Reading between the lines: A closer look at the effectiveness of early childhood education policy to reduce inequality in Argentina

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Reading Between the Lines:

A Closer Look at the Effectiveness of Early Childhood Education Policy to Reduce Inequality in Argentina

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This study looks more closely at Argentina's early childhood education policy, to determine whether it "ensures quality education and equal opportunities, without regional disparities and socio-economic inequities" –the main purpose of education policy in that country. In particular, the study examines how public kindergartens' effect on children's early literacy development compares to the effect of their alternative, private kindergartens. Panel data collected between 2004 and 2006 by Argentina's urban household survey is used to estimate a logit model for the probability of knowing how to read and write by the end of first grade. Estimations take into consideration the complex design of the survey data employed. The validity of the results obtained is further checked by the use of quasi-experimental econometric techniques. The study finds that, net of important individual, family, community and geographic characteristics, attending a public kindergarten has some effect on the probability that a child will know how to read and write by the end of first grade, but attending a private kindergarten has a more substantial effect on this probability. In turn, the analysis finds that knowing how to read and write by the end of first grade reduces the probability of repeating that grade. Perhaps more worryingly, the quality gap between public and private kindergartens is found to be larger in the poorest regions of the country, as well as among the poorest families. These findings are relevant to education policymaking in Argentina, where efforts have focused on expanding the *coverage* of preschool services, largely disregarding that there is a fundamental problem of unequal opportunities among children in terms of access to *high-quality* early childhood education. Specific policy recommendations that could improve the quality of public preschools are suggested, taking into account the political difficulty to introduce profound reforms in the education system.

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"A child of five would understand this.
Send someone to fetch a child of five".
(Groucho Marx)

1   Introduction

Argentina's public education system was conceived as a major pillar of economic growth and
social equity during the foundation of the country in the 1850s. And it was. But today, the
Argentine pride in its educational attainment is based more on nostalgia than on current facts.
True, enrollment in primary school is nearly 100 percent, and this is mainly attributable to the
availability of a free and universal public school system[2]. But access, enrollment and attendance
to school are no longer paralleled by educational progress[3]. Repetition rates in primary school
remain high compared to those in other Latin American countries, and they have increased in the
past decades, reaching over 6 percent in 2004. Ultimately, the problem of high repetition rates
contributes to 1 in every 5 children dropping out of primary school (UNESCO 2006).

The shortfalls in educational achievement are particularly present among first-graders. Almost 10
percent of children who enter primary school repeat first grade –again, well above the regional
average. Two main factors contribute to this problem. On one hand, there is a growing concern
about the extent to which public schools have been able to provide the kinds of environments
needed to enhance children's development upon entrance to the formal school system. On the
other hand, it seems that children are entering first grade with very low levels of cognitive and

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[2] Public primary schools absorb 77 percent of the students enrolled at that level.
[3] At the turn of the XIXth Century, Argentina exhibited, together with Uruguay, the highest literacy rate
among Latin American countries. Over 50 percent of the Argentine population ages 10 and above were
literate in 1900, compared to 43 percent in Chile, 33 percent in Costa Rica, 30 percent in Bolivia, 26
percent in Brazil, 22 percent in Mexico, and 17 percent in Bolivia (Engerman and Sokoloff 2002). A
hundred years later, Argentina was at the bottom of the rank among the Latin American countries that
participated in the 2006 PISA evaluations of reading comprehension skills. A recent study shows that the
scores obtained by Argentine students in the PISA evaluations are lower than those observed in countries
that have a comparable level of development (FIEL 2007).

non-cognitive development and that, in many cases, this underdevelopment is too costly for schools to revert.

As in most countries, children's lack of school readiness and their consequent educational deficits have been closely linked to women's increasing participation in the labor force[4] and to the limited availability of low-cost, high-quality early childhood care and education services. In the case of Argentina, children's failed experience in formal education has also been amplified by the sustained growth in families' financial constraints since the late 1970s and by the unprecedented decline of living standards during the 1998-2001 economic crisis, when poverty reached over 50 percent of households and 75 percent of children. This context accentuated the lack of proper environments for young children's development and it set the conditions for the perpetuation of poverty across generations. Today, 1.5 million primary-school-age boys and girls are seen wandering the streets, begging, stealing, or doing petty jobs, instead of being in school.

