

On Intergenerational Transmission of the Reading Habit: Is a Good Example the Best Sermon?

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ABSTRACT

The intergenerational transmission of preferences and habits has been less investigated than that of education and income. We focus on the intergenerational transmission of reading habits, a channel of particular interest since it entails a direct influence parents may have on child's preference formation. We identify the impact of the parents' role model by exploiting the different exposure of siblings to parents' example using a household fixed effect model and time use data. Our results show that there is a strong imitation effect: on the day of the survey, children are more likely to read after seeing their parent reading.

JEL Codes: J13 J22 J24 C21

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1. Introduction

Intergenerational transmission has been the object of extensive attention in the economic literature, mainly for its effect on mobility across generations. In fact, most research has focused on intergenerational transmission of education and income¹ and, more recently, on the transmission of cognitive abilities².

A new stream of literature studies the intergenerational transmission of preferences, habits and attitudes. Lindbeck and Nyberg (2006) analyse the transmission of norms related to work; Alvarez and Miles (2008) look at children's attitude to women work and domestic tasks while Dohmen *et al.* (2011) show how parents transmit to their children risk and trust attitudes.

The recent development of time use data makes it possible to look at the transmission across generations of behaviours such as time use choices, a topic on which the existing research is scarce and mainly concentrated on labour supply decisions (Del Boca *et al.*, 2000; Fernandez *et al.*, 2004; Kawaguchi and Miyazaki, 2009).

In this paper, we look at intergenerational transmission of the time devoted to reading, an activity that is crucial in the process of human capital accumulation and that is relevant for its positive links with educational outcomes and subsequent earnings (Connolly *et al.*, 1992). Cunningham and Stanovich (2001) show in fact that reading has accumulated effects over time with profound implications for the development of a wide range of cognitive abilities, verbal skills and declarative knowledge, while Stanovich (1986) emphasizes the role of reading for increasing the efficiency of the cognitive process.

Therefore, stimulating young people to read is a concern for educators and policy makers, and parents may transmit preferences and habits to their children by acting as good role models in promoting reading behaviours (Mullan, 2010).

Our analysis relies on the Italian Time Use Survey (2002-2003 and 2008-2009 pooled waves) conducted by ISTAT. While most time use surveys only consider one member of the household, and rarely children in primary school age, the Italian dataset makes it possible to analyse the relationship between the time parents devote to read and the time children devote on their own to the same activity in a given day. While reading is clearly not the only human capital building activity, we want to focus on an activity that can be done autonomously by children in the age range we are considering (6-15). Moreover, early acquisition of a reading ability seems to help the development of a lifetime habit to read (Cunningham and Stanovich, 1997).

Looking at the habit to do activities that produce human capital accumulation is probably more relevant than looking only at intergenerational transmission of IQ, because behaviours are a matter of choice while intelligence is not. If compared to the transmission of education, intergenerational transmission of the habit to read is less affected by the economic status of the family, but is crucial for its consequences on the continuous investment in human capital along an individual's life.

¹ For a survey on intergenerational transmission of education and earnings see Black and Devereux (2010).

² Brown *et al.* (2010) and Anger and Heineck (2010).

A further advantage of our intergenerational transmission analysis is that we use an objective measure of behaviour (the time parents' and children devote to read) as opposed to research based on qualitative issues such as the willingness to take risks and to trust other people (Dohmen *et al.*, 2011)

The intergeneration transmission of attitudes towards reading can be explained by both cultural and educational transmission from parents to children and by imitating behaviours. Parents teach their children the importance of reading and provide them with books, but Teale and Sulzby (1986) recognize the importance of children observing adults' reading behaviours. Imitation is therefore of particular interest, since it entails the direct influence parents may have on children's preference formation through their being a role model, and it opens the scope for active policies aimed at promoting good parenting behaviour.

In a recent study, Cardoso *et al.* (2010) document a positive association between parents' and children's time allocations in human capital building activities in France, Germany and Italy. In this paper we extend their analysis by concentrating our attention on the imitation channel. We exploit a larger and richer time use dataset, which includes information about when, with whom and in the presence of whom any particular activity is performed. Taking advantage of the presence of a large number of siblings in the data, we identify the imitation effect using a family fixed effect approach. In doing so, we exploit the variation that occurs among siblings: different children, for exogenous reasons, may have been exposed differently to parents' reading activities on the survey day. This within-family variation allows us to isolate the effect of imitation from the effects of the household environment and education received from the parents, which are common to the siblings.

We, thus, investigate if children are more likely to allocate time to reading activities when they observe their parents doing this activity on the same day (short run imitation effect). Researches on habits formation (Neal *et al.*, 2006; Wood and Neal, 2007) show that much of everyday actions are characterised by habitual repetition. Therefore, when parents read in the presence of their children, imitation by the child might be a channel concurring to the formation of the child's reading habit.

We look separately at the effect of mothers and fathers, since past research has shown that each parent can differently affect their children's decisions and behaviours (Anger S. and Heineck G., 2010; Ermish and Francesconi, 2002; Louriero *et al.* 2006; Bjorklund *et al.*, 2006; Farré *et al.*, 2009; Dohmen *et al.*, 2011; and Mullan, 2010).

We provide novel evidence on the existence of an imitation effect: on the day of the survey, the probability of children reading has a relevant increase after they see their parents reading. The mother's imitation effect increases the probability that the child reads from about 5% to about 29%. The father's imitation effect is just slightly smaller, raising the probability from about 6% to about 28%. These results seem to confirm the saying "a good example is the best sermon".

This research can be useful in the analysis of intergenerational transmission and, in particular, of the effects of parental role. Are parents able to influence their children preferences and choices through their behaviour? Therefore, do policies targeted at adults also produce effects on individuals of the following generation and are they, for that reason, more fruitful? Our findings suggest that role modelling by parents is a channel through which parental time use may affect children's behaviour and time allocation decisions, and, thereafter, future child outcomes.

The paper is organised as follows. Section 2 presents a review of the relevant literature. Section 3 describes the dataset used and the sample selection made for our empirical analysis. In section 4 the empirical strategy is presented. Results and robustness checks are discussed in section 5. Conclusions follow.

2. Background literature

There is a vast literature on intergenerational transmission and research on the topic can be divided into three main streams: studies that look at the transmission of education and income, analyses of the transmission of cognitive abilities and those that consider the transmission of behaviours, habits and attitudes.

