Do Parents Matter?
Practices On Fourth Graders' Reading
Comprehension Achievement in Montevideo Public Schools

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Abstract

The purpose of this study was to examine how parental practices were associated with achievement in reading comprehension among 4th graders in Montevideo, Uruguay public schools. Previous studies assessing the relative influence of the home have usually combined home factors with indicators of family socioeconomic status (SES), which has partially concealed the unique impact of home factors on student achievement. This study distinguishes the impact of family background factors, such as economic status and maternal education, from parental practices, which combined with the fact that it uses multilevel modeling to analyze the data, sets this study apart from other analyses of home factors and student achievement in developing countries.

The study used a cross-sectional database collected in Uruguay (CEPAL, 1991). It analyzed data from student language achievement test and family interviews for a subsample of 739 fourth graders attending 29 classrooms in Montevideo public schools. A reading comprehension outcome variable was constructed from the language achievement test. The relative impact on student achievement of years of preschool education, availability of reading and school resources at home, parental reading with the child, and parental discussion of child’s schooling at home was examined, controlling for family economic status and maternal education.

Results indicate that about four-fifths of the variation in student achievement remained at the student level. Although family economic status and maternal education had some influence on achievement, actual parental practices had an impact over and above those background characteristics. Of the four parental practices examined, three had an impact on achievement. Preschool education had a greater effect when the level of maternal education was above average. Access to a more literate environment and parental reading with the child had a positive influence on student reading comprehension. Parental discussion at home of child’s schooling was the only one with no effect on achievement. These results support the value of home-base family policies when considering student achievement.
Introduction

How do parents make a difference in children’s lives? How much of a child’s school achievement depends on the parents? Is it what parents do or what parents have that makes the difference? Answering these questions may suggest alternative routes for a nation to educate its children.

Most studies of student achievement in the production-function tradition have focused on school factors while controlling for home characteristics. The home construct has usually been derived from family background measures that have been bundled-up with socioeconomic (S) indicators derived from survey instruments. This study, on the other hand, has focused on the home, while taking into account of the nesting of children within classrooms by using multi-level modeling. It examined whether variation in reading comprehension achievement among 4th graders in Montevideo (Uruguay) public schools was systematically associated with specific parental practices such as sending the child to preschool, providing literacy materials at home, parental reading with the child, and discussing the child’s schooling among family members, controlling for economic status and maternal education. The emphasis on differentiating the impact of family background factors such as economic status and maternal education from parental practices, combined with using multi-level modeling, sets this study apart from other analyses of home factors and student-achievement in developing countries.

As will be seen, this study of 4th graders’ reading comprehension achievement in the Montevideo public schools concludes that parents matter. Specifically, it is what parents do in the context of the home, over and above the resources they have, that makes the difference. These results suggest that, while both families and schools are essential contributors to student achievement, limiting educational policy to the school sphere is to overlook the potential influence that families may have. The following section presents prior research on aspects of student achievement and the link to parental practices.

Prior Studies

Home versus School: Production-Function Studies

Social science researchers have long had an interest in understanding the various influences on student achievement. Home and school factors have been the source and inspiration of most studies and most of the controversial debates in the past decades. The results of the Coleman Report in the United States (1966) and the Plowden Report in England (Peaker, 1971) were disappointing and disturbing for educational researchers and society at large. The conclusion that family background had a greater impact on student achievement than the school sparked researchers to examine school processes in more detail in order to confirm that school mattered (Cuttenance, 1985; Hanushek, 1971, 1978; Jencks, 1972; Mosteller & Moynihan, 1972; Murnane, 1975; Purkey & Smith, 1983). In the developing world similar models were applied with more optimistic results than in the developed world:
school factors were identified which explained a larger proportion of variation in student achievement. Heyneman and Loxley (1983) conducted a pivotal study on determinants of student achievement in science, in 29 nations from Africa, Asia, Latin America and the Middle East. They demonstrated that the lower the country’s per capita income, the less influence the student’s family background had on achievement. Subsequent studies confirmed these findings (Harbison and Hanushek, 1992; Schiefelbein and Farrell, 1982).

While the socio-political context of that time can probably explain the interest of researchers to focus at the school level (Hoff-Ginsberg & Tardif, 1995; Illich, 1970), in doing so however, research postponed and overlooked examining the various ways that home factors, predicted student achievement. Not only have home factors proven to be predictors of student achievement in the developed world, as the early Coleman Report suggested (1966), but in the developing world new evidence is challenging earlier studies that minimized the influence of family background (Fuller and Clarke, 1994; Lockheed, Fuller, and Nyrongo, 1989; Riddell, 1989). Thus, it appears that home factors have proven to be essential predictors of student achievement than past research has revealed.

**Conceptualization of Home Factors**

As mentioned above, most school-effects studies in the production-function tradition have examined school factors while controlling for home characteristics constructed from indicators of family background. Family background has usually been bundled-up with socioeconomic indicators derived from survey instruments, such as parental education, occupation and income, easier to collect for nationwide samples. The use of such a measure of socioeconomic status (S) as a proxy for home factors poses several problems, some stem from problems of conceptualizing and measuring S itself (Hoff-Ginsberg & Tardiff, 1995), other problems refer to the inability of such a global proxy to precisely reflect home practices and processes (Clark, 1983). In fact, several studies have suggested that parental practices are the aspects of the home environment that make the most difference in children’s lives (White, 1982; Coleman 1966; Marjoribanks 1979). Looking at family practices provides a vehicle for understanding how families behave and make use of available resources, as opposed to considering only what families have.

