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Family structure and parental investment in Poland: quality time and extracurricular activities

Iga Magda and Magdalena Smyk

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Iga Magda

Institute for Structural Research and Warsaw School of Economics

Magdalena Smyk

FAME|GRAPE and Warsaw School of Economics

Abstract

This paper examines how family structure and parental characteristics shape parental investments in children, focusing on quality time and participation in extracurricular activities. Using data from the Determinants of Educational Decisions (UDE) panel survey in Poland, we construct a parental investment index (PII) for children aged 1–15 and analyze its determinants alongside patterns of extracurricular activity (ECA) participation. We find systematic differences by child gender and birth order: girls and first-borns receive significantly more parental quality time, although the advantage of first-borns is stronger for boys than girls. Family size reduces investment, particularly for later-born children, while only-child status has weaker effects. Parental education, cultural capital (proxied by the number of books in the household), and strong family ties in the parents' childhood are consistently associated with higher investments, especially in early childhood. Children's participation in ECAs reflects both parental background and gendered expectations, with girls more engaged in arts and boys in sports. Our findings highlight the joint importance of family composition, socioeconomic resources, and cultural norms in shaping parental strategies of investment in children's human capital.

Keywords:

parental investment, family structure

JEL Classification:

I24, J12, J16

Corresponding author: :

Magdalena Smyk, m.smyk@grape.org.pl

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Foundation of Admirers and Mavens of Economics
Group for Research in Applied Economics

w | grape.org.pl
e | grape@grape.org.pl
x | GRAPE_ORG
f | GRAPE.ORG
p | +48 799 012 202

1 Introduction

Parental investment in children’s development is widely recognized as a critical determinant of later life outcomes. Economic theories of the family (Becker, 1993; Heckman et al., 2006) emphasize that parents allocate time and resources to maximize their children’s human capital, treating child-rearing as an intertemporal investment. However, not all investments are equal. While financial inputs matter, evidence shows that quality time devoted to educational activities and participation in structured extracurricular activities yield particularly strong returns in cognitive and socio-emotional development (Hsin and Felfe, 2014; Eccles et al., 2003).

In this study, we take a comprehensive approach to the issue of investments in quality time spent with parents and extracurricular activities. Such activities allow children to develop their abilities, foster habits related to physical activity and regular engagement with the arts, and also support the acquisition of social skills, teaching organization and cooperation within groups. We analyze the intensity of this time through the lens of parental resources and education, family structure (including gender and birth order), and the socio-cultural resources of the family. To the best of our knowledge, this is the first study to consider all of these factors in an integrated manner.

Despite extensive literature on parental investments, less is known about how household composition and child characteristics interact with parental resources to shape these investments. Gender differences emerge early: girls are often reported to receive more instructional activities than boys (Baker and Milligan, 2016; Chuan et al., 2022). Birth order also matters, as first-borns benefit disproportionately from parental time and attention (Price, 2008). Moreover, household resources and parental education strongly influence both the quantity and quality of parental involvement (Guryan et al., 2008)). Yet prior studies often focus on one dimension at a time, neglecting how gender, birth order, and parental background jointly affect both time and extracurricular investments.

This paper addresses these gaps by analyzing rich household-level data from Poland, collected in 2013 and 2015. Using the UDE panel survey, we examine parental quality time with children under 15 and their participation in extracurricular activities. We focus on three main questions: (i) how do gender, birth order, and only-child status shape parental investment? (ii) to what extent do parental education, labor market status, and cultural resources predict these investments? and (iii) do determinants of parental quality time differ from those of extracurricular participation? Our findings contribute to the literature on intergenerational transmission of inequality by showing how family composition and cultural capital interact with socioeconomic status to shape human capital investments during childhood.

The paper is structured as follows. The next section reviews the existing literature on parental investment and extracurricular activities, followed by a description of the data and methods used in the study. Section three presents the results, and the final section concludes by highlighting the importance of the analysis from a policy perspective.

2 Literature Review

Economic research consistently indicates that parental investments, both financial and non-financial, are crucial for children’s later educational, social, and emotional outcomes. Economic theory of the family suggests that parents allocate resources to maximize their children’s human capital, viewing child-rearing as an investment in future returns (Becker, 1993). Heckman (2006) builds upon this by emphasizing the importance of early childhood investments, highlighting that enhancing family environments can improve both cognitive and non-cognitive skills, thereby influencing long-term success.

However, not all types of parental investment have the same impact (Hsin and Felfe, 2014). Only the quality time spend with children is a significant factor. Educational activities and structured time have a positive impact on children’s outcomes, while other joint activities do not affect future performance. The authors highlight the fact that employed women tend to compensate lower total time spend with children by investing more in quality time, and reducing activities that are insignificant from the perspective of child’s development. Fathers also compensate for mother’s employment, being more engaged in all types of activities. Milkie et al. (2010) show that quality time spent with children has a positive impact on children, but also on parental assessment of their work-life balance.

Apart from parental time investment, what positively impact children’s later life outcomes is participation in extracurricular activities (which is also a type of parental investment - financial or organizational) (Mahoney et al., 2005; Fredricks and Eccles, 2006). Eccles et al. (2003) show that participation in structured leisure activities positively affect youth development. The authors provide empirical evidence that participation in the involvement of extracurricular activities in educational performance and lower the chances of risky behavior during adolescence and young adulthood.

Our study explores the determinants of higher parental involvement in educational activities and quality time spent with children and participation in extracurricular activities. We particularly focus on whether gender of a child and family composition plays important role in shaping parental investments. Empirical evidence highlights that gender differences emerge early in parental time allocation. For instance, Baker and Milligan (2016) document that in Canada, the United Kingdom, and the United States, preschool girls receive more instructional time in activities such as reading compared to boys, which contributes to persistent differences in early literacy outcomes. Similarly, Chuan et al. (2022) find that daughters aged 3–5 in the US benefit from higher parental investment in early education, translating into enduring advantages in literacy during school years, although no comparable advantage is observed in mathematics.

Birth order is another important factor shaping parental investment. Price (2008) show that first-born children receive 20–30 more minutes of quality parent-child time per day than second-borns of the same age, as parents allocate roughly equal time at each moment while the overall availability of quality time declines as children grow older. Dai and Heckman (2013) and Cunha and Heckman (2007) further demonstrate that older siblings and early parenting influence young children’s cognitive skills both directly and indirectly, emphasizing the importance of early environmental conditions for the development of adolescent and adult cognitive and non-cognitive skills (Borghans et al., 2006; Cunha et al., 2010; Heckman et al., 2006; Knudsen et al., 2006).