Argentine policymakers have not remained unaffected by the general concern about the quality of public education or by the particular problem of school readiness among young children. In an effort to ensure that all children have a good start, the 1993 Federal Law of Education extended compulsory schooling to include 5-year olds. Accordingly, sub-national governments made large investments to ensure that the free and universal public school system could accommodate the increased enrollment of children in kindergarten. More recently, the 2006 National Law of Education extended the public school system to include 4-year olds, with enrollment at this age remaining voluntary. The implementation of this law will once again require governments to

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[4] For a rigorous analysis of the impact of maternal employment on early childhood development, see Hill, Waldfogel, Brooks-Gunn and Han (2005). The authors find that the negative effects of maternal employment on child development are particularly relevant when mothers work full-time during the first year postbirth, instead of postponing full-time work until after their child's first year or working part-time during the first year.

make considerable budgetary and administrative efforts to ensure that all 4-year olds have access to public preschools[5].

There is evidence that the extension of the universal public school system to include 5-year olds has improved the chances of success in school for those children who, otherwise, would have attended no kindergarten at all (Berlinski, Galiani and Gertler 2006). What this evidence shows is that attending a public kindergarten is better than attending *no kindergarten* –indeed, poor children are better off at public preschools than wandering the streets of the insecure neighborhoods in which they live. But is there a difference in the quality of education between public and private kindergartens? We don't know. Yet this comparison is important to assess the extent to which the public school system has been able to serve its main purpose –to ensure quality education and equal opportunities, without regional disparities and socio-economic inequities (*Ley Nacional de Educación* 2006).

For education policy to serve its objective of reducing inequality, public kindergartens need to be at least as good as private ones. Why? Because children from poorer families and children from poorer regions are more likely to attend a public kindergarten instead of a private one –and children from wealthier families and regions are more likely to attend a private kindergarten instead of a public one[6]. Looking into how public kindergartens compare to private ones is the underlying purpose of this study. The conjecture is that, in general, public kindergartens are not as good as private ones; and that the quality gap between public and private kindergartens is

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[5] According to estimates from the Ministry of Education, 1,300 new kindergartens should be built between 2008 and 2012 in order to comply with the National Law of Education's stipulation that the free and universal public school system expands it services to include 4-year olds. This would entail a total public investment worth US$1.17 billion (Inter-American Development Bank 2008).
[6] This is further discussed in Section 7.1.1.

larger in the poorest regions of the country (NW and NE), as well as among the children from the poorest families.

Two specific questions are addressed by this study. First, how does attending a public kindergarten affect the probability that a child will know how to read and write by the end of first grade, and how does attending a private kindergarten affect that probability? Second, to what extent does the inability to read and write by the end of first grade matter for grade retention?

The results of this study can help to inform the Argentine policymaking process, by shedding light on the main issues that should be addressed to ensure that early childhood education (ECE) policy effectively eliminates inequality of opportunity among children. Should the State care more about expanding the *coverage* of public ECE services to include 4-year olds, and eventually 3-year olds, or should it put more emphasis on improving the *quality* of the education services currently provided to 5-year olds? Should the public sector *fund* the extension of ECE services, but delegate the provision of these services to the private sector, or should the State preserve its role as a provider of ECE services but engage in closer consultation with private providers? Would it be advisable to formulate and implement regional ECE strategies rather than a national policy? Should interventions to improve the quality of ECE be targeted to the lower-income sectors of the population, or should the improvement be made across-the-board?

This study can also contribute to filling important gaps in the literature related to ECE. First, the study adds to the very limited amount of research that employs rigorous quantitative tools to evaluate the impact of ECE programs and policies in Latin America, and to the still more limited applied econometric research evaluating such programs in Argentina. Second, the comparative approach adopted by this study seeks to promote a new way of addressing questions about the effectiveness of ECE interventions, which measures not only their absolute but also their relative

success. Adopting a comparative approach is essential to make informed policy decisions, and it may also contribute to the academic debate about what constitutes a high-quality intervention. Surprisingly, there is a notable absence of empirical studies seeking to explicitly compare the effectiveness of alternative forms of ECE.