The literature on the intergenerational transmission of education and income shows that the positive correlation between parents and children is the result of both “nature” (genetic endowment) and “nurture”, i.e., better educated parents invest more in their children’s education (for a complete review, see Black and Devereux, 2010). Moreover, in households where parents are better educated, a better family environment and a higher quality of child/parent relationships contribute to persistency of education and income across generations.

The transmission of cognitive abilities from parents to children has been less investigated. Brown *et al.* (2010) for the U.K. and Anger and Heineck (2010) for Germany consider correlations in test scores, finding a strong transmission effect that is largely explained by the investments that parents make in their children. In particular, parents with better reading skills are better able to help their children in learning to read at home with positive effects on word fluency (see also Sènèchal and LeFevre, 2002). This is not true for the transmission of math abilities, which seems to be more the result of genetic transmission.

The last stream of the literature focuses on the transmission of preferences, habits and attitudes. In 1976, Robert Pollak discussed how preferences, especially in the short run, are influenced by other people’s past consumption behaviours: individuals’ preferences are such that they want to consume a given good when they observe other people around them already consuming that good. Waldkirch *et al.* (2004) analyse the transmission of consumption preferences and behaviours, Booth and Kee (2006) consider the intergenerational cultural transmission of norms regarding fertility, Jackson *et al.* (1997) and Louriero *et al.* (2006) look at smoking habits, Lindbeck and Nyberg (2006) at the intergenerational transmission of norms related to hard work, while Wilhelm *et al.* (2008) study the intergenerational transmission of generosity and Dohmen *et al.* (2011) discuss the transmission of risk and trust attitudes. All these works, which aim at understanding how habits are transmitted across generations and therefore which policies may be put into

action to promote “good” habits and attitudes and to reduce “bad” ones, find that parents influence their children preferences through their role modelling, educational choices and behaviours. The literature on the intergenerational transmission of time use preferences and time allocation is certainly more scant and, as already mentioned, focuses more on labour supply (Del Boca *et al.*, 2000; Fernandez *et al.*, 2004; Kawaguchi and Miyazaki, 2009) and on domestic work time (Alvarez and Miles, 2008). Only Mullan (2010) and Cardoso *et al.* (2010) study the time allocation of parents and children in human capital accumulating activities. In particular, Mullan (2010), using a time use dataset for the U.K., found a positive association between the reading time of parents and children between 13 and 18 years. Cardoso *et al.* (2010) investigate the association between parents and children time allocations in France, Germany and Italy. In their paper they use the Multinational Time Use Study and focus on how adolescents in the age range 15-19 allocate their time into three different activities (reading and studying, socialising and watching TV) and how this time is affected by parents’ time use decisions. Due to data limitation, none of these studies is able to identify the imitation effect. Moreover, by considering children between 6 and 15 years of age, we extend their analysis to younger children. This extension to young children is particularly relevant in the light of recent theories and results on the importance of early investment in children (Cunha and Heckman, 2007). The Italian dataset, in fact, is one of few Time Use datasets that provides a time diary even for children older than three. Furthermore, our dataset allows us to study which activities both parents and children do on the selected day, where they perform these activities and which family member is present and, compared to the harmonised dataset used by Cardoso *et al.* (2010), it contains a richer set of information and a large sample of siblings in the age range of interest that allow us to identify the imitation effect.

All the studies on intergenerational transmission share the methodological problem of how to separate “nurture” from “nature”, i.e., of how to isolate the effect of the parents’ variable of interest on the children’s variable from the effect of a more general family effect, including common genetic traits between parents and children. This problem has been solved in different ways: Loureiro *et al.* (2006) and Brown *et al.* (2010) use instrumental variables, Akee *et al.* (2008), Black *et al.*, 2005 and Holmlund *et al.* (2008) use a difference in differences approach when changes and reforms occur. Other authors exploit datasets in which either twins or adopted children are present to use a fixed effect approach. The presence in a dataset of individuals that share the same genetic traits but live in different families (for example, the children of twins, as in Behrman and Rosezweig, 2002, and in Pronzato, 2011), or that have a common family background but did not receive the same genetic transmission (for example natural and adopted children as in Plug, 2004) or, finally, individuals for whom information is available for both natural and adoptive parents (as in Bjorklund *et al.*, 2006) allows disaggregation of the effects of genetic transmission from the effects of family environment.

In our dataset, the number of twins is too small and we are not able to isolate nature from nurture. By exploiting the presence of a large number of siblings, however, we are able to disentangle the effect of imitation from the overall effect of nature and nurture, comparing the reading decisions of children who saw their parents reading, with those of their siblings not exposed to the same parental example.

Our focus on reading activities is due to the proved positive effects that reading has on cognitive development. Reading, in fact, increases the efficiency of the learning process (Stranovich, 1986) and individuals that read habitually during childhood read more over the years and this helps them to compensate for modest levels of innate cognitive abilities (Cunningham and Stranovich, 2001).

According to Teale and Sulzby (1986) the home environment can be a source of important child's literacy experience through interaction between parents and children in reading situations, through own children experience with books and through children observation of adults reading behaviour (e.g. reading the newspaper), while McKool (2007) shows how having parents that read for recreational purposes increases child's reading. In our dataset we have information only on a single day. However, we select our sample in order to exclude households that filled the diary on a non-standard day, and the literature on habits emphasizes that much of the everyday actions are characterised by habitual repetition (Neal *et al.*, 2006). We therefore believe that if a parent reads in the survey day, she is likely to read also during the rest of the week. Moreover, if she reads where her children can see her during the survey day, she is likely to do the same also on the others days. If an imitation effect exists, the repetition of an imitated behaviour can produce an habit for the child.

3. Sample selection and definition of time use variables

Our analysis of the reading activities builds on two pooled waves (2002-2003 and 2008-2009) of the Time Use Survey conducted by ISTAT that covers 39,325 households (respectively 21,075 in the wave 2002-2003 and 18,250 in the wave 2008-2009) and reports information on each household member.

An individual questionnaire containing socio-demographic information and a time diary were collected. All members older than three completed the time diary on a selected day³. In each municipality covered by the survey, households were divided into three groups and each group was asked to fill in the daily diary on a different day: a weekday, Saturday or Sunday⁴. Our analysis is based on diaries completed both during weekdays and weekend days. The diary reports information on the time spent on a large number of tasks. Activities are coded by the respondent as main or secondary activities⁵.