**Parental Practices and Student Achievement**

Within the child development field a long tradition of research has focused on the relationship between parental practices and student achievement. In efforts to assess the effects of parental involvement more specifically, recent studies have distinguished between parental practices in the context of the home and those in the context of the school. Parent-school involvement, like attendance at PTO meetings and school visits seem to be more associated with the teacher’s subjective evaluation of students than with the student’s achievement scores (Muller, 1993). On the other hand, home-based parental practices, like discussing the child’s schooling among family members, supervising homework,
television viewing and arranging for the child to take music classes have been found to capture more stable characteristics of the home environment and also to be positively associated with student achievement test score (Muller, 1993; Muller & Kerbow, 1993). In the past decade, researchers interested in understanding children's literacy development have emphasized the need to focus on the family as a social context for student learning (Snow, 1993; Purcell-Gates, 1994).

Among the wide range of home-based parental practices examined, there are some selected practices that prior studies have identified as important in their association with student achievement and can form the basis for policy intervention: the impact of preschool education on children's later schooling (Barnett, 1985; Lazar & Darlington, 1982; Lockheed & Verspoor, 1991; Myers, 1992); the presence of a literacy environment (Hess & Holloway, 1984; Snow, 1991); parental reading with the child (Henderson & Berla, 1994; Hess & Holloway, 1984) and verbal interactions at home (Clark, 1983; Muller, 1993). The impact of these practices on 4th graders reading comprehension achievement was tested in the context of public schools in Montevideo, Uruguay, controlling for the family economic status and maternal education.

The Context of the Study: Uruguay

Uruguay has a population of about 3 million people residing on 177,000 square kilometers of land, a small urban country situated between Brazil and Argentina. Almost half of the population lives in Montevideo, the capital city. There are no indigenous groups and the population is mostly of European descent with the vast majority coming from Spain and Italy.

Once known as the "Switzerland of America", Uruguay pioneered an egalitarian welfare state in Latin America. Its historically high levels of literacy and early universal access to primary education were widely recognized. Due to its high per capita income (US$3,300) and fairly even income distribution, Uruguay is generally considered one of the most highly developed countries in the region. Its social indicators reflect a high life expectancy (73 years), low infant mortality rate (20 per thousand), and a highly-educated adult population with illiteracy rates under 5% and an average of seven years of education.

In 1992, 422,381 students were enrolled in preschool and primary school. Of those students, 84% were in the public school system. About 40% of all primary school students reside in Montevideo. A typical school day lasts 4 hours and the school calendar covers an average of 180 days. According to CEPAL\(^1\) (1991), 80% of the students in Montevideo attended the school that was closest to their homes and over half of them lived within five blocks.

\(^1\) CEPAL is the United Nations Economic Commission for Latin America and the Caribbean (ECLAC).
For many decades, the country grew on the myth of being a highly cultured country (Rial, 1986, *un pais de culturosos*) that distinguished it from the rest of Latin America. However, current data does not seem to support that myth any longer. An achievement study undertaken by CEPAL (1991) has been instrumental in identifying current inequities in the educational system. The results signaled that only 5 percent of the students attending schools in the most disadvantaged areas had over 75 percent of the language achievement test correct, while about 50 percent of the student attending schools in the more advantaged areas did. Results were similar for mathematics achievement. For a country that grew up valuing education, it is painful to recognize the deterioration of its prestigious educational system and to acknowledge the implications this has for a supposedly homogeneous society.

The tradition of a strong, paternalistic welfare state that provides for all, while exhausted, still dominate the scope of possible alternatives considered. Examining the ways in which parental involvement at home contributes to student achievement in Uruguay represents a possibility for opening up new alternatives for policy discussion. State policies directed at involving parents in children's education and sharing responsibilities with the school can represent a radical shift in defining future relations between state and civil society.

**Research Design**

**Description of the Dataset**

A subsample of the cross sectional data collected by CEPAL in 1990 was analyzed. The purpose of the CEPAL study was to describe and analyze the quality of student achievement in the urban public primary schools in Uruguay (CEPAL, 1991).

The original study used a stratified random sample of public schools from Montevideo, two other cities and a reference sample of private schools from Montevideo. Information was collected on student achievement in language and mathematics along with family, principal and teacher data.

This study focused only on students from the Montevideo public schools (which represent about 2/3 of the original dataset). Montevideo was the only part of the sample that was drawn representatively and represents about 40% of the total primary school enrollment. Focusing on public schools not only has relevance for public policy but in the case of Uruguay, it subsumes the majority of the school population, since about 85 percent of students attend public elementary schools.

Cleaning up the dataset and satisfying the requirement that all students included have information on all instruments resulted in a final analytic sample of 739 fourth graders in 29 classrooms. The final analytic sample represents 93% of the total sample for Montevideo. No differences were found between the students removed and those remaining in the sample after
conducting sample two t-tests on the predictor variables. Comparison of mean statistics for basic variables indicated that, on average, the sample was representative of the population.