2 Literature Review

2.1 The rationale for a public ECE policy

The underlying objective of all ECE initiatives is to improve the environments in which young children are raised in a way that fosters their human development. There is conclusive evidence from developmental science that cognitive, linguistic, social, emotional and motor skills develop most rapidly sometime during the first 6 years of life, and that each skill contributes to the development of other skills (Shonkoff and Phillips 2000). The development of these skills is important because it determines an individual's capacity to achieve the things he values in life. In other words, human development goes hand in hand with individual freedom (Sen 1999).

But why should the State become involved in ECE? First, because children don't make decisions about how much to invest in their own ECE, and thus the State must ensure that the decisions made by families are in the best interests of the child. This is one of the underlying principles of the 1989 U.N. Convention on the Rights of the Child[7]. According to this argument, there is a

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[7] Recognition of the special vulnerability to which we are exposed during the first years of life led to the 1989 U.N. Convention on the Rights of the Child, where the international community agreed that all children have specific basic human rights, as well as the general ones inherent in every person. The four rights recognized as basic during childhood are the right to survival; to develop to the fullest; to protection from harmful influences, abuse and exploitation; and to participate fully in family, cultural and social life. The four guiding principles that have to be followed for any and all of these rights to be realized are non-discrimination; devotion to the best interests of the child; the right to life, survival and development; and respect for the views of the child.

moral reason for the State to ensure adequate ECE. For countries that have signed this Convention, there is also a *legal* reason to protect the basic rights of children, which include their right to develop to the fullest. A second reason for the State to intervene in ECE is that, even if families are willing to make the investments necessary to promote early childhood development, they may be unable to do so because of time, financial and knowledge constraints. These constraints are particularly present among poor families, and hence there is an *equity* reason for State intervention in ECE. Third, investment in ECE benefits not only the individual child, but also the child's family, the local community and society at large, including aggregate *social and economic* benefits.

The social benefits of ECE are generally associated with a better democracy –one in which individuals have developed critical thinking, communication skills, and the self-esteem necessary to voice their interests with conviction. These skills are important to promote political accountability as well as civilized participation in public life. The economic benefits to society occur in the form of an increase in labor productivity and economic growth, a reduction in poverty and inequality, and a reduction in the fiscal costs that arise from childhood poverty[8] (Holzer et.al. 2007). In other words, interventions in ECE belong to a rare species in the sense that they promote both equity and efficiency in the allocation of public resources. Regarding the efficiency of these interventions, Heckman and his colleagues have shown that investment during the first 6 years of life has the highest rate of return among the set of possible investments in

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[8] The main fiscal costs that arise from childhood poverty include the costs derived from the provision of welfare assistance and health care, as well as the costs of addressing crime. Holzer et.al. (2007) estimate that, in the United States, the fiscal costs of childhood poverty, together with the costs in terms of foregone labor productivity and economic output, represent 4 percent of GDP.

human capital[9], or alternatively, that ECE interventions are more *cost-effective* than later interventions to promote the accumulation of human capital (Heckman et.al. 2005).

2.2   Alternative forms of State intervention in early childhood education

While the theoretical and empirical case for government intervention in early childhood education is strong, when it comes to taking hands in the matter and designing policies that address the needs of children, there is little consensus on what should actually be done.

Differences emerge between countries and between programs in terms of *how* the State intervenes in ECE, what are the *objectives* of ECE policy, who are the *beneficiaries*, what *services* are delivered, what *delivery arrangements* are used, and what is the extent of *participation* by families and communities. These differences emerge because the choice of policy is affected by fiscal, political and geographical constraints, by cultural preferences, and by demographic and socio-economic patterns, all of which differ across countries. In Latin America, differences between countries and between programs also emerge because of the scarce knowledge about what it takes for ECE interventions to be successful.