Parental characteristics and household resources are also strong predictors of child outcomes. Higher parental education is consistently associated with increased parental involvement. For example, Guryan et al. (2008) find that college-educated mothers spend roughly 4.5 hours more per week on child care compared to mothers with a high school education or less, despite higher opportunity costs from employment. These patterns hold across different types of childcare, including basic, educational, and recreational activities. Similarly, Gimenez-Nadal and Molina (2013) show that mothers' education influences the time devoted to educational childcare by both parents in Spain and the UK, whereas fathers' education alone has no significant effect.

Taken together, the literature demonstrates that quality parental time and participation in extracurricular activities are linked to gender composition and family structure, as well as parents background. However, existing research often examines these factors in isolation or focused on particular age groups. Less is known about how family composition, gender, and parental characteristics jointly shape parental quality time investment and participation in different types of extracurricular activities across a broader population. Our study addresses this gap by analyzing detailed microdata to examine how these factors influence children's involvement in sports, arts, and other extracurricular activities, with particular attention to interactions between gender and family structure.

3 Data & methods

We use data from the study Determinants of Educational Decisions (UDE), a panel survey of Polish households designed to collect information on human capital formation from an intergenerational perspective. The survey includes questionnaires for adult respondents and their children, as well as retrospective questions about respondents' parents. It provides rich data on demographic and labour market characteristics, with detailed information on caregiving and educational activities. In addition, it covers respondents' labour market histories, and family biographies.

In our study, we focus on two types of questions: regarding *quality* time that parents spent with children and *extracurricular activities* of children below 15 years of age. We restrict our sample to households with head of the household (person who provides the largest share of the income), the head's wife/husband/partner, and at least one child below 15. This limitation was driven by the fact that the questions on quality time are asked in the following manner: *How often do you [respondent] or someone else at home spend time with the child in the following ways?*. Excluding other categories of households we make sure that the question regards a parent.

For two age groups: 1 to 6 years old (below primary school age), and 7 to 15 years old (primary school age) different categories of activities are provided. For the smaller children there are ten categories (questions): reading to the child, telling stories, singing songs, playing with letters (e.g. alphabet blocks), talking about what you did together, talking about what you read together, playing word games, writing letters or words, reading aloud signs, labels, etc., and playing board games. For older children there are six categories: talking about politics or social issues, talking about books, movies, or TV programs, spending time with the child in casual conversations, talking with the child about school, going with the child to

a bookstore or library, talking about what the child reads independently. For each question respondent can answer on the 4-levels scale: never or almost never, 1-2 per month, 1-2 per week, everyday or almost everyday. The distribution of answers for each question is provided in the Appendix Figures A1 and A2.

Four six out of ten activities: reading, telling stories, singing, playing with letters and talking about joint activities and books, most of the parents report that they do with children everyday or at least 1-2 per week. The remaining four activities: playing word games, writing, reading aloud, and playing board games are much more often reported as never performed with own child. This suggests that most of the variation in the joint index will come from those activities.

When it comes to older children, three groups of activities can be recognized. Spending time on casual talks or conversations about school is reported as everyday habit by most of the parents. Talking about books, movies, TV programs or books that the child read is also quite common. Majority of respondents report such activity 1-2 times per week. Finally, parents rarely report talking about politics or social issues, or going with a school-aged child to a bookstore or library.

In our analysis, we focus on an parental investment index (PII) which is a sum of described variables. For each frequency we ascribe a number: 0 for 'never', 1 for '1-2 a month', 2 for '1-2 per week', and 3 to 'everyday', and for each child we calculate a sum of answers from 10, if the child is below 8 years old, or 6 questions (if the child is between 8 and 15). We additionally provide a binary variable that is equal to 1 if the level of parental investment index is higher than a sample average (19.75 for smaller kids, and , and zero otherwise. The distribution of indices (separately for younger and older children) are provided in the Figure 1.

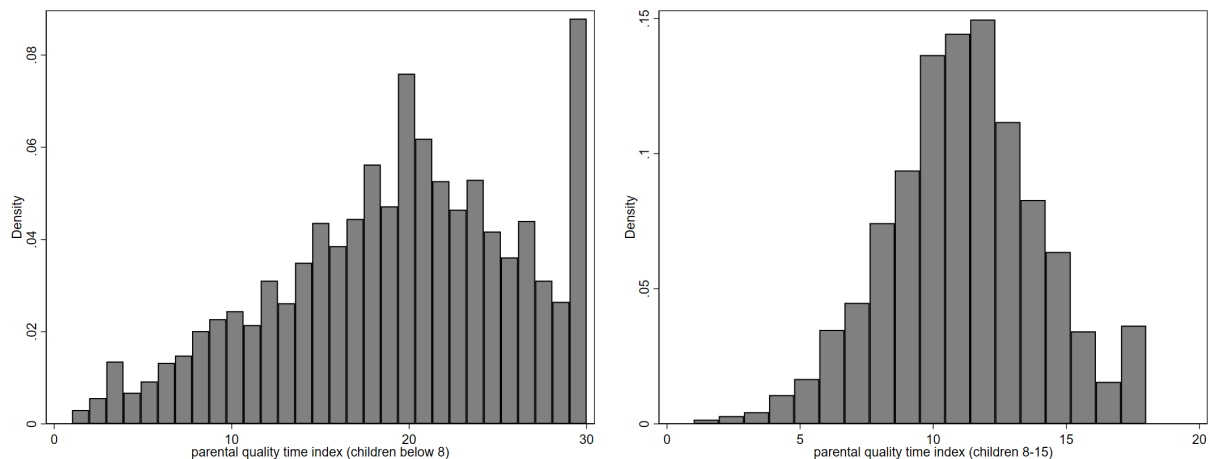
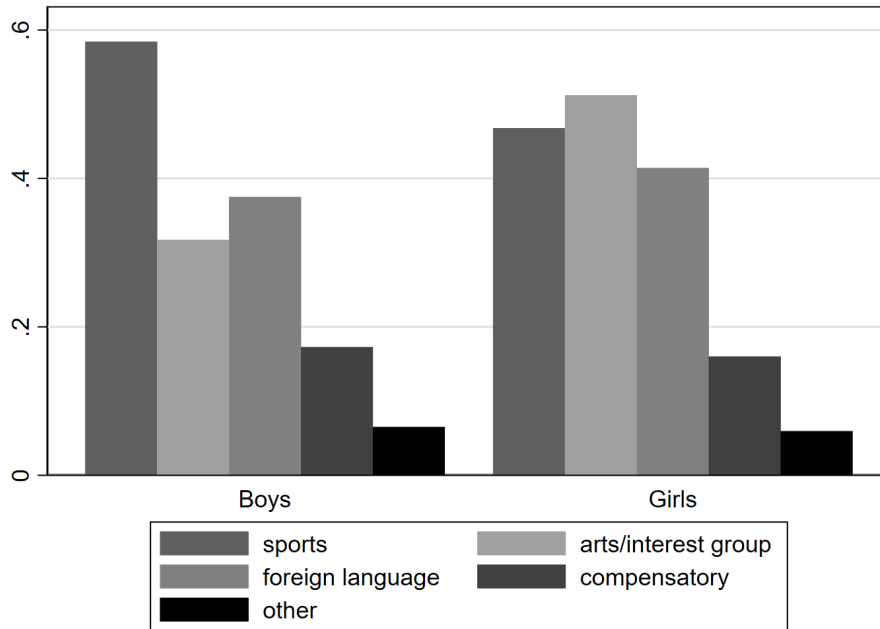