For our empirical analysis we selected a sample of children in the age range 6-15⁶, having at least one sibling in the same age range and living in a household where both parents were present. We excluded households in which any of the members (child, siblings or parents) filled in the diary on a "special" day (for example their own, siblings' or parents' sickness day) and those for whom either parent or any siblings in the relevant age range failed to complete the diary. We also excluded all children for whom one or more variables used in the econometric analysis of Section 4 were missing. Our final sample consists of 2,640 children (1,427 from the

³ The time diaries of very young children was completed by parents.

⁴ The oversampling of weekend diaries was a deliberate choice of the data collector.

⁵ For example, someone may be cooking and watching television or cooking and looking after the children. In these cases, the respondent chooses which of the activities is the main one and which is the secondary one.

⁶ Given our focus on activities the children can do on their own, we exclude very young children from our sample because it is highly likely that all their reading activities are done together with the parents.

first wave and 1,213 from the second one) belonging to 1,261 households (681 from the 2002-2003 wave and 580 from the 2008-2009 wave)⁷.

The aim of our analysis is to run intergenerational-type regressions to investigate whether children are more likely to allocate time to reading activities after having observed their parents doing the same activity. Information about where the activities were performed was crucial, since it allowed us to derive a measure of the time spent by parents reading in the presence of their kids.

We define the content of the reading activities as follows:⁸

- *For the children:* we consider whether the child is reading on her own, talking or reading to the siblings⁹. Notice that this measure only includes time autonomously spent by children in these activities (i.e., with no adult doing the activity with them) and is defined by the child as the primary activity.
- *For the parents:* we consider whether the parents are reading in the presence of their child or talking or reading to child's siblings. The above mentioned activities are included when declared either as a primary or secondary activity¹⁰.

Table 1 reports the basic descriptives of the allocation of time into reading activities in our sample. Looking at participation rates, on the sampled day, we observe about 17% of the mothers and 14% of the fathers engaged in reading while observed by their children. Only about 8% of the children were reported as reading. The corresponding observed average times are also very low, especially for the parents (about 6 minutes for mothers and 4 for fathers and children). These low values are certainly affected by the fact that we excluded homework, and all reading activities done at school (23% of our children spent more than 5 hours at school on the survey day). Moreover, we consider only the reading activities parents do in the presence of the children and the time spent by family members in the same place (typically home) is reduced by the number of hours children stay at school. Finally, we also exclude reading time of parents when children are sleeping.

⁷ The sample of households with at least one child in the 6-15 age range does not systematically differ from the sample we select for our analysis.

⁸ In a previous version of the paper (Mancini *et al.*, 2011) we could rely only on the first wave of data. This forced us to include homeworks in the reading category of children and helping children with homeworks in the parental reading. Here, the pooling of the two waves makes our estimation strategy feasible excluding homework time, and our analysis much neater.

⁹ "Talking and reading to.." is a time use category defined in the survey,

¹⁰ For the children we consider the reading activity only when it is the primary activity, i.e. when the child declares it is the principal activity. Instead, for parents, we also include the reading activity when it is declared as a secondary one, since we do not want to exclude those situations in which a parent is, for example, cooking (primary activity) while talking to the child.

Table 1**Reading and studying activity**

Time allocated – Minutes			
	Child	Mother*	Father*
Mean	4.43	5.78	4.15
Sd	19.42	24.16	17.33
Median	0	0	0
Obs	2,640	2,640	2,640
Participation rates (%)			
	Child	Mother*	Father*
Mean	8.29	17.34	13.67
Sd	27.58	37.87	34.36
Median	0	0	0
Obs	2,640	2,640	2,640

* in the presence of one of their children

Descriptive statistics reveal the association between parents' and children's use of time: Table 2, in fact, shows that children have a much higher probability of reading if at least one of the parents reads in their presence. This is true even when we disaggregate by birth order within the sample. The association seems stronger for mothers than for fathers. However, these figures are likely to be due to between households heterogeneity: in the next section we present an identification strategy to disentangle the imitation effect exploiting within family variation.

Table 2

Child reading probability conditional on parents reading in their presence

Overall					
	Mother		Father		Total
	Not reading	Reading	Not reading	Reading	
Child doesn't read	2,102	319	2,158	263	2,421
%	96.3%	69.7%	94.7%	72.9%	91.7%
Child read	80	139	121	98	219
%	3.7%	30.3%	5.3%	27.1%	8.3%
Obs	2,182	458	2,279	361	2,640
First child					
Child doesn't read	992	136	1011	117	1,128
%	95.5%	64.2%	93.5%	68.8%	90.2%
Child read	47	76	70	53	123
%	4.5%	35.8%	6.5%	31.2%	9.8%
Obs	1,039	212	1,081	170	1,251
Second child					
Child doesn't read	1,009	156	1,035	130	1,165
%	97.1%	73.6%	95.7%	76.5%	93.1%
Child read	30	56	46	40	86
%	2.9%	26.4%	4.3%	23.5%	6.9%
Obs	1,039	212	1,081	170	1,251

4. Empirical strategy

Participation rather than time spent in reading was chosen as a relevant measure of the time use variable¹¹. This choice was motivated by the large number of zero values highlighted in the previous section, which rules out any meaningful modelling of the amount of time devoted to the reading activities through either tobit or double-hurdle specifications. Interestingly, the collection of time use information in the diary is such that only reading episodes lasting more than 10 minutes are recorded. This makes the participation measure we consider more adequate to represent an example provided from parents on the one side, and a behaviour concurring to the reading habit formation of the child on the other side.

We identify the impact of the role model exerted by parents by means of a household fixed effect model, exploiting repeated observations on siblings to purge unobserved heterogeneity at the household level.

¹¹ For the parents this was reading in the presence of their children.