Objectives of ECE policy

ECE policy may have different purposes –to promote human development in a holistic manner, to promote some aspects of human development more than others, or to contribute to economic and social development. It is important to understand the objectives of a program or policy in order to assess its effectiveness.

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[9] Heckman (1999) calculated that in the Unites States, the return for every $1 invested in education is $6 if the investment is made during preschool, $4 during primary school, and $2 during high school.

In the past decade, the term "school readiness" has come to be the main focus of ECE programs in the United States. School readiness involves a level and combination of skills that are considered to be necessary for children to do well upon entry to the formal school system. Those who emphasize school readiness as a goal of ECE programs tend to end up showing a bigger concern for the development of cognitive skills. Thus, they focus on measuring the success of these programs in terms of their impact on test scores, dropout rates and repetition (Princeton-Brookings 2005).

In reaction to this trend, some authors have begun to emphasize the non-cognitive objectives of ECE programs, including the development of emotional skills (National Center for Children in Poverty 2002; Raver 2002). More strongly, other authors have come to question the assumptions made by advocates of school readiness, pointing out that the term doesn't recognize the potential adverse impacts in terms of self-fulfilling diminished expectations that arise from the early labeling of children as "unready" for school; that it turns away from ensuring that schools are ready for children; that it rejects all philosophical and scientific grounding that supports the notion that children learn at different rates and in different ways; and that it fails to respect diversity in cultural practices, in family values, and in individual ideas about what constitutes a successful learning experience (Farran and Shonkoff 1994; Fuller 2007).

In Latin America, "school readiness" goals have sometimes been incorporated into ECE interventions (The World Bank 2003 and 2006; UNESCO 1998a and 2006; Paxson and Schady 2005; Myers and Landers 1998). However, the majority of programs adopt a more holistic approach to human development. In addition, the reduction of poverty and inequality (Inter-American Development Bank 1999; Sen 1999) and the enhancement of community bonds (Bernard van Leer Foundation 2001) remain important goals of ECE programs in these countries.

Beneficiaries and scope of ECE policy

ECE interventions can involve the regulation, the funding and/or the provision of ECE services for children, for parents, or for both. In addition, interventions can be targeted or universal. More importantly, successful interventions can take any of these forms, but none of these forms ensures that the intervention will succeed.

In the United States, some of the most effective ECE programs belong to the group of targeted interventions, including the *Carolina Abecederian Project*, the *Infant Health and Development Project*, and the widely-cited *Perry Preschool Project*. More universal programs, such as *Head Start*, have also shown a positive impact although not as substantive as those observed among the most successful targeted programs. However, a targeted approach is not a guarantee for effectiveness, as shown by the impact evaluations of the *Houston Parent Child Development Center*, the *Milwaukee Project*, the *Early Training Project* and the *Institute for Developmental Science* (Currie 2001).

In Latin America, there is also evidence of successful targeted and universal ECE programs. Among the successful targeted programs, the salient case is that of the Colombian *Hogares Comunitarios de Bienestar Familiar* (*HCBF*), a program which relies at large on local communities for the delivery of ECE services. *HCBF* targets the provision of nutritional, health and education services to children up to age 6 years, as well as parenting education, to the poor rural and urban areas of the country. An evaluation[10] conducted by Attanasio and Vera-Hernandez (2006) found that the *HCBF* program had a large positive impact on children's

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[10] Attanasio and Vera-Hernandez (2006) relied on an instrumental variables approach to compare participating and non-participating children and mothers.

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medium-run health and nutritional outcomes[11], on their long-run educational achievements, and on women's participation in the labor force[12]. In particular, the authors found that the probability of attending school between ages 13 to 17 years was 19.8 percentage points higher among children who participated in *HCBF* before age 6 than among those who didn't participate in the program. Participation in the program also increased the probability of progressing in school by 16.5 percentage points among these children[13]. Other successful targeted approaches include parenting programs in Jamaica (Grantham-McGregor et.al. 1997), and the *Proyecto Integral de Desarrollo Infantil* program in Bolivia, which offers a combination of nutritional, care and education services for young children in poor urban areas (Behrman, Cheng and Todd 2004). In all of these cases, a higher exposure to ECE services meant a larger impact from participation in the program.