Figure 1: Parental investment index (PII): distributions

Additionally, as variables of interest, we explore questions regarding extracurricular activities. The distribution of participation in the sample is provided in the Figure 2. The majority of children (66% among girls, and 68% among boys) do not participate at all in any kind of extracurricular activity. The difference is significant at 5% level.

Figure 2: Distribution of participation in extracurricular activities by gender



Among those who participate in additional activities the most popular are sports (including dancing and gymnastics) with 61.49% participation among boys and 50.63% among girls (statistically different, $p\text{-value} = 0$), artistic classes or interest groups - with participation of 52.64% among girls and 33.33% (statistically different, $p\text{-value} = 0$) and foreign languages - 42.61% among boys and 45.09% among girls (no difference). Compensatory classes and other types of classes attract around 15% and 5%, respectively, of children in the sample, with no gender differences in frequency of participation.

In our analysis we focus on the likelihood that the child participate in the extracurricular activity at all, and whether the choice is a gender-typed (sport activities and arts/interest groups).

To recognize determinants of parental quality time investment among family characteristics such as family structure and parents family, educational and labor market background, we estimate OLS (dependent variable is a continuous index of parental investment) and logistic regressions - to estimate likelihood of exceeding the mean parental investment in the sample and probability of participation in extracurricular activities. In each regression, we cluster standard errors at the household level.

We look at several family structure characteristics: size of the family (represented by *Only Child* binary variable and *number of children*), birth order (*First Born*, only when there is more than one child), and gender of the child (*Girl*). As we are especially focused on the gender composition of the children, we add a variable recognizing whether first born child was a boy (*First Born: Boy*).

Being only child, first born child, and having first born boy is interacted with a gender of child for whom we observe the quality time and participation in the extracurricular activities. We control for child's age (categorical variable).

As for parental characteristics, we control for mother and father educational level (primary or vocational, secondary or tertiary), and labor market status (employed, unemployed, inactive), parents' age, number of books in the household (that is a common proxy for cultural and educational resources, (Engzell, 2021)), and reported by parents strong family ties regarding their childhood families. In the regressions regarding older children (school-aged), we additionally control for assessment of academic performance provided by parents.

Table 1 presents descriptive statistics for the main variables used in the analysis. The parental investment index (PII) for children below 8 years old has a mean value of 19.8 (SD = 6.9), while for children aged 8–15 it amounts to 11.4 (SD = 3.0). Approximately 56% of younger children and 49% of older children receive an above-average level of parental quality time investment. Participation in extracurricular activities (ECA) increases with age: 19% of younger children attend such activities compared to 49% among those aged 8–15 (33

Girls constitute about half of the sample across age groups. Among younger children, only children represent 33% and first-borns 19%, whereas among older children these shares are 31% and 44%, respectively. The average number of children in the household is close to two.

Parents of younger children are on average younger (mothers: 32.7 years, fathers: 35.2) compared to parents of older children (38.8 and 41.5 years, respectively). Regarding parental education, mothers of younger children are more likely to have completed tertiary education (42%) compared to those of older children (27%). Fathers show a similar pattern, with 30% having tertiary education among the younger group and 17% among the older.

Labor market status is also age-dependent: about two-thirds of mothers of younger children are employed, with a similar share among mothers of older children. Fathers are predominantly employed (over 90% in both groups).

Households in the sample are relatively resourceful in terms of cultural capital: 42% of younger children and 39% of older children live in households with 26–100 books, and around 13–14% live in households with more than 200 books. Finally, the majority of respondents report strong family ties during their own childhood (98% across both groups).

Although family income is an important predictor, we could not use this variable because, in the UDE survey, over 80% of respondents either refused or did not provide an answer to the question about household income.

4 Results

The results section presents the findings and interpretation of the estimations regarding three main outcomes: (1) parental quality time spent with children under the age of eight, (2) parental quality time spent with school-aged children (8–15 years), and (3) children's participation in extracurricular activities. In the interpretation, we place particular emphasis on the role of family composition and parental characteristics.

Table 2 summarizes the analysis of parental quality time spent with young children aged 1 to 7. We observe that girls consistently receive higher levels of investment than boys, both in the continuous parental investment index and in the likelihood of exceeding the sample average, as shown by the logit models. First-born children also receive substantially more investment than their later-born siblings, consistent with the long-standing finding that