Since we want to measure the imitation effect, we only consider the child's reading episodes that occurred after having seen the parents reading. The dependent variable is a binary measure, say $child_r_im_{ij}$, indicating whether the child participates in the reading activity **after** one parent. The crucial regressor we rely on to prove the existence of an intergenerational transmission through imitation is a child-specific measure of parents' engagement in the reading activity that occurred in the presence of each child, say $parent_r_{ij}$. The latter measure is child-specific because siblings may or may not have seen their parents reading in the survey day. The useful cases for identification come from families where parents are seen reading by at least one -but not all- of their children. In these families, we restrict the observation period for all siblings from the first moment the parent is seen reading by one child to the end of the day. Estimation is performed with a household fixed effect linear probability model which is specified as follows:

$$child_r_im_{ij} = \gamma_0 + \gamma_1 parent_r_{ij} + \gamma_2 Z_i + \mu_j + \varepsilon_{ij}$$

The intergenerational parameter γ_1 captures the short run imitation effect (the parents' example), and it can be estimated net of the whole set of unobservable confounders at the family level (μ_j). These include unobserved environmental and genetic factors, influencing both the parents' and children's preference towards the reading activity, as well as the educational message towards the importance of the reading activity that parents transmit to their kids (the parents sermon). On the right hand side we control for a number of exogenous child characteristics (Z_i). The child's age is inserted through a dummy equal to one if the child attends middle or high school (*middle/high school*), since in terms of differences in time use and school habits the major change comes from the transition from primary to middle school (and less from middle to high school). We allow the imitation effect to vary by child's age interacting the age dummy and the parents' reading and studying time. The gender dummy *girl* captures possible systematic differences in time use habits linked to the gender of the child. This dummy is interacted with the parents' reading time, to account for differences in the transmission of time use habits from parents to children related to the gender of the child. We also control for the child birth order (dummies *birth order: second* and *birth order: third or more*) and for the self-reported *general health* status of the child¹².

It is well known that child specific unobserved heterogeneity is not eliminated through a family fixed effect approach and that it can still be a source of bias for the parameter of interest. For our identification strategy to be valid, sibling variation in the exposure to the parents' example must be exogenous, i.e., uncorrelated with siblings' differences in individual unobserved determinants of the reading behaviour, such as preferences.¹³ A first, informal argument in favour of our identification strategy resides in the typical fixed weekly schedule within a given family of children in that age range, in particular for their out of home non-school engagements. This makes siblings' differences in exposure to treatment (seeing a parent engaged in

¹² In our data the health status is a categorical variable that ranges from 1 (excellent health status) to 5 (very bad health status).

¹³ This is analogous to the strict exogeneity assumption for panel data.

reading activities) on the survey day likely to be random. More importantly, we provide collateral and clean evidence that siblings' variation in the probability of being exposed to the treatment does not depend on difference in preferences across siblings. To this purpose, we investigate to what extent the probability that a child observes the mother (father) reading depends on his or her own preferences, after controlling for unobserved heterogeneity at the household level. To proxy for the former, we build two indicators of child's preferences for non-physical activities, typically performed at home, and for spending time outdoors¹⁴. The results, displayed in the two tables of Appendix 2, show that, in both cross sectional samples we use, there is no significant correlation between siblings' differences in the probability of observing the mother (father) reading and siblings' differences in preferences. This evidence corroborates the random nature of the within family variation observed in the day of the survey and strongly supports our identification strategy.

As a final remark, we recall a further threat to the validity of a household fixed approach generally emphasized in the literature on child production function (see Todd and Wolpin, 2007, among others): the potential source of bias due to the fact that parents might choose to invest more in kids with lower (unobserved) ability to compensate for their disadvantage. In our framework, this criticism is less likely to apply, since we look at the time allocation of parents in activities that are not directly targeted to children. They are, therefore, not an input measure that is likely to react to unobserved child characteristics, or to previous children outcomes.

In Table 3 we cross-tabulate the observed reading activity of children by the reading activity of parents. We separate those children who read after they saw either the mother or the father doing the same from those who have not observed their parents reading¹⁵. The probability that the child reads increases sharply when exposed to the parental example, both for the mother and the father. The numbers provide preliminary descriptive evidence of the existence of the imitation effect we want to estimate.

¹⁴ The survey questionnaire asks the children if they would like to engage more or less (or if they are satisfied with their engagement) in several typical child-activities. For each item we create a dummy equal to 1 if the child wants to spend more time in that activity. We then create two indicators that capture the preferences over non-physical activities and over activities made outdoor by grouping and summing up the corresponding dummies. The activities included in 2002 and 2008 are coded differently and in 2008 a residual category "other" was also introduced. In 2002 for non-physical activities we consider homework, computer courses, language courses and theater, dance or music, assuming that for physical activities children have to spend time outdoor and to play outdoor (opposed to playing inside). In 2008 for non-physical activities we consider homework and general cultural activities (like theater, dance, music and so on), while for physical activities we have only "preferring to play outdoor" (opposed to playing inside).

¹⁵ For families in which parents did not read at all in the presence of their children, we look at the participation into reading activity by the child during the whole day. This implies that the observational period for children in families where one of the parent was observed reading in the sampled day is shorter.

Table 3

**Sample frequency of children's reading activity
by observation of parents' reading activity**

Mother			
	Not reading	Reading	Obs
Child doesn't read	2,273	179	2,452
%	96.1%	65.1%	92.9%
Child read	92	96	188
%	3.9%	34.9%	7.1%
Obs	2,365	275	2,640
Father			
Child doesn't read	2,297	152	2,449
%	94.8%	70.0%	92.8%
Child read	126	65	191
%	5.2%	30.0%	7.2%
Obs	2,423	217	2,640

Table 4 shows the within-family variability on which we base our identification strategy. In this table we report the number of cases (individuals) belonging to families in which we observe at least one sibling variation for the reading activity. More precisely, looking at the upper part of the table, we have 353 cases where we have within-sibling variation in exposure to reading through only the mother and 279 cases of variation in exposure through only the father. As far as children are concerned, we observe 318 cases where one of the siblings reads after the mother while at least one of the others does not, and 309 cases with sibling variation after the father. Notice that among the above mentioned cases of useful variations on the right hand side, we are left with variability on the left hand side as shown in the bottom section of Table 4, where we count the records corresponding to within-family variation of both adult reading and child reading.

Table 4**Within family variability (individuals)**

Adult reading		
	Mother	Father
Obs	353	279
%	13.4%	10.6%
Number of obs	2,640	2,640
Child reading after		
	Mother	Father
Obs	318	309
%	12.0%	11.7%
Number of obs	2,640	2,640
Both adult reading and child reading after		
	Mother	Father
Obs	139	85
%	39.4%	30.5%
Number of obs	353	279

Finally, in Table 5 we present the same cross-tabulation as Table 3, restricted to the above-mentioned subsamples of cases exhibiting within-family variation. It is interesting to note that the pattern for both parents is similar to that of Table 3.