Among the universal ECE programs in the region, the cases of preschools in Uruguay and Argentina are the most rigorously evaluated. In the case of Uruguay, Berlinski, Galiani and Manacorda (2006) take advantage of retrospective household survey data to estimate how preschool attendance affects subsequent enrollment in school. The authors find that attending preschool sometime between ages 3 to 5 years increases by over 20 percentage points the probability of being in school by age 15. Moreover, the authors find that children are slightly more likely to be enrolled in school at age 15 if they attended two years of preschool instead of one, but that attending three years of preschool instead of two does not add anything to that. In

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[11] Regarding the improvement in nutritional outcomes, Attanasio and Vera-Hernandez (2006) estimate that attendance to a community home increases the height reached by a child at age 6 years by 2.36 centimeters for a boy and 2.39 for a girl. A higher exposure makes the program even more beneficial.
[12] Mothers of participating children are 31 percentage points more likely to participate in the labor force, and they are likely to work 75 hours more each month, compared to mothers of non-participating children.
[13] The HCBF program had smaller impacts on educational attainment of children between ages 8 and 12 years. For these children, the probability of progressing in school was only 2 percentage points higher if they had attended participated in the program than if they had not.

addition, Berlinski, Galiani and Manacorda (2006) show that preschools benefit children relatively more when they are outside the City of Montevideo.

To look into the case of Argentina, Berlinski and Galiani (2005) use a quasi-experimental technique[14] to assess the extent to which the expansion of the public preschool system during the 1990s led to an increase in the enrollment of children ages 3 to 5 years. The authors find that half of the 15 percentage point increase in preschool enrollment between 1991 and 2001 was due to the expansion of the public school system. Furthermore, Berlinski, Galiani and Gertler (2006) find evidence that attending one year of preschool (sometime between ages 3 to 5 years) improves the chances to do well in the third grade of primary school. This is evidenced by the improvement in math and language test scores as well as in behavioral skills observed among children who participated in preschool relative to comparable children but who didn't go to preschool. The authors also find that the benefits from preschool are relatively higher among children who live in the poorer municipalities.

Services and delivery of ECE policy

ECE policy can include different services, including the provision of care, early stimulation and education for young children; the organization of structured interactions between children and their parents in the presence of an educator; and the administration of parenting programs that seek to improve parents' capacity to understand and address children's developmental needs. In turn, each of these services may be provided at children's homes; at community homes or premises; at other privately-owned premises, including private preschools as well as the

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[14] Berlinski and Galiani (2005) use a differences-in-differences approach, which takes advantage of the different rates at which provinces constructed public preschools between 1993 and 1999. Construction of preschools was necessary to comply with the 1993 Federal Law of Education, which mandated the universal provision of public education for 5-year olds.

companies that employ the child's parents; or at publicly-owned centers, including preschools and day care centers, among others. The responsibility for the delivery of ECE services may fall on preschool teachers, social workers, volunteers, NGOs, relevant social actors (e.g. religious organizations), well-educated parents in the community, or college students, to name a few.

Whatever the specific services provided, and whatever the place in which they are delivered, two crucial aspects define the quality of ECE services: the *safety* and the *responsiveness* of the environment. Moreover, once basic safety standards are ensured, the responsiveness of the environment becomes the most crucial determinant of a child's early development. At home or at school, responsive environments are associated with caretakers who are highly motivated to address children's needs and who have advanced linguistic skills (Brauner, Gordic and Zigler 2004). In other words, the *motivation* and the *linguistic skills* of whoever delivers the services to children and families is a crucial determinant of the quality of an ECE program.

Another important factor that affects an ECE program's impact is the exposure to the services provided. In general, more frequent and longer interactions between the beneficiaries and the responsible caretaker or educator contribute to the program's success (Attanasio and Vera-Hernandez 2006; Behrman, Cheng and Todd 2004; Berlinski, Galiani and Manacorda 2006).