**Measures**

The goal of this study was to relate variation in the outcome variable reading comprehension achievement, to the question variables, describing selected parental practices, while controlling for family economic status and maternal education. The following section presents the variables employed in the study according to the role they played as outcome, question or control.

**Outcome Variable**

The outcome variable, reading comprehension achievement was constructed from a subscale of CEPAL Language Achievement Test. The content of the test was designed to cover the official fourth grade public school curriculum and contained multiple choice items, short answers and an essay. The test had an overall estimated reliability of 0.87.

Reading Comprehension. The reading comprehension outcome was constructed by adding scores obtained on the eight items in the Reading Comprehension subscale of the test. The student had to read a short text (160 words) and answer questions covering sentence meaning and text comprehension. The Cronbach's alpha reliability for this subscale was .69 and its first principal component contained 33% of the total variance.

**Predictor Variables**

Measures of the practices identified for use in this study were constructed from the family interview instrument which, in 74% of the cases, had the mother as the respondent and in the remaining cases, had the father, a sibling or a grandparent. From among these questions, four measures of parental practices were created. They were: years of preschool education (PRESC), reading and school resources available at home (HMRES), parents reading with the child at home (READS), and discussion of the child's schooling at home (DISCUSS). Each variable was measured at the student level.

**Question Variables**

Preschool Attendance (PRESC): A measure of student's years of preschool attendance was constructed from the parents' report of the age of the child's initial attendance at preschool. The item codings were recoded so that a value of zero indicated that the child had never attended preschool and a value of 3 indicated that the child had attended since he or she was 3 years old or younger.
Reading and School Resources at Home (HMRES): In order to better capture the literacy environment in the home, a composite was created by standardizing and adding four items from the family interview: the number of books at home; the frequency of newspaper reception at home per week; the frequency of reception of a school-related children’s magazine per month; and the number of school materials available in the home. Items were recoded so that higher numbers indicated higher values and were standardized prior to summing since they were all measured on different scales. Exploratory principal components analysis indicated reasonable internal consistency for the composite (the first principal component contained 52% of the total variance and Cronbach’s alpha reliability was .69).

Parents Reading with the Child (READS): A measure of parental reading with the child was created by adding two parent self-report items from the family interview that measured the last occurrence of their reading together with the child, and by dividing the sum in half to maintain the original scale. Responses to the items were coded on a five point scale that had previously been recoded so that higher numbers indicated more recent activity (5= "This week").

Discussion of Child’s Schooling (DISCUSS): A measure of the last time that the child’s schooling was discussed at home was created from an item in the questionnaire. Here again, the item was recoded so that higher numbers referred to events closer in time (4= "This week").

Control Variables

In this study, it was important to distinguish parental practices from family economic status and maternal education, which have usually been identified by previous studies as synonymous of family background. It was also necessary to differentiate maternal education from economic status rather than create a socioeconomic status composite in order to examine the relative contribution of each aspect to student achievement. The two control variable were created from items in the family interview:

Mother’s Education (MOMED). Years of mother’s education was created by adding the years of education completed by the mother.

Economic Status (ECSTATUS): A measure of household economic status was created by standardizing and adding six items from the family interview, including some conventional indicators of economic status (such as monthly income and sum of material goods at home) as well as some indicators that were considered to more appropriately capture economic differences in the Uruguayan context. Among these latter were included a four point scale rating of the quality of the home produced by the interviewer; a measure of the crowdiness of the home; the availability of sanitation at home; and the type of home tenure. These indicators summarized a more stable economic status than did monthly income. When necessary, items were recoded so that higher numbers indicated higher values. Both income and crowdiness were logarithmically transformed to normalize the distribution of raw values, since the original distributions were skewed towards higher values, with a few families having very high incomes and large
availability of rooms at home. Items were standardized prior to addition since they were all measured on different scales. Exploratory Principal Component Analyses (PCA) indicated reasonable internal consistency among the measures (the first principal component contained 53% of the total variance and Cronbach's alpha reliability was .82 for the composite).

**Description of the Analytic Sample**

Students in the analytic sample on average, have attended preschool for 1.5 years (S.D.=1.07), have been read at least once in the previous month by their parents at home and their schooling has also been discussed at home at least once in the previous month. They have mothers with an average of 7.75 years of education (S.D.= 3.75). In the case of reading comprehension, mean achievement was 4.81 (S.D.=2.45) with 10 as the maximum possible score. The distribution of raw scores appears normally distributed.

Examining the estimated correlation matrix presented in Table 1 shows that, all correlations among the variables are positive. Correlations among predictors and outcome are also low to moderate, ranging in values from .12 to .39 for reading comprehension achievement. The presence of reading and school resources available at home (HMRES) was the variable most highly correlated with reading comprehension (.39), while discussion of the child's schooling at home (DISCUSS) was the least correlated (.12) with the outcome. This suggests that considered individually, the question variables are not expected to be very strong predictors of reading comprehension, although it will be necessary to explore how they work together. It also suggests that parental practices of the type that describe the parent as a teacher (DISCUSS) may not be highly predictive in this study.

