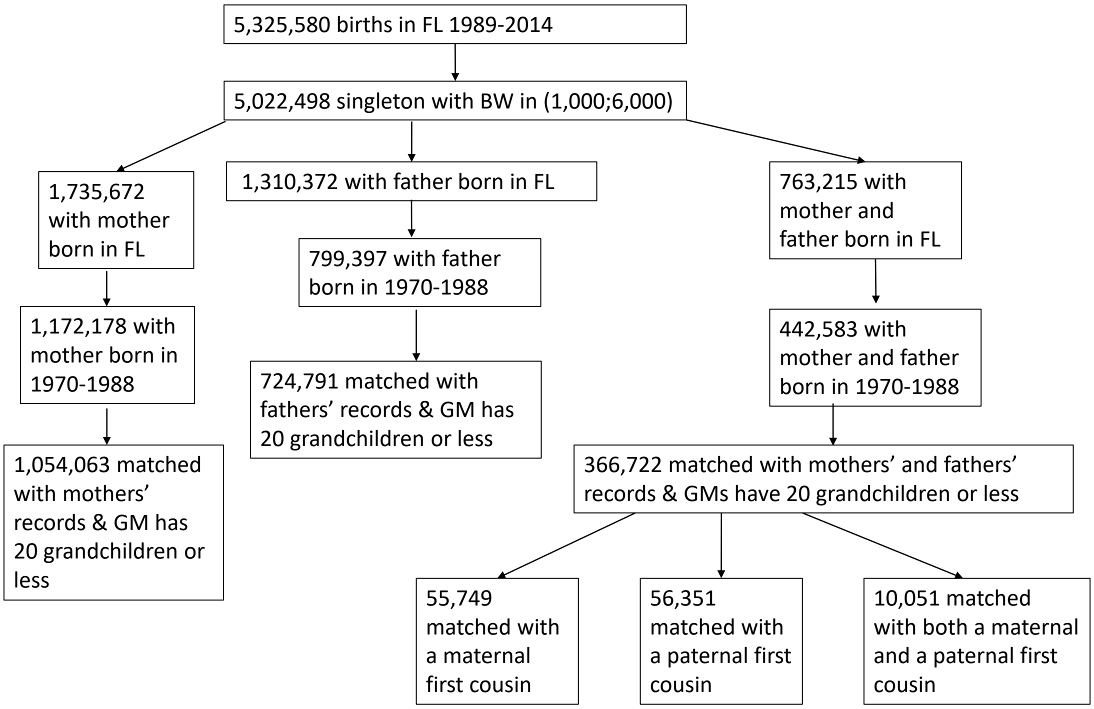
Notes - All estimates are conducted on the sample of children matched to both paternal and maternal birth records. The sample is restricted to singleton children who were born in Florida between 1989 and 2014, and whose mothers and fathers were born in Florida between 1970 and 1988. We exclude children 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

Figure A.1: Sample Selection for the Population of Parents



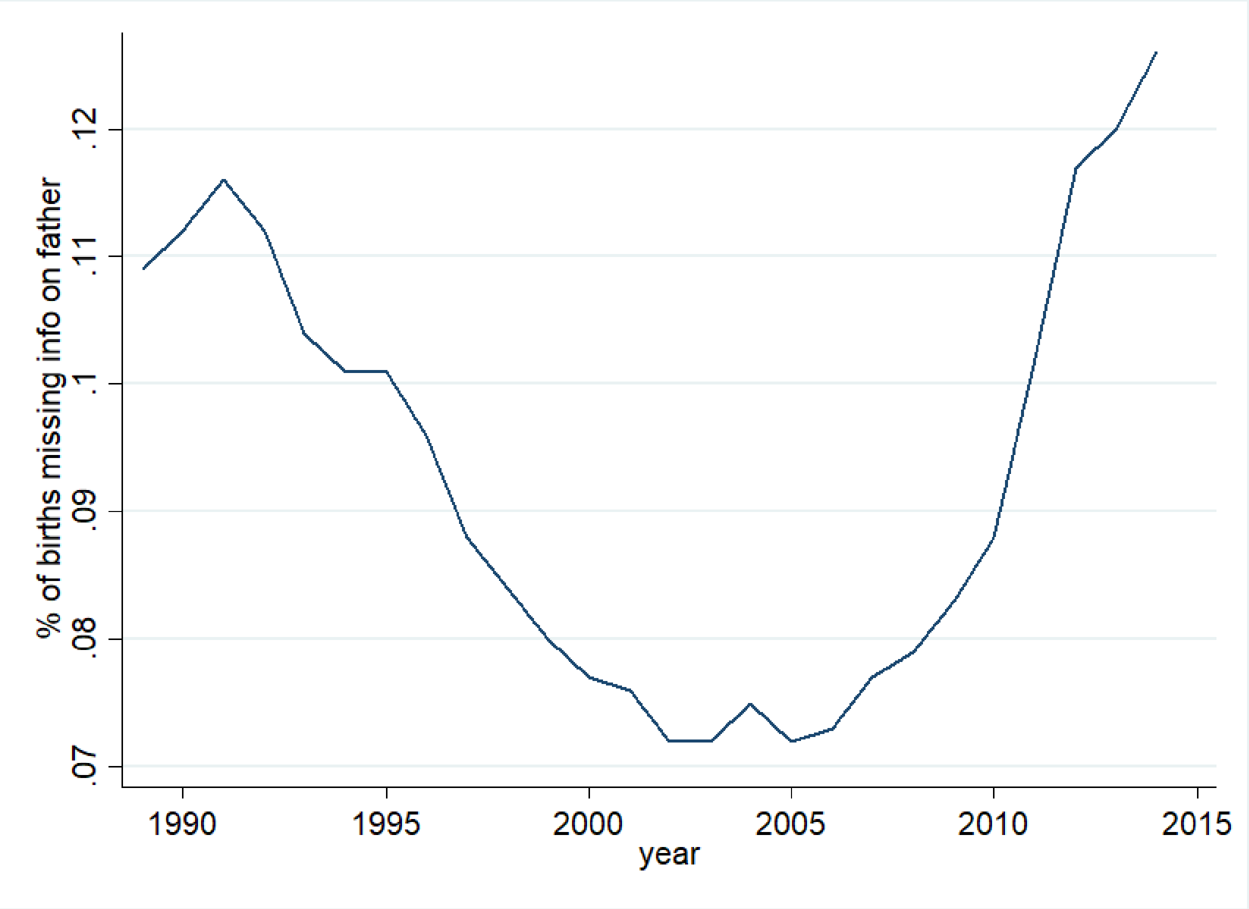
Notes - The diagram on the left illustrates how women whose children are included in the analysis are selected starting from the total population of women born in Florida during the period 1970-1988. The diagram on the rights illustrates how men whose children are included in the analysis are selected starting from the total population of men born in Florida during the period 1970-1988.