Table 1: Descriptive statistics

VARIABLES	Children below 8		Children 8–15		All – ECA	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
PII index (below 8)	19.75	6.93				
PII index > average (below 8)	0.56	0.50				
PII index (8–15)			11.37	3.01		
PII index > average (8–15)			0.49	0.50		
ECA participation	0.19	0.40	0.49	0.50	0.33	0.47
Girl	0.50	0.50	0.48	0.50	0.48	0.50
First Born	0.19	0.39	0.44	0.50	0.30	0.46
Only Child	0.33	0.47	0.31	0.46	0.32	0.47
Later Born Child	0.48	0.50	0.25	0.43	0.38	0.49
First Born: Boy	0.52	0.50	0.53	0.50	0.52	0.50
Number of children	1.93	0.91	2.03	1.02	1.98	0.96
Mother’s education						
primary or vocational	0.44	0.50	0.61	0.49	0.51	0.50
secondary	0.14	0.34	0.12	0.33	0.14	0.34
tertiary	0.42	0.50	0.27	0.44	0.36	0.48
Father’s education						
primary or vocational	0.62	0.48	0.77	0.42	0.69	0.46
secondary	0.07	0.26	0.05	0.22	0.06	0.25
tertiary	0.30	0.46	0.17	0.38	0.24	0.43
Mother’s LMS						
employed	0.66	0.47	0.70	0.46	0.68	0.47
unemployed	0.19	0.39	0.16	0.37	0.17	0.38
inactive	0.16	0.36	0.14	0.35	0.15	0.36
Father’s LMS						
employed	0.93	0.25	0.89	0.31	0.91	0.28
unemployed	0.05	0.22	0.07	0.25	0.06	0.24
inactive	0.02	0.13	0.04	0.20	0.03	0.16
Mother’s age	32.71	5.24	38.79	5.75	35.44	6.32
Father’s age	35.23	5.88	41.47	6.44	38.05	6.94
No. of books in the hh						
below 10 books	0.08	0.27	0.11	0.31	0.09	0.29
11–25 books	0.19	0.39	0.23	0.42	0.21	0.41
26–100 books	0.42	0.49	0.39	0.49	0.40	0.49
101–200 books	0.17	0.38	0.15	0.36	0.16	0.37
more than 200 books	0.14	0.35	0.11	0.32	0.13	0.34
Strong family ties (in childhood)	0.98	0.15	0.98	0.14	0.98	0.14
No. of observations	4,623		4,454		9,588	

birth order matters for human capital formation. However, the interaction between first-born status and gender points to an asymmetry: first-born girls benefit less than first-born boys, which may reflect persistent gendered expectations in the household. The only-child status is positively associated with investment, the coefficients are relatively small and turns out to be not statistically significant, suggesting that being the sole focus of parental attention does not translate into substantially higher educational inputs beyond what is explained by birth order and gender alone. The logit results confirm these findings: both being a girl and being the first-born significantly increase the probability that parental investment exceeds the sample average, whereas the moderating effects of the interaction terms are weaker and less robust.

Turning to parental and household characteristics, the results underscore the importance of socioeconomic background and cultural capital in determining the allocation of educational resources. Maternal and paternal education — particularly tertiary attainment — is strongly associated with higher levels of investment, raising both the parental investment index and the probability that investment is above average. Similarly, paternal labor market participation, especially employment, has a significant positive effect, whereas maternal labor market status appears to matter less. Cultural resources at home, proxied by the number of books, show a strikingly consistent and monotonic pattern: comparing households with very few books to those with extensive collections, we see the increase in both the level and the likelihood of above-average investment, with the largest effects observed once households cross the threshold of 100 books. Finally, strong family ties experienced by parents in their own childhood are a powerful predictor of intergenerational transmission of investment: parents who grew up in families with close relationships are significantly more likely to invest above the sample average in their children’s education. The logit results highlight how these parental and cultural factors shift the probability distribution, not just the mean level, of investment, suggesting that both socioeconomic endowments and inherited family norms shape how parents prioritize educational resources across children.

Table 3 presents the results for parental quality time investment in school-aged children (8–15 years). Similar to the findings for younger children, gender remains an important determinant: girls receive significantly more parental quality time than boys, both in terms of the investment index and in the probability of exceeding the sample average. First-born children also benefit from higher investments, though the interaction term indicates that first-born girls receive less additional attention than their male counterparts, suggesting a partial offset of the birth-order advantage. The results for only children are not statistically significant, and the interaction between being a girl and an only child even points to lower investment levels, though this effect is less robust. Family size also plays a role: each additional child in the household reduces the likelihood of above-average parental time investment, an effect that is particularly pronounced in the subsample of later-born children. Finally, the age profile of school-aged children reveals a decline in quality time as children grow older, with a marked drop for those aged 14–15 compared to the 8–10 reference group. However, this effect is only significant for the sample including first born children, and when continuous measure is analyzed. There is no expected drop in probability to exceed the mean.

Parental and household characteristics again emerge as strong predictors of investment. Parents’ perceptions of a child’s academic performance are especially influential: children

Table 2: Parental quality time investment: children below 8

VARIABLES	All		Only Later Born Children	
	OLS	Logit	OLS	Logit
	Parental investment index (PII)	PII > average	Parental investment index (PII)	PII > average
Girl	1.280*** (0.419)	0.270** (0.131)	1.329*** (0.421)	0.280** (0.129)
First Born	1.432*** (0.374)	0.406*** (0.131)		
Girl×First Born	-0.859* (0.516)	-0.100 (0.182)		
Only Child	0.470 (0.491)	0.213 (0.154)		
Girl×Only Child	0.148 (0.532)	0.052 (0.170)		
First Born: Boy	0.561 (0.435)	0.157 (0.132)	0.587 (0.435)	0.163 (0.129)
Girl×First Born: Boy	-0.372 (0.577)	-0.063 (0.180)	-0.414 (0.579)	-0.072 (0.177)
Number of Children	-0.050 (0.250)	0.017 (0.072)	-0.113 (0.260)	0.001 (0.073)
Child's age (ref: 1-2 year old)				
3-5 year old	4.719*** (0.253)	1.091*** (0.078)	4.348*** (0.368)	0.948*** (0.107)
6-7 year old	5.458*** (0.304)	1.372*** (0.098)	4.917*** (0.417)	1.127*** (0.129)
Mother's education (ref: primary & vocational) secondary	0.364 (0.352)	0.157 (0.110)	0.182 (0.527)	0.211 (0.150)
tertiary	0.799*** (0.294)	0.224** (0.094)	0.552 (0.455)	0.165 (0.131)
Father's education (ref: primary & vocational) secondary	0.344 (0.422)	0.142 (0.135)	0.561 (0.693)	0.130 (0.198)
tertiary	0.512* (0.290)	0.170* (0.095)	0.492 (0.453)	0.082 (0.135)
Mother's LMS (ref: unemployed) employed	-0.135 (0.312)	0.006 (0.096)	-0.460 (0.451)	-0.036 (0.133)
inactive	-0.566 (0.409)	-0.136 (0.120)	-0.775 (0.570)	-0.155 (0.159)
Father's LMS (ref: unemployed) employed	1.013** (0.514)	0.330** (0.156)	1.836** (0.775)	0.669*** (0.230)
inactive	0.594 (0.971)	0.185 (0.309)	1.600 (1.231)	0.565 (0.398)
Mother's age	0.028 (0.034)	0.017 (0.011)	0.067 (0.050)	0.023 (0.015)
Father's age	-0.018 (0.029)	-0.009 (0.009)	-0.026 (0.040)	-0.010 (0.012)
No. of books in the hh (ref: below 10 books)				
11-25 books	0.939* (0.508)	0.316** (0.148)	0.957 (0.647)	0.242 (0.183)
26-100 books	1.562*** (0.476)	0.437*** (0.139)	1.123* (0.606)	0.268 (0.173)
101-200 books	2.425*** (0.525)	0.693*** (0.157)	2.076*** (0.709)	0.552*** (0.204)
more than 200 books	1.892*** (0.551)	0.448*** (0.163)	1.177 (0.773)	0.265 (0.218)
Strong family ties (in parents childhood)	3.779*** (0.750)	0.941*** (0.236)	4.803*** (1.015)	0.910*** (0.329)
Constant	8.156*** (1.360)	-3.039*** (0.427)	6.416*** (1.875)	-3.154*** (0.576)
Observations	4,623	4,623	2,227	2,227
R-squared	0.150		0.122	

Notes: Robust standard errors in parentheses.