**Table 1**

Estimated Correlation Matrix Among Predictors and Reading Comprehension (n=739)

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ECSTATUS</td>
<td>1.0</td>
<td>.62***</td>
<td>.46***</td>
<td>.38***</td>
<td>.22***</td>
<td>.28***</td>
<td>.26***</td>
</tr>
<tr>
<td>2. HMRES</td>
<td></td>
<td>1.0</td>
<td>.45***</td>
<td>.37***</td>
<td>.38***</td>
<td>.32***</td>
<td>.39***</td>
</tr>
<tr>
<td>3. MOMED</td>
<td></td>
<td></td>
<td>1.0</td>
<td>.38***</td>
<td>.17***</td>
<td>.20***</td>
<td>.29***</td>
</tr>
<tr>
<td>4. PRESC</td>
<td></td>
<td></td>
<td></td>
<td>1.0</td>
<td>.18***</td>
<td>.20***</td>
<td>.17***</td>
</tr>
<tr>
<td>5. READS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.0</td>
<td>.39***</td>
<td>.19***</td>
</tr>
<tr>
<td>6. DISCUSS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.0</td>
<td>.12*</td>
</tr>
<tr>
<td>7. READING COMPREHENSION</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.0</td>
</tr>
</tbody>
</table>

*p<.05; **p<.01; ***p<.001
ECSTATUS: Economic Status; HMRES: Reading and School Resources at Home
MOMED: Maternal Education; PRESC: Years of Preschool
READS: Parental Reading with Child; DISCUSS: Parental Discussion of Child's Schooling among Family Members
Data Analyses

The three types of variables described above (outcome, question and control) are all measured at the student-level. However, the data used in this study are hierarchical in nature, with groups of students being nested within classrooms. Although the goal of this study is to predict variation in student literacy achievement on the basis of parental practices, which are all student-level variables, it cannot ignore the fact that students in the same class may share common unobserved classroom characteristics.

Rather than conducting the analyses at either the student or classroom level, the study employed multilevel modeling, a type of regression analysis that recognizes the existence of nesting in the data through the use of explicit models representing key relationships at the student and class levels (Bryk & Raudenbush, 1992). Both within-classroom and between-classroom models were fit simultaneously to the data. The within-classroom (“level-1”) model described the role of parental practices on reading comprehension achievement among 4th grade students, controlling for maternal education and economic status. The between-classroom (“level-2”) model, took into account the fact that the fundamental nature of the data was hierarchical, with students nested within classrooms. The data provided a large number of degrees of freedom in specifying level-1 covariates (n=739 students). However, the fact that the degrees of freedom at level-2 were fewer (n=29 classrooms) limited my capacity to include multiple covariates at the classroom level.

This two-level conceptual model is represented mathematically by the following equations for reading comprehension achievement. The first equation (level-1) represents the student-level model and describes the relationship between the reading comprehension achievement of the \( i \)th student in the \( j \)th classroom for 6 student-level predictors.

\[
\text{Reading}_{ij} = \beta_{0j} + \beta_{1j} (\text{ECSTATUS})_{ij} + \beta_{2j} (\text{MOMED})_{ij} + \beta_{3j} (\text{PRES})_{ij} + \beta_{4j} (\text{HMRES})_{ij} + \beta_{5j} (\text{READS})_{ij} + \beta_{6j} (\text{DISCUSS})_{ij} + e_{ij}
\]

where

- \( \text{Reading}_{ij} \) is the observed value of reading comprehension achievement for the \( I \) student in the \( j \) classroom;
- \( (\text{ECSTATUS})_{ij}, (\text{MOMED})_{ij}, (\text{PRES})_{ij}, (\text{HMRES})_{ij}, (\text{READS})_{ij}, (\text{DISCUSS})_{ij} \) represent the value of those student-level characteristics for student \( I \) in class \( j \). Each one is group-mean centered, and thus represents the deviation of that characteristic from the group-mean;
- \( \beta_{0j} \) represents the reading achievement for the average student in class \( j \) because all predictors are centered on their classroom means.
The parameters in this level-1 equation represent the relationship between achievement and the student level predictor and control variables within a specific classroom. To allow these within-class regression coefficients representing the effects of parental practices and family background characteristics to vary randomly across classrooms, we then specified a second model ("level-2") that accounted for the nesting of children within classes. The intercept coefficients in this equation captured the average effect of each level-1 predictors across all classrooms. The level-2 model is represented by the following equations:

\[
\begin{align*}
\beta_{0j} &= \gamma_{00} + u_{0j} \\
\beta_{1j} &= \gamma_{10} + u_{1j} \\
\beta_{2j} &= \gamma_{20} + u_{2j} \\
\beta_{3j} &= \gamma_{30} + u_{3j} \\
\beta_{4j} &= \gamma_{40} + u_{4j} \\
\beta_{5j} &= \gamma_{50} + u_{5j} \\
\beta_{6j} &= \gamma_{60} + u_{6j}
\end{align*}
\]

where

- $\gamma_{00}$ is the classroom average reading achievement among all classrooms;
- $\gamma_{10}$ is the classroom average reading achievement-economic status slope;
- $\gamma_{20}$ is the classroom average reading achievement-maternal education slope;
- $\gamma_{30}$ is the classroom average reading achievement-years of preschool slope;
- $\gamma_{40}$ is the classroom average reading achievement-reading resources slope;
- $\gamma_{50}$ is the classroom average reading achievement-parental reading slope;
- $\gamma_{60}$ is the classroom average reading achievement-discussion slope;
are classroom-level error terms assumed to be drawn randomly from a multivariate normal distribution with zero mean vector and general covariance matrix $T$.