Figure A.2: Sample Selection for the Population of Children



Notes - This diagram illustrates how the three main samples of children used in the analysis are selected starting from the total population of children born in Florida during the study period (1989-2014).

Figure A.3: Fraction of children missing information on paternal name



Notes - Data are drawn from the FL Vital Statistics data (1989-2015).

Table A.1: Summary Statistics

Variable	N	Mean	Std. Dev.	Min	Max
Child's birth weight (grams)	366,722	3,275	533.079	1,001	5,953
Logarithm of 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 intrauterine growth	366,572	84.434	12.929	22.915	283.476
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
Logarithm of mother's birth weight	366,722	8.068	0.180	6.911	8.682
Logarithm of 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 intrauterine growth	330,908	82.327	13.023	23.205	253.556
Father's intrauterine growth	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. Intrauterine growth is defined as birth weight divided by gestation weeks.

Table A.2: Descriptive statistics, Matching and Selection on Birth Weight

		birth weight (grams)		low birth weight	
Samples	N	mean	st. dev.	mean	st.dev
All singleton children born in FL 1989-2014, BW in (1000; 6000)	5,022,498	3319.807	535.337	0.060	0.237
Matched with mothers, parental BW in (1000; 6000)	1,054,063	3271.739	537.270	0.070	0.255
Matched with fathers, parental BW in (1000; 6000)	724,791	3289.486	531.002	0.065	0.247
Matched with fathers and mothers, parental BW in (1000; 6000)	366,722	3275.071	533.079	0.068	0.251
Matched with fathers, mothers and a maternal first cousin	55,749	3242.176	537.059	0.075	0.264
Matched with fathers, mothers and a paternal first cousin	56,351	3251.957	532.468	0.073	0.260
Matched with fathers, mothers, maternal cousin and paternal cousin	10,051	3237.638	535.179	0.076	0.265

Notes - This table reports baseline descriptive statistics for birth weight (in grams) and an indicator for being born with a birth weight below 2500 grams (LBW) for the entire sample of children born in Florida between 1989 and 2014, and the sub-sample of children matched to the records of their parents (see Section 3 for detail).

Table A.3: Selection in the Population of Mothers

Mothers' health at birth		Sample 1	Sample 2	Sample 3	Sample 4
Birth weight (grams)	mean	3260.418	3245.317	3237.488	3197.964
	st. dev.	549.716	538.114	535.524	551.039
	N	1,166,855	552,569	225,871	32,145
Low birth weight (<2500 grams)	mean	0.078	0.078	0.079	0.097
	st. dev.	0.268	0.268	0.270	0.295
	N	1,166,855	552,569	225,871	32,145
Very low birth weight (<1500 grams)	mean	0.007	0.005	0.005	0.006
	st. dev.	0.083	0.073	0.073	0.080
	N	1,166,855	552,569	225,871	32,145
Birth weight > 4000 grams	mean	0.072	0.067	0.064	0.058
	st. dev.	0.259	0.250	0.245	0.234
	N	1,166,855	552,569	225,871	32145.000
Gestation weeks	mean	39.454	39.428	39.401	39.202
	st. dev.	2.748	2.801	2.833	2.978
	N	1,054,241	492,650	204,653	29,105
Born premature	mean	0.103	0.109	0.112	0.132
	st. dev.	0.303	0.312	0.315	0.338
	N	1,054,241	492,650	204,653	29,105
Maternal grandparents' characteristics					
Grandmother is black	mean	0.244	0.323	0.372	0.477
	st. dev.	0.429	0.468	0.483	0.499
	N	1,166,630	552,484	225,840	32,144
Grandfather is black	mean	0.178	0.228	0.265	0.326
	st. dev.	0.382	0.420	0.441	0.469
	N	1,166,614	552,473	225,832	32,141
Grandmother's education: at least some college	mean	0.297	0.209	0.203	0.161
	st. dev.	0.457	0.406	0.402	0.368
	N	1,101,830	521,253	215,483	30,810
Grandfather's education: at least some college	mean	0.383	0.288	0.274	0.228
	st. dev.	0.486	0.453	0.446	0.420
	N	923,402	414,283	168,004	22,513
Grandmother's mail zipcode is high poverty	mean	0.259	0.312	0.331	0.386
	st. dev.	0.438	0.463	0.471	0.487
	N	1,091,124	524,478	213,773	30,640
Grandmother's mail zipcode is low income	mean	0.182	0.216	0.227	0.261
	st. dev.	0.386	0.412	0.419	0.439
	N	1,095,589	527,047	214,934	30,829
Mother is married	mean	0.777	0.722	0.686	0.657
	st. dev.	0.416	0.448	0.464	0.475
	N	1,166,547	552,401	225,810	32,135

Notes - Sample 1 includes all women born in Florida between 1970-1988, with a birth weight between 1000 and 6000 grams. Sample 2 includes all women born in Florida between 1970-1988, with a birth weight between 1000 and 6000 gram who are matched with a child born in Florida between 1989 and 2014 with a birth weight between 1000 and 600 grams. Sample 3 includes all women born in Florida between 1970-1988, with a birth weight between 1000 and 6000 gram who are matched with a child born in Florida between 1989 and 2014 with a birth weight between 1000 and 6000 grams; and with the record of their partner born in Florida between 1970 and 1988 with a birth weight between 1000 and 6000 grams. Sample 4 includes all women born in Florida between 1970-1988, with a birth weight between 1000 and 6000 gram who are matched with a child born in Florida between 1989 and 2014 with a birth weight between 1000 and 6000 grams; and with the record of their partner born in Florida between 1970 and 1988 with a birth weight between 1000 and 6000 grams; and the record of their sister born in FL between 1970 and 1988, with a birth weight between 1000 and 6000 grams, who is also matched with child born in FL 1989-2014 with birth weight between 1000 and 6000 grams.