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

Table 3: Parental quality time investment: school-aged children (8-15)

VARIABLES	All		Only Later Born Children	
	OLS	Logit	OLS	Logit
	Parental investment index (PII)	PII > average	Parental investment index (PII)	PII > average
Girl	0.515** (0.257)	0.364** (0.183)	0.496* (0.261)	0.367** (0.187)
First Born	0.508*** (0.163)	0.177 (0.126)		
Girl×First Born	-0.660*** (0.240)	-0.317* (0.182)		
Only Child	0.354 (0.255)	0.124 (0.176)		
Girl×Only Child	-0.630** (0.298)	-0.287 (0.215)		
First Born: Boy	-0.187 (0.265)	-0.022 (0.183)	-0.193 (0.266)	-0.023 (0.183)
Girl×First Born: Boy	-0.375 (0.351)	-0.309 (0.251)	-0.369 (0.354)	-0.323 (0.253)
Number of Children	-0.159 (0.104)	-0.110* (0.062)	-0.238** (0.111)	-0.159** (0.075)
Child's age (ref: 8-10 year old)				
11-13 year old	-0.070 (0.100)	-0.054 (0.074)	-0.137 (0.184)	-0.200 (0.137)
14-15 year old	-0.287** (0.140)	-0.063 (0.097)	-0.404 (0.516)	0.036 (0.339)
How parent assess child's academic performance? (ref: bad or rather bad)				
average	0.677* (0.346)	0.377 (0.239)	1.025* (0.558)	1.113** (0.508)
good or very good	1.534*** (0.338)	0.815*** (0.233)	1.999*** (0.532)	1.637*** (0.492)
Mother's education (ref: primary & vocational)				
secondary	0.178 (0.162)	0.069 (0.110)	-0.137 (0.326)	0.035 (0.213)
tertiary	0.565*** (0.133)	0.347*** (0.100)	0.373 (0.263)	0.177 (0.212)
Father's education (ref: primary & vocational)				
secondary	-0.242 (0.231)	-0.151 (0.153)	-0.381 (0.526)	-0.087 (0.350)
tertiary	0.392*** (0.144)	0.291** (0.115)	0.135 (0.283)	0.055 (0.242)
Mother's LMS (ref: unemployed)				
employed	-0.091 (0.155)	-0.009 (0.105)	0.022 (0.286)	0.130 (0.199)
inactive	0.106 (0.219)	0.162 (0.137)	0.405 (0.394)	0.500** (0.245)
Father's LMS (ref: unemployed)				
employed	0.265 (0.257)	0.106 (0.158)	0.115 (0.501)	0.075 (0.301)
inactive	0.463 (0.357)	0.130 (0.234)	0.527 (0.648)	0.332 (0.467)
Mother's age	-0.029* (0.017)	-0.026** (0.011)	-0.046 (0.031)	-0.044** (0.021)
Father's age	0.011 (0.015)	0.009 (0.010)	0.019 (0.028)	0.024 (0.018)
No. of books in the hh (ref: below 10 books)				
11-25 books	0.326 (0.206)	0.302** (0.136)	0.531 (0.352)	0.328 (0.239)
26-100 books	0.695*** (0.192)	0.493*** (0.129)	0.840** (0.334)	0.485** (0.230)
101-200 books	1.209*** (0.216)	0.836*** (0.149)	1.287*** (0.394)	0.753*** (0.276)
more than 200 books	1.251*** (0.238)	0.850*** (0.165)	1.667*** (0.450)	0.945*** (0.313)
Strong family ties (in parents childhood)	0.714 (0.442)	0.392 (0.275)	0.336 (0.774)	0.069 (0.424)
Constant	9.112*** (0.792)	-1.142** (0.529)	9.582*** (1.414)	-1.392 (0.990)
Observations	4,454	4,454	1,125	1,125
R-squared	0.089		0.096	

Notes: Robust standard errors in parentheses.

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

assessed as having “good” or “very good” results receive substantially more quality time, both in absolute terms and in the probability of being above average. This suggests two direction possible effects: first, it is possible that parents assess better educational performance of children with whom they spent more time with, second, lack of quality time with parents can correlate with a lower educational self-investment. Education levels of both mothers and fathers, particularly tertiary attainment, are positively associated with parental investment, although the effects are somewhat weaker for later-born children. Parental labor market status is less systematically related to quality time, though there is some evidence that maternal inactivity—potentially reflecting greater availability of time—is associated with above-average investment for later-born children. Maternal age has a small but significant negative effect, reducing both the index and the probability of exceeding the sample average, while paternal age does not appear to matter. Cultural resources at home are again strongly and monotonically associated with investment: households with over 100 books show the highest levels of parental quality time, and these effects remain robust across specifications. Unlike the results for younger children, however, strong family ties experienced in parents’ own childhood do not significantly predict investments in school-aged children. Overall, these results highlight that both family composition and parental background shape the allocation of quality time, but that the determinants evolve as children grow older and parental time competes more directly with children’s growing independence and school commitments.

Finally, table 4 presents results of logit regression estimates of participation in extracurricular activities (ECA) for children, distinguishing between any ECA, sports activities, and arts/interests activities (type of activity within the group of children who participates in any ECA). The analysis is reported for the full sample and for later-born children only.

Overall, the results indicate that gender plays a significant role in ECA participation. Girls are more likely to participate in arts/interest activities (coefficients = 1.172*** for all children, 1.155*** for later-born children), while they are less likely to participate in sports (coefficients = -0.354* and -0.344*). Participation in any ECA is slightly higher for girls, but significant only for later born children.