In the student-level and class-level models $\beta_{0j}$ represents the average reading achievement for classroom $j$, controlling for all included student-level characteristics. The $\gamma$'s capture the average effects of the level-1 predictors across all classrooms. Parameters $\gamma_{50}, \gamma_{40}$. $\gamma_{50}$ and $\gamma_{60}$ represent the effects of student-level policy-manipulable characteristics that predict student achievement. If $\gamma_{50}$ is positive, for instance, we will know that children who are read to in the home tend to have a higher reading achievement in 4th. grade. The HLM package was used to fit all models (Bryk et al, 1989). All level-1 predictors that showed no evidence of variation across classrooms were fixed when tests for interactions among predictors were conducted.

Analyses proceeded through three stages for each of the outcomes: first, a model with no predictors was fitted, which enabled a partition of variation within and between classrooms to be described. Second, a base-line control model was fitted by first including economic status and subsequently adding maternal education as level-1 predictors. Finally, models were specified to examine the effects of each of the key predictors, controlling for the relevant covariates. In subsequent analyses tests for both linear and non-linear interactions among selected level-1 predictors were also conducted.

When cases were missing values on the predictors, the missing values were replaced by class averages (to retain cases in the analyses). Economic status (ECSTATUS) was the variable with the higher frequency of missing data (82) followed by reading and school resources at home (HMRES) with 21. Each one of the remaining variables had only a few cases missing. Parallel analyses were also conducted using listwise deletion of cases with missing data which resulted in minor changes, indicating that the results reported for the final model with imputed missing values is robust. The level-1 predictors were centered around their classroom means. The next section presents major findings and final model.

Results

Final Model

Specifying a base-line model with no predictors at either level allowed to determine the amount of variation to be explained at each level. Of the estimated total variance, 86% of the variation in reading comprehension achievement is within-class. This suggests that most of the variation is among students within classrooms, with little variation attributable to teacher and classroom level characteristics. These results also imply that there is greater potential for
detecting systematic relationships between student-level characteristics and reading comprehension (the focus of this study), than between level-2 characteristics and the same outcome.

An initial control model was fitted by adding economic status and subsequently including maternal education. Question variables were added to the control-model singly in order to determine their individual influence, and then jointly as a group. This procedure allowed to determine the final fitted model and suggested how the different predictors impact achievement.

This study confirms prior research that has established an association between family economic status and student achievement. Students with higher family economic status tend to have higher achievement scores, while students with lower economic status tend to have lower achievement scores. However, the influence of family economic status is minimal. Including economic status as a predictor of reading achievement only contributes to reducing the amount of level-one variation by less than 2 percent (See Table 2).

**Table 2**

*Reading Comprehension. HLM estimated gamma coefficients, (standard errors) and p values reported*

A taxonomy of fitted HLM models showing the effects of including student-level control variables

<table>
<thead>
<tr>
<th>Model</th>
<th>Predictors</th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Effects</td>
<td>INTERCEPT, $\gamma_{00}$</td>
<td>4.81***</td>
<td>4.81***</td>
<td>4.81***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.19)</td>
<td>(.19)</td>
<td>(.19)</td>
</tr>
<tr>
<td></td>
<td>ECSTATUS, $\gamma_{10}$</td>
<td>.08**</td>
<td>.05~</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.03)</td>
<td>(.03)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MOMED, $\gamma_{20}$</td>
<td>.12***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.03)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Random Effects</td>
<td>Within-class variance</td>
<td>5.16</td>
<td>5.07</td>
<td>4.93</td>
</tr>
<tr>
<td></td>
<td>% explained</td>
<td>1.7</td>
<td></td>
<td>4.5</td>
</tr>
<tr>
<td></td>
<td>Between-class variance</td>
<td>$u_0$ .83</td>
<td>.83</td>
<td>.84</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$u_1$ .00</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$u_2$ .00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

~p<.10, *p<.05, **p<.01, ***p<.0001
The results from this study also suggest how economic status impacts student literacy achievement. In the case of reading achievement, the joint inclusion of maternal education and a single parental practice reduces the impact of family economic status to one third of its value when singly included and becomes irrelevant as a predictor. When all parental practices are included as a block without taking into account maternal education, family economic status also becomes irrelevant as a predictor. These results support the notion that family economic status can be considered a predictor of student achievement, but that it is what parents do that makes a difference to student achievement.

The final fitted model is presented in Table 3. The three parental practice predictors that showed a positive bivariate influence on reading comprehension achievement (years of preschool education, reading and school resources at home, and parental reading) were jointly added to assess the effects of their combined presence, controlling for family economic status and maternal education. Parental discussion had been removed from the model since there was no evidence that it had an influence on reading comprehension achievement. In addition, the model explored the possibility of linear and non-linear interactions between years of preschool and maternal education.

