For Better or For Worse

The Role of Fathers in Child Development

Ericka G. Rascon-Ramirez *
University of Essex
Institute for Social and Economic Research
erasco@essex.ac.uk

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Abstract

This paper analyses the role of fathers in child development using parental cognitive and non-cognitive variables rarely used in Family Economics. Using the Mexican Life Survey (MxFLS), the study explores *traditional* models of parental investment by analysing the influence of parental human capital on child cognitive development and health; and *non-traditional* models by studying the role of parental emotional status, stress, future valuation and risk aversion on the same outcomes. Results highlight a large and significant association between parental cognitive skills and child's cognitive ability, having both parents similar influence. In contrast to previous empirical studies, maternal schooling is no longer the main mechanism through which mothers influence cognitive development; her cognitive ability has a larger and significant influence on child's cognitive ability and educational expenditure. Using panel data methods, non-traditional models provide new evidence about the negative association between father's depression and child cognitive development.

JEL :

Keywords : Cognitive ability, health, parental involvement, child development, random and fixed effects.

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1 Introduction

In the end, man is an event which cannot judge itself, but,
for better or worse, is left to the judgment of others.
Carl Gustav Jung

The field of Family Economics has gained increasing attention since Samuelson (1954) and Becker (1965) suggested a rational choice approach for understanding family behaviour. As a result, empirical research in this field has been also growing in the last decades given its policy implications for developing and developed countries.

Theoretical studies have provided different frameworks to comprehend how families take decisions for improving the welfare of their family members. Based upon the altruistic or common preference models suggested by Becker (1964), cooperative and non-cooperative framework have been developed to explain the bargaining process between father and mother with dissimilar tastes and preferences.

Using these frameworks, empirical studies have shed light on the relevance of parental investment during early childhood, as well as the influence of relative bargaining power of household decision makers on resource allocation for children. The majority of these studies highlight the relevance of mothers on child development and the scant or small influence of fathers. Although these results have not been questioned in most of the empirical studies in Family Economics, psychologists have found that *good* and *bad* fathers might have significant effects on child cognitive abilities and other skills (Lamb, 2004). Nevertheless, from the economic perspective, with exception of a few empirical studies such as Thomas (1994) and Rubalcava and Contreras (2000), a remarkable influence of mothers and the scant effect of fathers on child development do not provoke the minimal scepticism among empirical economists.[1]

Poor evidence of father's involvement in child development might be explained by two main reasons: traditional roles and insufficient information about fathers in household surveys or experimental data. Traditional parental roles as housewives and breadwinners may impose unidimensional alternatives for being a father or a mother. For instance, Thomas (1990) has shown that father's involvement is mainly expressed through income and education. In addition, absent information about father's human capital and non-cognitive traits, as well as the quality of the interaction with his child and spouse may cause an underestimation of father's inputs in child development models. The collection and use of human capital variables, specially those reflecting technology for health and cognitive production, may provide a better understanding about the quality of parental inputs. In addition, measures related to emotional status, risk aversion and future valuation may provide information about home environments and how much parents valuate human capital investment for their children.

[1] A recent article by Blundel et al. (2005) challenges the idea of 'mothers care more for children than fathers' by proving that a key property of the collective approach is not that the mother has a larger willingness to pay for child goods, but that her marginal willingness is more sensitive to increases in her private consumption than that of the father.

Using the Mexican Life Survey (MxFLS 2002-2005), this study provides a better understanding about different channels through which fathers may influence child development. This analysis identifies *traditional* and *non-traditional* mechanisms: the first one is represented by parental human capital (schooling and cognitive ability); and the second is an extension of the first one by including emotional status, future valuation, and other non-cognitive traits. Subsequently, I analyse parental characteristics to identify potential biases of parental coefficients as a consequence of assortative mating.

Our findings suggest that both parents are relevant for cognitive development, where father's and mother's cognitive ability present similar associations with child's ability. To unravel the potential genetic transmission that parental cognitive variables may reflect in cognitive models, we use a choice outcome related to cognitive development − schooling expenditure, to study the influence of parental cognitive ability. We find that also for schooling expenditure father's cognitive ability has a similar influence as mother's. In regard to child's health, we observe that after controlling for father's and mother's height, parental human capital becomes insignificant with exception of father's schooling. In addition, when we analyse non-traditional models, we encounter fathers with moderate or severe depression decreases child's cognitive ability in approximately half a standard deviation.

This study enriches the field of Family Economics by re-assessing father's involvement in child development in a developing country facing rapid economic changes, but still preserving traditional parental roles for child-bearing. Some of these changes have been translated into an increase of female labour force participation that poses new parental strategies for allocating resources to children. In addition, the findings of this study are relevant for understanding the potential indirect consequences of social benefit requirements for parent to influence child development. The existence of social programmes based on conditional cash transfers (CCT), where mothers are the main recipients, may widen the differences between fathers and mothers involvement leading to inefficient investments in human capital.

This study provides for the first time an analysis of father's influence on child cognitive skills and health from an economic perspective. To achieve this aim, the paper is organised as follows: Section 2 provides a literature review on child development and parental behaviour; Section 3 describes the theoretical framework used for the empirical analysis; Section 4, 5 and 6 describe the empirical models, data and results; and Section 7 provides some public policy implications and conclusions derived from the main results of this paper.

2 Literature Review

To study the main contributors of child development, the literature in Economics has taken two types of approaches. The first one is based upon the formulation of child production functions to better comprehend the effect of parent, school, and environmental inputs on child's outcomes. The aim of this approach is to identify the channels through which these inputs

may generate the optimum production of cognitive skills and health. The second approach attempts to find the impact or association of parental traits and environmental conditions on child outcomes.[2] Although this approach tries to analyse the channels through which child outcomes are affected, it does not seek to identify the technology used by parents or others (for instance, schools) for home production. It is worth mentioning, the production function approach aims at understanding the technological process parents follow for producing human capital − such as cognitive abilities and health, by using home or market inputs.

Although the current study follows the second approach, the following subsections briefly discuss the literature about cognitive and health development to provide a better understanding of the main contribution of this work.

2.1 Cognitive Development and Parental Behaviour

Theoretical frameworks have been developed to better understand the main determinants of child cognitive acquisition. Part of this theoretical work formalises the formation of cognitive ability as a cumulative process. The common strategy to exemplify the skill formation process is through a production function in order to determine the relationship between inputs and cognitive outputs. Todd and Wolpin (2003) specifies the production of cognitive achievement as a function of current and past family and school inputs, which are combined with individual's genetic endowment of mental capacity to produce cognitive outcomes. While this approach recognizes the existence of parent and school-supplied inputs at a given age of the child, it does not formulate how current and past inputs influence future stages. Hence, Cunha and Heckman (2007) posit a model of cognitive formation with multiple stages during childhood, where the technology allows for the dependence of future cognitive skills on those acquired in earlier stages. In addition, this framework considers the dynamic complementarity between cognitive skills produced at first stages and subsequent skills.[3] In contrast to Todd and Wolpin (2003), these authors explicitly consider the elasticity of substitution between skills obtained in early stages and those obtained later.

The empirical literature provides a variety of findings regarding the impact of parental human capital on child's cognitive ability. Studies based on the production framework reveals a large influence of parental background on child outcomes. For instance, Cunha and Heckman (2008) find large effects of parental inputs on child's cognitive skills at early ages, and larger effect on non-cognitive skills at later ages. In accordance with these findings, Todd and Wolpin (2004) show that both contemporaneous and lagged inputs matter in the production of current achievement. The magnitude of the effect of lagged inputs is similar to the effect of current inputs.

[2]Through out this paper, the terms *impact* and*effect* refer to causal interpretations.

[3]The dependence of cognitive skills across the skill formation process is termed *self-productivity* by the authors, which implies that cognitive skills produced at one stage increases the skills achieved at later stages. In regard to the *dynamic complementarity*, the cognitive acquisition of one stage raises the productivity of investment in future stages. This allows for synergy across skills during childhood.

Regarding the work developed for understanding the effects and associations of parental traits on child's cognitive ability, Sigman et al. (1989) have found that not only family resources are important for child's cognitive ability, but also a good nutrition may reinforce his cognitive development. Other studies have combined genetic and environmental factors to explain the existence of high cognitive ability children. According to Petrill, et al. (1998), the magnitude of genetic influences on cognitive ability depends on child's age. Furthermore, math test scores and grade repetition are positive and significantly affected by mother's schooling, see Carneiro et. al (2005); and income and caring attitudes have revealed positive effects on child's cognitive skills, as Michael (2005) shows. Furthermore, children with high ability mothers are more likely to be benefited from federal programs that aim at improving the skills of poor children than those with low ability mothers, as Currie (2009) discussed.

Another branch of the empirical literature regarding cognitive abilities has been focused on the effect of maternal employment and child cognitive skills. Empirical findings suggest that maternal employment on child's cognitive ability is negative during the first years of the child's life, as Bernal (2008) and James-Burdumy (2005) have shown. In contrast, other studies have found that maternal labour participation in early ages have no net effect on child's cognitive ability, see Leibowitz (1977) and Blau (1992). An important finding from the latter is that the impact of maternal labour participation relies upon when it occurs. The common methodologies used to analyse the impact of parental human capital and maternal employment on child cognitive ability are instrumental variables and fixed effects. Some of the studies that have used instrumental variables are: Blau and Grossberg (1992), Bernal and Keane (2006) and Carneiro, et. al (2005). Family fixed effect estimations have been used in Currie and Thomas (1996) and James-Burdumy (2005). The common variables used to instrument maternal labour participation are: mother's tuition fee, to identify the causal effect of mother's schooling on children's schooling performance in Carneiro et. al (2005); state and individual-specific welfare rules variables to estimate the cognitive ability production function, Bernal and Keane (2006) ; and the percentage of the county labour force employed in services to understand the effect of maternal employment on child development, James-Burdumy (2005), among others.

3 Theoretical Framework

In this section a simplified cognitive and health production framework is described. Although the main purpose of this study is not the estimation of cognitive or health production functions - given the lack of information regarding past investments during early childhood; this study uses the following framework to comprehend *traditional* and *non-traditional* channels that might affect child outcomes. In addition, this theoretical framework is used to support the interpretation of the potential endogeneity of parental indicators.

3.1 Cognitive and Health Production

The theoretical model assumes parents are willing to invest in child inputs to encourage cognitive and health development. Hence, each parent utility will be represented as the following:

$$U^p = U^p[Z^p, H^p, U^c(X^c, H^c), A^c)] \tag{1}$$

Where U^p represents parental utility as a function of parental consumption Z^p, parental health H^p, child's utility U^c, and child's cognitive ability A^c. Child's utility is a function of child's consumption X^c and health H^c. Even though child's cognitive skills will be translated into future utility for the child, his utility does not rely on cognitive skills given that he is not aware of the long run benefits of investing in them. Because parents like to have 'smart' children, child cognitive skills will appear as an element of parental utility (or as a public good of the household). To better understand the composition of child outcomes, equation (2) and (3) present the production function of child cognitive ability and health:

$$A^c = A^c[X^c, X^m(\phi^m, X^f), X^f(\phi^f, X^m), E(X^m, X^f)] \tag{2}$$

$$H^c = H^c[X^c, X^m(\phi^m, X^f), X^f(\phi^f, X^m), E(X^m, X^f)] \tag{3}$$

Where X^c is child consumption; X^m represents maternal inputs as a function of her preferences and tastes ϕ^m, and her husband's inputs X^f (or traits); and X^f is a function of father's inputs relying on his tastes and preferences ϕ^f, as well as on maternal inputs. The last element of (2) and (3) represents 'home environment' which depends on parental inputs. Following the conceptual framework of Todd and Wolpin (2003), cognitive and health are acquired through a transformation process in which current and past inputs are combined among them and interacted with genetic endowments.[4]

To identify parental *traditional* and *non-traditional* mechanisms to influence child development, cognitive ability A^c and health H^c are represented by D^c. Because both production functions are conformed by the same inputs, partial derivatives of D^c with respect to each of its components will identically behave for both functions. This implies *traditional* and *non-traditional* channels will be manifested in the same manner for cognitive and health development, but it does not mean partial derivatives will be the same among child outcomes.

Both types of channels are shown in (4) through the partial derivatives of D^c (child development: cognitive ability and health) with respect to parental inputs:

[4]The authors highlight two stages for understanding cognitive production: before and after attending school. The first stage of cognitive acquisition is determined by genetics and family inputs, whereas the second one is driven by the cumulative achievement during the first stage (preschool) and cognitive stimulation received at school. Acknowledging the relevance of school attainment, cognitive models discussed in Section 4 consider schooling of the child to clean up parental coefficients from schooling effect. Further description regarding how child's schooling is introduced in the cognitive models is found in Subsection 4.1

$$\partial D^c/\partial X^j = \partial D^c/\partial X^j + \partial D^c/\partial X^{j-1} \cdot \partial X^{j-1}/\partial X^j + \partial E/\partial X^j \quad (4)$$

The first component represents the *traditional* channel of parent *j's* on child development, the second explains the partial interactions between parent *j's* traits and his/her partner *j-1's*, and the third one represents *non-traditional* channels. The second component can be interpreted as assortative mating. Section 4 explains these channels and their empirical implementation.

3.2 Family Bargaining Framework

Based upon the parental utility function described above, this section discusses in detail the assumptions behind the distributional process followed by parents to allocate resources among household members. The framework is derived from the collective model, whereby the household consists of two individuals with different preferences, and the decision process leads to Pareto-efficient outcomes.[5] The aim of the collective approach is to formalise the notion of bargaining power within the household and the idea that changes in this power might generate changes in parental behaviour even when total resources are kept constant, as Blundell et al. (2005) highlight. Hence, the bargaining or decision power of family members is reflected into a weighting factor μ for each member. This weight is represented as a function of prices, income, preferences and distributional factors and may be interpreted as a sharing rule where the maximization problem follows two steps.[6] Firstly, family members gather their incomes and distribute these resources between household members according to their weighting factor. Subsequently, each member separately chooses his private consumption and time allocation (leisure and labour) subject to a budget constraint.

Using the parental utility specification in (1), the household maximizes the following welfare function W^h:

$$W = (\mu)U^m[Z^m, H^m, U^c(X^c, H^c), A^c)] + (1-\mu)U^f[Z^f, H^f, U^c(X^c, H^c), A^c)] \quad (5)$$

subject to

$$w_m h^m + w_f h^f + y_m + y_f = P_x X + w_m(T - h^m) + w_f(T - h^f) \quad (6)$$

and equation (2) and (3).

Where m and f refer to mothers and fathers, w represents labour income, h is hours of work, y is non-labour income, $P_x X$ embraces expenditure on mother's, father's and child's goods, and $w_{m/f}(T - h^{m/f})$ is the cost of spending time with the child (leisure) for mothers and fathers. The household maximizes (5) subject to (6), (2), and (3) in order to obtain the optimal set of X, Z, and $h^{m/f}$, where the selection of $h^{m/f}$ is relevant for determining the time

[5] See Chiappori, Fortin and Lacroix (2002) for further details about the collective model.

[6] The decision rule relies upon exogenous factors which influence bargaining power of family members. If these factors are in favour of a specific member of the family, his/her weight in the household welfare function will be higher than those faced by the rest of family members.

allocated to the child ($T - h^{m/f}$). Following Chiappori et al.(2002), for any given w_m, w_f, y_m, y_f, P_x, preference traits (parental schooling, age, cognitive skills), and distribution factors (social programmes, divorce reforms), there exists a μ or weighting factor that solves the above maximization problem.

Because the *standard* collective model relies on the assumption that commodities are privately consumed, Blundel et al.(2005) develop an extension of this framework in order to consider public consumption within the household. For identifying individual welfare and the decision process in an empirical context, it is required a separability assumption or the presence of a distribution factor.[7] Even though this study does not aims at calculating preferences on private and public goods and/or Pareto weights, this framework provides further knowledge regarding how father and mother bargain to invest in human capital for the child. For instance, if Pareto weights are a function of wages, prices, preferences and distributional factors, an increase on wages may have different effects on the household: income effect, price effect, substitution effect (inputs), and bargaining power effect. Hence, changes in variables related to μ may create different changes within the household.