Birth order also appears relevant. Being a first-born child is positively associated with participation in any ECA (0.400***), though this effect is attenuated for girls as indicated by the negative interaction term ($\text{Girl} \times \text{First Born} = -0.251^*$). Only children show increased likelihood of engaging in arts/interests activities (0.620***), but this effect is again moderated by gender ($\text{Girl} \times \text{Only Child} = -0.437^*$), suggesting that parental resources and expectations for single children may differ by gender.

Age effects are substantial and intuitive: younger children (1–2 years) are much less likely to participate in any ECA, sports, or arts activities, while older children (6–13 years) have higher participation probabilities. For children aged 14–15, the likelihood of participating in sports and arts activities declines slightly, consistent with typical developmental patterns and possibly the start of more specialized or academic-focused commitments.

Higher maternal and paternal education is generally associated with higher participation in ECAs, particularly for arts/interest activities. Household resources, measured by the number of books, similarly increase the likelihood of ECA participation, especially for children in households with more than 100 books. Parental labor market status and age have smaller and more mixed effects, though some significant negative associations are observed for inactive mothers.

Cultural resources of the household (proxied by number of owned books) matter for the probability of children begin engaged in any type of ECA and probability of choosing art or interest group instead of different type of activity, it does not matter for probability of choosing sport.

5 Conclusions

Our analysis demonstrates that parental investment in children is shaped by both family structure and parental background. Girls consistently receive more quality time than boys, and first-born children benefit disproportionately compared to their later-born siblings. However, the advantage of first-borns is gendered: first-born boys receive more additional investment than first-born girls. This suggests that traditional gender expectations may influence parental allocation of time, with boys receiving an extra boost when they are the eldest. In contrast to findings from developing countries, while gender, number of siblings, and birth order matter, interactions, such as the gender of the firstborn child, do not correlate in any way with parental involvement.

The results also show that family size matters. Each additional child in the household reduces parental investment, particularly for later-borns, pointing to the trade-offs inherent in time allocation. Contrary to expectations, being an only child does not systematically translate into higher investments, suggesting that parental strategies may be more strongly guided by relative sibling position than by exclusivity of parental attention.

We find that parental background plays a more significant and consistent role. Parental education and household cultural capital emerge as robust predictors of investment. Tertiary-educated parents, especially mothers, devote more quality time, while the number of books in the household shows a strikingly monotonic association with both time and extracurricular participation. This supports the idea that cultural resources serve not only as direct inputs but also as signals of parental preferences and norms regarding education. Importantly, parents who experienced strong family ties in their own childhood are more likely to spend above average time with their children, highlighting the intergenerational transmission of family culture and values.

Participation in extracurricular activities reveals complementary but distinct patterns. While overall participation remains modest, older children and those in culturally resourceful households are more likely to take part. Gender norms clearly shape choices: girls gravitate toward arts and interest groups, while boys are more likely to engage in sports. These patterns reinforce traditional gender roles in skill development and leisure, raising questions about the persistence of gendered pathways into adulthood.

Taken together, our findings suggest that parental investments are jointly determined by structural constraints (family size, birth order), socioeconomic resources (education, labor market status), and cultural endowments (books, family norms). They also reveal that investments are not gender-neutral, but shaped by expectations that may reinforce long-term inequalities. However, this strand is limited in comparison to, for example, parental background.

From a policy perspective, our results highlight the importance of supporting families with multiple children and those with lower cultural and educational resources, to reduce dis-

Table 4: Extracurricular activities

VARIABLES	Any ECA = 1		ECA - sport = 1, other ECA = 0		ECA - Arts/Intrests = 1, other ECA = 0	
	Logit All	Logit Only Later Born	Logit All	Logit Only Later Born	Logit All	Logit Only Later Born
Girl	0.269 (0.126)	0.274** (0.128)	-0.354* (0.197)	-0.344* (0.198)	1.172*** (0.210)	1.155*** (0.213)
First Born	0.400*** (0.098)		0.125 (0.155)		0.119 (0.172)	
Girl×First Born	-0.251* (0.134)		0.010 (0.215)		0.000 (0.223)	
Only Child	0.195 (0.133)		-0.004 (0.194)		0.620*** (0.212)	
Girl×Only Child	-0.320** (0.155)		0.282 (0.239)		-0.437* (0.248)	
First Born: Boy	-0.116 (0.128)	-0.128 (0.130)	0.189 (0.201)	0.216 (0.204)	0.187 (0.227)	0.162 (0.232)
Girl×First Born: Boy	0.061 (0.175)	0.068 (0.178)	-0.012 (0.276)	-0.054 (0.280)	-0.203 (0.296)	-0.137 (0.302)
Number of Children	-0.076 (0.052)	-0.054 (0.056)	-0.074 (0.067)	-0.167* (0.089)	0.146** (0.070)	0.122 (0.080)
Child's age (ref: 3-5 year old)						
1-2 year old	-1.924*** (0.159)	-1.996*** (0.248)	-0.750** (0.302)	-0.969** (0.479)	-1.543*** (0.453)	-2.272** (1.057)
6-7 year old	1.011*** (0.085)	0.980*** (0.135)	0.017 (0.138)	-0.284 (0.229)	0.425*** (0.146)	0.535** (0.242)
8-10 year old	1.617*** (0.084)	1.716*** (0.132)	0.043 (0.133)	-0.154 (0.223)	0.469*** (0.138)	0.789*** (0.232)
11-13 year old	1.896*** (0.094)	1.988*** (0.154)	0.180 (0.144)	-0.045 (0.252)	0.336** (0.150)	0.575** (0.258)
14-15 year old	1.517*** (0.112)	1.030*** (0.377)	-0.108 (0.171)	-0.349 (0.626)	-0.055 (0.174)	-0.729 (0.817)
Mother's education (ref: primary & vocational)						
secondary	0.188** (0.087)	0.301** (0.149)	0.191 (0.127)	0.273 (0.243)	0.398*** (0.130)	0.456* (0.240)
tertiary	0.702*** (0.078)	0.721*** (0.137)	0.201* (0.104)	0.384* (0.207)	0.366*** (0.109)	0.547** (0.215)
Father's education (ref: primary & vocational)						
secondary	0.217* (0.117)	0.128 (0.223)	0.117 (0.153)	-0.062 (0.336)	-0.030 (0.169)	0.656* (0.340)
tertiary	0.214*** (0.083)	0.165 (0.145)	0.378*** (0.109)	0.172 (0.213)	0.045 (0.109)	0.238 (0.217)
Mother's LMS (ref: unemployed)						
employed	0.124 (0.081)	0.179 (0.144)	-0.090 (0.117)	0.030 (0.229)	0.190 (0.121)	-0.305 (0.225)
inactive	-0.329*** (0.112)	-0.191 (0.183)	-0.045 (0.158)	0.094 (0.283)	-0.006 (0.170)	-0.078 (0.284)
Father's LMS (ref: unemployed)						
employed	-0.004 (0.122)	0.067 (0.205)	0.217 (0.172)	-0.012 (0.327)	0.199 (0.195)	-0.160 (0.318)
inactive	-0.071 (0.215)	0.342 (0.363)	-0.313 (0.272)	-0.775 (0.528)	-0.156 (0.309)	-0.768 (0.572)
Mother's age	-0.010 (0.008)	-0.024* (0.014)	0.011 (0.013)	0.016 (0.024)	0.004 (0.013)	0.002 (0.024)
Father's age	0.010 (0.007)	0.026** (0.012)	-0.011 (0.011)	-0.002 (0.019)	0.001 (0.011)	-0.010 (0.018)
No. of books in the hh (ref: below 10 books)						
11-25 books	0.219* (0.118)	0.067 (0.191)	-0.070 (0.172)	-0.392 (0.314)	0.040 (0.180)	-0.315 (0.312)
26-100 books	0.455*** (0.112)	0.435** (0.179)	-0.102 (0.161)	-0.283 (0.287)	0.205 (0.168)	0.074 (0.285)
101-200 books	0.668*** (0.127)	0.691*** (0.212)	0.103 (0.176)	0.054 (0.320)	0.348* (0.183)	-0.124 (0.322)
more than 200 books	1.000*** (0.134)	1.043*** (0.215)	0.183 (0.184)	-0.089 (0.329)	0.601*** (0.189)	0.240 (0.333)
Constant	-2.490*** (0.299)	-2.810*** (0.474)	-0.050 (0.446)	0.138 (0.814)	-2.752*** (0.473)	-1.483* (0.802)
Observations	9,588	3,635	3,271	901	3,261	894