Results indicate that the availability of reading and school resources at home (HMRES \( p \leq .001 \)) and parental reading with the child (READS \( p \leq .05 \)) are positively associated with reading comprehension, controlling for family economic status and maternal education. The t-statistics of -2.19 for MOMED2*PRESC indicates that an interaction effect exists between years of preschool and the square of maternal education.

Including all three primary question predictors and interaction terms between preschool and maternal education in a model predicting student's fourth grade reading comprehension achievement results in a decrease in the unexplained level-1 variance from 5.16 when no predictors were included to 4.66, a total decrease of 9.7\%, or a 5.5\% decrease over a model with only control variables.  

2. Very similar results were obtained when examining student writing achievement, supporting the implications of these findings across students literacy skills. In the case of vocabulary achievement, preschool education and availability of reading materials were the parental practices that had an impact over and above family economic status and maternal education.
Table 3
Final Fitted Model for Reading Comprehension Achievement
HLM estimated gamma coefficients, (standard errors) and p-values reported

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Final Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intercept, $\gamma_{00}$</td>
</tr>
<tr>
<td></td>
<td>4.83***</td>
</tr>
<tr>
<td></td>
<td>(.20)</td>
</tr>
<tr>
<td>Economic Status (ECSTATUS), $\gamma_{10}$</td>
<td>-.02</td>
</tr>
<tr>
<td></td>
<td>(.03)</td>
</tr>
<tr>
<td>Maternal Education (MOMED), $\gamma_{20}$</td>
<td>-.09**</td>
</tr>
<tr>
<td></td>
<td>(.03)</td>
</tr>
<tr>
<td>Maternal Education Squared (MOMED2), $\gamma_{30}$</td>
<td>-.00</td>
</tr>
<tr>
<td></td>
<td>(.01)</td>
</tr>
<tr>
<td>Years of Preschool (PRESC), $\gamma_{40}$</td>
<td>.25*</td>
</tr>
<tr>
<td></td>
<td>(.10)</td>
</tr>
<tr>
<td>Reading and School Resources (HMRES), $\gamma_{50}$</td>
<td>.21***</td>
</tr>
<tr>
<td></td>
<td>(.04)</td>
</tr>
<tr>
<td>Parental Reading with Child (READS), $\gamma_{60}$</td>
<td>.17*</td>
</tr>
<tr>
<td></td>
<td>(.07)</td>
</tr>
<tr>
<td>MOMED*PRESC, $\gamma_{70}$</td>
<td>.03</td>
</tr>
<tr>
<td></td>
<td>(.03)</td>
</tr>
<tr>
<td>MOMED2*PRESC, $\gamma_{80}$</td>
<td>-.01*</td>
</tr>
<tr>
<td></td>
<td>(-.00)</td>
</tr>
</tbody>
</table>

Random Effects
Within-class variance          4.66
%explained                     9.7
Between-class variance          .85

~p<=.10; *p<=.05; **p<=.01; ***p<=.001; # Fixed at level-2
Preschool Education

Having children attend preschool (as represented in this study by years of preschool attendance, PRESC) is an important influence on children's fourth grade reading comprehension achievement, but the magnitude of its effect differs by the level of maternal education. Figure 1 displays the fitted relationships between reading achievement and years of preschool for high and low values of mother's education.

When maternal education is above average, having the child start preschool at an earlier age has a positive influence on their reading achievement score. For instance, for a child whose mother has completed 11.5 years of education, all other things being equal, the estimated achievement score in reading comprehension is 5.06 with one year of preschool but goes up to 5.5 with three years of preschool. However, when maternal education is below average, the effects of preschool education are reduced. For instance, for a child whose mother has completed 4 years of primary education, all other things being equal, preschool does not have an effect in the case of reading achievement: the child's estimated reading achievement score will be the same with one or with three years of preschool.
At the higher end of the maternal education spectrum, the parental decision to have children attend preschool becomes an important contributor to later student achievement. As results from studies in other countries have suggested (McGinn, 1994; Raudenbush et al, 1991), the quality of available preschool services may be an intervening factor in explaining these results. The schools that currently offer preschool classes are those located in more advantaged areas and tend to be of higher quality and better equipped than those located in less advantaged areas. It is also possible to speculate that more educated parents who recognize the importance of preschool education are supporting and providing their children's education in other ways. The impact of a year difference in preschool education was still felt four years later in student's achievement in different literacy skills.

The fact that the impact of preschool education does not seem to be as strong for children of less educated mothers is a matter of concern, particularly when so many efforts are now being directed at making preschool available to those children. Preschool teachers in Uruguay have at least 15 years of education; their educational level is not likely to be a factor. It may be a sign of low quality preschool services that, in spite of having highly educated teachers, have not developed the appropriate curriculum programs and pedagogies to work with children from less advantaged backgrounds. Two factors can help explain the results for Uruguayan children. Preschool education in Uruguay is only recently beginning to be recognized as an important time for children's development, and neither the curriculum nor teacher's pedagogy have been updated to incorporate these new trends. Only about half of the teachers have received additional training in preschool education, while the remaining half has to rely on their basic primary education training. These teachers have not received any special training to work with children from less advantaged households. There is probably a mismatch between their training and the realities they encounter, and no specific program has been designed to help them and the children make the best use of their time in preschool.