In Appendix 1 the summary statistics of the variables used in the empirical analysis are shown. On average, in both waves the families considered have about 4.5 members. The percentage of parents with college education is quite low : 7% for mothers in 2002, rising to 12% in 2008, and 8% for fathers in 2002, rising to 12% in 2008. In 2002, 30% of mothers have never worked, while only 23% have a full time job. Reflecting the increasing trend in women labour force participation, the corresponding figures in 2008 are 23% and 31%. An upward trend can also be observed in the participation to reading activities for both children and parents. Turning to child specific characteristics, it can be noticed that the sample composition in terms of gender and birth order is quite stable across the two waves, while the second sample seems to include less older children (i.e. children attending middle and high schools). In our pooled cross section estimation, we will account for these time changes by way of appropriate year dummies.

Table 5**Within family variability (individuals) in relevant subsamples**

Mother			
	Not reading	Reading	Obs
Child doesn't read	171	105	276
%	93.4%	61.8%	78.2%
Child read	12	65	77
%	6.6%	38.2%	21.8%
Obs	183	170	353
Father			
Child doesn't read	139	94	233
%	96.5%	69.6%	83.5%
Child read	5	41	46
%	3.5%	30.4%	16.5%
Obs	144	135	279

5. Results*5.1 Estimated imitation effects*

We report in Table 6 the estimated coefficients of interest. Full estimation results are displayed in Appendix 3. We look at three separate specifications including as regressors a) an indicator for the mother's reading activity, b) an indicator for the father's reading activity c) two separate indicators for the reading activity of mother and father. For each of these three specifications we start by estimating raw correlations without inserting any controls (first column), then we condition to the child's characteristics X and to the type of sampled day (second column) and, finally, we extend the specification to the interactions of parental time with child gender and child age (third column).

The intergenerational coefficient captures the effect of the parent's example and, within a family fixed effect approach, this is causal as far as unobservable differences between siblings are unrelated to their difference in exposure to the parent's reading example¹⁶.

¹⁶ In the longer version of the paper (Mancini *et al.*, 2011) we estimate the intergenerational association in the reading habit without distinguishing between "sermon" and "example" ("long run" model). We find a positive association between parents' and children's reading habits that is stronger for the mother. This association persists and maintains a relevant magnitude even after controlling for a set of observable child's and family characteristics. Despite the conditioning on a large set of covariates, this positive association is likely not to capture the causal effect of the role model played by parents.

Results of Table 6 show that the imitation effect is significant and of considerable magnitude for all three specifications considered. We take column 2 as the preferred specification, since interactions of the parent's time variable with the child's age and gender prove not to be significant, testifying the fact that we cannot identify separately the parental influence according to the child's age and the child's gender. Having observed the mother reading makes a child over eight-times more likely to engage in the same activity afterwards, raising the estimated reading probability from about 4% to about 34%. Direct imitation of the father alone leads to a similar increase in the probability that a child will read: from about 5% if the child does not observe the father reading, to about 36% if the child does. In the bottom part of Table 6 we show that the imitation effect keeps significant and sizable when we disentangle the effect of each parent, and evaluate the effect of imitating the mother (father) while controlling for the possible imitation of the father (mother). The mother's imitation effect, net of the exposure to the father's example, makes the probability that the child will read to increase from about 5% to about 29%, i.e. the probability becomes almost six-times bigger. The father's imitation effect turns out to be just slightly smaller: the probability that the child will read after the father's example raises from about 6% to about 28%, becoming almost five-times bigger. In Tables A3.1 to A3.3 in Appendix 3 we report the full estimation results.

Table 6**Estimated imitation effect. Linear probability model, family fixed effects**Child variable: *child_r_im* (=1 if child engages in reading activity after observing the parent reading)Child specific parent variables: *mother_r* (=1 if mother observed reading by the child)*father_r* (=1 if father observed reading by the child)

VARIABLES	(1)	(2)	(3)
	Raw (FE)	Child (FE)	Inter (FE)
<i>Reference Prob(child_r_im=1)</i>	<i>0.04</i>	<i>0.038</i>	<i>0.037</i>
Mother_r_im	0.302*** (0.055)	0.302*** (0.055)	0.317*** (0.079)
Mother_r_im*wave 2008	0.021 (0.084)	0.017 (0.084)	0.015 (0.085)
Middle and high school		0.004 (0.017)	0.005 (0.016)
Girl		-0.002 (0.013)	-0.000 (0.012)
Mother_r_im*middle/high school			-0.011 (0.067)
Mother_r_im*Girl			-0.015 (0.067)
<i>Reference Prob(child_r_im=1)</i>	<i>0,046</i>	<i>0,048</i>	<i>0,047</i>
Father_r_im	0.314*** (0.056)	0.310*** (0.055)	0.304*** (0.071)
Father_r_im*wave 2008	-0.086 (0.084)	-0.088 (0.084)	-0.093 (0.085)
Middle and high school		-0.002 (0.017)	-0.001 (0.017)
Girl		0.021 (0.013)	0.017 (0.013)
Father_r_im*middle/high school			-0.023 (0.063)
Father_r_im*Girl			0.043 (0.065)

Columns 2 and 3 include as controls: birth order, child health, time spent at school.

Table 6 (cont'd)**Estimated imitation effect. Linear probability model, family fixed effects**

Child variable: *child_r_im* (=1 if child engages in reading activity after observing the parent reading)
 Child specific parent variables: *mother_r* (=1 if mother observed reading by the child)
father_r (=1 if father observed reading by the child)

VARIABLES	(1)	(2)	(3)
	Raw (FE)	Child (FE)	Inter (FE)
<i>Reference Prob(child_r_im=1)</i>	0.047	0.049	0.048
<i>Reference Prob(child_r_im=1)</i>	0.054	0.056	0.055
Mother_r_im	0.239*** (0.065)	0.241*** (0.065)	0.243*** (0.090)
Mother_r_im*wave 2008	0.078 (0.098)	0.074 (0.098)	0.071 (0.099)
Father_r_im	0.220*** (0.069)	0.217*** (0.068)	0.241*** (0.089)
Father_r_im*wave 2008	-0.095 (0.101)	-0.094 (0.101)	-0.095 (0.101)
Middle and high school		-0.004 (0.016)	0.001 (0.016)
Girl		0.003 (0.012)	0.001 (0.012)
Mother_r_im*middle/high school			-0.027 (0.081)
Mother_r_im*Girl			0.023 (0.085)
Father_r_im*middle/high school			-0.028 (0.087)
Father_r_im*Girl			-0.009 (0.087)

Columns 2 and 3 include as controls: birth order, child health, time spent at school.