Participation of families and communities in ECE policy

ECE interventions need to secure parental involvement with the program in order to be successful. If parents don't grasp the importance of understanding the stages and needs of childhood development, then training activities to enhance parental skills will not be fruitful. If parents don't interact with other caretakers to provide information about their children, then identifying and responding to children's needs at center-based caretaking and educational

arrangements will be too difficult. Ultimately, if parents don't trust the public policies in place, they will not send their children to daily-care centers or preschools.

The literature agrees that in order for parents to get involved with ECE programs they need to be consulted and included at the initial stages of the design of the program. Giving parents a sense of ownership of the program is crucial to enhance their further participation in it. There are various ways to do this, such as encouraging the creation of public-private partnerships for the design, delivery and monitoring of programs (e.g. in the *HCBF* program in Colombia and in the *Madres Guías* program in Honduras); building on the experience and enhancing the capabilities of already existing parental associations or community groups involved with the provision of ECE services (e.g. in the case of Kenya, through the promotion of community-owned pre-schools); easing the institutional and financial constraints faced by NGOs that work with children (e.g. in Mexico's *Proyecto Nacional de Educación Inicial*), and finding creative ways to let parents know about the existence and benefits of a program (e.g. through the use of radio broadcasting in Ecuador). While all of them have worked in different countries, the literature agrees that, where possible, building on the work of already existing parental associations, communities or NGOs should be prioritized, rather than setting up all-new institutional schemes for the design, delivery and monitoring of programs (Balachander 1999).

In addition to having parents contribute to the development of ECE programs, understanding the particular difficulties that parents might face in the upbringing of their children is crucial to determine where the program should focus –and therefore its success[15]. Policymakers need to

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[15] For instance, some parents might have a concern about the social hazards of the community in which their children will be raised (including drug-trafficking and criminal activity); others may be relatively more concerned about the economic or geographic constraints that they face (such as lack of access to day-care centers and preschools because of infrastructure deficiencies or non-affordable costs), and others may be more concerned about their own limitations and lack of experience to enhance children's development (uneducated parents; teenage mothers).

understand where parents' biggest concerns lay in order to put different weights on the components of the ECE programs designed (Bernard van Leer Foundation 2001).

Securing parental involvement thus involves two sides: on one hand, policymakers need to make sure that parents contribute to making the program work, and on the other hand, policymakers need to understand that behind children's unsatisfied needs are their parents and their constraints.

2.3   ECE intervention vs. ECE provision

That the literature is not conclusive about how ECE policy should be formulated and implemented, suggests the existence of a varied number of ways in which the State can intervene to ensure that everyone has access to safe and responsive environments during early childhood. Governments can fund the supply and demand of high-quality ECE services; regulate caretakers' and educators' qualifications; regulate preschools' safety standards; set the national curriculum; mandate enrollment at certain ages; evaluate preschools and alternative ECE programs, and put in place mechanisms that increase their accountability.

What is less clear is why government *provision*, and not just government intervention, is justified in the realm of ECE (Stiglitz 2000; Currie 2001). The discussion of this issue tends to revolve around certain moral values, educational philosophies and political ideologies. Indeed, the building of a cohesive and civilized citizenry and the strengthening of democracy have always been claimed as important goals of public schools –as envisioned by Alberdi and Sarmiento in nineteenth-century Argentina, or by Horace Mann and John Dewey in the United States (Alberdi 1852; Dewey 1938; Fuller 2007; Tyack 2003; Cooney, Croos and Trunk 1993). However, the evidence that ECE programs improve some dimension of a society's political functioning is

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limited to the very few programs in which participants have been tracked for a long period, such as the Perry Preschool Project in the United States (Currie 2001).

Controversially, Fuller (2007) argues that governments in the United States have become increasingly interested in providing universal preschool education not only because of an interest in human development and educational outcomes, but also because universal ECE services are particularly beneficial to middle-income sectors, and hence their provision entails an opportunity for the government to expand its political power and to pursue its ideological agenda. As discussed in the next Section, the recent changes in the definition of the objectives and the scope of ECE policy in Argentina suggest that Fuller's argument might also apply here, in the sense that the provision of universal ECE services is guided by political and ideological considerations more than by a concern about the best interests of children.