Books and School Materials

One of the most consistent effects on student achievement in the literacy skills is the effect of the presence of a literacy environment at home. Students who had more books and school materials available at home tended to have higher reading achievement scores.

The relationship is strongly positive. In order to make comparisons in terms of standard deviations, the gamma coefficient was multiplied by the standard deviation of HMRES. Students with one standard deviation difference in the availability of books and school materials at home were found to have associated a .60 point difference in reading comprehension.

The logic underlying this finding is straightforward. Access to print materials and literacy resources at home is likely to influence student's literacy achievement by providing students with more opportunities to learn, experience, and develop literacy-related skills. While the mere presence of books is not sufficient to explain the possible uses that a family might or might not have for print, literacy resources were measured in this study by also including
newspaper and magazine possession at home and the availability of school materials. These factors are likely to better capture active uses of print at home, rather than their mere presence (Purcell-Gates et al., 1995). It is likely that parents who provide their children with these daily resources also make use of them as adults, giving children a chance to discover the functional uses of print. As a result, these children are more likely to achieve at a higher level in vocabulary, reading and writing.

**Parental Reading with the Child**

Parental reading with the child at home, as measured by the parent’s report on the last occurrence of their joint reading, was found in this study to be associated with student reading comprehension. In order to make comparisons in terms of standard deviations, the gamma coefficient was multiplied by the standard deviation of READS. Students with one standard deviation difference in the frequency of being read at home were found to have associated a .24 point difference in reading comprehension.

**Effect Size Associated with Predictors**

Since predictors are measured in different units across outcomes that have different ranges of possible scores and some predictors interact, to facilitate comparison of these effects, the estimated gamma coefficients reported are multiplied by the standard deviation of the associated predictor and divided by the standard deviation of the relevant outcome. This produces a statistic that describes the difference in reading comprehension score (in standard deviation units) associated with a one standard deviation difference in the predictor. Since the effects of preschool education vary by outcome and level of maternal education, the effects are reported in Table 4 for high and low values of maternal education.

<table>
<thead>
<tr>
<th>Practice</th>
<th>Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading Resources (HMRES)</td>
<td>.25</td>
</tr>
<tr>
<td>Parental Reading (READS)</td>
<td>.10</td>
</tr>
<tr>
<td>Preschool (PRESC)</td>
<td></td>
</tr>
<tr>
<td>High MOMED</td>
<td>.10</td>
</tr>
<tr>
<td>Low MOMED</td>
<td>0</td>
</tr>
</tbody>
</table>
It can be observed that, all other things equal, access to books and school resources at home (HMRES) has a higher impact on student achievement than either parental reading with the child or a year of preschool. The effects of parental reading with the child at home and a year of preschool appear to have similar effects in the case of reading, for children of highly educated mothers (.10). These results encourage the design of family policies to increase access to books and parental reading with the child in order to promote student literacy achievement.

**Parental Discussion of the Child's Schooling**

This study was unable to detect a relationship between the frequency of parental discussion of the child's schooling among family members and student achievement in reading comprehension and hence the variable was removed from the final model. The potential for a relationship between parental discussion and student achievement was suggested during the preliminary investigation of the data early in the analysis. Before family economic status and maternal education were controlled, parental discussion was positively related to student achievement. When the student control variables were included in the model, the effect of parental discussion was reduced to zero. There are two possible explanations for this. It may indicate that certain aspects of student background, represented by the control variables, are important to student literacy achievement and are also related in some ways to parental discussion. It may be related to the nature of family discussion. Or both may operate together.

The possibility of student background characteristics influencing student literacy achievement and being related to parental discussion became evident when examining the estimated correlation between predictors reported in Table 1. Both family economic status and maternal education are correlated with parental discussion (r = .28; r = .20). This suggests that parents who discuss their children's schooling tend to have higher economic status and the mothers have higher levels of education. When economic status is statistically controlled, the positive effects of parental discussion disappear.

The second possible reason why the study showed no effect of parental discussion has to do with the nature of discussion itself. Some parents may discuss their children's schooling at home only when the children seem to be having difficulties in school, while other parents may do it when the children do well. If that is the case then, the effects of parental discussion on children's achievement might be canceled out in this study because they are working in opposite directions.

This is not to say that parental discussion has no positive effect on student achievement. More likely, the effect of parental discussion was not statistically detectable in this sample. For any one or a combination of these reasons, or for some other unknown and unspecified reason, the results of this study do not confirm a statistically significant influence of parental discussion on student reading achievement.
Conclusions and Policy Implications

The results of this study provide three conclusions. First, parents do make a difference; second, a considerable amount of student achievement can be explained by parental contributions; finally, it is what parents do, more than what they have, that matters. While confirming, unsurprisingly, that the type of home children are raised in does make a difference in children’s lives, what is refreshing and encouraging is the possibilities that this study provides for identifying steps that policy makers can take to improve a child’s likelihood of higher achievement. This study shows that student achievement in literacy skills is systematically related to family practices in which the state has room to intervene.