Table A.4: Selection in the Population of Fathers

Fathers' health at birth		Sample 1	Sample 2	Sample 3	Sample 4
Birth weight (grams)	mean	3384.756	3380.677	3366.280	3336.224
	st. dev.	582.604	562.752	564.772	575.157
	N	1,224,307	426,569	222,053	32,098
Low birth weight, (< 2500 grams)	mean	0.065	0.060	0.063	0.073
	st. dev.	0.247	0.237	0.243	0.261
	N	1,224,307	426,569	222,053	32,098
Very low birth weight (< 1500 grams)	mean	0.007	0.004	0.005	0.005
	st. dev.	0.084	0.065	0.067	0.072
	N	1,224,307	426,569	222,053	32,098
Birth weight > 4000 grams	mean	0.123	0.117	0.113	0.105
	st. dev.	0.329	0.322	0.316	0.307
	N	1,224,307	426,569	222,053	32,098
Apgar score	mean	9.147	9.185	9.189	9.200
	st. dev.	0.849	0.814	0.833	0.858
	N	747,780	219,495	115,578	16,500
Gestation weeks	mean	39.332	39.345	39.289	39.124
	st. dev.	2.792	2.781	2.839	2.938
	N	1,106,110	376,995	196,597	28,324
Born premature	mean	0.112	0.114	0.120	0.138
	st. dev.	0.315	0.317	0.325	0.345
	N	1,106,110	376,995	196,597	28,324
Paternal grandparents' characteristics					
Grandmother is black	mean	0.240	0.318	0.387	0.498
	st. dev.	0.427	0.466	0.487	0.500
	N	1,224,093	426,508	222,029	32,098
Grandfather is black	mean	0.176	0.230	0.278	0.345
	st. dev.	0.381	0.421	0.448	0.475
	N	1,224,079	426,506	222,027	32,097
Grandmother's education: at least some college	mean	0.299	0.215	0.194	0.150
	st. dev.	0.458	0.411	0.395	0.357
	N	1,143,868	398,991	207,820	30,168
Grandfather's education: at least some college	mean	0.385	0.295	0.267	0.218
	st. dev.	0.487	0.456	0.443	0.413
	N	963,130	323,314	162,796	22,272
Grandmother's mail zipcode is high poverty	mean	0.258	0.311	0.346	0.410
	st. dev.	0.438	0.463	0.476	0.492
	N	1,144,397	407,157	213,002	31,018
Grandmother's mail zipcode is low income	mean	0.181	0.214	0.235	0.272
	st. dev.	0.385	0.410	0.424	0.445
	N	1,149,119	409,149	214,237	31,209
Mother is married	mean	0.779	0.737	0.700	0.676
	st. dev.	0.415	0.440	0.458	0.468
	N	1,224,005	426,446	221,987	32,091

Notes - Sample 1 includes all men born in Florida between 1970-1988, with a birth weight between 1000 and 6000 grams. Sample 2 includes all men born in Florida between 1970-1988, with a birth weight between 1000 and 6000 gram who are matched with a child born in Florida between 1989 and 2014 with a birth weight between 1000 and 600 grams. Sample 3 includes all men born in Florida between 1970-1988, with a birth weight between 1000 and 6000 gram who are matched with a child born in Florida between 1989 and 2014 with a birth weight between 1000 and 6000 grams; and with the record of their partner born in Florida between 1970 and 1988 with a birth weight between 1000 and 6000 grams. Sample 4 includes all men born in Florida between 1970-1988, with a birth weight between 1000 and 6000 gram who are matched with a child born in Florida between 1989 and 2014 with a birth weight between 1000 and 6000 grams; and with the record of their partner born in Florida between 1970 and 1988 with a birth weight between 1000 and 6000 grams; and matched with the record of their brother born in FL between 1970 and 1988, with a birth weight between 1000 and 6000 grams, who is also matched with child born in FL 1989-2014 with birth weight between 1000 and 6000 grams.

Table A.5: Regression of Child's Birth Weight on Parents' Birth Weight, Clustering at the Grandmother Level

	(1)	(2)	(3)	(4)	(5)
			Panel A		
Dependent variable:			Child's birth weight (grams)		
Mother's birth weight (grams)	0.2370***	0.2221***	0.1353***	0.1326***	0.2158***
	(0.0022)	(0.0022)	(0.0126)	(0.0140)	(0.0052)
Socio-demographic controls		X		X	X
Maternal GM fixed effects			X	X	
Observations	366,722	329,232	366,722	329,232	48,944
			Panel B		
Dependent variable:			Child's birth weight (grams)		
Father's birth weight (grams)	0.1451***	0.1290***	0.1027***	0.1050***	0.1318***
	(0.0020)	(0.0020)	(0.0107)	(0.0119)	(0.0049)
Socio-demographic controls		X		X	X
Paternal GM fixed effects			X	X	
Observations	366,722	329,232	366,722	329,232	49,660

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 (maternal) grand-mother level in Panel A and at the (paternal) grandmother level in Panel B. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table A.6: Regression of Child's Birth Weight on Both Parents' Birth Weights, Clustering at the Grandmother Level

Dependent variable: Child's birth weight (grams)	(1)	(2)	(3)	(4)	(5)	(6)
Mother's birth weight (grams)	0.2281***	0.2163***	0.1344***	0.1312***	0.1909***	0.1911***
	(0.0020)	(0.0021)	(0.0103)	(0.0116)	(0.0052)	(0.0061)
	(0.0022)	(0.0022)	(0.0127)	(0.0142)	(0.0069)	(0.0079)
Father's birth weight (grams)	0.1312***	0.1195***	0.0883***	0.0892***	0.0996***	0.1019***
	(0.0018)	(0.0019)	(0.0052)	(0.0061)	(0.0097)	(0.0108)
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 bw = father bw (p-value)	0	0	6.32e-05	0.00131	0	0

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. 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 maternal grandmother level. *** p<0.01, ** p<0.05, * p<0.1

Table A.7: Regression of Child's Birth Weight on Mother's Birth Weight, Larger Sample of Mothers Matched with Children

	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A					
Dependent variable:	Child's birth weight (grams)					
Mother's birth weight (grams)	0.233***	0.126***	0.199***	0.131***	0.130***	0.128***
	(0.001)	(0.004)	(0.001)	(0.004)	(0.005)	(0.005)
	Panel B					
Dependent variable:	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***
	(0.001)	(0.004)	(0.001)	(0.004)	(0.004)	(0.004)
Maternal GM fixed effects		X		X	X	X
Mother's race - Child sex and year of birth			X	X	X	X
GM county × year			X	X	X	X
Poverty in mother's zip code birth					X	X
Mother' age and education dummies - Parity						X
Mother county fixed effects						
Observations	1,054,063	1,052,473	1,054,063	1,051,903	978,850	972,035