5.2 Robustness checks

In this subsection we comment upon the outcomes of a number of sensitivity analyses performed to validate our finding on the existence of an imitation effect. The detailed outputs are contained in Appendix 4.

To start with, we display in Table A4.1 the results of an alternative identification strategy, which is much more stringent than the one used to derive the main results presented above. We fix here a point in time (4 p.m.) before which the parents can be observed by their children reading or not, while the behaviour of children is observed after 3.30 p.m. (i.e., we allow activity overlapping for a 30 minute span). Not surprisingly, the number of useful cases for estimation is now quite low, and therefore we cannot identify separate effects for the two parents. Thus, we estimate a specification with a single indicator capturing

whether the child saw at least one of the parents reading. Interestingly, we still spot a significant imitation effect, with similar magnitude as before: the probability that the child engages in the reading activity increases from 4% to 26% following the example of any parent.

A second check consisted in repeating our estimation using the fact that the child reads *before* having seen either parents reading as the dependent variable. The aim of this exercise was to make sure that we are isolating a short run imitation effect and not just capturing habits or other mechanisms. Table A4.2 shows that the main coefficients associated to the parents' reading activities are reduced to about one third of the corresponding figures obtained above, confirming that a substantial component of our estimated effect is indeed imitation.

In a third step we performed some sensitivity on the sample selection criteria. We constructed two new samples to make sure that our sample selection requirement (both parents having filled the daily diary) does not produce biased results. In the first sample, we included all child/mother pairs for which we have both the time diary, and in this sample we tested the mother estimates. In the second sample, we did the same for the child/father pairs. The results remained the same, with only marginal changes in the coefficients (see Table A4.3).

Finally, we run two further regressions including in the model two new variables: time spent at home by the child, and a dummy indicating whether the child already engaged in reading activities before the reading episode we analyse. Time spent at home captures the exposure to the parents' reading example, which is most likely to occur at home with respect to other places. Previous reading activity conveys information about the reading patterns of the child. These child specific variables are likely to be endogenous, but they are certainly correlated both with the reading activity of the child and with that of the parents. The results displayed in Table A4.4 show that these two new regressors leave the estimated imitation effect almost unaltered.

Conclusions

We exploit the presence of households with more than one child in the Italian time use dataset to learn about intergenerational transmission of preferences for human capital building activities, such as reading, between parents and their children aged 6-15. In particular, we investigate whether children are more likely to study and read when they observe their parents doing these activities on the day of the survey (short run imitation effect).

With our identification strategy, the estimated intergenerational coefficient captures the effect of the parents' example. We find novel evidence of a short run imitation effect: children are much more likely to read after seeing their parents reading. The imitation of the mother increases the probability that the child reads from

about 5% to about 29%. The imitation of the father is only slightly lower, raising the probability that the child reads from about 6% to about 28%.

These results rely on a family fixed effect approach and, therefore, disentangle what the parents teach by example (experienced differently by the siblings of the same family in the survey day) from what they tell their children to do (the unobserved parents' educational attitude shared by siblings).

Since children imitate the observed parents' behaviours, we corroborate the saying "a good example is the best sermon" and conclude that the role model played by parents is a channel through which parental time use may affect children's behaviour and time allocation decisions, and thereafter future children outcomes.

Our results shed new light on the mechanisms of intergenerational transmission of preferences and attitudes that are essential for targeting human capital accumulation policies. The imitation mechanism would be particularly important for children with low-educated parents, who provide less stimulus to the reading habits of their children, but who might act as an example when they engage in reading at home. Further research is needed to study imitation of both "positive" behaviour, like socializing, doing physical activities, diet habits¹⁷ and for "negative" behaviours, like smoking and alcohol consumption, watching TV and being violent.

If it is true that parents influence children's actions by example, more attention should be paid to adults' habits. Programs for parents may in fact contribute to improving children's life-course trajectories and to reducing health and developmental problems that are associated to higher costs for the government and for the society as a whole.

¹⁷ Many researches found that parental obesity explains children's being overweight (Whitaker *et al*, 1997)

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Appendix 1.1

Summary statistics of the selected sample

Variables	2002		2008	
	Mean	SD	Mean	SD
Child reading	0.069	0.254	0.098	0.298
Mother reading	0.161	0.368	0.187	0.390
Father reading	0.126	0.332	0.148	0.356
Middle and high school	0.521	0.500	0.421	0.494
Girl	0.471	0.499	0.486	0.500
Birth order: first	0.406	0.491	0.419	0.494
Birth order: second	0.457	0.498	0.465	0.499
Birth order: third or more	0.138	0.345	0.116	0.321
Child's general health status	1.542	0.578	1.458	0.556
Time diary compiled in the summer	0.208	0.406	0.257	0.437
Time diary compiled in the weekend	0.611	0.488	0.665	0.472
Child's time at home (hours)	461.002	152.015	447.115	163.145
More than 5 hours at school	0.237	0.425	0.215	0.411
Mother age	38.730	4.458	40.392	4.434
Mother compulsory school	0.549	0.498	0.421	0.494
Mother high school	0.381	0.486	0.461	0.499
Mother college	0.070	0.255	0.118	0.323
Mother always housewife	0.298	0.457	0.230	0.421
Mother full time	0.230	0.421	0.306	0.461
Father age	42.572	5.046	43.780	4.847
Father compulsory school	0.552	0.497	0.497	0.500
Father high school	0.365	0.482	0.379	0.485
Father college	0.083	0.276	0.124	0.329
Father blue collar	0.340	0.474	0.341	0.474
Father unemployed	0.063	0.243	0.043	0.203
Father white collar	0.074	0.262	0.097	0.296
Father self employed	0.104	0.305	0.143	0.350
Number of family components	4.565	0.903	4.515	0.980
North	0.308	0.462	0.462	0.499
Center	0.135	0.342	0.115	0.319
South	0.556	0.497	0.423	0.494
Number of observations	1,427		1,213	
Number of families	671		580	