For empirical purposes, the focus of the analysis is based on equations (2) and (3) where: X^c is represented by child's characteristics (age, schooling and gender); and $X^{m/f}$ is a set of parental traits (cognitive and non-cognitive). Because it is likely fathers and mothers may have different tastes and preferences for investing in human capital, the collective model represents an ideal theoretical framework for our empirical analysis. The following section presents the empirical model, as well as a detail description of parental and child variables.

4 Empirical Evidence

4.1 Cognitive Ability and Height Models

Empirical models are based upon the theoretical framework described in Section 3. Although the purpose of this study is not to construct a child production function, it is worth highlighting that I use the above theoretical framework to explain the associations between observable and unobservable characteristics, as well as some causal effects of parental traits on child outcomes. The two dimensions of child development discussed in the following sections are: cognitive ability and height. Our regressors are classified into traditional and non-traditional variables. The first contains parental human capital variables which reflect past investment decisions of the child's grandparents. The second set is compounded by non-human capital variables, that may reflect contemporaneous and permanent traits of parental personalities. Using the two waves of the MxFLS (2002 and 2005), our models are estimated for children between 5 to 12 years old living with mother and father in both periods. At the end of the empirical analysis,

[7] The authors prove these assumptions are required to identify preferences on private and public goods as well as Pareto weights, just by observing individual labour supply, aggregate household consumption, expenditure on the public good, and wages.

we also include those children living with their father in 2002, but facing divorce or separation between 2002 and 2005. The data section provides further description of the variables used for cognitive and height models.

To identify the *traditional* and *non-traditional* channels mentioned before, the empirical specification of equations (2) and (3) is the following:

$$C_{it} = X_{it}\beta + X_{ht}\delta + u_i + \epsilon_{it} \tag{7}$$

Where C_{it} is any outcome of child i in time t, X_{it} corresponds to the characteristics of the child i varying over time t, X_{ht} represents parental traits in household h at time t, u_i is the unobservable characteristics of the child i invariant over time, and ϵ_{it} is the error term of child i varying over time. From the set of X_{it} variables, child's schooling is likely to be endogenous given its correlation with current and past cognitive skills; causing a simultaneous causality. Despite the focus of this study is the association of parental traits on child development, the influence of child's schooling on cognitive development cannot be neglected. Thus, a two-step-procedure is followed for cleaning up the schooling component from our child's cognitive dependent variable. Firstly, child's cognitive ability is regressed on child's schooling; and secondly, using the residuals of the first step regression as dependent variable, specification (7) is estimated without schooling but the rest of $\mathbf{X}$.[8] The second stage of this estimation is referred as the complete model of cognitive ability. It is worth mentioning this procedure do not eliminate the potential endogeneity of child's schooling, however, it helps us to focus our analysis on only the cognitive ability not explained by schooling. For the height models, the original variable is used as dependent variable.

In the context of cognitive ability and health outcomes, the concern of having an unobservable component invariant overtime correlated with our covariates is clearly present. For both types of outcomes, u_i may reflect genetic endowments and parental personality features invariant over time that could be correlated with our covariates. Therefore, random effects and fixed effects were considered for all specifications. For the cognitive models, random effect models do not present systematic differences from fixed effect coefficients; on the contrary, health models present systematic differences between random and fixed effect coefficients. Even though the systematic differences do not allow us to make any causal interpretation for the health models using random effects, these results are presented in the *Appendix* to better comprehend the association of parental invariant variables and health outcomes. Because this study focuses on the association of several parental traits constant over time − parental cognitive ability, risk aversion an propensity to migrate, the interpretation of our results are mainly derived from random effect models.

The existence of systematic differences between random and fixed effects provides evidence regarding the relevance of genetic (initial) endowments for health indicators which are not entirely represented by parental height - further discussion of these results in the next sections.

[8] Further details of this procedure can be found in Carneiro and Heckman (2003).

In addition, although cognitive models do not present systematic differences between random and fixed effect specifications, we cannot entirely ensure that parental human capital coefficients can be interpreted as causal. Because these variables are time-invariant, the fixed effect specification do not allow to identify their coefficients. However, if we assume the main source of endogeneity is the transmission of genetic endowments, human capital coefficients may be less unbiased by using parental cognitive measures.

4.2 Assortative Mating and Parental Coefficients

To identify the differential effects of mother and father on child's specifications we may address the potential bias caused by assortative mating. Becker (1973) implies that *likes* and *unlikes* mate when that maximizes total household commodity output, regardless on the type of trait − either financial, genetic or psychological. The empirical economic literature has been mainly focussed on marital sorting by either income (Lam and Schoeni, 1994) or human capital (Ermisch et al. 2006) for understanding intergenerational transmission of earnings and schooling.

The discussion of assortative mating in our context becomes relevant for disentangling the sources for which mother's and father's coefficients may differ. For instance, a couple with identical human capital may have similar ways to produce a household commodity (intelligence or health) for the kid. Thus, parent's human capital may be a substitute of each other's. In the econometric context, this can be translated into the loss of significance of one of the parental traits as a consequence of the multicollinearity between mother's and father's. On the contrary, if parents have different human capital stocks, they may complement each other's inputs for producing household commodities. When this complementarity of traits exists, coefficients of parental traits may present counter-intuitive interpretations. For instance, if intelligent and highly educated women marry highly educated but low-cognitive ability men, when both join their inputs for producing a household commodity that affects child's development, the home environment created by both parents (unobserved by the researcher) may increase the marginal effects of the parent with the lowest cognitive endowment. Hence, although father's cognitive ability is lower than mother's, both coefficients may present statistically similar magnitudes.

As a result, a positive correlation of parental traits may reflect either *assortative mating* or *cross-productivity*. The first involves pre-marriage characteristics that make individuals to mate. For instance, highly educated men marry highly educated women which may boost the effect of schooling on child's outcomes through the home environment created by both. The second happens after the marriage and can lead to two types of household production dynamics: specialisation (without learning) and learning within marriage; (Huan et al. 2009) discusses the later.

But **why is assortative mating relevant for our study ?** Assortative mating and learning within marriage are potential sources of endogeneity that may bias parental coefficients. Although our data do not allow to model in a first step the decision of getting married, we are able to analyse the degree of assortative mating in our sample by using the following

specification:

$$P_s = X_i\beta + X_s\delta_1 + X_{s_{-1}}\delta_2 + \pi_h + \vartheta_s \tag{8}$$

Where P_s is any parental cognitive or non-cognitive trait of the father or mother s, X_i corresponds to the characteristics of the child i, X_s represents characteristics of father or mother s, $X_{s_{-1}}$ represents cognitive and non-cognitive traits of the partner s_{-1} , π_h is the unobservable characteristics household level, and ϑ_s is the error term of father or mother s. Because human capital variables do not vary over time, our specifications only uses the second wave of the survey (2005) and clusters by household. In the Section 6, we interpret a set of regressions of parental traits for understanding the degree of assortative mating, as well as we partition the empirical analysis according to the degree of similarity in human capital between father and mother.

4.3 Child development and Shocks

Finally, given the plasticity of cognitive skills and health during childhood, it is plausible to find remarkable changes in cognitive and height development if the child faces dramatic changes in home environment and resource allocation. Therefore, the last specification adds information about household shocks between 2002-2005. Although fixed effects models allow us to relax the assumption of zero correlation between time-invariant unobserved characteristics at the individual level and $\mathbf{X}$, we cannot control for time-variant variables unobserved by the researcher, but correlated with our regressors. Thus, the inclusion of unique data regarding household shocks allow us to reduce the potential bias of parental coefficients as a consequence of this correlation. A full description of these variables is discussed in Section 5. Because the absence or loss of fathers between 2002-2005 is also part of the time-variant variables, we complement our analysis by including children having both parents in 2002, but without living with his/her father in 2005 with the rest of the sample.

The aim of this estimation is to find potential differences between two-parent and single-parent children:

$$C_{it} = X_{it}\beta + X_{ht}\delta + D_i\gamma + X_{it} * D_i\gamma_1 + X_{ht} * D_i\gamma_2 + u_i + \epsilon_{it} \tag{9}$$

All variables shown in (9) are the same used for (7) including a dummy variable D_i equal to one if the child lived with his father and mother in 2002, but only with his mother in 2005. Interactions of this dummy are included to identify differences between both type of children in all the covariates considered in (7). Even though the endogeneity of marriage interruption does not allow measuring the effect of father's absence on child outcomes, we are able to answer how different children with both parents are from those without father in 2005.[9]

[9]Child's specifications considering household shocks are reported in *Appendix*.

5 Data

The Mexican Life Survey (MxFLS) is the first longitudinal dataset in Mexico which follows household members regardless their residency after the baseline interview. The survey is representative at the national, rural and urban level, as well as at regional level according to socio-demographic partitions by state. Baseline interviews were carried out in 2002 and the first follow-up was done in 2005/2006. This survey has been planned to be followed-up every three years in a ten-year-span. One of the main advantages of this survey is to allow tracking socio-economic conditions, epidemiological and demographic changes of 8,440 households, corresponding to 35,000 individuals, to better understand welfare dynamics and migration decisions of the Mexican Population.

For the purposes of the current study, our objective population is a group of approximately 2,400 children between 5 and 12 years old in 2002 who were tracked in 2005 living with father and mother in both waves. The first part of our analysis considers 2,388 and 2,364 children with father and mother in both years (for cognitive and height specifications, respectively); and the second part includes 214 children living with both parents in 2002, but only with their mother in 2005.

Cognitive and health outcomes used for this study are based on Raven tests and height measures collected by the MxFLS team. Cognitive measures are transformed into standard z-scores according to child's age, whereas height is expressed into z-scores according to child's age and gender following the international benchmarks recommended by the WHO (World Health Organization).

The covariates considered for the specifications (7), (8) and (9) are classified into child and parental characteristics. The first set of variables contains age, squared age, and gender of the child, whereas the second one is divided into *traditional* and *non-traditional* parental traits.

For the *traditional* channel, specifications (7)-(9) consider the following parental human capital variables: cognitive ability and schooling. The first human capital variable reflects the quality of parental-child interaction and genetic transmission of intelligence (for cognitive models); and the second, provides a proxy of the information acquired by parents for transforming inputs into better cognitive skills and health.[10][11] . Parental cognitive measures are also obtained from Raven tests and transformed into standard deviations per age (z-scores).

In spite of having measurements of parental schooling and cognitive abilities for both waves (MxFLS-1 and MxFLS-2), this study uses the average of cognitive scores and schooling using both years. Although time-variant human capital measures allow us to identify fixed effect coefficients for these variables, changes between 2002-2005 are not consistent with the theoretical understanding of cognitive and schooling acquisition. On the one hand, cognitive skills are

[10]Parental age can also be considered as a human capital variable because reflects the accumulated experience in child rearing.

[11]Thomas (1994) interprets parental schooling and age as indicators of parental technology for producing health; however, having cognitive measures in our survey allows to disentangle the role of parental ability on the production of health and cognitive abilities from the role of information.

determined during childhood and early adolescence; on the other hand, although schooling (knowledge) is more plastic than cognitive acquisition, changes in parental schooling are rarely observed in official aggregate data. While the MxFLS reports some people with higher education in 2005, the data also show people with less schooling for the same year. In addition, cognitive ability measures collect slightly different scores in 2002 and 2005. Thus, these findings reveal measurement error in both variables, however, it is hard to argue which year provides closer information to the real score. Therefore, to avoid unreliable assumptions regarding which year better collects parental human capital variables, the empirical analysis considers the average of parental cognitive scores and years of schooling.

Regarding the *non-traditional* channels, these are represented by parental non-cognitive characteristics measured by parental risk aversion, future valuation, parental closeness, emotional status, and distress. These variables may indirectly affect the quality and quantity of parent-child interaction, as well as the environment the child faces.

Parental risk aversion was constructed using a hypothetical lottery carried out only for the second round of the MxFLS. This module was applied to 15-year-old individuals or older as a hypothetical game to reveal risk aversion. Individuals had the chance to select between two bags with two possible outcomes each one: low and high payments. The 'safer' bag contained a higher 'low payment' than the 'riskier' bag; but a lower 'high payment' than the 'riskier' one. The game consists of six lotteries where low and high payments vary. The increasing difference between both payments helps to identify 'riskier' or 'risk lover' individuals. If the person was consistently choosing safer payments across the six lotteries, he/she was classified as 'the most risk averse'; therefore, the more risk the interviewee was willing to take, higher score he got. The 'most risk averse' group obtained a score of one, whereas the riskiest group obtained 10 points. Once the construction of the 'risk loving' indicator was carried out, this was grouped into four categories: group '1' for those individuals with score between 1 to 3, group '2' for those between 4 to 6, group '3' from 7 to 9, and group '4' with score equal to 10 - riskiest group.

The future valuation measure was extracted from a direct question to 15-year-old individuals or older, about considering the future when they make decisions as regards spending and saving. This variable was introduced as a dummy in specifications (7) to (9).

In contrast to future valuation and risk loving, parental closeness is not based on a direct question regarding how close the parent perceives is to the child. Using the subjective probability on the likelihood to migrate far from the family, this variable captures parent-child closeness, as well as how he/she values his physical presence during childhood.

Regarding emotional status, this indicator is constructed by using a twenty-question-module about individual's own perception on emotional aspects of his/her life. This module has been validated by the National Institute of Psychiatrics in Mexico for identifying anxiety, moderate and severe depression.[12] Each question reflects a symptom of depression and is scored from normal to severe (1 to 4 values). Scores were added up to construct the *Caraveo Depression*

[12]Further details in Rubalcava and Teruel (2006) .

Index with a minimum value of 20 and a maximum of 80. Following the partitions suggested by the National Institute of Psychiatrics, parents are classified as anxious if they scored between 36 to 45 points; moderately depressed if they were between 46 to 65; and severely depressed if they presented a score between 66 to 80.

Finally, the last set of non-traditional traits is compounded by parental distress using blood pressure measures. Parents were classified as moderately stressed if their systolic and diastolic pressure were above 120 and 80 mm/Hg respectively (moderate blood pressure); and severely stressed if their systolic and diastolic were above 140 and 90 mm/Hg (high blood pressure) respectively. This proxy is based on the work of Patel and Marmot (1987) where they show in a randomized control trial the association of relaxation and stress on blood pressure.

Additional variables were considered in the empirical specifications (7), (8) and (9) to control for family structure, birth order, sibling age gap, birth weight, parental income, parental *BMI*, as well as parental background using grandparents information (type of employment, schooling, and an indicator if the grandparent is still alive).

Table 4 in *Appendix* presents a brief description of child and parental variables for those children identify in MxFLS-1 between 5 to 12 years old and having both parents in the two waves. Child cognitive ability and height are normalized to mean zero and variance equal to one by age group for regressions.[13] To better comprehend the data, table 4 presents original values of both variables without being transformed into standard deviations. The proportion of right questions for assessing cognitive development is 64 percent out of 18 questions; this percentage increases with age. Height measurements reported in the survey reveal that the average height of girls is 138 cm and of boys 139 cm where 7.2 and 8.9 percent are classified as stunted, respectively.[14]

The main demographic composition of the households where the population of interest lives, is characterized by parents in their late thirties with a high concentration of children under 12 years old (47 percent of household members). The average sibling age gap is about 3.8 years which hints at potential public good rivalry within the household.

Concerning parental human capital and non-cognitive traits, Table 3 shows the average schooling for mothers is 6.4 years and for fathers 6.9 [15]; and their cognitive z-score means are -0.20 and 0.02, respectively.[16] Figure 1 of *Appendix* show non-parametric representations of the relationship between parental schooling and cognitive ability across parental age. These illustrate a systematic difference between fathers and mothers across the age spectrum; father's human capital is remarkably higher than mother's.

[13]Height z-scores were created by age and sex.

[14]Stunted children are defined as children with less than -2 standard deviations of height's z-score.

[15]The survey does not report grade of education for undergraduate and postgraduate schooling, therefore, adult schooling is underestimated at the top of the schooling distribution. Undergraduate and postgraduate adults received a value of '14' to represent the highest value of the distribution.