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.8: Regression of Child's Birth Weight on Father's Birth Weight, Larger Sample of Fathers Matched with Children

	(1)	(2)	(3)	(4)	(5)	(6)
			Panel A			
Dependent variable:			Child's birth weight (grams)			
Father's birth weight (grams)	0.142***	0.102***	0.112***	0.105***	0.105***	0.108***
	(0.001)	(0.006)	(0.002)	(0.006)	(0.006)	(0.007)
			Panel B			
Dependent variable:			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***
	(0.002)	(0.005)	(0.002)	(0.005)	(0.005)	(0.006)
Paternal GM fixed effects		X		X	X	X
Father's race - Child sex and year of birth			X	X	X	X
GM county × year			X	X	X	X
Poverty in mother's zip code birth					X	X
Father' age and education dummies - Parity						X
Father county fixed effects						
Observations	724,791	723,825	724,791	723,501	665,367	606,655

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

Table A.9: Children Low Birth Weight Status by Parental Low Birth Weight Status

Fraction of children who are low birth weight by parental low birth weight status		
	Father is low birth weight	
Mother is low birth weight	0	1
0	0.06	0.09
1	0.12	0.16

Table A.10: Regression of Child's Birth Weight on Parents' Birth Weight, Inverse Probability Weighting

Dependent variable:	Child's birth weight (grams)							
hline	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	Child's birth weight (grams)							
	Sample of mothers matched with children and fathers				Sample of mothers matched with children and fathers who are matched with a sister			
	Panel A							
Mother's birth weight (grams)	0.2292***	0.2170***	0.1245***	0.1288***	0.2285***	0.2160***	0.1239***	0.1319***
	(0.0022)	(0.0023)	(0.0114)	(0.0127)	(0.0060)	(0.0062)	(0.0095)	(0.0105)
Socio-demographic controls		X		X		X		X
Maternal GM fixed effects			X	X			X	X
Observations	331,402	297,411	331,402	297,411	51,081	44,842	51,081	44,842
Mean of Dep. Var.	3273	3287			3241	3257		
	Panel B							
Father's birth weight (grams)	0.1451***	0.1296***	0.1027***	0.1050***	0.1465***	0.1318***	0.1027***	0.1046***
	(0.0019)	(0.0020)	(0.0097)	(0.0109)	(0.0047)	(0.0049)	(0.0076)	(0.0085)
Socio-demographic controls		X		X		X		X
Paternal GM fixed effects			X	X			X	X
Observations	366,722	329,232	366,722	329,232	56,351	49,660	56,351	49,660
Mean of Dep. Var.	3275	3289			3252	3267		

Notes - All estimates are conducted on the sample of children matched to both paternal and maternal birth records using inverse probability weighting. 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). 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 Birth Weight on Parents' Birth Weight, Lee Bounds

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Child's birth weight (grams)					
	Panel A					
Set missing as:	95th percentile			5th percentile		
Mother's birth weight (grams)	0.1698***	0.1479***	0.0633***	0.1155***	0.1308***	0.0889***
	(0.0011)	(0.0011)	(0.0036)	(0.0011)	(0.0011)	(0.0036)
Socio-demographic controls		X			X	
GM fixed effects			X			X
Observations	1,684,809	1,589,743	1,684,809	1,684,809	1,589,743	1,684,809
Mean of Dep. Var.	3577	3577		2946	2946	
	Panel B					
Set missing as:	95th percentile			5th percentile		
Father's birth weight (grams)	0.0704***	0.0558***	0.0280***	0.0573***	0.0674***	0.0596***
	(0.0009)	(0.0010)	(0.0036)	(0.0010)	(0.0010)	(0.0037)
Observations	1,528,590	1,426,977	1,528,590	1,528,590	1,426,977	1,528,590
Mean of Dep. Var.	3718	3718		2815	2815	
Socio-demographic controls		X			X	
GM fixed effects			X			X

Notes - This Table reports the results of a Lee bounds exercise that assigns the 95th percentile (columns 1-3) and 5th percentile (columns 4-6) of the birth weight distribution to non-linked observations. In Panel A (Panel B), we ran regressions for the effect of a mother's (father's) birth weight on a child's birth weight including the observations of mothers (fathers) who were not matched with a child. To do so, we needed to assign a value of the variable "child's birth weight" to parents who were not linked and thus had a missing value for that variable. In columns (1) to (3), we assigned to these observations the 95th percentile of the birth weight distribution of all children born between 1989 and 2014. In columns (4) to (6), we assigned to these observations the 5th percentile of the birth weight distribution of all children born between 1989 and 2014. 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.12: Intergenerational transition matrices (unconditional)

		Quintiles of child's birth weight					
Quintiles of mother's birth weight		1	2	3	4	5	Total
1	(N)	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	(N)	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	(N)	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	(N)	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	(N)	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	(N)	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 $\chi^2(16)$ = 2.3e+04, p-value = 0.000

		Quintiles of child's birth weight					
Quintiles of father's birth weight		1	2	3	4	5	Total
1	(N)	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	(N)	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	(N)	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	(N)	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	(N)	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	N	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 $\chi^2(16)$ = 1.0e+04, p-value= 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. The Pearson χ^2 tests the hypothesis that the rows and columns in the tables are independent.

Table A.13: Intergenerational transition matrices (adjusting 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	N	23,341	17,024	13,129	11,230	8,634	73,358
	%	31.82	23.21	17.9	15.31	11.77	100
2	N	18,683	16,796	14,201	13,117	10,641	73,438
	%	25.44	22.87	19.34	17.86	14.49	100
3	N	14,930	15,556	14,612	14,862	13,319	73,279
	%	20.37	21.23	19.94	20.28	18.18	100
4	N	11,822	13,737	14,466	16,550	16,729	73,304
	%	16.13	18.74	19.73	22.58	22.82	100
5	N	8,525	10,806	13,067	17,603	23,342	73,343
	%	11.62	14.73	17.82	24	31.83	100
Total	N	77,301	73,919	69,475	73,362	72,665	366,722
	%	21.08	20.16	18.94	20	19.81	100
Pearson $\chi^2(16) = 2.2e+04, p-value = 0.000$							

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

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. The Pearson χ^2 tests the hypothesis that the rows and columns in the tables are independent.