Having shown that most of the variation in student achievement is at the student level, it becomes necessary to move beyond the school itself to develop a concept of education that makes use of all available resources and promotes children’s development to its full potential. Educating parents on how they can be helpful resources at home for their children appears as a promising avenue, not only to increase children’s chances of success at school but also to develop new modes of partnership between the state and civil society.

Policy Implications and Considerations

One purpose of this study is to suggest to educational policy makers in Uruguay some potential interventions that could promote student achievement. Certainly, appropriate application of the generalized findings to another country will depend to a large extend on how well the country’s situation parallel’s that of Uruguay. The homogeneous culture of Uruguay facilitated the examination of parental practices without having to deal with issues of culture and race. This section discusses some aspects that may inform policy-decisions. It discusses the meaning of the research findings for designing effective policies and addresses the concept of family educational policies in relation to school policies.

The Meaning of the Research Findings

When interpreting research findings as the basis for policy design, it is critical to remember the meaning of the effects detected. When we find, as we do in this study, that access to books and school resources at home has a positive influence on reading achievement, does that mean that distributing books to families will help the children achieve? Not very likely. When a variable such as the presence of books, literacy materials and school resources at home is found to have an effect on literacy achievement, it is probably capturing an effect not simply of access to material, but of opportunities for children to use, look at and experiment with those materials as well as to observe other family members doing the same. Simplistic policies that merely distribute books to children will not necessarily recreate the appropriate environment where those books are read and those school materials used. Just encouraging parental reading with the child
may not be enough; teaching parents how to read with the child in order to make it a more effective experience might be necessary.

When we find a positive influence of preschool education on reading achievement, as we do for children of more educated mothers, what does that mean? Would merely increasing access to preschool to other children guarantee a similar effect in their achievement in reading? It may not, just by itself. What this study detects is an effect for those children whose parents have by themselves decided that preschool education was important for their children -- without any specific policy promoting the importance of preschool. Those parents are very likely making a series of other decisions surrounding their children's lives, decisions that are also contributing to their children's reading achievement. As a predictor in this study, preschool education captures parental interest and involvement in their children's education as well as the treatment effect of actually participating in preschool. Merely increasing access will not provide for the other activities that parents involved in their children's education are currently offering. It might be necessary to accompany an increase in access to preschool with a parental education campaign to change attitudes about schooling and child development. Parents need to learn about the benefits of preschool and also about other ways they can support their children's education. Parents can support children's achievement, for instance, by providing books and school materials and by reading with their children.

Families and School Partnerships

Another aspect to consider when family policies are designed is their role in relation to school policies. Family policies should support and supplement school policies, not substitute for them. Families and schools should work together to promote student achievement, and it is the role of the state to provide the institutional framework for this to happen. Encouraging and supporting family-school partnerships will not only contribute to student achievement; it will also help strengthen and educate civil society to share responsibilities with the state. How, then, will family and school policies be linked? Will the educational system be responsible for implementing those family policies or will a new system be created to do so? In that case, how will the links be established between them? Will the school building be the common ground for delivering both type of policies? How will principals and teachers become aware of what the state is promoting at the family level? How can they be part of the process?

These questions are relevant not only at the practical level to guarantee effective delivery, but conceptually as well, to correspond with a more enlarged view of what educating children is and requires today. If an independent organization is created to provide for family policies disconnected from what is done at the classroom level, this delivers a very different message from one in which family policies are interlinked with the school system. While sometimes the search for effectiveness pushes us to create novel institutions, free from old vices and complex administrative procedures, it is worth remembering the ultimate goal of such policies. Institutions should not contradict in structure what they were designed to offer in purpose. Family policies should be connected with the school system. Knowledge of the present
organization, its limitations and potentials, expertise and clarity on the ultimate goal, as well as wisdom, are required to make the appropriate decisions.

**Final Thoughts**

This study suggests that it may be possible to promote children's achievement in reading comprehension by sending them to preschool, by providing them with books and school resources at home, and by having parents read with them. It challenges previous conclusions from research in the developing world that has emphasized the role of the school over that of the home in predicting student achievement. It proves that it is essential to examine home factors to understand more completely the process involved in student achievement. It also shows that identifying effective family practices, provides more room for intervention. Subsequent studies could try to identify other relevant family practices that are specific to particular skills and ages.

Policies aimed at the family can certainly help parents create the appropriate environment for a child's achievement. The message can be delivered by the mass media, teachers and principals, communities and governments. Schools can be relieved of the heavy burden of complete responsibility for the children's education, and can once again, begin to share it with parents. Promoting family practices that support children's achievement is a way for teachers and parents to be partners in children's education. It is a way for the state to strengthen civil society, share responsibilities, and promote development.
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by Jacques van der Gaag and Donald Winkler

by Miriam Schneidman

Paper No. 3: “Evaluación de los Programas para Niños y Jóvenes Vulnerables”
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by Rosella Cominetti and Gonzalo Ruiz (In Preparation)

Paper No. 13.: “The Impact of School Quality on the Level and Distribution of Earnings - Evidence from Honduras”
by Arjun Singh Bedi and John H.Y. Edwards

Paper No. 14.: “Do Parents Matter? The Role of Parental Practices on Fourth Graders’ Reading Comprehension Achievement in Montevideo Public Schools”
by Yahel Duthilleul