[16]Cognitive z-scores for children and adults were created for all sampled individuals. Although the group of analysis is around 1,900 children (less than the interviewed children as a consequence of missing values), z-scores were created before reducing the sample for modelling purposes.

Regarding parental non-cognitive traits, fathers and mothers do not present significant differences between risk loving and future valuation. The highest concentrations for risk loving appear in Level 2 and Level 4 (out of 4 categories) for both genders. Parental closeness measured by the propensity to migrate is persistently higher than mother's for all partitions. And for mental health indicators, mothers are more anxious than fathers (13 versus 4 per cent), but regarding moderate and severe depression both show similar incidences (3 per cent). Figure 3 of *Appendix* presents non-parametric regressions of the *Caraveo Depression Index* across parental age, illustrating an increasing pattern with a constant gap between parents; mothers are always above father's index. Inversely, parental stress measures (blood pressure indicators) reveal that fathers are more stressed than mothers: 32 versus 19 per cent for moderate stress and 10 versus 4 per cent for high stress. Figure 2 *Appendix* show diastolic and systolic blood pressure across parental age. Both have an increasing behaviour across the age spectrum with a systematic gap between fathers and mothers; fathers are more stressed than mothers in the overall. Individual incomes present significant disparities as it would be expected. In average, father's income is twice than mother's.[17]

6 Results

6.1 Traditional and Non-traditional Channels

This subsection follows specifications (7)-(9) described in Section 4. Cognitive and health models gradually include parental traits to identify potential biases that may be reflected in mother's coefficients if father's characteristics are neglected. Random and fixed effect models were estimated for all specifications and hausman tests are reported for every model. Although height models present systematic differences between random and fixed effects coefficients, random fixed effects are reported in *Appendix* to provide further information about the relation between constant parental variables over time (human capital) and child development. It it worth highlighting that human capital variables cannot be analysed through the fixed effect specifications because they are constructed as averages between 2002 and 2005; likewise parental risk loving, future valuation, and propensity to migrate are not identified by fixed effect models given that they were collected only in the second wave (2005).

Cognitive specifications

Table 1 presents traditional models of child's cognitive ability. These models include only parental human capital variables to disentangle the potential bias of maternal coefficients by omitting father's traits. All columns control for child's characteristics, demographic composition, low weight at birth, sibling age gap and sibling order. In addition, column (5) includes grandparent's information to control for family background and possible assortative mating.

[17] Incomes are transformed into cubic roots to smooth the dispersion of our series.

The first column presents a coefficient of 0.06 for maternal schooling, which remains significant after controlling for father's schooling, however, it decreases around 50 percent (0.03). A salient result shown in this table is the loss of significance of maternal schooling after including mother's cognitive ability. To complement the association of these variables with child's cognitive ability, we observe the inclusion of father's ability decreases mother's in 20 percent.

Table 1: Child's Cognitive Ability and Traditional Models
Random Effects at Individual Level

Dependent variable: Child's Cog. Ability (z-score)	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Human Capital					
Mother's Schooling	0.061***	0.032***	0.008	0.007	0.005
	[0.005]	[0.007]	[0.007]	[0.006]	[0.007]
Father's Schooling		0.046***	0.040***	0.027***	0.027***
		[0.006]	[0.006]	[0.006]	[0.006]
Mother's Cognitive Ability (z-score)			0.258***	0.213***	0.213***
			[0.020]	[0.021]	[0.021]
Father's Cognitive Ability (z-score)				0.168***	0.164***
				[0.022]	[0.022]
Constant	-0.891***	-1.050***	-0.685***	-0.554**	-0.554**
	[0.256]	[0.254]	[0.251]	[0.249]	[0.275]
Observations	3740	3740	3740	3740	3740
Number of groups	2388	2388	2388	2388	2388
Sigma e	0.87	0.87	0.87	0.87	0.87
Sigma u	0.42	0.4	0.34	0.32	0.3
Sigma s	0.96	0.95	0.93	0.92	0.92
Rho	0.19	0.17	0.14	0.12	0.10

Note: Regressions control for child characteristics, demographic composition, low weight at birth, sibling age gap and first order. Column (5) controls for assortative mating by including grandparent's schooling, employment and an indicator if they are still alive. Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1.

In addition, this table shows large and significant parental coefficients in all columns, where mothers present the largest coefficient of cognitive ability, and fathers have the largest schooling coefficients. In contrast to the majority of empirical studies, cognitive ability specifications do not show mother's education as the main contributor to child cognitive development. However, maternal cognitive ability presents a large and significant association, as well as father's schooling and cognitive ability.[18]

It is worth highlighting that these models show a new finding regarding the role of father's schooling on child development; its coefficient remains significant even after controlling for income (column 11 to 13 of table 6). This result may be reflecting either bargaining power in favour of fathers as a result of schooling differences between fathers and mothers, or better knowledge than mothers to transform inputs into cognitive skills.[19] Despite that maternal education is no longer significant in cognitive specifications, maternal cognitive ability is consistently higher than paternal for all specifications shown in tables 1 and 6. Although fathers

[18]Interacting these models by child's gender, we observe no significant differences between girls and boys in these models. These results are not shown in the paper.

[19]Even after controlling for a dummy of "mother having higher education than father", paternal schooling remains highly significant. This result is not shown in 1. Further analysis is provided in the next sections on the potential assortative mating reflected in our coefficients.

may spend less time with their children than mothers, parental cognitive coefficients are quite similar. Fathers with higher cognitive skills might be aware of and able to compensate the lack of paternal-child interaction through quality time with their children (for instance: playing, helping on homework, reading to the child, among other activities). These results reveal both parents might have similar technologies for transforming home and community inputs into child cognitive skills.

For the *non-traditional* channel measured by parental non-cognitive traits, risk loving and future valuation show the expected positive association with cognitive abilities. Based on empirical studies suggesting a positive relation between risk loving and inter-temporal preferences with adult cognitive ability (Dohmen et al. 2010), we would expect the same association with child cognitive skills. For instance, risk loving parents may be less conventional and more able to try new approaches for bringing up their children than their risk adverse counterparts; controlling for future valuation, we eliminate the possibility of reflecting in the risk loving coefficients irresponsible parental behaviour regarding saving decisions. In addition, we would also expect a positive relationship between child cognitive development and parental future valuation if parents consider cognitive skill formation as a strategy for long-term investment. In spite of the existence of empirical findings supporting the above interpretations, Table 6 shows only the third classification of maternal risk loving statistically significant (the 4th level represents the highest degree of risk loving). Hence, having weak evidence regarding this association, it is not possible to derive further conclusions. Regarding parental attachment measured by the propensity to migrate, we observe a negative association with cognitive ability. When we control for the rest of covariates, column (13), the remaining significant coefficients are: mother's propensity to migrate (highest) and father's propensity to migrate (second lowest). These result shed light on the potential beneficial effects parent-child (physical) closeness may have on child development.

Regarding the emotional stability of parents, paternal mental instability is negatively related to child's cognitive development, having a more detrimental association for children with moderate/severe depressed fathers (less than half of a standard deviation than children with fathers without depression). In spite of the positive and significant coefficient of maternal depression, after controlling for the rest of covariates, maternal mental health is no longer significant (column 13). Though mothers present higher depression index than fathers (see Figure 3 of *Appendix*), paternal depression presents a larger association with child's cognitive ability than maternal. The significant relation between depression and cognitive development highlights the importance of home environment for cognitive acquisition. Paternal depression may influence cognitive formation not only through the quality of parent-child interaction, but also through the provision of market goods. Mentally unstable fathers could face a decrease in productivity that may affect wage earnings. Furthermore, parental stress is also negatively related to child's ability, but none of these coefficients are significant.

The above results shed light on the relevance of *non-traditional* channels on child cognitive

development. Although the coefficients of risk loving, inter-temporal preferences, and closeness present weak significance, these variables provide evidence about the importance of parental-child closeness (measured by propensity to migrate) and innovative child-bearing (measure by risk loving).

Despite the fact that parental human capital variables are fixed between 2002 and 2005, the fixed effect models may allow us to identify causal effects for time-variant non-cognitive traits. It is worth mentioning under the context of cognitive skills, parental variables might be mainly correlated to genetic endowments and preferences u_i. In addition, the potential simultaneous causality between child cognitive skills and parental non-cognitive traits is not likely to happen in a practical context. Cognitive skills are rarely seen in the literature as causal factors of parental depression, stress and income; unless the child suffers an abnormal mental condition that may affect parental behaviour. Hence, assuming fixed genetic endowment and common parental preferences for investing in child cognitive skills, fixed effect specifications provide causal effects of non-traditional variables variant over time.[20]

Table 8 highlights two types of significant variables in fixed effect specifications: paternal mental health is still showing negative coefficients, but it is only the coefficient of anxious fathers which remains significant. It is likely that the reduced number of observations of moderate and severe depressed fathers makes the coefficient non-significant given the low variation between the two waves (only 3 percent of fathers belongs to this group). In addition, paternal stress also presents a significant and negative impact on child cognitive skills. Hence, we conclude from these findings that non-cognitive traits related to paternal emotional stability plays an imperative role in child cognitive acquisition. Parental anxiety causes a delay on child's cognitive development by half a standard deviation, whereas father's stress causes a delay of 0.16 standard deviations.

Finally, another finding to point out is the impact of maternal moderate or severe depression of 0.6 standard deviations of cognitive skills. Without further information about the main reason of her current mental condition, it is difficult to determine why this effect is positive when mothers face emotional instability. However, if the main reason is related to father-mother interaction, the child might play a valuable strategy of bargaining inside the household − therefore, emotionally unstable mothers may differently spend time with their children in contrast to emotionally stable women . Nevertheless, this study does not have enough evidence to strongly support this interpretation.

Health Specifications

Table 2 presents random effect models for height per age. These coefficients reveal slightly different results from cognitive models. In accordance with other studies, maternal schooling

[20]Hausman test based on Column 13 of Table 5 does not reject systematic similarity of random and fixed effect coefficients for variant variables between 2002 and 2005. Hence, coefficients of this table are interpreted as causal effects, instead of simple associations. Hausman tests for the cognitive models are reported in table 8.

and cognitive abilities are highly related to child's height; father's human capital also presents a significant association with child's height. When father's schooling is added to the specification of column (2), maternal schooling falls 0.03 standard deviations (34 per cent). After adding father's cognitive skills, mother's schooling is not affected; however, mother's cognitive coefficient decreases 0.02 standard deviations (12 per cent). Comparing parental human capital of column (13) of table 10 of *Appendix*, father's schooling is the only significant human capital variable.

Table 2: Child's Height and Traditional Models
Random Effects at Individual Level

Dependent variable: Child's Height (z-score)	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Human Capital					
Mother's Schooling	0.079***	0.049***	0.038***	0.037***	0.029***
	[0.006]	[0.008]	[0.008]	[0.008]	[0.008]
Father's Schooling		0.046***	0.043***	0.039***	0.036***
		[0.007]	[0.007]	[0.007]	[0.008]
Mother's Cognitive Ability (z-score)			0.130***	0.113***	0.106***
			[0.027]	[0.028]	[0.028]
Father's Cognitive Ability (z-score)				0.063**	0.056**
				[0.028]	[0.028]
Constant	-1.858***	-2.012***	-1.826***	-1.779***	-1.866***
	[0.314]	[0.312]	[0.314]	[0.314]	[0.339]
Observations	3663	3663	3663	3663	3663
Number of groups	2364	2364	2364	2364	2364
Sigma e	0.83	0.83	0.83	0.83	0.84
Sigma u	0.86	0.85	0.84	0.84	0.82
Sigma s	1.19	1.19	1.18	1.18	1.17
Rho	0.51	0.51	0.5	0.5	0.49

Note: Regressions control for child characteristics, demographic composition, low weight at birth, sibling age gap and first order. Column (5) controls for assortative mating by including grandparent's schooling, employment and an indicator if they are still alive. Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1.

The non-traditional channel explained through parental non-cognitive skills performs also quite different from child cognitive models. Parental risk loving attitudes present positive relation with height, but just level 2 for mothers (lowest) and level 4(highest) for fathers are significant.[21] Although the measure of future valuation is based upon a general question regarding future consideration for saving and consumption decisions, mother's valuation shows a significant positive association with child height. Father's future valuation does not appear relevant for these models.[22]

Concerning income variables, both parental incomes are significant. Mother's income presents a negative relation with height, whereas father's is positive. Although the potential endogeneity of these variables does not allow us to draw causal conclusions, these results might be reflecting parental labour supply effects. According to some studies, maternal employment is likely to

[21] As it was mentioned before, risk loving considers four partitions; the highest level of risk aversion (lowest level of risk loving) is the omitted variable in all specifications.

[22] Mother's propensity to migrate presents an unexpected relation with child's height (positive). Using random effects, it is likely that the assumption of no correlation of unobservable components and covariates is not held. Therefore, migration propensity coefficients might be reflecting spurious correlation with child's height.

be detrimental for child's development, for instance Bernal (2008) and others have shown the negative impact on cognitive skills and health outcomes. Therefore, both variables might be reflecting two different mechanisms to influence child's health. Father's income may reflect the provision of goods to encourage height development, whereas mother's may reflect time spent with the child (which might be affected by mother's labour participation). Looking at Table 13, fixed effect models reveal that none of the time-variant covariates are significant with exception of father's height. Even though parental income is no longer significant, Hausman test does not show systematic difference between random and fixed effect coefficients for this variable. Hence, according to the sign of these coefficients, maternal income impacts negatively on child's height, whereas father's income affects positively.[23]

6.2 Assortative mating

Following specification (8) of Section 4.1, each parental human capital and non-cognitive trait is regressed on parental characteristics, as well as on his/her partner's traits. Looking at tables 14-17, diagonal coefficients of the same variable reveals some evidence of assortative mating between parents. For instance, father and mother's schooling coefficients in parental schooling regressions (column 3 to 4 of table 14) present similar magnitudes (0.34 vs 0.43), as well as in cognitive coefficients in columns 3 to 4 (0.26 vs 0.26). These human capital variables are the main regressor analyse for assortative mating, given that these two are very likely to have been already established before parent's marriage. By looking at the test of equality reported at the end of table 14, we observed that coefficient are significantly different in schooling specifications, but not in parental cognitive models. The later sheds light on a degree of positive cognitive assortative mating.

In addition, the association between parental traits and partner's characteristics behaves quite dissimilar between fathers and mothers. Maternal schooling presents more significant associations in father's specifications than fathers in mother's.

Regarding cognitive ability covariates, the number of significant coefficients is lower than for schooling regressors. Mother's cognitive specification presents similar coefficients than fathers; however, mother's ability shows a significant positive association with father's risk loving, but negatively related to her own risk loving attitude. It is worth mentioning that father's cognitive skills present a highly significant and negative coefficient in the specification for mother's depression index. More able fathers marry women more likely to be mentally stable, as well as more aware of future valuation. It is interesting to notice that parental cognitive skills are negatively related to their own risk loving index, but positively related to his/her partner's risk loving attitudes.

As it is expected, mothers considering the future for consumption and saving decisions are positively related to father's cognitive ability and father's future valuation, as well as to

[23]Hausman Test for the height model (column 19 in Table 3 and column 2 in Table 7) presents a Chi-square of 74.81 and p-value of 0.0208.

risk loving. In the case of fathers, they present only significant effects on mother's valuation specification, as well as father's age and father's income. Analysing the coefficients of parental propensity to migrate, father's propensity appears significant for mother's depression index. Although mother's propensity present a positive coefficient in father's depression specification, this is not significant. Hence, this result sheds light on the relevance of considering father-mother closeness to better understand the environment faced by the child.

General conclusions based on tables 14-17 underpin some evidence of assortative mating, as well as unbalanced associations between fathers and mothers. Although parents select similar personalities to them to get married, parental human capital presents dissimilar coefficients in partner's specifications. For instance, although human capital is negatively related to partner's depression, father's cognitive coefficient is higher on mother's depression than mother's schooling coefficient on father's depression. In addition, father's propensity to migrate is positively related to mother's depression. This result allows the identification of some indirect effects of father's through mother's emotional status.