Appendix 1.2

Summary statistics of the general sample

All children 6-15 in families with at least two children 6-15

Variables	2002		2008	
	Mean	SD	Mean	SD
Child reading	0.073	0.260	0.093	0.291
Mother reading	0.184	0.387	0.182	0.386
Father reading	0.143	0.350	0.140	0.348
Middle and high school	0.478	0.500	0.370	0.483
Girl	0.481	0.500	0.486	0.500
Birth order: first	0.419	0.494	0.425	0.495
Birth order: second	0.466	0.499	0.470	0.499
Birth order: third or more	0.115	0.319	0.105	0.306
Child's general health status	1.548	0.599	1.456	0.561
Time diary compiled in the summer	0.235	0.424	0.254	0.435
Time diary compiled in the weekend	0.643	0.479	0.625	0.484
Child's time at home (hours)	452.828	173.020	447.228	167.907
More than 5 hours at school	0.192	0.394	0.206	0.404
Mother age	38.534	4.475	39.916	4.532
Mother compulsory school	0.498	0.500	0.814	0.389
Mother high school	0.418	0.493	0.025	0.158
Mother college	0.084	0.277	0.108	0.311
Mother always housewife	0.263	0.441	0.222	0.415
Mother full time	0.241	0.428	0.323	0.468
Father age	42.290	4.904	43.266	5.045
Father compulsory school	0.513	0.500	0.822	0.383
Father high school	0.385	0.487	0.018	0.134
Father college	0.102	0.303	0.111	0.314
Father unemployed	0.339	0.473	0.326	0.469
Father blue collar	0.051	0.219	0.069	0.253
Father white collar	0.083	0.276	0.095	0.294
Father self employed	0.107	0.309	0.137	0.344
Number of family components	4.491	0.846	4.483	0.917
North	0.347	0.476	0.447	0.497
Center	0.144	0.351	0.128	0.334
South	0.509	0.500	0.425	0.495
Number of observations	2,724		1,781	
Number of families	1,293		855	

Appendix 2

Table A2.1. Correlation between seeing the mother reading and child preferences

VARIABLES	2002			2008		
	(0)	(1)	(2)	(0)	(1)	(2)
	rho	FE raw	FE child	Rho	FE raw	FE child
Non-physical activities		0.001 (0.010)	-0.003 (0.011)		0.006 (0.023)	0.005 (0.023)
Outdoor		-0.034 (0.026)	-0.037 (0.026)		-0.024 (0.032)	-0.024 (0.031)
Middle and high school			0.033 (0.026)			0.032 (0.026)
Girl			0.040** (0.019)			0.028 (0.020)
Birth order: second			0.023 (0.019)			-0.000 (0.020)
Birth order: third or more			0.036 (0.039)			-0.006 (0.041)
General health			0.007 (0.026)			-0.008 (0.027)
More than 5 hours at school			-0.038 (0.033)			-0.025 (0.031)
Constant	0.087*** (0.007)	0.110*** (0.019)	0.062 (0.050)	0.124*** (0.007)	0.127*** (0.008)	0.119** (0.047)
Rho	0.419	0.418	0.417	0.571	0.571	0.571
Observations	1,427	1,427	1,427	1,213	1,213	1,213
R-squared	0.000	0.003	0.012	0.000	0.001	0.011
Number of families	671	671	671	580	580	580

Table A2.2. Correlation between seeing the father reading and child preferences

VARIABLES	2002			2008		
	(0) rho	(1) FE raw	(2) FE child	(0) rho	(1) FE raw	(2) FE child
Non-physical activities		-0.006 (0.010)	-0.008 (0.010)		-0.009 (0.022)	-0.010 (0.021)
Outdoor		-0.039* (0.020)	-0.037* (0.022)		0.007 (0.024)	0.008 (0.024)
Middle and high school			0.026 (0.023)			0.040 (0.025)
Girl			0.009 (0.017)			0.025 (0.019)
Birth order: second			0.004 (0.017)			0.006 (0.018)
Birth order: third or more			0.014 (0.034)			0.019 (0.032)
General health			-0.006 (0.023)			-0.005 (0.027)
More than 5 hours at school			-0.034 (0.030)			-0.020 (0.036)
Constant	0.071*** (0.006)	0.103*** (0.015)	0.099** (0.045)	0.096*** (0.006)	0.097*** (0.007)	0.073 (0.046)
Rho	0.444	0.443	0.441	0.557	0.556	0.556
Observations	1,427	1,427	1,427	1,213	1,213	1,213
R-squared	0.000	0.007	0.011	0.000	0.000	0.011
Number of famID	671	671	671	580	580	580

Appendix 3

Table A3.1. Family fixed effects results. Mother

VARIABLES	(1) FE raw	(2) FE child	(3) FE inter
<i>Reference Prob(child_r_im=1)</i>	<i>0.04</i>	<i>0.038</i>	<i>0.037</i>
Mother_r_im	0.302*** (0.055)	0.302*** (0.055)	0.317*** (0.079)
Mother_r_im*wave 2008	0.021 (0.084)	0.017 (0.084)	0.015 (0.085)
Middle and high school		0.004 (0.017)	0.005 (0.016)
Girl		-0.002 (0.013)	-0.000 (0.012)
Birth order: second		-0.022* (0.013)	-0.022* (0.013)
Birth order: third or more		-0.038 (0.027)	-0.038 (0.027)
General health		0.003 (0.018)	0.003 (0.019)
More than 5 hours at school		0.018 (0.020)	0.018 (0.020)
Mother_r_im*middle/high school			-0.011 (0.067)
Mother_r_im*Girl			-0.015 (0.067)
Child's time at home			
Constant	0.039*** (0.004)	0.045 (0.034)	0.043 (0.035)
Observations	2,640	2,640	2,640
R-squared	0.107	0.114	0.114
Number of families	1,251	1,251	1,251

Table A3.2. Family fixed effects results. Father

VARIABLES	(1)	(2)	(3)
	FE raw	FE child	FE inter
<i>Reference Prob(child_r_im=1)</i>	<i>0.046</i>	<i>0.048</i>	<i>0.047</i>
Father_r_im	0.314*** (0.056)	0.310*** (0.055)	0.304*** (0.071)
Father_r_im*wave 2008	-0.086 (0.084)	-0.088 (0.084)	-0.093 (0.085)
Middle and high school		-0.002 (0.017)	-0.001 (0.017)
Girl		0.021 (0.013)	0.017 (0.013)
Birth order: second		-0.026** (0.013)	-0.026** (0.013)
Birth order: third or more		-0.063** (0.025)	-0.064** (0.025)
General health		-0.013 (0.019)	-0.012 (0.019)
More than 5 hours at school		0.014 (0.020)	0.014 (0.020)
Father_r_im*middle/high school			-0.023 (0.063)
Father_r_im*Girl			0.043 (0.065)
Child's time at home			
Constant	0.050*** (0.003)	0.078** (0.035)	0.078** (0.035)
Observations	2,640	2,640	2,640
R-squared	0.071	0.081	0.082
Number of families	1,251	1,251	1,251