2.4   The public vs. private debate in education

Whatever the reasons behind the government's interest in becoming a direct provider of ECE services, evaluations of whether publicly-provided ECE services are doing a good job compared to privately-provided services can be a very useful source of information for policymakers. Understanding how public preschools compare to private ones can help to make knowledgeable decisions about future policy steps.

However, there is no reliable evidence about how publicly-provided ECE services compare to privately-provided ones:

- When looking into ECE in Latin America as a whole, most of the literature ignores this comparative approach. Those studies that have attempted to compare different ECE experiences in the region have come across serious impediments because of the lack of

comparable data, or worse, because of the complete absence of data (Waiser 1998; Deutsche 1998; Schady 2006).

- In the specific case of Argentina, the official studies that seek to quantify the role of public preschools are merely a description of statistics that show an increase of enrollment in public preschools during the 1990s (*Ministerio de Educación* 2005 and 2006). The two econometric studies discussed before are the only ones that have evaluated the impact of expanding the universal provision of public education to include 5-year olds (Berlinski and Galiani 2005; Berlinski, Galiani and Gertler 2006). While these studies provide evidence that going to preschool is better than not going to preschool in terms of subsequent success in school, they do not assess how public preschools compare to their alternative, private preschools.

On the other hand, when it comes to primary and secondary school, the bulk of econometric studies conclude that publicly-provided education is associated with significantly worse educational outcomes than privately-provided education:

- In Latin America, there is evidence that children in public primary schools do significantly worse than children in private ones, as measured by standardized language and math tests, even after controlling for student background and selection (Lockheed and Jimenez 1994; UNESCO 1998b; UNESCO 2000). When it comes to assessing the reasons why public schools are doing a worse job than private ones, UNESCO (2000) finds that the differences in test scores between public and private primary schools in Latin America stem from differences in students' socioeconomic background and in school characteristics. Some of these school characteristics favor public schools, such as the level of teachers' salaries, but a larger set of characteristics put public schools at a

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disadvantage, including the availability of learning materials, the size of libraries, teachers' exclusive commitment to work in that school and not in several schools, and teachers' and parents' involvement in the school's activities. Interestingly, teachers' experience, the main criteria for the determination of teachers' salaries in Argentina, does not seem to make any difference in terms of test scores. Also, infrastructure and equipment do not seem to be relevant predictors of children's school performance.

- In Argentina, the existing literature concludes that, at both the primary and secondary school level, children do worse when they attend a public school than when they attend a private one, as measured by performance in national tests of language and math, by repetition rates and by dropout rates, and even when comparing children of the same socio-economic status (Montoya 2001; Llach, Montoya and Roldán 1999). Moreover, the difference between public and private schools' educational outcomes increases as we move to poorer provinces. In the big cities, such as the City of Buenos Aires, the educational outcomes of public and private schools are not significantly different (Montoya 2001; Llach, Montoya and Roldán 1999; UNESCO 1998b; UNESCO 2000). When it comes to assessing the reasons why public schools in Argentina are doing a worse job than private ones, the literature coincides in pointing out that private schools use their resources more efficiently. Llach and his colleagues (1999) and Montoya (2001) find evidence that some of the differences in educational outcomes between public and private schools cannot be explained by differences in infrastructure, equipment, teachers' qualifications and salaries, students' background, or selection of the best students into the best schools. The authors attribute this unexplained disadvantage of public schools relative to private ones to differences in the institutional design, the management scheme and the set of incentives that exist to align teachers' actions with the schools' objectives.

To the extent that public preschools are being built in already existing public schools to "take advantage" of already functioning resources, it might seem reasonable at first sight to conjecture that the delivery of quality public preschools is being contaminated by whatever leads public schools to provide a lower quality of education than the one available at private schools. This temptation should be avoided, for two main reasons:

- Most of the studies that conclude that public schools yield lower educational achievement than private ones need to be taken with a grain of salt. In general, they have been criticized because of their insufficient proof that there is a *causal* relationship between the types of school attended (public or private) and the subsequent level of educational attainment. In particular, while these studies compare children in different types of schools and with the same observable characteristics (socio-economic status, parental education, etc.), they cannot ensure that the unobservable characteristics are also similar between children in public and in private schools. In theory, there could be unobservable characteristics such as the value of education within the family that guide the choice of school as well as the student's success.