6.3 Children without father in the second wave

Based on specification (9), this section adds to the original sample of two-parent children, those infants who faced the separation of their parents between 2002 and 2005. Bringing into focus those children with both parents in the two waves, but not living with their father in 2005, random effect models were considered to analyze the association between parental traits and child outcomes.

The set of parental variables used for this analysis is similar to the set considered in the above section; however, variables collected uniquely for 2005 are not captured in the random effect specifications. Thus, parental risk loving, future valuation, and propensity to migrate are not identified. In addition, the interaction of the dummy variable 'having father in 2002, but not in 2005' with overweight, presents problems of multicollinearity as a result of the few non-zero interactions . Hence, this variable does not appear in these models either. For those father's variables collected in 2002 without follow up in 2005, imputed values from 2002 were considered to fill around fifty percent of non-missing observations of 2005 (specially for emotional status and stress). In order to carry out this imputation, the assumption behind is that the father remained with the same emotional condition and stress as in 2002. Because this assumption is quite strong, the focus of this section will be on human capital variables and income.

The results of the random effect models are shown in Table 8. Each child outcome presents two columns: the first column contains child characteristics, parental cognitive and non-cognitive traits, as well as the dummy variable of 'having or not having father in 2005' (equal to one if the father left home in 2005); and the second column, presents the same variables described before and their interactions with the dummy of absent father. It is worth to notice that the columns including all the interactions does not strictly replicate the coefficients shown in Tables (2) to (5), the reason is explained by the absence of family background characteristics as controls of

these models given the large number of missing values for children with absent fathers. However, the coefficients reported in column (19) of Tables (2) to (5) are very similar to the first set of coefficients (without interaction) in columns (2), (4), (6), and (8) of Table 8.

Analysing odd columns of Table 8, the dummy of 'having father in 2002, but not in 2005' is not significant for most of the outcomes with exception of height, where its coefficient is positive. Looking at the interactions of this variable with parental human capital in columns (2), (4), (6) and (8); the four outcomes behave quite different between them. For instance, mother's schooling presents a negative differential coefficient γ_1 and highly significant, whereas father's schooling does not show any significance. Because the model is controlling for income, mother's schooling might be reflecting maternal participation and therefore, time allocation on child-parent activities. It is likely that mothers without her partner start reallocating her time to other activities to compensate his partner's absence. Hence, more educated mothers may be more likely to find an employment and reduce the time spent with the child at home; this is in accordance with the negative effect of maternal employment on child cognitive skills found by Bernal (2008). In addition, interacted maternal cognitive ability presents a positive and highly significant relation with child's ability. This finding sheds light on the possibility that highly cognitive able mothers are more likely to compensate children than less able mothers providing better quality of mother-child interaction or other inputs to ameliorate father's absence, for instance child care or informal care. Regarding interacted father's cognitive ability, this variable shows a negative and significant coefficient, reflecting a negative association of his absence and the development of child's cognitive skills.

Even though this study does not allow a causal interpretation of marriage dissolution on child outcomes, comparing the cognitive abilities of two-parent children to single-parent children (not having father in 2005) in Graphics (X) and (Y) of *Appendix*[24], we observe that children with father in 2002, but without him in 2005 are having a cognitive distribution more skewed to the left than the rest of children. This reveals that children facing marriage dissolution are already experiencing inadequate home environment which is detrimental for their cognitive performance. Hence, it is likely that γ_1 coefficients (or differential coefficients) are reflecting not only the association of father's absence and child cognitive development, but also a precedent home environment not beneficial for the child. In general, there is some evidence about mothers of single-parent children compensating for the absent father-child interaction, even if the father is still living at home. Regarding the interacted variables of health models, a positive coefficient of maternal cognitive ability appears for height and body mass index, but not for anaemia. Inversely, interacted father's cognitive ability is negatively associated with child's health outcomes, but the only one significant is anaemia (which is not detrimental for the child). Finally, in accordance to the above explanation regarding income variables, maternal income is positively related to height, but fathers present a negative association. It is likely that maternal income might be reflecting not only more resources allocated to the child, but also an increase

[24]Not shown in this version of the paper.

on the bargaining power of the mother after marriage dissolution.

6.4 A matter of genetic transmission or father's involvement ?

In our specifications of cognitive ability, we observe father's is as important as mother's in terms of human capital. However, our models cannot ensure the significant coefficients of parental cognitive ability reflects parental involvement or just genetic transmission. In this section we explore the same human capital variables discussed above, controlling for the rest of variables shown in columns (13).

Table 3 shows a subset of 2,900 observations (instead of 3,740) for which we have individual information about schooling expenditure. By running our model of cognitive ability and the logarithm of schooling expenditure we observe that not only maternal schooling is significant, as the empirical literature has found, but also cognitive abilities of both parents are still significant. Father's cognitive ability is around 35 percent higher than mother's.

This result supports the finding about the relevance of fathers on human capital investment and schooling decisions.

Table 3: Cognitive Abilities and Schooling Expenditure
Random Effects at the individual level

Parental Human Capital	**(1) Resid. Cog. Ability**	**(2) Ln(Schooling Exp.)**
Mother's Schooling	0.007	0.018**
	[0.008]	[0.008]
Father's Schooling	0.023***	0.022***
	[0.007]	[0.007]
Mother's Cognitive Ability (z-score)	0.213***	0.053**
	[0.023]	[0.023]
Father's Cognitive Ability (z-score)	0.173***	0.072***
	[0.024]	[0.024]

Note: Regressions control for child characteristics, demographic composition, low weight at birth, sibling age gap, first order, parental *BMI*, year and state dummies. All columns control for grandparent's schooling, employment and an indicator if they are still alive. Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1.

7 Conclusions

This study provides a better understanding of the *traditional* and *non-traditional* channels of father's role in child development. Our conclusions point out dissimilar associations of parental cognitive and non-cognitive traits on child development. In contrast to the majority of empirical studies on Family Economics for developing countries, this study shows an unknown father's role on child cognitive ability and child health through parental human capital and non-cognitive traits. After controlling for parental cognitive ability and demographic composition, mother's schooling loses significance in child's cognitive models, but father's remains significant even

after controlling for parental non-cognitive traits.

An unexpected finding is derived from random effect specifications regarding the similarity of parental cognitive coefficients on child cognitive models. Although mother's cognitive ability is greater than father's, both of them are highly significant across child's cognitive specifications. As psychologists have found regarding parental emotional stability and cognitive skills, this study sheds light on the negative association of father's depression and stress on child cognitive ability. Additionally, height models suggest that non-cognitive skills are not strongly associated with child's health, but there is a strong and significant association between parental human capital and child height.

When the study compares single-parent children (without father in 2005) with two-parent children, random effect models provide evidence regarding the importance of home environment even before marriage dissolution. Although the separation of parents might directly affect child development, there is some evidence about differences of home environments between both types of children that are already affecting child cognitive performance before the separation of their parents.

For better, fathers influence child development through different channels. Our findings show evidence of a more dimensional role of fathers in Mexico beyond the traditional role of breadwinners. However, if fathers are not aware of the consequences of inadequate home environments, these can be detrimental for child development in the long-term.

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A Appendix: Figures and Tables

Table 4: Descriptive Statistics: Dependent Variables

Variable	**Mean**	**St. Deviation**	**Min.**	**Max.**
Cognitive Ability - All children (5 to 12 years old)	11.5 (64%)	4	0	18
Cognitive Ability - 5 years old	9.0 (50%)	4	0	18
Cognitive Ability - 6 years old	9.2 (51%)	3	1	18
Cognitive Ability - 7 years old	9.9 (55%)	4	2	18
Cognitive Ability - 8 years old	10.8 (64%)	3	1	17
Cognitive Ability - 9 years old	11.5 (64%)	3	0	18
Cognitive Ability - 10 years old	12.1 (67%)	3	1	18
Cognitive Ability - 11 years old	12.7 (71%)	3	1	18
Cognitive Ability - 12 years old	13.2 (73%)	3	0	18
Height of girls (cm)	138.0	16	94	178
Height of boys (cm)	138.7	17	93	187

Note: Descriptive statistics are based on the unbalanced panel used for the main models. The number of observations corresponds to those used for cognitive specifications: 3,740 children between 5-12 years old.

Figure 1: Parental Cognitive Ability and Schooling by Age

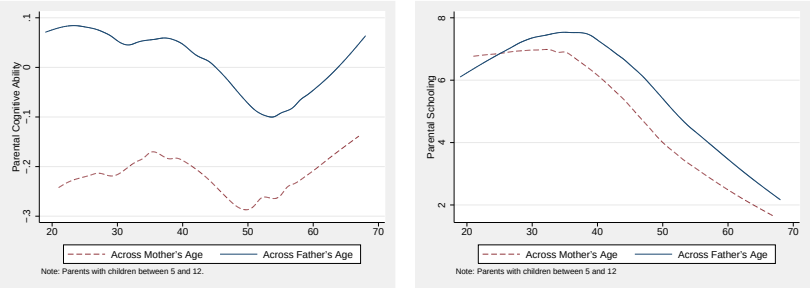

Figure 2: Parental Diastolic and Systolic Blood Pressure by Age

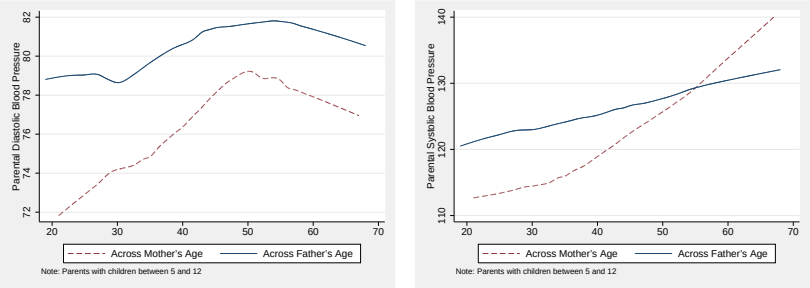

Figure 3: Parental Depression Index by Age

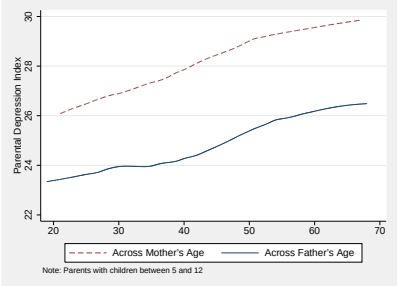

Table 5: Descriptive Statistics: Independent Variables

Variable	Mean	St. Deviation	Min.	Max.
Socio-demographics Variables				
Child's Characteristics				
Age	10	3	5	16
Squared Age	113	58	25	256
Sex	0.49	0.50	0.0	1.0
First born	0.32	0.47	0.0	1.0
Demographic Characteristics				
Sibling Age Gap (Standard Deviation)	3.79	1.35	1.3	11.3
Proportion of Children between 5 to 12	0.38	0.14	0.0	0.8
Proportion of Adolescents between 13 to 18	0.11	0.13	0.0	0.8
Proportion of Adults between 19 to 64	0.42	0.11	0	1
Proportion of Adults above	0.01	0.05	0	1
Traditional Variables				
Parental Age				
Mother's Age	37	7	20	67
Father's Age	40	8	19	68
Parental Human Capital				
Mother's Schooling	6.43	3.60	0.0	14.0
Father's Schooling	6.94	3.85	0.0	14.0
Mother's Cognitive Ability (z-score)	-0.20	0.89	-2.3	2.2
Father's Cognitive Ability (z-score)	0.02	0.88	-2.3	2.3
Non-traditional Variables				
Parental Risk Loving				
Mother's Risk Loving (Level 2)	0.38	0.48	0	1
Mother's Risk Loving (Level 3)	0.12	0.32	0	1
Mother's Risk Loving (Level 4)	0.34	0.47	0	1
Father's Risk Loving (Level 2)	0.38	0.49	0	1
Father's Risk Loving (Level 3)	0.11	0.32	0	1
Father's Risk Loving (Level 4)	0.34	0.47	0	1
Parental Future Valuation				
Mother's Future Valuation	0.67	0.47	0	1
Father's Future Valuation	0.68	0.47	0	1
Parental Closeness				
Mother's propensity to migrate (25 to 50 % prob.)	0.07	0.25	0	1
Father's propensity to migrate (25 to 50% prob.)	0.10	0.30	0	1
Mother's propensity to migrate (51 to 75 % prob.)	0.07	0.25	0	1
Father's propensity to migrate (51 to 75 % prob.)	0.10	0.30	0	1
Mother's propensity to migrate (Above 75 % prob.)	0.03	0.16	0	1
Father's propensity to migrate (Above 75 % prob.)	0.04	0.21	0	1
Parental Mental Health				
Anxious Mother	0.13	0.33	0	1
Anxious Father	0.04	0.21	0	1
Moderate and Severe Depressed Mother's	0.03	0.17	0	1
Moderate and Severe Depressed Father's	0.03	0.17	0	1
Parental Stress				
Mother's Moderate Stress (80/120 mmHg)	0.19	0.39	0	1
Father's Moderate Stress (80/120 mmHg)	0.32	0.47	0	1
Mother's High Stress (90/140 mmHg)	0.04	0.20	0	1
Father's High Stress (90/140 mmHg)	0.10	0.29	0	1
Parental Income				
Mother's Income (1/3)	6	6	0	41
Father's Income (1/3)	13	6	0	59

Note: Descriptive statistics are based on the unbalanced panel used for the main models. The number of observations corresponds to those used for cognitive specifications: 3,740 children between 5-12 years old.

Table 6: Child's Cognitive Ability and Non-Traditional Models
Random Effects at Individual Level

Dep. Var.: Child's Cog. Ability (z-score)	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**
Human Capital													
Mother's Schooling	0.005	0.005	0.004	0.004	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.004	0.004
	[0.007]	[0.007]	[0.007]	[0.007]	[0.007]	[0.007]	[0.007]	[0.007]	[0.007]	[0.007]	[0.007]	[0.007]	[0.007]
Father's Schooling	0.027***	0.027***	0.027***	0.026***	0.027***	0.026***	0.027***	0.026***	0.027***	0.027***	0.027***	0.027***	0.024***
	[0.006]	[0.006]	[0.006]	[0.006]	[0.006]	[0.006]	[0.006]	[0.006]	[0.006]	[0.006]	[0.006]	[0.006]	[0.006]
Mother's Cognitive Ability (z-score)	0.215***	0.214***	0.213***	0.213***	0.214***	0.211***	0.213***	0.214***	0.213***	0.214***	0.213***	0.213***	0.214***
	[0.021]	[0.021]	[0.021]	[0.021]	[0.021]	[0.021]	[0.021]	[0.021]	[0.021]	[0.021]	[0.021]	[0.021]	[0.021]
Father's Cognitive Ability (z-score)	0.163***	0.165***	0.163***	0.164***	0.164***	0.167***	0.163***	0.163***	0.164***	0.165***	0.164***	0.164***	0.169***
	[0.022]	[0.022]	[0.022]	[0.022]	[0.022]	[0.022]	[0.022]	[0.022]	[0.022]	[0.022]	[0.022]	[0.022]	[0.022]
Parental Risk Loving													
Mother's Risk Loving (Level 2)	0.041	0.032											0.033
	[0.048]	[0.050]											[0.050]
Mother's Risk Loving (Level 3)	0.129**	0.119*											0.124**
	[0.060]	[0.061]											[0.062]
Mother's Risk Loving (Level 4)	0.08	0.063											0.056
	[0.049]	[0.052]											[0.052]
Father's Risk Loving (Level 2)		0.034											0.041
		[0.049]											[0.049]
Father's Risk Loving (Level 3)		0.031											0.035
		[0.063]											[0.063]
Father's Risk Loving (Level 4)		0.058											0.063
		[0.051]											[0.051]
Parental Future Valuation													
Mother's Future Valuation			0.02	0.003									0.002
			[0.036]	[0.038]									[0.038]
Father's Future Valuation				0.049									0.037
				[0.037]									[0.038]
Parental Closeness													
Mother's propensity to migrate (25 to 50 % prob.)					0.069	0.092							0.089
					[0.058]	[0.059]							[0.059]
Mother's propensity to migrate (51 to 75 % prob.)					-0.07	-0.052							-0.049
					[0.062]	[0.063]							[0.062]
Mother's propensity to migrate (Above 75 % prob.)					-0.212**	-0.186*							-0.188*
					[0.097]	[0.098]							[0.100]
Father's propensity to migrate (25 to 50% prob.)						-0.133**							-0.133**
						[0.054]							[0.054]
Father's propensity to migrate (51 to 75 % prob.)						-0.062							-0.062
						[0.054]							[0.054]
Father's propensity to migrate (Above 75 % prob.)						-0.128*							-0.124
						[0.077]							[0.078]
Parental Mental Health													
Mother's Anxiety							0.044	0.06					0.06
							[0.048]	[0.048]					[0.048]
Mother's Moderate/Severe Depression							-0.128	0.404*					0.376
							[0.094]	[0.226]					[0.239]
Father's Anxiety								-0.232***					-0.238***
								[0.086]					[0.087]
Father's Moderate/Severe Depression								-0.554**					-0.500**
								[0.237]					[0.251]
Parental Stress													
Mother's Moderate Stress (80/120 mmHg)									-0.031	-0.02			-0.013
									[0.045]	[0.045]			[0.045]
Mother's High Stress (90/140 mmHg)									0.04	0.054			0.036
									[0.073]	[0.074]			[0.075]
Father's Moderate Stress (80/120 mmHg)										-0.052			-0.053
										[0.038]			[0.038]
Father's High Stress (90/140 mmHg)										-0.005			-0.012
										[0.055]			[0.056]
Parental Income													
Mother's Income (1/3)											0.001	0.001	0.001
											[0.003]	[0.003]	[0.003]
Father's Income (1/3)												0.001	0.000
												[0.003]	[0.003]
Constant	-0.607**	-0.634**	-0.561**	-0.575**	-0.541**	-0.510*	-0.563**	-0.559**	-0.549**	-0.531*	-0.554**	-0.558**	-0.598**
	[0.277]	[0.277]	[0.275]	[0.276]	[0.275]	[0.275]	[0.275]	[0.274]	[0.274]	[0.274]	[0.275]	[0.275]	[0.277]
Observations	3740	3740	3740	3740	3740	3740	3740	3740	3740	3740	3740	3740	3740
Number of groups	2388	2388	2388	2388	2388	2388	2388	2388	2388	2388	2388	2388	2388
Sigma e	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Sigma u	0.3	0.3	0.3	0.3	0.3	0.29	0.3	0.31	0.3	0.3	0.3	0.3	0.3
Sigma s	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Rho	0.10	0.11	0.10	0.10	0.10	0.10	0.10	0.11	0.10	0.10	0.11	0.10	0.11