Notes: Robust standard errors in parentheses.

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

parities in parental investment. Expanding access to extracurricular activities—particularly for children from less advantaged households—could help mitigate inequalities arising from differential parental time allocation. Moreover, awareness campaigns and educational programs that challenge gender stereotypes in parental investment and extracurricular choices may foster more equitable opportunities for boys and girls alike.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the author(s) used ChatGPT in order to improve language and readability of the text. After using this tool/service, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

References

- Baker, M. and Milligan, K. (2016). Boy-girl differences in parental time investments: Evidence from three countries. *Journal of Human capital*, 10(4):399–441.
- Becker, G. S. (1993). *A treatise on the family: Enlarged edition*. Harvard university press.
- Borghans, L., Duckworth, A. L., Heckman, J. J., and ter Weel, B. (2006). The economics and psychology of personality traits. *Journal of Human Resources*, 43(4):972–1059.
- Chuan, A., List, J. A., Samek, A., and Samujjwala, S. (2022). Parental investments in early childhood and the gender gap in math and literacy. In *AEA Papers and Proceedings*, volume 112, pages 603–608. American Economic Association 2014 Broadway, Suite 305, Nashville, TN 37203.
- Cunha, F. and Heckman, J. J. (2007). The technology of skill formation. *American Economic Review*, 97(2):31–47.
- Cunha, F., Heckman, J. J., and Schennach, S. M. (2010). Estimating the technology of cognitive and noncognitive skill formation. *Econometrica*, 78(3):883–931.
- Dai, X. and Heckman, J. J. (2013). Older siblings’ contributions to young child’s cognitive skills. *Economic modelling*, 35:235–248.
- Eccles, J. S., Barber, B. L., Stone, M., and Hunt, J. (2003). Extracurricular activities and adolescent development. *Journal of social issues*, 59(4):865–889.
- Engzell, P. (2021). What do books in the home proxy for? a cautionary tale. *Sociological Methods & Research*, 50(4):1487–1514.
- Fredricks, J. A. and Eccles, J. S. (2006). Is extracurricular participation associated with beneficial outcomes? concurrent and longitudinal relations. *Developmental psychology*, 42(4):698.
- Gimenez-Nadal, J. and Molina, J. (2013). Parents’ education as a determinant of educational childcare time. *Journal of Population Economics*, 26(2):719–749. RePEc:spr:jopoec:v:26:y:2013:i:2:p:719-749.
- Guryan, J., Hurst, E., and Kearney, M. (2008). Parental education and parental time with children. *Journal of Economic Perspectives*, 22(3):23–46. RePEc:aea:jecper:v:22:y:2008:i:3:p:23-46.

- Heckman, J. J. (2006). Skill formation and the economics of investing in disadvantaged children. *Science*, 312(5782):1900–1902.
- Heckman, J. J., Stixrud, J., and Urzua, S. (2006). The effects of cognitive and noncognitive abilities on labor market outcomes and social behavior. *Journal of Labor Economics*, 24(3):411–482.
- Hsin, A. and Felfe, C. (2014). When does time matter? maternal employment, children’s time with parents, and child development. *Demography*, 51(5):1867–1894.
- Knudsen, E. I., Heckman, J. J., Cameron, J. L., and Shonkoff, J. P. (2006). Economic, neurobiological, and behavioral perspectives on building america’s future workforce. *Proceedings of the National Academy of Sciences*, 103(27):10155–10162.
- Mahoney, J. L., Larson, R. W., and Eccles, J. S. (2005). *Organized activities as contexts of development: Extracurricular activities, after school and community programs*. Psychology Press.
- Milkie, M. A., Kendig, S. M., Nomaguchi, K. M., and Denny, K. E. (2010). Time with children, children’s well-being, and work-family balance among employed parents. *Journal of Marriage and Family*, 72(5):1329–1343.
- Price, J. (2008). Parent-child quality time: Does birth order matter? *Journal of Human Resources*, 43(1). RePEc:uwp:jhriss:v:43:y:2008:i:1:p240-265.