Table A.14: Intergenerational transition matrices (adjusting for the other parent's 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	N	19,788	15,082	12,079	10,523	8,375	65,847
	%	30.05	22.9	18.34	15.98	12.72	100
2	N	15,967	14,983	12,685	12,181	10,030	65,846
	%	24.25	22.75	19.26	18.5	15.23	100
3	N	12,901	13,710	13,187	13,499	12,550	65,847
	%	19.59	20.82	20.03	20.5	19.06	100
4	N	10,326	12,125	12,874	14,974	15,547	65,846
	%	15.68	18.41	19.55	22.74	23.61	100
5	N	7,705	9,615	11,662	15,783	21,081	65,846
	%	11.7	14.6	17.71	23.97	32.02	100
Total	N	66,687	65,515	62,487	66,960	67,583	329,232
	%	20.26	19.9	18.98	20.34	20.53	100
Pearson $\chi^2(16) = 1.7e+04, p-value = 0.000$							

		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	N	14,920	14,224	12,770	12,697	11,235	65,846
	%	22.66	21.6	19.39	19.28	17.06	100
3	N	13,330	13,384	12,696	13,408	13,029	65,847
	%	20.24	20.33	19.28	20.36	19.79	100
4	N	11,732	12,440	12,573	14,148	14,953	65,846
	%	17.82	18.89	19.09	21.49	22.71	100
5	N	10,024	10,911	11,802	14,836	18,273	65,846
	%	15.22	16.57	17.92	22.53	27.75	100
Total	N	66,687	65,515	62,487	66,960	67,583	329,232
	%	20.26	19.9	18.98	20.34	20.53	100
Pearson $\chi^2(16) = 6.3e+03, p-value = 0.000$							

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. The Pearson χ^2 tests the hypothesis that the rows and columns in the tables are independent.

Table A.15: Intergenerational transition matrices (adjusting for the other parent's birth weight, 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	N	19,788	15,082	12,079	10,523	8,375	65,847
	%	30.05	22.9	18.34	15.98	12.72	100
2	N	15,967	14,983	12,685	12,181	10,030	65,846
	%	24.25	22.75	19.26	18.5	15.23	100
3	N	12,901	13,710	13,187	13,499	12,550	65,847
	%	19.59	20.82	20.03	20.5	19.06	100
4	N	10,326	12,125	12,874	14,974	15,547	65,846
	%	15.68	18.41	19.55	22.74	23.61	100
5	N	7,705	9,615	11,662	15,783	21,081	65,846
	%	11.7	14.6	17.71	23.97	32.02	100
Total	N	66,687	65,515	62,487	66,960	67,583	329,232
	20.26	19.9	18.98	20.34	20.53	100	
Pearson $\chi^2(16) = 1.7e+04, p-value = 0.000$							

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

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. The Pearson χ^2 tests the hypothesis that the rows and columns in the tables are independent.

Table A.16: Regression of Child's Birth Weight on Parents' Birth Weight, Logarithm

	(1)	(2)	(3)	(4)	(5)
			Panel A		
Dependent variable:			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	48,944
			Panel B		
Dependent variable:			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	49,660

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.17: Regression of Child's Birth Weight on Both Parents' Birth Weight, Logarithm

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	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's log(BW)=Father's 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. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table A.18: Regression of Child's Indicator for Being Small for Gestational Age on Parents' Indicator for Being Small for Gestational Age

	(1)	(2)	(3)	(4)	5
			Panel A		
Dependent Variable:			Child is small for gestational age		
Mother is small for gestational age	0.095***	0.088***	0.050***	0.049***	0.094***
	(0.002)	(0.003)	(0.011)	(0.012)	(0.007)
Socio-demographic controls		X		X	X
Maternal GM fixed-effects			X	X	
Observations	330,782	297,151	330,782	297,151	41,523
			Panel B		
Dependent Variable:			Child is small for gestational age		
Father is small for gestational age	0.061***	0.054***	0.043***	0.039***	0.066***
	(0.002)	(0.002)	(0.010)	(0.012)	(0.007)
Socio-demographic controls		X		X	X
Paternal GM fixed-effects			X	X	
Observations	322,407	289,751	322,407	289,751	40,346

Notes - "Small for gestational age" 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 sample 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 sample for parents includes all the non-plural births that occurred in Florida between 1970 and 1988 with birth weight in the interval (1000;6000). 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 and with no missing information on gestational age. 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 in Panel A and at the father level in Panel B. *** p<0.01, ** p<0.05, * p<0.1

Table A.19: Regression of Child's Indicator for Being Small for Gestational Age on Both Parents' Indicator for Being Small for Gestational Age

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable:	Child is small for gestational age					
Mother is small for gestational age	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	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	NO	YES	NO	YES	NO	YES
Maternal G.M. FE	NO	NO	YES	YES	NO	NO
Paternal G.M. FE	NO	NO	NO	NO	YES	YES
Observations	296,579	266,591	296,579	266,591	296,579	266,591
Observations	296,589	266,600	296,589	266,600	296,589	266,600

Notes - "Small for gestational age" equals one if the infant's birth weight is below the 10th percentile for his/her gestation week and gender. The reference sample 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 sample for parents includes all the non-plural births that occurred in Florida between 1970 and 1988 with birth weight in the interval (1000;6000). 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 and with no missing information on gestational age. Socio-demographic controls include child's gender, maternal and paternal age and education, birth order, year fixed effects, and county fixed effects. Standard errors are clustered at the mother level. *** p<0.01, ** p<0.05, * p<0.1

Table A.20: Regression of Child's Intrauterine Growth on Parents' Intrauterine Growth

	(1)	(2)	(3)	(4)	(5)
			Panel A		
Dependent variable:			Child's intrauterine growth		
Mother's intrauterine growth	0.2156***	0.2087***	0.1288***	0.1300***	0.2034***
	(0.0022)	(0.0023)	(0.0106)	(0.0122)	(0.0063)
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		
Dependent variable:			Child's intrauterine growth		
Father's intrauterine growth	0.1414***	0.1308***	0.0986***	0.0980***	0.1328***
	(0.0020)	(0.0021)	(0.0106)	(0.0117)	(0.0055)
Socio-demographic controls		X		X	X
Paternal GM fixed effects			X	X	
Observations	322,407	289,751	322,407	289,751	89,129

Notes - Intrauterine growth 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.21: Regression of Child's Intrauterine Growth on Both Parents' Intrauterine Growth

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Child's intrauterine growth					
Mother's intrauterine growth	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 intrauterine growth	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's IUGR=Father's IUGR](p-value)	0	0	0.00384	0.0193	0	1.85e-10

Notes - Intrauterine growth 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.22: Regression of Child's Prematurity on Parents' Prematurity