Note: Regressions control for child characteristics, demographic composition, low weight at birth, sibling age gap, first order and parental *BMI* in column (5), (6), and (13). All columns of non-traditional models control for assortative mating by including grandparent's schooling, employment and an indicator if they are still alive. Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1.

Table 7: Child's Cognitive Ability and Traditional Models
Random Effects at Individual Level using Balanced Panel

Dependent variable: Child's Cog. Ability (z-score)	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Human Capital					
Mother's Schooling	0.053***	0.024***	0.001	0.000	0.000
	[0.007]	[0.008]	[0.008]	[0.008]	[0.009]
Father's Schooling		0.049***	0.042***	0.028***	0.028***
		[0.007]	[0.007]	[0.007]	[0.008]
Mother's Cognitive Ability (z-score)			0.258***	0.212***	0.216***
			[0.024]	[0.025]	[0.025]
Father's Cognitive Ability (z-score)				0.177***	0.165***
				[0.027]	[0.027]
Constant	-0.749**	-0.929***	-0.593**	-0.461	-0.638**
	[0.302]	[0.300]	[0.294]	[0.291]	[0.324]
Observations	2704	2704	2704	2704	2704
Number of groups	1352	1352	1352	1352	1352
Sigma e	0.87	0.87	0.87	0.87	0.87
Sigma u	0.45	0.43	0.37	0.35	0.33
Sigma s	0.98	0.96	0.94	0.93	0.93
Rho	0.21	0.19	0.16	0.14	0.13

Note: Regressions control for child characteristics, demographic composition, low weight at birth, sibling age gap and first order. Column (5) controls for assortative mating by including grandparent's schooling, employment and an indicator if they are still alive. Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1.

Table 8: Child's Cognitive Ability and Non-Traditional Models

Random Effects at Individual Level using Balanced Panel

Dep. Var.: Child's Cog. Ability (z-score)	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**
Human Capital													
Mother's Schooling	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.001	0.000	-0.001	-0.001
	[0.009]	[0.009]	[0.009]	[0.009]	[0.009]	[0.009]	[0.009]	[0.009]	[0.009]	[0.009]	[0.009]	[0.009]	[0.009]
Father's Schooling	0.028***	0.028***	0.028***	0.028***	0.028***	0.029***	0.028***	0.026***	0.028***	0.028***	0.028***	0.028***	0.027***
	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]
Mother's Cognitive Ability (z-score)	0.219***	0.217***	0.216***	0.216***	0.214***	0.210***	0.216***	0.218***	0.216***	0.217***	0.216***	0.216***	0.212***
	[0.025]	[0.025]	[0.025]	[0.025]	[0.025]	[0.025]	[0.025]	[0.025]	[0.025]	[0.025]	[0.025]	[0.025]	[0.025]
Father's Cognitive Ability (z-score)	0.165***	0.169***	0.165***	0.165***	0.165***	0.169***	0.165***	0.166***	0.165***	0.166***	0.165***	0.165***	0.176***
	[0.027]	[0.027]	[0.027]	[0.027]	[0.027]	[0.026]	[0.027]	[0.027]	[0.027]	[0.027]	[0.027]	[0.027]	[0.027]
Parental Risk Loving													
Mother's Risk Loving (Level 2)	0.07	0.061											0.042
	[0.059]	[0.061]											[0.061]
Mother's Risk Loving (Level 3)	0.232***	0.216***											0.198**
	[0.074]	[0.076]											[0.077]
Mother's Risk Loving (Level 4)	0.135**	0.111*											0.09
	[0.061]	[0.064]											[0.064]
Father's Risk Loving (Level 2)		0.055											0.069
		[0.058]											[0.058]
Father's Risk Loving (Level 3)		0.096											0.107
		[0.079]											[0.079]
Father's Risk Loving (Level 4)		0.082											0.104*
		[0.060]											[0.061]
Parental Future Valuation													
Mother's Future Valuation			0.017	0.006									0.002
			[0.044]	[0.047]									[0.047]
Father's Future Valuation				0.033									0.019
				[0.046]									[0.047]
Parental Closeness													
Mother's propensity to migrate (25 to 50 % prob.)					0.091	0.131*							0.134*
					[0.071]	[0.071]							[0.072]
Mother's propensity to migrate (51 to 75 % prob.)					-0.055	-0.047							-0.039
					[0.077]	[0.078]							[0.077]
Mother's propensity to migrate (Above 75 % prob.)					-0.166	-0.162							-0.154
					[0.125]	[0.131]							[0.132]
Father's propensity to migrate (25 to 50 % prob.)						-0.221***							-0.215***
						[0.063]							[0.063]
Father's propensity to migrate (51 to 75 % prob.)						0.026							0.026
						[0.068]							[0.070]
Father's propensity to migrate (Above 75 % prob.)						-0.117							-0.102
						[0.093]							[0.093]
Parental Stress													
Mother's Moderate Stress (80/120 mmHg)							0.018	0.042					0.04
							[0.060]	[0.060]					[0.060]
Mother's High Stress (90/140 mmHg)							-0.179	0.303					0.221
							[0.120]	[0.222]					[0.232]
Father's Moderate Stress (80/120 mmHg)								-0.275***					-0.303***
								[0.101]					[0.102]
Father's High Stress (90/140 mmHg)								-0.489**					-0.372
								[0.242]					[0.250]
Parental Mental Health													
Mother's Anxiety									0.016	0.033			0.048
									[0.053]	[0.053]			[0.054]
Mother's Moderate/Severe Depression									-0.004	0.02			-0.021
									[0.093]	[0.094]			[0.095]
Father's Anxiety										-0.066			-0.071
										[0.045]			[0.045]
Father's Moderate/Severe Depression										-0.04			-0.043
										[0.066]			[0.067]
Parental Income													
Mother's Income (1/3)											0.002	0.002	0.003
											[0.003]	[0.003]	[0.003]
Father's Income (1/3)												0.001	0.000
												[0.003]	[0.003]
Constant	-0.726**	-0.766**	-0.645**	-0.651**	-0.650**	-0.648**	-0.639**	-0.635**	-0.636**	-0.609*	-0.635**	-0.639**	-0.754**
	[0.324]	[0.325]	[0.325]	[0.324]	[0.324]	[0.325]	[0.323]	[0.322]	[0.323]	[0.324]	[0.324]	[0.325]	[0.326]
Observations	2704	2704	2704	2704	2704	2704	2704	2704	2704	2704	2704	2704	2704
Number of groups	1352	1352	1352	1352	1352	1352	1352	1352	1352	1352	1352	1352	1352
Sigma e	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Sigma u	0.32	0.33	0.33	0.33	0.33	0.32	0.33	0.33	0.33	0.33	0.33	0.33	0.32
Sigma s	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.92
Rho	0.12	0.12	0.13	0.13	0.12	0.12	0.12	0.13	0.13	0.13	0.13	0.13	0.12

Note: Regressions control for child characteristics, demographic composition, low weight at birth, sibling age gap, first order and parental *BMI* in column (5), (6), and (13). All columns of non-traditional models control for assortative mating by including grandparent's schooling, employment and an indicator if they are still alive. Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1.

Table 9: Child's Cognitive Ability and Non-Traditional Models
Fixed Effects at Individual Level

Dep. Var.: Child's Cog. Ability (z-score)	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
Parental Mental Health							
Mother's Anxiety	-0.027	0.003					0.000
	[0.091]	[0.090]					[0.089]
Mother's Moderate/Severe Depression	-0.003	0.687**					0.633*
	[0.168]	[0.334]					[0.350]
Father's Anxiety		-0.512***					-0.531***
		[0.130]					[0.131]
Father's Moderate/Severe Depression		-0.660*					-0.580
		[0.345]					[0.361]
Parental Stress							
Mother's Moderate Stress (80/120 mmHg)			0.012	0.034			0.036
			[0.070]	[0.070]			[0.070]
Mother's High Stress (90/140 mmHg)			-0.082	-0.06			-0.105
			[0.118]	[0.117]			[0.116]
Father's Moderate Stress (80/120 mmHg)				-0.04			-0.051
				[0.063]			[0.063]
Father's High Stress (90/140 mmHg)				-0.167*			-0.165*
				[0.089]			[0.090]
Parental Income							
Mother's Income (1/3)					0.006	0.006	0.008
					[0.005]	[0.005]	[0.005]
Father's Income (1/3)						0.000	0.002
						[0.004]	[0.004]
Constant	0.156	0.103	0.146	0.28	0.108	0.107	0.200
	[0.518]	[0.513]	[0.517]	[0.523]	[0.517]	[0.517]	[0.530]
Observations	3740	3740	3740	3740	3740	3740	3740
Number of observations	2388	2388	2388	2388	2388	2388	2388
Sigma e	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Sigma u	0.88	0.89	0.88	0.89	0.88	0.88	0.89
Sigma s	1.24	1.24	1.24	1.24	1.24	1.24	1.24
Rho	0.51	0.51	0.51	0.51	0.51	0.51	0.51
Hausman Test							
No. of parameters	42	44	42	44	41	42	52
Chi2	29.67	36.57	28.98	32.74	27.45	28.52	40.41
Prob >chi2	0.92	0.78	0.94	0.89	0.95	0.94	0.88

Note: Regressions control for child characteristics, demographic composition, low weight at birth, sibling age gap, first order and parental *BMI* in column (5), (6), and (13). All columns of non-traditional models control for assortative mating by including grandparent's schooling, employment and an indicator if they are still alive. Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1.

Table 10: Child's Height and Non-Traditional Models
Random Effects at Individual Level

Dep. Var.: Child's Height (z-score)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Human Capital														
Mother's Schooling	0.029***	0.028***	0.027***	0.027***	0.028***	0.027***	0.029***	0.030***	0.029***	0.029***	0.030***	0.030***	0.025***	0.002
	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]
Father's Schooling	0.036***	0.036***	0.035***	0.035***	0.034***	0.033***	0.036***	0.037***	0.036***	0.036***	0.036***	0.034***	0.032***	0.025***
	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.007]
Mother's Cognitive Ability (z-score)	0.106***	0.101***	0.105***	0.105***	0.094***	0.091***	0.107***	0.106***	0.106***	0.108***	0.106***	0.104***	0.083***	0.036
	[0.028]	[0.028]	[0.028]	[0.028]	[0.028]	[0.027]	[0.028]	[0.028]	[0.028]	[0.028]	[0.028]	[0.028]	[0.027]	[0.025]
Father's Cognitive Ability (z-score)	0.056**	0.059**	0.052*	0.053*	0.060**	0.057**	0.058**	0.058**	0.056**	0.056**	0.056**	0.055*	0.056*	0.005
	[0.028]	[0.028]	[0.028]	[0.028]	[0.028]	[0.028]	[0.028]	[0.028]	[0.028]	[0.028]	[0.028]	[0.028]	[0.029]	[0.026]
Parental Risk Loving														
Mother's Risk Loving (Level 2)	0.174***	0.182***											0.174***	0.107*
	[0.066]	[0.067]											[0.067]	[0.061]
Mother's Risk Loving (Level 3)	0.134	0.123											0.079	0.059
	[0.084]	[0.086]											[0.086]	[0.077]
Mother's Risk Loving (Level 4)	0.127*	0.086											0.073	-0.004
	[0.067]	[0.072]											[0.072]	[0.064]
Father's Risk Loving (Level 2)		-0.028											0.01	-0.03
		[0.066]											[0.066]	[0.060]
Father's Risk Loving (Level 3)		0.048											0.069	0.01
		[0.091]											[0.090]	[0.080]
Father's Risk Loving (Level 4)		0.107											0.116*	0.054
		[0.070]											[0.070]	[0.063]
Parental Future Valuation														
Mother's Future Valuation			0.139***	0.125**									0.116**	0.061
			[0.049]	[0.051]									[0.051]	[0.046]
Father's Future Valuation				0.043									0.011	-0.014
				[0.051]									[0.051]	[0.046]
Parental Closeness														
					[0.049]	[0.049]							[0.049]	[0.057]
Mother's propensity to migrate (25 to 50 % prob.)					0.304***	0.318***							0.312***	0.179**
					[0.091]	[0.091]							[0.091]	[0.077]
Mother's propensity to migrate (51 to 75 % prob.)					0.024	0.02							0.03	-0.024
					[0.083]	[0.085]							[0.086]	[0.078]
Mother's propensity to migrate (Above 75 % prob.)					0.256*	0.251*							0.259*	0.121
					[0.131]	[0.130]							[0.132]	[0.125]
						[0.046]							[0.046]	[0.056]
Father's propensity to migrate (25 to 50 % prob.)						-0.104							-0.114	-0.140**
						[0.072]							[0.071]	[0.062]
Father's propensity to migrate (51 to 75 % prob.)						0.009							0.002	-0.056
						[0.081]							[0.080]	[0.071]
Father's propensity to migrate (Above 75 % prob.)						0.145							0.128	0.005
						[0.100]							[0.102]	[0.090]
Parental Mental Health														
Mother's Anxiety							0.014	0.005					-0.01	-0.067
							[0.061]	[0.061]					[0.061]	[0.058]
Mother's Moderate/Severe Depression							0.119	0.261					0.327	-0.076
							[0.111]	[0.351]					[0.398]	[0.379]
Father's Anxiety								0.169*					0.144	0.131
								[0.096]					[0.094]	[0.092]
Father's Moderate/Severe Depression								-0.163					-0.209	0.149
								[0.347]					[0.392]	[0.373]
Parental Stress														
Mother's Moderate Stress (80/120 mmHg)									-0.018	-0.019			-0.047	-0.082*
									[0.051]	[0.052]			[0.051]	[0.047]
Mother's High Stress (90/140 mmHg)									0.002	0.002			0.002	0.002
									[0.092]	[0.092]			[0.092]	[0.089]
Father's Moderate Stress (80/120 mmHg)										-0.04			-0.04	-0.034
										[0.044]			[0.044]	[0.041]
Father's High Stress (90/140 mmHg)										0.071			0.041	0.05
										[0.066]			[0.065]	[0.061]
Parental Income														
Mother's Income (1/3)											-0.003	-0.004	-0.005*	-0.003
											[0.003]	[0.003]	[0.003]	[0.003]
Father's Income (1/3)												0.008**	0.006*	0.004
												[0.003]	[0.003]	[0.003]
Parental Height and Weight														
Mother's Height (cm)														0.037***
														[0.004]
Father's Height (cm)														0.035***
														[0.004]
Mother's Weight (kg)														0.009***
														[0.002]
Father's Weight (kg)														0.003
														[0.002]
Constant	-2.011***	-2.024***	-1.914***	-1.927***	-1.959***	-1.991***	-1.864***	-1.860***	-1.865***	-1.859***	-1.867***	-1.903***	-2.212***	-13.945***
	[0.338]	[0.338]	[0.340]	[0.339]	[0.338]	[0.336]	[0.339]	[0.339]	[0.340]	[0.339]	[0.339]	[0.340]	[0.337]	[0.714]
Observations	3663	3663	3663	3663	3663	3663	3663	3663	3663	3663	3663	3663	3663	3663
Number of groups	2364	2364	2364	2364	2364	2364	2364	2364	2364	2364	2364	2364	2364	2364
Sigma e	0.84	0.84	0.84	0.84	0.84	0.83	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.83
Sigma u	0.82	0.82	0.82	0.82	0.81	0.81	0.82	0.82	0.82	0.82	0.82	0.82	0.8	0.64
Sigma s	1.17	1.17	1.17	1.17	1.16	1.16	1.17	1.17	1.17	1.17	1.17	1.17	1.16	1.05
Rho	0.49	0.49	0.49	0.49	0.48	0.48	0.49	0.49	0.49	0.49	0.49	0.49	0.48	0.38

Note: Regressions control for child characteristics, demographic composition, low weight at birth, sibling age gap, first order and parental *BMI* in column (5), (6), and (13). All columns of non-traditional models control for assortative mating by including grandparent's schooling, employment and an indicator if they are still alive. Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1.