Appendix

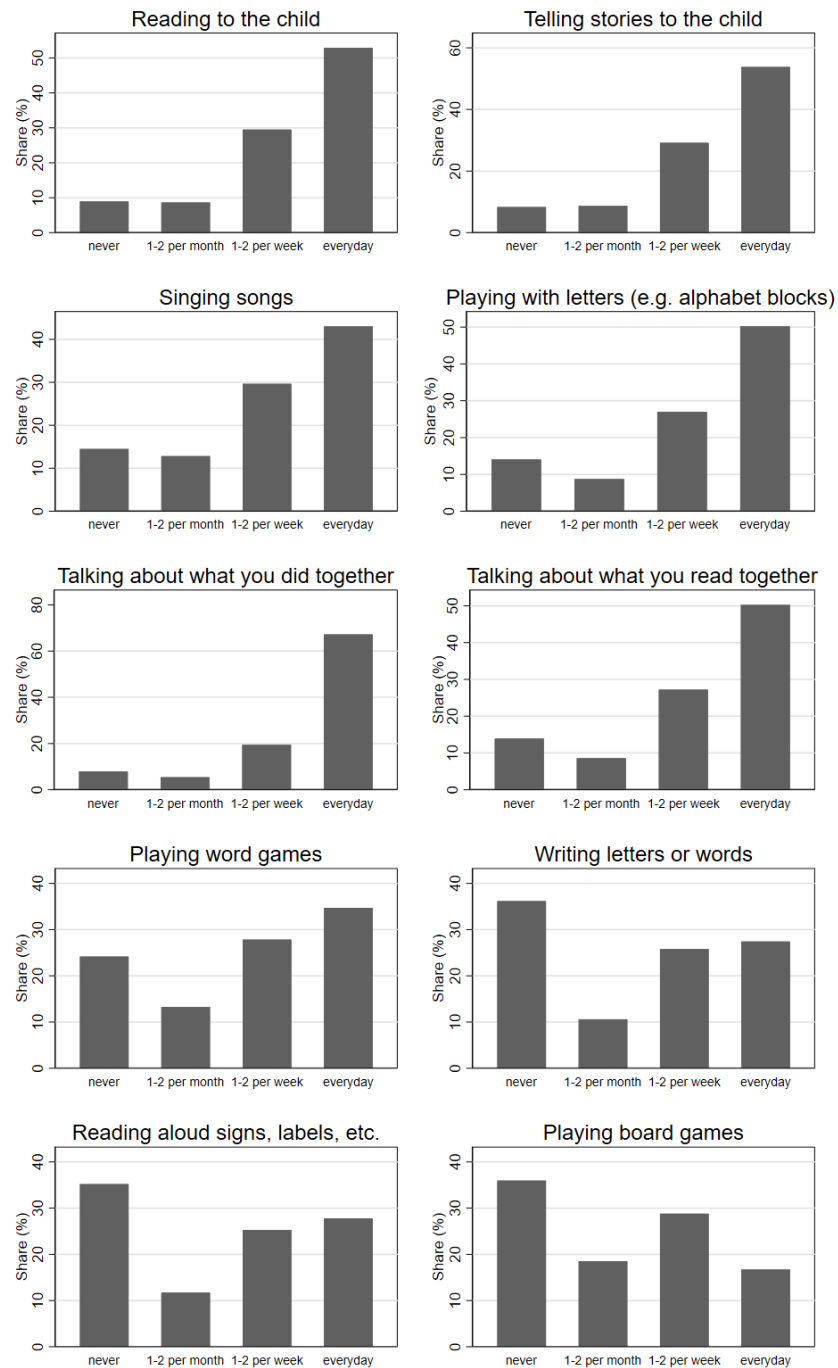


Figure A1: Parental activities with the child below 8

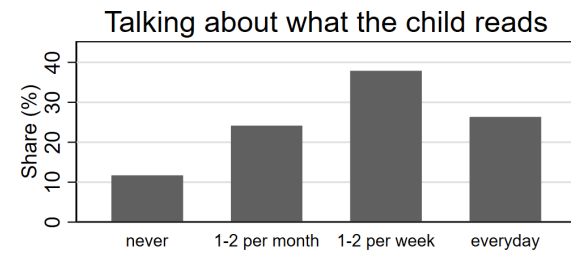
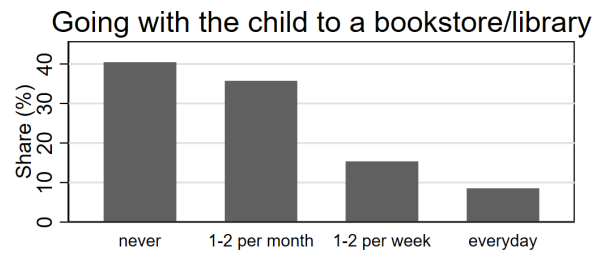
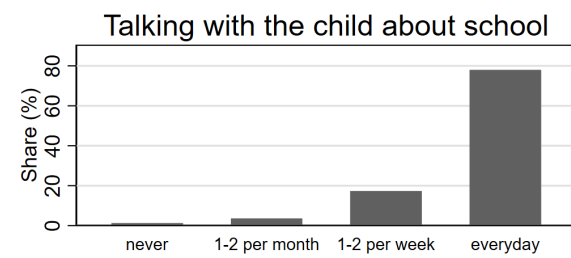
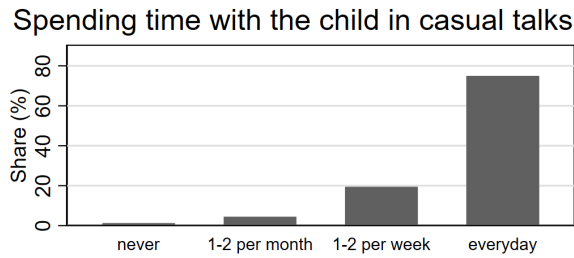
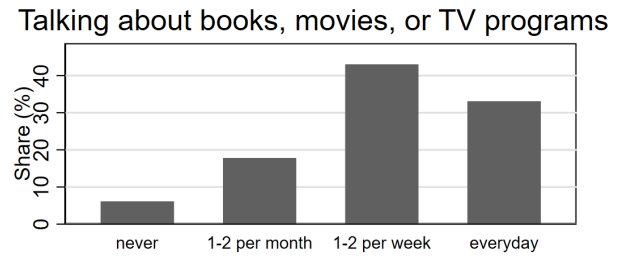
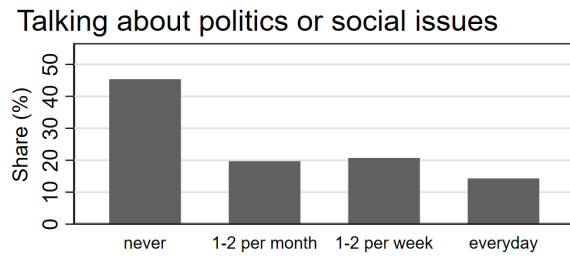


Figure A2: Parental activities with school aged children