	(1)	(2)	(3)	(4)	(5)
			Panel A		
Dependent variable:			Child is premature (mean=0.12)		
Mother is premature	0.0496***	0.0422***	0.0040	0.0025	0.0236***
	(0.0016)	(0.0017)	(0.0077)	(0.0086)	(0.0055)
Socio-demographic controls		X		X	X
Maternal GM fixed effects			X	X	
Observations	330,782	297,151	330,782	297,151	41,523
			Panel B		
Dependent variable:			Child is premature (mean=0.12)		
Father is premature	0.0165***	0.0097***	0.0001	0.0021	0.0105**
	(0.0019)	(0.0020)	(0.0092)	(0.0103)	(0.0053)
Socio-demographic controls		X		X	X
Paternal GM fixed effects			X	X	
Observations	322,407	289,751	322,407	289,751	40,346

Notes - A premature birth is defined as being born before the 37th gestational week. 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.23: Regression of Child's Prematurity on Both Parents' Prematurity

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Child is premature (mean=0.12)					
Mother is premature	0.0353***	0.0282***	-0.0017	0.0000	0.0263***	0.0275***
	(0.0022)	(0.0023)	(0.0104)	(0.0118)	(0.0063)	(0.0074)
Father is premature	0.0166***	0.0099***	-0.0064	-0.0064	-0.0008	0.0022
	(0.0020)	(0.0021)	(0.0071)	(0.0081)	(0.0102)	(0.0114)
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)	4.79e-10	6.86e-09	0.714	0.653	0.0245	0.0644

Notes - A premature birth is defined as being born before the 37th gestational week. 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

Table A.24: Regression of Child's Gestational Length on Parents' Gestational Length

	(1)	(2)	(3)	(4)	(5)
			Panel A		
Dependent variable:	Child's gestational length (mean=38.8)				
Mother's gestational length	0.0496***	0.0422***	0.0040	0.0025	0.0311***
	(0.0016)	(0.0017)	(0.0077)	(0.0086)	(0.0044)
Socio-demographic controls		X		X	X
Maternal GM fixed effects			X	X	
Observations	330,782	297,151	330,782	297,151	41,523
			Panel B		
Dependent variable:	Child's gestational length (mean=38.8)				
Father's gestational length	0.0232***	0.0176***	0.0007	0.0053	0.0133***
	(0.0016)	(0.0017)	(0.0079)	(0.0089)	(0.0046)
Socio-demographic controls		X		X	X
Paternal GM fixed effects			X	X	
Observations	322,407	289,751	322,407	289,751	40,346

Notes - Gestational length is defined as the number of gestation weeks at the time of the birth. 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.25: Regression of Child's Gestational Length on Both Parents' Gestational Length

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Child's gestational length (mean=38.8)					
Mother's gestation length	0.0489***	0.0418***	0.0043	0.0023	0.0308***	0.0300***
	(0.0017)	(0.0018)	(0.0083)	(0.0094)	(0.0050)	(0.0059)
Father's gestation length	0.0221***	0.0171***	0.0048	0.0060	0.0024	0.0079
	(0.0017)	(0.0018)	(0.0059)	(0.0068)	(0.0088)	(0.0098)
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	0.967	0.743	0.00558	0.0553

Notes - Gestational length is defined as the number of gestation weeks at the time of the birth. 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. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table A.26: Regression of Child's Birth Weight on Parents' Birth Weight, Full-term Births Only

	(1)	(2)	(3)	(4)	(5)
			Panel A		
Dependent variable:			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	37,069
			Panel B		
Dependent variable:			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	37,967

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.27: Regression of Child's Birth Weight on Both Parents' Birth Weight, Full-term Births Only

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	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.28: Regression of Child's Indicator for Being Low Birth Weight on Parents' Indicator for Being Low Birth Weight

	(1)	(2)	(3)	(4)	(5)
			Panel A		
Dependent variable:	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	0.0413***
	(0.0022)	(0.0023)	(0.0091)	(0.0104)	(0.0052)
Socio-demographic controls		X		X	X
Maternal GM fixed effects			X	X	
Observations	366,722	329,232	366,722	329,232	48,944
			Panel B		
Dependent variable:	Child is low birth weight (BW<2,500 grams)				
Father is low birth weight (BW<2,500 grams)	0.0270***	0.0214***	0.0250***	0.0228***	0.0248***
	(0.0021)	(0.0022)	(0.0097)	(0.0104)	(0.0054)
Socio-demographic controls		X		X	X
Paternal GM fixed effects			X	X	
Observations	366,722	329,232	366,722	329,232	49,660

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.29: Regression of Child's Indicator for Being Low Birth Weight on Both Parents' Indicator for Being Low Birth Weight

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Child is low birth weight (BW<2,500 grams)					
Mother is low birth weight (BW<2,500 grams)	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 grams)	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 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's LBW=Father's LBW](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.30: Regression of Child's Indicator for Being Low Birth Weight on Parents' Indicator for Being Low Birth Weight, Larger Sample of Parents Matched with Children

	(1)	(2)	(3)	(4)	(5)
			Panel A		
Dependent variable:	Child is low birth weight (BW<2,500 grams)				
Mother is low birth weight					
(BW<2,500 grams)	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		
Dependent variable:	Child is low birth weight (BW<2,500 grams)				
Father is low birth weight					
(BW<2,500 grams)	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

Table A.31: Regression of Child's Indicator for Being High Birth Weight on Parents' Indicator for Being 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 grams)	0.1070***	0.1065***	0.0525***	0.0559***	0.0988***
	(0.0028)	(0.0029)	(0.0118)	(0.0132)	(0.0080)
Socio-demographic controls		X		X	X
Maternal GM fixed effects			X	X	
Observations	366,722	329,232	366,722	329,232	48,944
			Panel B		
Dependent variable:		Child is high birth weight (BW>4,000 grams)			
Father is high birth weight (BW>4,000 grams)	0.0577***	0.0544***	0.0293***	0.0323***	0.0524***
	(0.0018)	(0.0019)	(0.0080)	(0.0090)	(0.0050)
	(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	49,660

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 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.32: Regression of Child's Indicator for Being High Birth Weight on Both Parents' Indicator for Being High Birth Weight

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Child is high birth weight (BW>4,000 grams)					
Mother is high birth weight (BW>4,000 grams)	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 grams)	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 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's HBW=Father's HBW](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.