Table 11: Child's Height and Traditional Models

Random Effects at Individual Level using Balanced Panel

Dependent variable: Child's Height (z-score)	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Human Capital					
Mother's Schooling	0.073***	0.042***	0.029***	0.029***	0.025**
	[0.008]	[0.009]	[0.010]	[0.010]	[0.010]
Father's Schooling		0.051***	0.047***	0.043***	0.041***
		[0.010]	[0.009]	[0.010]	[0.010]
Mother's Cognitive Ability (z-score)			0.149***	0.136***	0.127***
			[0.032]	[0.034]	[0.034]
Father's Cognitive Ability (z-score)				0.049	0.04
				[0.034]	[0.035]
Constant	-1.259***	-1.458***	-1.262***	-1.224***	-1.268***
	[0.368]	[0.366]	[0.367]	[0.368]	[0.399]
Observations	2598	2598	2598	2598	2598
Number of groups	1299	1299	1299	1299	1299
Sigma e	0.83	0.83	0.83	0.83	0.84
Sigma u	0.82	0.81	0.8	0.8	0.78
Sigma s	1.17	1.16	1.15	1.15	1.14
Rho	0.49	0.48	0.48	0.48	0.47

Note: Regressions control for child characteristics, demographic composition, low weight at birth, sibling age gap and first order. Column (5) controls for assortative mating by including grandparent's schooling, employment and an indicator if they are still alive. Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1.

Table 12: Child's Height and Non-Traditional Models

Random Effects at Individual Level using Balanced Panel

Dep. Var.: Child's Height (z-score)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Human Capital														
Mother's Schooling	0.024**	0.023**	0.022**	0.022**	0.024**	0.022**	0.026**	0.026**	0.025**	0.025**	0.025**	0.024**	0.019*	-0.001
	[0.010]	[0.010]	[0.010]	[0.010]	[0.010]	[0.010]	[0.010]	[0.010]	[0.010]	[0.010]	[0.010]	[0.010]	[0.010]	[0.010]
Father's Schooling	0.042***	0.041***	0.041***	0.041***	0.038***	0.039***	0.041***	0.041***	0.041***	0.041***	0.041***	0.039***	0.037***	0.030***
	[0.010]	[0.010]	[0.010]	[0.010]	[0.010]	[0.010]	[0.010]	[0.010]	[0.010]	[0.010]	[0.010]	[0.010]	[0.010]	[0.009]
Mother's Cognitive Ability (z-score)	0.126***	0.118***	0.125***	0.125***	0.112***	0.109***	0.127***	0.127***	0.127***	0.128***	0.127***	0.126***	0.097***	0.049
	[0.034]	[0.034]	[0.035]	[0.035]	[0.034]	[0.034]	[0.034]	[0.034]	[0.034]	[0.034]	[0.034]	[0.034]	[0.034]	[0.031]
Father's Cognitive Ability (z-score)	0.036	0.041	0.038	0.037	0.046	0.046	0.04	0.039	0.041	0.041	0.04	0.04	0.044	0.007
	[0.034]	[0.035]	[0.035]	[0.035]	[0.034]	[0.034]	[0.035]	[0.035]	[0.035]	[0.035]	[0.035]	[0.035]	[0.035]	[0.032]
Parental Risk Loving														
Mother's Risk Loving (Level 2)	0.184**	0.187**											0.165*	0.121
	[0.085]	[0.086]											[0.086]	[0.079]
Mother's Risk Loving (Level 3)	0.008	-0.002											-0.06	-0.075
	[0.108]	[0.109]											[0.106]	[0.097]
Mother's Risk Loving (Level 4)	0.204**	0.147											0.126	0.066
	[0.087]	[0.091]											[0.090]	[0.082]
Father's Risk Loving (Level 2)		0.013											0.043	-0.03
		[0.081]											[0.082]	[0.074]
Father's Risk Loving (Level 3)		-0.013											0.015	-0.034
		[0.119]											[0.118]	[0.106]
Father's Risk Loving (Level 4)		0.177**											0.178**	0.064
		[0.085]											[0.086]	[0.078]
Parental Future Valuation														
Mother's Future Valuation			0.155**	0.133**									0.102	0.073
			[0.061]	[0.065]									[0.064]	[0.057]
Father's Future Valuation				0.06									0.031	0.009
				[0.065]									[0.065]	[0.059]
Parental Closeness														
					[0.058]	[0.058]							[0.059]	[0.069]
Mother's propensity to migrate (25 to 50 % prob.)					0.422***	0.441***							0.447***	0.264***
					[0.107]	[0.107]							[0.108]	[0.095]
Mother's propensity to migrate (51 to 75 % prob.)					0.203*	0.188							0.195	0.1
					[0.116]	[0.118]							[0.119]	[0.108]
Mother's propensity to migrate (Above 75 % prob.)					0.281*	0.263							0.271	0.124
					[0.162]	[0.164]							[0.171]	[0.161]
						[0.056]							[0.056]	[0.069]
Father's propensity to migrate (25 to 50 % prob.)						-0.112							-0.127	-0.154**
						[0.086]							[0.086]	[0.074]
Father's propensity to migrate (51 to 75 % prob.)						0.074							0.055	-0.002
						[0.101]							[0.101]	[0.090]
Father's propensity to migrate (Above 75 % prob.)						0.079							0.074	-0.005
						[0.135]							[0.137]	[0.118]
Parental Mental Health														
Mother's Anxiety							0.007	0.007					-0.001	-0.066
							[0.076]	[0.076]					[0.077]	[0.073]
Mother's Moderate/Severe Depression							0.257**	0.935**					1.063**	0.658
							[0.122]	[0.448]					[0.477]	[0.489]
Father's Anxiety								0.053					0.007	-0.007
								[0.106]					[0.105]	[0.105]
Father's Moderate/Severe Depression								-0.72					-0.824*	-0.44
								[0.449]					[0.478]	[0.484]
Parental Stress														
Mother's Moderate Stress (80/120 mmHg)									0.038	0.038			0.022	0.001
									[0.056]	[0.057]			[0.056]	[0.053]
Mother's High Stress (90/140 mmHg)									-0.013	-0.01			-0.033	-0.039
									[0.108]	[0.108]			[0.108]	[0.108]
Father's Moderate Stress (80/120 mmHg)										-0.054			-0.045	-0.068
										[0.051]			[0.050]	[0.048]
Father's High Stress (90/140 mmHg)										0.073			0.042	0.054
										[0.076]			[0.075]	[0.071]
Parental Income														
Mother's Income (1/3)											0.001	0.000	0.000	0.001
											[0.004]	[0.004]	[0.004]	[0.004]
Father's Income (1/3)												0.007*	0.006	0.003
												[0.004]	[0.004]	[0.004]
Parental Height and Weight														
Mother's Height (cm)														0.030***
														[0.005]
Father's Height (cm)														0.034***
														[0.005]
Mother's Weight (kg)														0.008***
														[0.003]
Father's Weight (kg)														0.005*
														[0.003]
Constant	-1.404***	-1.468***	-1.331***	-1.344***	-1.405***	-1.502***	-1.271***	-1.256***	-1.262***	-1.255***	-1.267***	-1.298***	-1.744***	-12.488***
	[0.393]	[0.394]	[0.401]	[0.400]	[0.397]	[0.394]	[0.399]	[0.399]	[0.400]	[0.399]	[0.399]	[0.399]	[0.393]	[0.894]
Observations	2598	2598	2598	2598	2598	2598	2598	2598	2598	2598	2598	2598	2598	2598
Number of groups	1299	1299	1299	1299	1299	1299	1299	1299	1299	1299	1299	1299	1299	1299
Sigma e	0.84	0.84	0.84	0.84	0.84	0.83	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.83
Sigma u	0.78	0.78	0.78	0.78	0.76	0.76	0.78	0.78	0.78	0.78	0.78	0.78	0.75	0.62
Sigma s	1.14	1.14	1.14	1.14	1.13	1.13	1.14	1.14	1.14	1.14	1.14	1.14	1.12	1.04
Rho	0.46	0.46	0.46	0.47	0.46	0.46	0.46	0.46	0.47	0.46	0.47	0.46	0.45	0.36

Note: Regressions control for child characteristics, demographic composition, low weight at birth, sibling age gap, first order and parental *BMI* in column (5), (6), and (13). All columns of non-traditional models control for assortative mating by including grandparent's schooling, employment and an indicator if they are still alive. Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1.

Table 13: Child's Height and Non-Traditional Models
Fixed Effects at Individual Level

Dep. Var.: Child's Height (z-score)	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Parental Mental Health								
Mother's Anxiety	-0.003	-0.003					-0.008	-0.014
	[0.090]	[0.090]					[0.091]	[0.088]
Mother's Moderate/Severe Depression	0.064	0.485					0.449	0.191
	[0.152]	[0.817]					[0.823]	[0.965]
Father's Anxiety		0.087					0.071	0.041
		[0.125]					[0.124]	[0.125]
Father's Moderate/Severe Depression		-0.461					-0.404	-0.114
		[0.802]					[0.808]	[0.946]
Parental Stress								
Mother's Moderate Stress (80/120 mmHg)			0.036	0.046			0.033	0.019
			[0.064]	[0.064]			[0.064]	[0.064]
Mother's High Stress (90/140 mmHg)			-0.045	-0.033			-0.031	-0.057
			[0.117]	[0.118]			[0.119]	[0.120]
Father's Moderate Stress (80/120 mmHg)				-0.083			-0.075	-0.084
				[0.061]			[0.061]	[0.060]
Father's High Stress (90/140 mmHg)				-0.019			-0.028	-0.013
				[0.087]			[0.087]	[0.086]
Parental Income								
Mother's Income (1/3)					0.000	-0.001	-0.001	-0.001
					[0.004]	[0.004]	[0.004]	[0.004]
Father's Income (1/3)						0.003	0.003	0.002
						[0.005]	[0.005]	[0.004]
Parental Height and Weight								
Mother's Height (cm)								0.000
								[0.009]
Father's Height (cm)								0.031***
								[0.010]
Mother's Weight (kg)								-0.001
								[0.005]
Father's Weight (kg)								0.009
								[0.006]
Constant	-1.676***	-1.650***	-1.691***	-1.563***	-1.680***	-1.689***	-1.710***	-7.217***
	[0.492]	[0.490]	[0.489]	[0.487]	[0.491]	[0.490]	[0.498]	[1.920]
Observations	3663	3663	3663	3663	3663	3663	3663	3663
Number of groups	2364	2364	2364	2364	2364	2364	2364	2364
Sigma e	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.83
Sigma u	1.2	1.21	1.21	1.2	1.2	1.2	1.19	1.1
Sigma s	1.47	1.47	1.47	1.47	1.47	1.46	1.45	1.38
Rho	0.67	0.67	0.68	0.67	0.68	0.67	0.67	0.64
Hausman Test								
No. of parameters	42	44	42	44	41	42	52	56
Chi2	61.55	61.33	62.74	69.61	63.37	64.71	74.81	97.78
Prob >chi2	0.03	0.04	0.02	0.01	0.01	0.01	0.02	0.00

Note: Regressions control for child characteristics, demographic composition, low weight at birth, sibling age gap, first order and parental *BMI* in column (8). All columns of non-traditional models control for assortative mating by including grandparent's schooling, employment and an indicator if they are still alive. Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1.