Table A3.3. Family fixed effects results. Mother and Father

VARIABLES	(1)	(2)	(3)
	FE raw	FE child	FE inter
<i>Reference Prob(child_r_im=1) mother</i>	0.047	0.049	0.048
<i>Reference Prob(child_r_im=1) father</i>	0.054	0.056	0.055
Mother_r_im	0.239*** (0.065)	0.241*** (0.065)	0.243*** (0.090)
Mother_r_im*wave 2008	0.078 (0.098)	0.074 (0.098)	0.071 (0.099)
Father_r_im	0.220*** (0.069)	0.217*** (0.068)	0.241*** (0.089)
Father_r_im*wave 2008	-0.095 (0.101)	-0.094 (0.101)	-0.095 (0.101)
Middle and high school		-0.004 (0.016)	0.001 (0.016)
Girl		0.003 (0.012)	0.001 (0.012)
Birth order: second		-0.021* (0.013)	-0.022* (0.012)
Birth order: third or more		-0.049* (0.026)	-0.049* (0.026)
General health		-0.004 (0.018)	-0.003 (0.018)
More than 5 hours at school		0.013 (0.019)	0.011 (0.019)
Mother_r_im*middle/high school			-0.027 (0.081)
Mother_r_im*Girl			0.023 (0.085)
Father_r_im*middle/high school			-0.028 (0.087)
Father_r_im*Girl			-0.009 (0.087)
Child's time at home			
Constant	0.029*** (0.005)	0.049 (0.033)	0.046 (0.034)
Observations	2,640	2,640	2,640
R-squared	0.157	0.162	0.163
Number of families	1,251	1,251	1,251

Appendix 4

Table A4.1. Alternative estimation strategy

Estimated imitation effect. Linear probability model, family fixed effects

Child variable: *child_r_im* (=1 if child engages in reading activity after 4 pm)
 Child specific parent variables: *parents_r* (=1 if either of the parents is observed reading by the child before 4.30 pm)

VARIABLES	(1) FE raw	(2) FE child
<i>Reference Prob(child_r_im=1)</i>	0.039	0.037
Parents_r_im	0.218*** (0.047)	0.218*** (0.047)
Parents_r_im*wave 2008	0.113 (0.079)	0.113 (0.079)
Middle and high school		0.004 (0.015)
Girl		-0.002 (0.012)

*This is the sample average estimated probability for a young child conditional to *parents_rs=0*

Table A4.2. Robustness check: child reads before having seen the parent

VARIABLES	FE child	
	Mother	Father
<i>Reference Prob(child_r_im=1)</i>	0.033	0.047
Parental time coeff	0.094*** (0.034)	0.081** (0.037)
Parental time coeff* wave 2009	0.073 (0.055)	0.066 (0.064)
Middle and high school	0.006 (0.015)	0.006 (0.015)
Girl	0.000 (0.011)	0.008 (0.012)
Birth order: second	-0.012 (0.011)	-0.012 (0.012)
Birth order: third or more	-0.028 (0.023)	-0.035 (0.024)
General health	-0.005 (0.016)	0.002 (0.017)
More than 5 hours at school	0.003 (0.017)	0.003 (0.019)
Constant	0.044 (0.030)	0.046 (0.029)
Observations	2,640	2,640
R-squared	0.032	0.020
Number of families	1,251	1,251

Table A4.3. Robustness check: sample selected only for mothers' or fathers' estimates

VARIABLES	FE child	
	Mother	Father
<i>Reference Prob(child_r_im=1)</i>	0.038	0.038
Parental time coeff	0.301*** (0.053)	0.298*** (0.053)
Parental time coeff* wave 2009	0.018 (0.084)	-0.061 (0.082)
Middle and high school	0.008 (0.016)	-0.005 (0.017)
Girl	-0.000 (0.012)	0.022* (0.013)
Birth order: second	-0.022* (0.012)	-0.027** (0.013)
Birth order: third or more	-0.036 (0.026)	-0.069*** (0.025)
General health	-0.003 (0.018)	-0.016 (0.019)
More than 5 hours at school	0.013 (0.019)	0.012 (0.019)
Constant	0.052 (0.033)	0.085** (0.034)
Observations	2,804	2,728
R-squared	0.112	0.082
Number of famID	1,327	1,294

Table A4.4. Robustness check: control for time spent at home by the child and by child's previous reading activity

VARIABLES	Time at home		Child's previous reading activities	
	Mother	Father	Mother	Father
<i>Reference Prob(child_r_im=1)</i>	0.037	0.047	0.046	0.057
Parent_r_im	0.300*** (0.055)	0.306*** (0.055)	0.237*** (0.057)	0.249*** (0.067)
Parent_r_im*wave 2008	0.018 (0.084)	-0.086 (0.084)	-0.049 (0.094)	-0.167 (0.105)
Middle and high school	0.004 (0.017)	-0.003 (0.017)	0.002 (0.013)	-0.007 (0.012)
Girl	-0.003 (0.013)	0.019 (0.013)	-0.003 (0.010)	0.015* (0.009)
Birth order: second	-0.022* (0.013)	-0.026** (0.013)	-0.013 (0.010)	-0.016* (0.009)
Birth order: third or more	-0.039 (0.027)	-0.065** (0.025)	-0.015 (0.022)	-0.040** (0.020)
General health	0.003 (0.018)	-0.012 (0.019)	0.005 (0.017)	-0.015 (0.015)
More than 5 hours at school	0.021 (0.020)	0.020 (0.020)	0.015 (0.014)	0.012 (0.015)
Child's time at home	0.000 (0.000)	0.000 (0.000)		
Child's previous reading activities			0.688*** (0.052)	0.747*** (0.044)
Constant	0.020 (0.046)	0.033 (0.047)	0.014 (0.028)	0.044 (0.027)
Observations	2,640	2,640	2,640	2,640
R-squared	0.114	0.083	0.433	0.545
Number of families	1,251	1,251	1,251	1,251