Table A.33: Regression of Child's Birth Weight on Parents' Birth Weight, Whites Only

	(1)	(2)	(3)	(4)	(5)
			Panel A		
Dependent variable:			Child's birth weight (grams)		
Mother's birth weight (grams)	0.2040***	0.1994***	0.1237***	0.1300***	0.1949***
	(0.0027)	(0.0027)	(0.0167)	(0.0169)	(0.0077)
Socio-demographic controls		X		X	X
Maternal GM fixed effects			X	X	
Observations	202,659	199,827	202,659	199,827	22,969
			Panel B		
Dependent variable:			Child's birth weight (grams)		
Father's birth weight (grams)	0.1137***	0.1076***	0.1017***	0.1078***	0.1102***
	(0.0025)	(0.0025)	(0.0164)	(0.0166)	(0.0072)
Socio-demographic controls		X		X	X
Paternal GM fixed effects			X	X	
Observations	202,659	199,827	202,659	199,827	23,607

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.34: Regression of Child's Birth Weight on Both Parents' Birth Weight, Whites Only

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	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. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table A.35: Regression of Child's Birth Weight on Parents' Birth Weight, Blacks Only

	(1)	(2)	(3)	(4)	(5)
			Panel A		
Dependent variable:			Child's birth weight (grams)		
Mother's birth weight (grams)	0.1896***	0.1882***	0.1221***	0.1188***	0.1759***
	(0.004)	(0.004)	(0.018)	(0.019)	(0.0083)
Socio-demographic controls		X		X	X
Maternal GM fixed effects			X	X	
Observations	115,131	109,469	115,131	109,469	18,798
			Panel B		
Dependent variable:			Child's birth weight (grams)		
Father's birth weight (grams)	0.0941***	0.0913***	0.1061***	0.1039***	0.0893***
	(0.003)	(0.003)	(0.017)	(0.017)	(0.008)
Socio-demographic controls		X		X	X
Paternal GM fixed effects			X	X	
Observations	115,131	109,469	115,131	109,469	18,364

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.36: Regression of Child's Birth Weight on Both Parents' Birth Weight, Blacks Only

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	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. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table A.37: Regression of Child's Birth Weight on Parents' Birth Weight, by Grandmother's Educational Attainment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Maternal Grandmother Education:									
	At least High School				High School Dropout		At least High School		High School Dropout	
Dependent variable:	Child's birth weight (grams)									
Mother's birth weight (grams)	0.2386***	0.2259***	0.1129***	0.1163***	0.2217***	0.2117***	0.1632***	0.1587***	0.2180***	0.2078***
	(0.0026)	(0.0027)	(0.0152)	(0.0168)	(0.0035)	(0.0037)	(0.0183)	(0.0209)	(0.0069)	(0.0085)
Socio-demographic controls		X		X		X		X		
Paternal GM fixed effects			X	X			X	X		
Observations	224,116	205,073	224,116	205,073	125,454	108,908	125,454	108,908	28,726	18,261
Mean of Dep. Var.	3300	3313			3226	3240				
	Paternal Grandmother Education:									
	At least High School				High School Dropout		At least High School		High School Dropout	
Dependent variable:	Child's birth weight (grams)									
Father's birth weight (grams)	0.1478***	0.1313***	0.0921***	0.0946***	0.1266***	0.1181***	0.1008***	0.1046***	0.1336***	0.1201***
	(0.0025)	(0.0025)	(0.0151)	(0.0166)	(0.0032)	(0.0034)	(0.0169)	(0.0198)	(0.0064)	(0.0082)
Socio-demographic controls		X		X		X		X		
Paternal GM fixed effects			X	X			X	X		
Observations	213,354	195,359	213,354	195,359	129,273	112,445	129,273	112,445	27,831	18,795
Mean of Dep. Var.	3299	3312			3232	3246				

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 column 9-10 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.38: Regression of Child's Birth Weight on Both Parents' Birth Weight, by Grandmother's Educational Attainment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Paternal Grandmother Education: At least High School						Paternal Grandmother Education: High School Dropout					
Dependent variable:	Child's birth weight (grams)											
maternal birth weight	0.2295***	0.2197***	0.1115***	0.1146***	0.1707***	0.1740***	0.2158***	0.2072***	0.1634***	0.1586***	0.1910***	0.1812***
	(0.0026)	(0.0026)	(0.0150)	(0.0166)	(0.0092)	(0.0107)	(0.0034)	(0.0036)	(0.0183)	(0.0209)	(0.0120)	(0.0146)
paternal birth weight	0.1339***	0.1230***	0.0883***	0.0890***	0.0847***	0.0899***	0.1193***	0.1101***	0.0778***	0.0762***	0.1059***	0.1014***
	(0.0023)	(0.0024)	(0.0073)	(0.0084)	(0.0160)	(0.0177)	(0.0032)	(0.0034)	(0.0086)	(0.0103)	(0.0221)	(0.0262)
Socio-demographic controls		X		X		X		X		X		X
Maternal GM fixed effects			X	X					X	X		
Paternal GM fixed effects					X	X					X	X
Observations	224,116	205,073	224,116	205,073	224,116	205,073	125,454	108,908	125,454	108,908	125,454	108,908

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). Standard errors in parentheses are clustered at the mother level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table A.39: Regression of Child's Birth Weight on Parents' Birth Weight, by Income in the Grandmother's Zip Code

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Maternal Grandmoter Zip Code Income:									
	Above Median				Below Median			Above Median	Below Median	
Dependent variable:	Child's birth weight (grams)									
Mother's birth weight	0.2316***	0.2216***	0.1216***	0.1240***	0.2314***	0.2159***	0.1346***	0.1373***	0.2203***	0.2048***
	(0.0031)	(0.0032)	(0.0250)	(0.0267)	(0.0026)	(0.0028)	(0.0158)	(0.0185)	(0.0087)	(0.0066)
Socio-demographic controls		X		X		X		X		
Paternal GM fixed effects			X	X			X	X		
Observations	137,462	127,402	137,462	127,402	201,464	176,705	201,464	176,705	16,713	28,852
Mean of Dep. Var.	3322	3331			3239	3253				

	Paternal Grandmoter Zip Code Income:									
	Above Median				Below Median			Above Median	Below Median	
Dependent variable:	Child's birth weight (grams)									
Father's birth weight	0.1356***	0.1244***	0.0807***	0.0843***	0.1420***	0.1258***	0.1206***	0.1251***	0.1289***	0.1290***
	(0.0029)	(0.0030)	(0.0237)	(0.0252)	(0.0025)	(0.0026)	(0.0149)	(0.0175)	(0.0081)	(0.0062)
Socio-demographic controls		X		X		X		X		
Paternal GM fixed effects			X	X			X	X		
Observations	137,462	127,402	137,462	127,402	201,464	176,705	201,464	176,705	17,117	28,973
Mean of Dep. Var.	3322	3331			3239	3253				