Table 14: Assortative Mating: Parental Human Capital Models

Clustered OLS by household using MxFLS 2005

Dep. Var. in columns	**(1) Edu Mum**	**(2) Edu Dad**	**(3) Cog Mum**	**(4) Cog Dad**
Human Capital				
Mother's Schooling		0.425***	0.067***	-0.007
		[0.038]	[0.010]	[0.010]
Father's Schooling	0.336***		-0.006	0.068***
	[0.031]		[0.009]	[0.009]
Mother's Cognitive Ability (z-score)	0.679***	-0.074		0.259***
	[0.094]	[0.114]		[0.035]
Father's Cognitive Ability (z-score)	-0.069	0.884***	0.262***	
	[0.105]	[0.117]	[0.035]	
Parental Risk Loving				
Mother's Risk Loving (Level 2)	0.010	-0.177	-0.022	0.067
	[0.228]	[0.277]	[0.078]	[0.074]
Mother's Risk Loving (Level 3)	-0.556**	0.175	-0.136	0.028
	[0.272]	[0.339]	[0.093]	[0.094]
Mother's Risk Loving (Level 4)	-0.089	-0.310	-0.099	0.101
	[0.247]	[0.290]	[0.082]	[0.078]
Father's Risk Loving (Level 2)	0.338	-0.194	-0.035	-0.094
	[0.245]	[0.283]	[0.086]	[0.080]
Father's Risk Loving (Level 3)	0.604**	-0.696**	-0.066	-0.095
	[0.280]	[0.337]	[0.098]	[0.100]
Father's Risk Loving (Level 4)	0.356	0.002	0.069	-0.162**
	[0.264]	[0.298]	[0.088]	[0.082]
Parental Future Valuation				
Mother's Future Valuation	0.257	0.033	0.067	0.054
	[0.182]	[0.206]	[0.057]	[0.058]
Father's Future Valuation	0.042	0.432**	-0.040	-0.027
	[0.179]	[0.194]	[0.058]	[0.058]
Parental Closeness				
Mother's propensity to migrate (25 to 50 % prob.)	0.112	0.263	0.313***	-0.132
	[0.283]	[0.339]	[0.092]	[0.090]
Mother's propensity to migrate (51 to 75 % prob.)	0.290	-0.499	0.137	0.125
	[0.313]	[0.392]	[0.102]	[0.103]
Mother's propensity to migrate (Above 75 % prob.)	0.732	0.099	0.137	-0.192
	[0.519]	[0.588]	[0.152]	[0.155]
Father's propensity to migrate (25 to 50 % prob.)	0.267	0.074	-0.005	0.112
	[0.261]	[0.347]	[0.080]	[0.095]
Father's propensity to migrate (51 to 75 % prob.)	0.396	-0.336	-0.043	0.098
	[0.253]	[0.299]	[0.079]	[0.075]
Father's propensity to migrate (Above 75 % prob.)	0.153	-0.206	-0.045	0.247**
	[0.367]	[0.458]	[0.104]	[0.112]
Parental Stress				
Mother's Moderate Stress (80/120 mmHg)	-0.404	0.144	-0.008	0.012
	[0.287]	[0.311]	[0.094]	[0.085]
Mother's High Stress (90/140 mmHg)	-0.041	-0.422	0.225	0.014
	[0.629]	[0.899]	[0.242]	[0.258]
Father's Moderate Stress (80/120 mmHg)	0.260	-0.242	0.045	0.095
	[0.215]	[0.258]	[0.079]	[0.073]
Father's High Stress (90/140 mmHg)	-0.027	-0.770	-0.089	0.383**
	[0.524]	[0.558]	[0.162]	[0.170]
Parental Mental Health				
Mother's Anxiety	-0.398	0.308	-0.072	-0.060
	[0.277]	[0.315]	[0.073]	[0.063]
Mother's Moderate/Severe Depression	-2.420***	0.723	-0.050	0.040
	[0.736]	[1.386]	[0.184]	[0.461]
Father's Anxiety	-0.246	-0.767**	0.136	-0.067
	[0.355]	[0.390]	[0.116]	[0.113]
Father's Moderate/Severe Depression	1.284*	0.409	0.047	-0.358
	[0.739]	[1.414]	[0.198]	[0.447]
Parental Income				
Mother's Income (1/3)	0.066***	0.000	-0.010**	0.003
	[0.013]	[0.015]	[0.004]	[0.004]
Father's Income (1/3)	-0.001	0.041**	0.010**	0.002
	[0.014]	[0.016]	[0.004]	[0.004]
Constant	2.015	1.426	-0.905*	-1.496***
	[1.580]	[1.723]	[0.480]	[0.453]
Test of Equality				
SUR cluster by household				
Parental Schooling chi2(1)	17.5		22.9	
	0.00		0.00	
Parental Cognitive Abilities chi2(1)	23.14		0.07	
	0.000		0.790	
Observations	1939	1939	1939	1939
R-squared	0.59	0.53	0.34	0.32
RMSE	2.39	2.69	0.75	0.74
R2	0.59	0.53	0.34	0.32
AdjR2	0.57	0.51	0.31	0.29
F	28.8	20.1	9.4	8.9

Note: Regressions control for child characteristics, demographic composition, low weight at birth, sibling age gap, first order and parental *BMI* in column (8). All columns control for grandparent's schooling, employment and an indicator if they are still alive. Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1.

Table 15: Assortative Mating: Non-Traditional Parental Variable Models
Clustered OLS by household using MxFLS 2005

Dep. Var. in columns	(1) Risk Mum L2	(2) Risk Mum L3	(3) Risk Mum L4	(4) Risk Dad L2	(5) Risk Dad L3	(6) Risk Dad L4	(7) Fut Mum	(8) Fut Dad
Human Capital								
Mother's Schooling	0.01	-0.009**	0.00	0.00	0.01	0.00	0.01	0.00
	[0.006]	[0.004]	[0.006]	[0.006]	[0.003]	[0.006]	[0.006]	[0.006]
Father's Schooling	0.00	0.01	-0.01	0.00	-0.008**	0.01	0.00	0.011**
	[0.005]	[0.004]	[0.005]	[0.005]	[0.003]	[0.005]	[0.005]	[0.005]
Mother's Cognitive Ability (z-score)	0.02	-0.02	-0.02	-0.02	-0.01	0.034*	0.02	-0.01
	[0.019]	[0.012]	[0.019]	[0.019]	[0.011]	[0.018]	[0.018]	[0.019]
Father's Cognitive Ability (z-score)	0.00	-0.01	0.02	0.00	0.00	-0.031*	0.02	-0.01
	[0.019]		[0.019]	[0.020]	[0.013]	[0.018]	[0.019]	[0.019]
Parental Risk Loving								
Mother's Risk Loving (Level 2)				0.281***	-0.03	-0.02	-0.01	0.075*
				[0.043]	[0.028]	[0.038]	[0.042]	[0.041]
Mother's Risk Loving (Level 3)				0.116**	0.06	0.07	-0.01	0.00
				[0.055]	[0.042]	[0.051]	[0.056]	[0.054]
Mother's Risk Loving (Level 4)				-0.06	0.01	0.342***	0.02	0.02
				[0.041]	[0.028]	[0.040]	[0.044]	[0.043]
Father's Risk Loving (Level 2)	0.220***	0.03	0.03				-0.03	-0.06
	[0.043]	[0.029]	[0.038]				[0.043]	[0.043]
Father's Risk Loving (Level 3)	-0.04	0.089**	0.179***				-0.04	-0.05
	[0.054]	[0.044]	[0.054]				[0.059]	[0.059]
Father's Risk Loving (Level 4)	-0.108***	0.01	0.398***				0.04	0.01
	[0.042]	[0.028]	[0.041]				[0.045]	[0.044]
Parental Future Valuation								
Mother's Future Valuation	-0.03	0.00	0.03	-0.05	-0.02	0.069**		0.317***
	[0.035]	[0.025]	[0.034]	[0.035]	[0.025]	[0.032]		[0.034]
Father's Future Valuation	0.073**	-0.02	-0.02	-0.060*	-0.01	0.052*	0.314***	
	[0.033]	[0.024]	[0.033]	[0.034]	[0.025]	[0.032]	[0.033]	
Parental Closeness								
Mother's propensity to migrate (25 to 50 % prob.)	0.02	0.146***	-0.118**	-0.06	0.02	-0.01	0.00	0.07
	[0.054]	[0.049]	[0.055]	[0.055]	[0.039]	[0.057]	[0.049]	[0.043]
Mother's propensity to migrate (51 to 75 % prob.)	-0.02	0.02	0.00	-0.09	-0.05	0.03	-0.01	-0.03
	[0.053]	[0.039]	[0.058]	[0.057]	[0.036]	[0.057]	[0.057]	[0.058]
Mother's propensity to migrate (Above 75 % prob.)	0.287***	0.03	-0.166***	-0.235***	-0.03	0.09	-0.05	-0.11
	[0.078]	[0.055]	[0.057]	[0.089]	[0.046]	[0.086]	[0.072]	[0.075]
Father's propensity to migrate (25 to 50 % prob.)	0.05	-0.03	-0.05	0.04	-0.03	0.07	-0.01	-0.01
	[0.048]	[0.030]	[0.046]	[0.047]	[0.027]	[0.046]	[0.044]	[0.045]
Father's propensity to migrate (51 to 75 % prob.)	-0.03	0.02	0.086*	0.104**	0.00	-0.03	-0.02	-0.08
	[0.049]	[0.035]	[0.049]	[0.050]	[0.035]	[0.048]	[0.048]	[0.047]
Father's propensity to migrate (Above 75 % prob.)	-0.01	0.05	0.01	0.177**	-0.02	-0.06	0.08	-0.08
	[0.076]	[0.059]	[0.076]	[0.076]	[0.041]	[0.066]	[0.071]	[0.072]
Parental Stress								
Mother's Moderate Stress (80/120 mmHg)	-0.05	0.00	0.04	-0.01	-0.01	0.05	-0.06	0.089**
	[0.042]	[0.030]	[0.045]	[0.043]	[0.027]	[0.045]	[0.047]	[0.040]
Mother's High Stress (90/140 mmHg)	0.04	-0.13	0.16	-0.304**	-0.20	0.20	-0.14	-0.14
	[0.266]	[0.117]	[0.131]	[0.127]	[0.123]	[0.159]	[0.177]	[0.165]
Father's Moderate Stress (80/120 mmHg)	0.02	0.02	-0.06	-0.107*	0.01	0.09	0.137**	-0.06
	[0.067]	[0.055]	[0.065]	[0.060]	[0.048]	[0.064]	[0.056]	[0.062]
Father's High Stress (90/140 mmHg)	-0.04	0.17	-0.18	0.323**	0.256*	-0.275*	0.06	0.09
	[0.264]	[0.123]	[0.129]	[0.131]	[0.132]	[0.154]	[0.176]	[0.165]
Parental Mental Health								
Mother's Anxiety	0.188***	-0.04	-0.05	-0.04	0.01	0.01	0.07	0.02
	[0.056]	[0.031]	[0.050]	[0.058]	[0.034]	[0.050]	[0.050]	[0.051]
Mother's Moderate/Severe Depression	-0.337**	0.393**	-0.10	0.05	0.22	-0.288**	-0.21	0.26
	[0.158]	[0.183]	[0.125]	[0.191]	[0.231]	[0.123]	[0.208]	[0.185]
Father's Anxiety	-0.01	0.05	-0.01	-0.07	0.04	0.01	-0.02	-0.01
	[0.044]	[0.033]	[0.043]	[0.045]	[0.030]	[0.043]	[0.045]	[0.045]
Father's Moderate/Severe Depression	0.06	-0.100*	0.03	0.06	-0.08	0.08	0.06	-0.02
	[0.096]	[0.060]	[0.096]	[0.085]	[0.059]	[0.093]	[0.099]	[0.117]
Parental Income								
Mother's Income (1/3)	0.00	0.00	0.00	0.00	0.00	0.00	0.004*	0.00
	[0.002]	[0.002]	[0.002]	[0.003]	[0.002]	[0.002]	[0.002]	[0.002]
Father's Income (1/3)	0.00	0.00	0.00	0.00	0.005***	0.00	0.00	0.005**
	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]
Constant	0.952***	0.067	-0.077	0.139	0.001	0.277	0.063	0.372
	[0.300]	[0.201]	[0.278]	[0.293]	[0.190]	[0.285]	[0.279]	[0.281]
Observations	1939	1939	1939	1939	1939	1939	1939	1939
R-squared	0.16	0.11	0.18	0.16	0.07	0.21	0.21	0.19
RMSE	0.45	0.31	0.44	0.45	0.31	0.43	0.42	0.43
R2	0.16	0.11	0.18	0.16	0.07	0.21	0.21	0.19
AdjR2	0.12	0.07	0.15	0.12	0.03	0.18	0.18	0.16
F	3.52	1.84	9.6	3.54	1.35	7.96	5.07	4.03

Note: Regressions control for child characteristics, demographic composition, low weight at birth, sibling age gap, first order and parental *BMI* in column (8). All columns control for grandparent's schooling, employment and an indicator if they are still alive. Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1.

Table 16: Assortative Mating: Non-Traditional Parental Variable Models
Clustered OLS by household using MxFLS 2005

Dep. Var. in columns	(1) Mig Mum (25-50%)	(2) Mig Mum (51-75%)	(3) Mig Mum (Above 75%)	(4) Mig Dad (25-50%)	(5) Mig Dad (51-75%)	(6) Mig Dad (Above 75%)	(7) Inc Mum	(8) Inc Dad
Human Capital								
Mother's Schooling	0.00	0.00	0.00	0.00	0.01	0.00	0.387***	0.00
	[0.003]	[0.003]	[0.002]	[0.004]	[0.004]	[0.003]	[0.079]	[0.075]
Father's Schooling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.174***
	[0.003]	[0.003]	[0.002]	[0.004]	[0.004]	[0.003]	[0.068]	[0.066]
Mother's Cognitive Ability (z-score)	0.031***	0.01	0.00	0.00	-0.01	0.00	-0.575**	0.535**
	[0.010]	[0.011]	[0.006]	[0.012]	[0.012]	[0.008]	[0.242]	[0.238]
Father's Cognitive Ability (z-score)	-0.01	0.02	-0.01	0.01	0.01	0.017*	0.16	0.11
	[0.010]	[0.011]	[0.006]	[0.014]	[0.011]	[0.009]	[0.243]	[0.212]
Parental Risk Loving								
Mother's Risk Loving (Level 2)	0.01	-0.01	0.039***	-0.01	0.03	0.01	0.55	-0.55
	[0.023]	[0.022]	[0.012]	[0.030]	[0.023]	[0.018]	[0.552]	[0.502]
Mother's Risk Loving (Level 3)	0.089**	0.00	0.02	-0.05	0.05	0.03	1.183*	-0.10
	[0.035]	[0.028]	[0.014]	[0.035]	[0.033]	[0.029]	[0.691]	[0.667]
Mother's Risk Loving (Level 4)	-0.01	0.00	0.01	-0.05	0.069***	0.01	0.59	-0.32
	[0.025]	[0.024]	[0.008]	[0.030]	[0.025]	[0.019]	[0.561]	[0.482]
Father's Risk Loving (Level 2)	-0.02	-0.048*	-0.036**	0.04	0.053**	0.045**	-0.29	-0.46
	[0.024]	[0.025]	[0.016]	[0.026]	[0.025]	[0.021]	[0.595]	[0.545]
Father's Risk Loving (Level 3)	0.00	-0.061**	-0.03	0.02	0.03	0.02	-0.26	1.210*
	[0.032]	[0.031]	[0.017]	[0.031]	[0.036]	[0.023]	[0.744]	[0.666]
Father's Risk Loving (Level 4)	-0.02	-0.03	-0.02	0.064**	0.02	0.01	-0.13	-0.57
	[0.026]	[0.026]	[0.016]	[0.028]	[0.027]	[0.019]	[0.620]	[0.550]
Parental Future Valuation								
Mother's Future Valuation	0.00	0.00	-0.01	-0.01	-0.01	0.02	0.682*	0.44
	[0.016]	[0.018]	[0.009]	[0.021]	[0.022]	[0.017]	[0.393]	[0.406]
Father's Future Valuation	0.024*	-0.01	-0.01	0.00	-0.03	-0.02	-0.08	0.881**
	[0.014]	[0.019]	[0.009]	[0.021]	[0.022]	[0.017]	[0.392]	[0.398]
Parental Closeness								
Mother's propensity to migrate (25 to 50 % prob.)				0.172***	0.092**	-0.01	-0.17	0.92
				[0.053]	[0.038]	[0.025]	[0.796]	[0.796]
Mother's propensity to migrate (51 to 75 % prob.)				0.03	0.130**	0.070*	-0.35	0.20
				[0.038]	[0.053]	[0.036]	[0.723]	[0.774]
Mother's propensity to migrate (Above 75 % prob.)				0.147*	0.11	0.02	1.12	1.24
				[0.087]	[0.071]	[0.037]	[1.606]	[1.549]
Father's propensity to migrate (25 to 50 % prob.)	0.121***	0.02	0.04				-0.23	0.73
	[0.038]	[0.025]	[0.023]				[0.652]	[0.667]
Father's propensity to migrate (51 to 75 % prob.)	0.069***	0.091**	0.03				0.13	-0.86
	[0.026]	[0.037]	[0.019]				[0.658]	[0.595]
Father's propensity to migrate (Above 75 % prob.)	0.00	0.108**	0.02				-0.94	0.83
	[0.034]	[0.049]	[0.019]				[0.702]	[0.773]
Parental Stress								
Mother's Moderate Stress (80/120 mmHg)	0.02	0.02	0.02	-0.02	-0.01	0.01	0.11	0.53
	[0.027]	[0.026]	[0.014]	[0.028]	[0.027]	[0.021]	[0.554]	[0.488]
Mother's High Stress (90/140 mmHg)	-0.01	-0.03	-0.17	0.07	0.110**	-0.12	6.30	7.39
	[0.067]	[0.073]	[0.130]	[0.086]	[0.056]	[0.131]	[7.725]	[5.958]
Father's Moderate Stress (80/120 mmHg)	0.02	0.00	-0.025*	-0.01	0.06	0.03	1.18	0.64
	[0.045]	[0.045]	[0.014]	[0.056]	[0.055]	[0.038]	[0.982]	[0.660]
Father's High Stress (90/140 mmHg)	-0.03	0.05	0.19	0.06	-0.103*	0.16	-4.85	-9.09
	[0.064]	[0.071]	[0.136]	[0.088]	[0.057]	[0.144]	[7.457]	[5.701]
Parental Mental Health								
Mother's Anxiety	-0.01	-0.02	0.01	0.01	-0.04	-0.01	-1.07	0.39
	[0.023]	[0.018]	[0.018]	[0.042]	[0.026]	[0.025]	[0.788]	[0.681]
Mother's Moderate/Severe Depression	0.05	0.05	-0.03	-0.08	0.09	0.01	0.30	-2.14
	[0.092]	[0.073]	[0.026]	[0.087]	[0.108]	[0.070]	[1.932]	[1.503]
Father's Anxiety	-0.044**	-0.01	-0.01	0.04	0.01	0.02	-0.79	0.07
	[0.019]	[0.026]	[0.011]	[0.034]	[0.029]	[0.021]	[0.523]	[0.580]
Father's Moderate/Severe Depression	0.105*	0.07	0.05	-0.10	-0.09	0.01	0.06	0.60
	[0.056]	[0.080]	[0.045]	[0.066]	[0.055]	[0.059]	[1.414]	[1.297]
Parental Income								
Mother's Income (1/3)	0.00	0.00	0.00	0.00	0.00	0.00		0.148***
	[0.001]	[0.001]	[0.001]	[0.002]	[0.002]	[0.001]		[0.036]
Father's Income (1/3)	0.00	0.00	0.00	0.00	-0.003*	0.00	0.160***	
	[0.002]	[0.001]	[0.001]	[0.002]	[0.002]	[0.001]	[0.039]	
Constant	0.077	-0.042	-0.101	-0.055	0.067	0.118	-11.599***	8.771**
	[0.157]	[0.133]	[0.082]	[0.185]	[0.189]	[0.132]	[3.699]	[3.751]
Observations	1939	1939	1939	1939	1939	1939	1939	1939
R-squared	0.11	0.09	0.07	0.08	0.08	0.08	0.16	0.22
RMSE	0.24	0.24	0.15	0.29	0.29	0.21	5.79	5.57
R2	0.11	0.09	0.07	0.08	0.08	0.08	0.16	0.22
AdjR2	0.07	0.05	0.03	0.04	0.04	0.04	0.12	0.19
F	1.29	0.97	0.42	1.09	1.35	0.7	2.44	4.29

Note: Regressions control for child characteristics, demographic composition, low weight at birth, sibling age gap, first order and parental *BMI* in column (8). All columns control for grandparent's schooling, employment and an indicator if they are still alive. Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1.