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 column 9-10 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.40: Regression of Child's Birth Weight on Both Parents' Birth Weight, by Income in the Grandmother's Zip Code

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Paternal Grandmoter Zip Code Income Above Median						Paternal Grandmoter Zip Code Income Below Median					
Dependent variable:	Child's birth weight (grams)											
Mother's birth weight (grams)	0.2250***	0.2171***	0.1224***	0.1236***	0.1847***	0.1846***	0.2230***	0.2104***	0.1342***	0.1374***	0.1913***	0.1929***
	(0.0031)	(0.0032)	(0.0248)	(0.0265)	(0.0142)	(0.0158)	(0.0026)	(0.0027)	(0.0156)	(0.0183)	(0.0079)	(0.0096)
Father's birth weight (grams)	0.1251***	0.1168***	0.0898***	0.0925***	0.0834***	0.0858***	0.1287***	0.1167***	0.0851***	0.0820***	0.1156***	0.1201***
	(0.0028)	(0.0029)	(0.0136)	(0.0151)	(0.0236)	(0.0251)	(0.0024)	(0.0025)	(0.0080)	(0.0097)	(0.0149)	(0.0173)
Socio-demographic controls		X		X		X		X		X		X
Maternal GM fixed effects			X	X					X	X		
Paternal GM fixed effects					X	X					X	X
Observations	137,462	127,402	137,462	127,402	137,462	127,402	201,464	176,705	201,464	176,705	201,464	176,705

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). Standard errors in parentheses are clustered at the mother level. *** p<0.01, ** p<0.05, * p<0.1

Table A.41: Regression of Child's Birth Weight on Both Parents' Birth Weight, by Child's Gender

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:			Child's birth weight (grams)			
Mother's birth weight (grams)	0.2306***	0.2185***	0.1369***	0.1337***	0.1925***	0.1913***
	(0.0026)	(0.0027)	(0.0106)	(0.0120)	(0.0059)	(0.0068)
Mother's birth weight × Child if female	-0.0044	-0.0045	-0.0052	-0.0048	-0.0020	-0.0004
	(0.0033)	(0.0035)	(0.0057)	(0.0062)	(0.0056)	(0.0061)
Father's birth weight (grams)	0.1262***	0.1148***	0.0861***	0.0869***	0.0937***	0.0977***
	(0.0024)	(0.0025)	(0.0059)	(0.0067)	(0.0100)	(0.0112)
Father's birth weight × Child is female	0.0103***	0.0095***	0.0044	0.0046	0.0110**	0.0084
	(0.0031)	(0.0032)	(0.0053)	(0.0058)	(0.0052)	(0.0056)
Child is female	-137.3620***	-133.5060***	-117.8308***	-120.4505***	-149.7381***	-147.4426***
	(14.4547)	(15.1334)	(24.7798)	(27.0062)	(24.2606)	(26.5209)
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 BW=Father BW](p-value)	0.0000	0.0000	0.0477	0.0764	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. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table A.42: Regression of Child's Birth Weight on Mother's Birth Weight, Indicator for Being Low Birth Weight, by Child's Gender

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Child is low birth weight (BW<2,500 grams)					
Mother is low birth weight	0.0530***	0.0455***	-0.0005	-0.0133	0.0518***	0.0478***
	(0.0028)	(0.0029)	(0.0099)	(0.0112)	(0.0065)	(0.0074)
Mother is low birth weight × Child is female	0.0172***	0.0176***	0.0157**	0.0175**	0.0139*	0.0201**
	(0.0040)	(0.0042)	(0.0077)	(0.0085)	(0.0073)	(0.0081)
Father is low birth weight	0.0173***	0.0132***	0.0091	0.0083	0.0140	0.0137
	(0.0026)	(0.0028)	(0.0072)	(0.0082)	(0.0105)	(0.0113)
Father is low birth weight × Child is female	0.0176***	0.0153***	0.0198***	0.0173**	0.0209***	0.0206***
	(0.0039)	(0.0041)	(0.0075)	(0.0082)	(0.0073)	(0.0079)
Child is female	0.0119***	0.0106***	0.0129***	0.0118***	0.0134***	0.0118***
	(0.0009)	(0.0009)	(0.0017)	(0.0018)	(0.0017)	(0.0018)
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's LBW=Father's LBW](p-value)	0.0000	0.0000	0.0477	0.0764	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

Table A.43: Regression of Zip Code Median Family Income on Child's Birth Weight

	(1)	(2)	(3)	(4)
Panel A: Sample of children matched with mothers	Median family income in zip-code (in 1970 $1,000)			
Mother's birth weight (grams)	0.053***	0.012***	0.005***	0.005
	(0.001)	(0.001)	(0.002)	(0.000)
GM fixed effects			X	X
Mother's race - Child sex and year of birth - GM county x year		X	X	X
Mother' age - Parity - Mother's county				X
Observations	979,077	978,563	803,987	799,112
Mean of Y	9.725	9.725	9.628	9.632
Panel B: Sample of children matched with fathers	Median family income in zip-code (in 1970 $1,000)			
Father's birth weight (grams)	0.048***	0.017***	0.003	0.003
	(0.001)	(0.001)	(0.003)	(0.002)
GM fixed effects			X	X
Mother's race - Child sex and year of birth - GM county x year		X	X	X
Father' age - Parity - Mother's county				X
Observations	665,417	665,122	497,037	493,866
Mean of Dep.Var.	10.01	10.01	9.957	9.962

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. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table A.44: Regression of Child's Birth Weight on Zip Code Median Family Income

	(1)	(2)	(3)	(4)
Dependent variable:	Child's birth weight (grams)		Child's log birth weight	
Real median family income in zip-code (in 1970$)	0.0166***	0.0130***		
	(0.0004)	(0.0003)		
Mother's birth weight		0.2290***		
		(0.0021)		
Log median family income in zip-code (in 1970$)			0.0601***	0.0484***
			(0.0012)	(0.0012)
Mother's log birth weight				0.2007***
				(0.0022)
Socio-demographic Controls	X	X	X	X
Observations	337,719	337,719	337,621	337,621
Mean of Dep. Var.	3273	3273	8.078	8.078

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). Standard errors in parentheses are clustered at the mother level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$