Table 17: Assortative Mating: Non-Traditional Parental Variable Models

Clustered OLS by household using MxFLS 2005

Dep. Var. in columns	(1) Anx Mum	(2) Anx Dad	(3) Dep Mum	(4) Dep Dad	(5) BpMod Mum	(6) BpMod Dad	(7) BpHig Mum	(8) BpHig Dad
Human Capital								
Mother's Schooling	-0.01	0.00	-0.001*	0.00	-0.01	0.01	0.00	0.00
	[0.005]	[0.003]	[0.001]	[0.001]	[0.004]	[0.004]	[0.001]	[0.002]
Father's Schooling	0.00	-0.004*	0.00	0.00	0.00	-0.01	0.00	-0.003*
	[0.004]	[0.002]	[0.001]	[0.001]	[0.003]	[0.004]	[0.001]	[0.002]
Mother's Cognitive Ability (z-score)	-0.01	0.01	0.00	0.00	0.00	0.01	0.00	0.00
	[0.013]	[0.009]	[0.001]	[0.001]	[0.012]	[0.015]	[0.002]	[0.006]
Father's Cognitive Ability (z-score)	-0.01	-0.01	0.00	0.00	0.00	0.032**	0.00	0.018**
	[0.011]	[0.009]	[0.003]	[0.003]	[0.011]	[0.015]	[0.003]	[0.008]
Parental Risk Loving								
Mother's Risk Loving (Level 2)	-0.02	0.00	0.00	0.00	0.081***	0.02	0.00	0.01
	[0.030]	[0.021]	[0.005]	[0.005]	[0.029]	[0.030]	[0.006]	[0.013]
Mother's Risk Loving (Level 3)	0.00	0.01	0.00	0.00	0.03	0.06	0.02	-0.01
	[0.038]	[0.028]	[0.004]	[0.004]	[0.034]	[0.042]	[0.018]	[0.015]
Mother's Risk Loving (Level 4)	0.01	-0.01	0.00	0.00	0.02	0.02	0.00	0.00
	[0.033]	[0.022]	[0.003]	[0.003]	[0.027]	[0.031]	[0.006]	[0.014]
Father's Risk Loving (Level 2)	0.02	-0.01	-0.01	0.01	-0.02	-0.04	0.00	0.01
	[0.029]	[0.020]	[0.007]	[0.007]	[0.033]	[0.033]	[0.007]	[0.010]
Father's Risk Loving (Level 3)	0.01	0.01	-0.01	0.015*	0.00	0.01	0.01	0.00
	[0.036]	[0.028]	[0.008]	[0.009]	[0.041]	[0.042]	[0.020]	[0.014]
Father's Risk Loving (Level 4)	0.04	0.01	-0.01	0.00	-0.02	-0.01	-0.01	0.01
	[0.033]	[0.022]	[0.007]	[0.006]	[0.032]	[0.034]	[0.007]	[0.013]
Parental Future Valuation								
Mother's Future Valuation	-0.03	0.033**	0.00	0.00	0.03	-0.01	-0.01	0.01
	[0.026]	[0.014]	[0.004]	[0.003]	[0.022]	[0.027]	[0.008]	[0.011]
Father's Future Valuation	0.049**	-0.01	0.00	0.00	0.02	-0.01	0.01	0.00
	[0.022]	[0.015]	[0.004]	[0.003]	[0.022]	[0.027]	[0.009]	[0.013]
Parental Closeness								
Mother's propensity to migrate (25 to 50 % prob.)	0.04	0.01	0.00	0.00	-0.02	-0.06	0.00	0.03
	[0.045]	[0.032]	[0.004]	[0.004]	[0.029]	[0.036]	[0.009]	[0.020]
Mother's propensity to migrate (51 to 75 % prob.)	0.04	0.00	0.00	0.00	-0.03	0.00	0.00	0.03
	[0.044]	[0.032]	[0.004]	[0.004]	[0.024]	[0.052]	[0.008]	[0.029]
Mother's propensity to migrate (Above 75 % prob.)	0.109*	-0.04	-0.03	0.03	0.03	-0.01	-0.01	0.05
	[0.066]	[0.027]	[0.022]	[0.022]	[0.062]	[0.067]	[0.006]	[0.044]
Father's propensity to migrate (25 to 50 % prob.)	-0.02	0.00	0.00	0.00	0.00	0.04	-0.01	-0.02
	[0.033]	[0.028]	[0.004]	[0.004]	[0.036]	[0.042]	[0.007]	[0.015]
Father's propensity to migrate (51 to 75 % prob.)	-0.02	0.03	0.00	0.00	-0.03	0.00	0.00	-0.023*
	[0.032]	[0.028]	[0.003]	[0.003]	[0.024]	[0.037]	[0.008]	[0.014]
Father's propensity to migrate (Above 75 % prob.)	0.01	0.03	-0.01	0.01	-0.02	0.05	0.00	0.00
	[0.048]	[0.038]	[0.010]	[0.012]	[0.044]	[0.057]	[0.010]	[0.029]
Parental Stress								
Mother's Moderate Stress (80/120 mmHg)		0.088***		0.01	0.01	-0.01	0.01	0.01
		[0.031]		[0.004]	[0.026]	[0.035]	[0.007]	[0.018]
Mother's High Stress (90/140 mmHg)		0.08		0.933***	0.28	0.26	0.00	0.29
		[0.061]		[0.042]	[0.246]	[0.215]	[0.012]	[0.229]
Father's Moderate Stress (80/120 mmHg)	0.205***		0.00		0.02	-0.03	-0.01	0.03
	[0.068]		[0.007]		[0.052]	[0.050]	[0.005]	[0.036]
Father's High Stress (90/140 mmHg)	-0.148***		0.945***		-0.28	-0.21	-0.01	-0.24
	[0.032]		[0.039]		[0.237]	[0.208]	[0.012]	[0.221]
Parental Mental Health								
Mother's Anxiety	0.00	0.01	0.01	-0.01		0.089*		0.00
	[0.035]	[0.030]	[0.014]	[0.013]		[0.048]		[0.021]
Mother's Moderate/Severe Depression	0.12	-0.065*	-0.01	0.00		0.515***		0.07
	[0.123]	[0.039]	[0.011]	[0.010]		[0.144]		[0.085]
Father's Anxiety	-0.02	-0.02	0.00	0.00	0.090**		0.033*	
	[0.030]	[0.016]	[0.002]	[0.002]	[0.035]		[0.019]	
Father's Moderate/Severe Depression	0.05	0.07	0.05	-0.04	-0.06		-0.01	
	[0.088]	[0.071]	[0.042]	[0.037]	[0.080]		[0.030]	
Parental Income								
Mother's Income (1/3)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	[0.002]	[0.001]	[0.001]	[0.001]	[0.002]	[0.002]	[0.000]	[0.001]
Father's Income (1/3)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	[0.002]	[0.001]	[0.001]	[0.001]	[0.002]	[0.002]	[0.000]	[0.001]
Constant	0.306	0.033	-0.022	0.024	-0.533***	0.134	-0.025	0.025
	[0.203]	[0.127]	[0.016]	[0.016]	[0.172]	[0.212]	[0.056]	[0.085]
Observations	1939	1939	1939	1939	1939	1939	1939	1939
R-squared	0.09	0.08	0.89	0.89	0.12	0.11	0.09	0.08
RMSE	0.31	0.21	0.06	0.06	0.28	0.34	0.08	0.15
R2	0.09	0.08	0.89	0.89	0.12	0.11	0.09	0.08
AdjR2	0.05	0.04	0.88	0.88	0.08	0.07	0.05	0.04
F	1.68	0.69	123.68	88.5	1.4	1.84	0.12	0.33

Note: Regressions control for child characteristics, demographic composition, low weight at birth, sibling age gap, first order and parental *BMI* in column (8). All columns control for grandparent's schooling, employment and an indicator if they are still alive. Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1.

Table 18: Child's Cognitive Ability and Household Shocks
Random and Fixed Effects at the individual level

Variables	**(1)**	**(2)**	**(3)**
Human Capital			
Mother's Schooling	0.004	0.004	
	[0.007]	[0.007]	
Father's Schooling	0.024***	0.024***	
	[0.006]	[0.006]	
Mother's Cognitive Ability (z-score)	0.214***	0.212***	
	[0.021]	[0.021]	
Father's Cognitive Ability (z-score)	0.169***	0.169***	
	[0.022]	[0.022]	
Parental Mental Health			
Mother's Anxiety	0.065	0.061	-0.009
	[0.048]	[0.049]	[0.090]
Mother's Moderate/Severe Depression	0.391	0.396	0.601*
	[0.267]	[0.272]	[0.361]
Father's Anxiety	-0.227***	-0.243***	-0.534***
	[0.088]	[0.088]	[0.132]
Father's Moderate/Severe Depression	-0.516*	-0.528*	-0.57
	[0.277]	[0.282]	[0.376]
Parental Stress			
Mother's Moderate Stress (80/120 mmHg)	-0.015	-0.018	0.035
	[0.046]	[0.046]	[0.071]
Mother's High Stress (90/140 mmHg)	0.035	0.039	-0.101
	[0.075]	[0.075]	[0.117]
Father's Moderate Stress (80/120 mmHg)	-0.051	-0.05	-0.042
	[0.038]	[0.038]	[0.064]
Father's High Stress (90/140 mmHg)	-0.012	-0.011	-0.173*
	[0.056]	[0.056]	[0.091]
Parental Income			
Mother's Income (1/3)	0.001	0.001	0.007
	[0.003]	[0.003]	[0.005]
Father's Income (1/3)	0.000	0.000	0.002
	[0.003]	[0.003]	[0.004]
Household Shocks			
Death of Hh member		0.137**	0.035
		[0.064]	[0.096]
Accident or Illness of Hh member		0.045	0.025
		[0.049]	[0.076]
Unemployment or Business Failure of Hh member		0.065	-0.002
		[0.057]	[0.091]
Lost of property by natural disaster		0.134	0.05
		[0.146]	[0.248]
Lost of harvest		-0.063	-0.067
		[0.074]	[0.145]
Lost or stolen animals		-0.071	-0.178
		[0.089]	[0.132]
Constant	-0.608**	-0.636**	0.147
	[0.278]	[0.277]	[0.532]
Observations	3722	3722	3722
Number of groups	2382	2382	2382
Sigma e	0.87	0.87	0.87
Sigma u	0.29	0.29	0.89
Sigma s	0.92	0.92	1.24
Rho	0.1	0.1	0.51

Note: Regressions control for child characteristics, demographic composition, low weight at birth, sibling age gap, first order and parental *BMI* in column (8). All columns control for grandparent's schooling, employment and an indicator if they are still alive. Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1.

Table 19: Child's Height and Household Shocks

Random and Fixed Effects at the individual level

Variables	(1)	(2)	(3)
Human Capital			
Mother's Schooling	0.001	0.000	
	[0.008]	[0.008]	
Father's Schooling	0.025***	0.025***	
	[0.007]	[0.007]	
Mother's Cognitive Ability (z-score)	0.035	0.036	
	[0.025]	[0.025]	
Father's Cognitive Ability (z-score)	0.003	0.000	
	[0.026]	[0.026]	
Parental Mental Health			
Mother's Anxiety	-0.067	-0.069	-0.008
	[0.058]	[0.058]	[0.089]
Mother's Moderate/Severe Depression	0.012	-0.03	0.213
	[0.409]	[0.410]	[0.964]
Father's Anxiety	0.134	0.127	0.056
	[0.093]	[0.093]	[0.125]
Father's Moderate/Severe Depression	0.046	0.054	-0.205
	[0.401]	[0.401]	[0.944]
Parental Stress			
Mother's Moderate Stress (80/120 mmHg)	-0.085*	-0.086*	0.003
	[0.047]	[0.047]	[0.064]
Mother's High Stress (90/140 mmHg)	0.001	0.000	-0.064
	[0.089]	[0.089]	[0.120]
Father's Moderate Stress (80/120 mmHg)	-0.033	-0.033	-0.077
	[0.042]	[0.042]	[0.061]
Father's High Stress (90/140 mmHg)	0.051	0.049	-0.004
	[0.061]	[0.061]	[0.087]
Parental Income			
Mother's Income (1/3)	-0.003	-0.003	-0.001
	[0.003]	[0.003]	[0.005]
Father's Income (1/3)	0.004	0.003	0.001
	[0.003]	[0.003]	[0.004]
Parental Anthropometrics			
Mother's Height	0.037***	0.037***	0.001
	[0.004]	[0.004]	[0.009]
Father's Height	0.036***	0.035***	0.030***
	[0.004]	[0.004]	[0.011]
Mother's Weight	0.009***	0.009***	-0.001
	[0.002]	[0.002]	[0.005]
Father's Weight	0.003	0.003	0.009*
	[0.002]	[0.002]	[0.006]
Death of Hh member		-0.048	-0.065
		[0.070]	[0.091]
Accident or Illness of Hh member		0.017	0.003
		[0.050]	[0.074]
Unemployment or Business Failure of Hh member		0.150**	0.124
		[0.061]	[0.082]
Lost of property by natural disaster		-0.207	-0.100
		[0.150]	[0.203]
Lost of harvest		-0.095	0.039
		[0.084]	[0.117]
Lost or stolen animals		0.071	0.081
		[0.101]	[0.129]
Constant	-14.007***	-13.973***	-7.221***
	[0.717]	[0.720]	[1.954]
Observations	3646	3646	3646
Number of groups	2359	2359	2359
Sigma e	0.83	0.83	0.83
Sigma u	0.64	0.64	1.1
Sigma s	1.05	1.05	1.38
Rho	0.38	0.37	0.64

Note: Regressions control for child characteristics, demographic composition, low weight at birth, sibling age gap, first order and parental *BMI* in column (8). All columns control for grandparent's schooling, employment and an indicator if they are still alive. Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1.