- Providing a high-quality early childhood environment implies a different combination of resources than high-quality education at later stages of a child's education and development. In other words, while an educational establishment may lack the infrastructure, equipment, or skilled teachers necessary to ensure a high-quality education for primary and secondary school students, that same educational establishment, with those same resources, may be able to provide high-quality ECE services.

In this context, this study seeks to add to the limited amount of research that employs econometric tools to evaluate the impact of ECE programs in Latin America, and to the still more

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limited applied econometric research evaluating ECE policy in Argentina. The comparative approach adopted seeks to promote a more relevant way of addressing questions about the effectiveness of ECE policies, by measuring the success of an ECE policy or program relative to its alternatives. Finally, the use of quasi-experimental econometric techniques seeks to address concerns about the reliability of the results found.

3   Background: ECE in Argentina

In Argentina, ECE is legally defined as the provision of care and education services for children from ages 0 to 5 years. The law recognizes that families are the primary caretakers of their children, and that the State's role is to guarantee that children's developmental needs be addressed. As part of its action as a guarantor, since the 1993 Federal Law of Education, the State demands that families enroll 5-year olds in a certified educational institution. Families can choose from a wide variety of such institutions (managed by the public or private sector, formal or non-formal in their approach to learning, with full-day or part-day shifts), but provincial governments must still fund and provide ECE services for all 5-year olds.

Objectives of ECE policy

The objectives of Argentina's ECE policy include the development of young children's cognitive, emotional, social and motor skills, but a bigger emphasis has been placed on the development of those skills associated with school readiness, and in particular, on *linguistic and communication skills*. More recently, ECE policy has also been seen as part of the overall national education policy, whose main purpose is "to ensure quality education and equal opportunities, without regional disparities or socio-economic inequities" (*Ley de Educación Nacional* 2006). In relation

to this, ECE policy has also assumed as an objective the enhancement of social and cultural cohesion and the building of an educated citizenry.

Beneficiaries of ECE policy

On average, preschool enrollment among children ages 3 to 5 years reaches 64 percent. Although the law states that the provinces must provide universal public education for all 5-year olds, the 2001 National Census revealed that only 79 percent of children that age were enrolled in kindergarten, compared to 73 percent in 1991. In addition, since 2006 the State demands that provincial governments also fund and provide universal ECE services for 4-year olds (but enrollment at this age is not mandatory). Compliance with this law will entail substantial public investments in construction, expansion and reparation of schools. Today, gross enrollment rates reach 48 percent among 4-year olds. Eventually, the government intends to expand public services in order to achieve universal provision of ECE for 3-year olds as well. Only 30 percent of these younger children are currently enrolled in preschool.

The "on average" preschool enrollment rate hides the disparities between geographic regions. In the NE of the country, where poverty reached over 70 percent of children in the second half of 2004, only 43 percent of children ages 3 to 5 years were enrolled in preschool according to the last Census. On the other hand, in the City of Buenos Aires, where poverty reached 26 percent of children in 2004, enrollment in preschool reached 93 percent of children ages 3 to 5 years. The maps in Figures 1 to 3 and the summary of regional statistics in Table 1 show that in the poorest regions, which are also the regions with the highest childhood poverty rate, it is less likely that children will be enrolled in preschool. On the other hand, if children in the poorer regions *are* enrolled in preschool, it is more likely that they will be enrolled in a public establishment instead

of in a private one. As we move into the wealthier regions, the relative importance of enrollment in public preschools vis-à-vis private ones falls (Figure 4).

Services and delivery of ECE policy

As discussed earlier, two crucial aspects define the quality of ECE services: first, the compliance with *basic safety standards,* and second, the *responsiveness* of the environment, which in this case depends on the *motivation* and the *linguistic skills* of preschool teachers, as well as on the number of children whose need they need to address.

Regarding compliance with basic safety standards, the 1998 National Census of School Infrastructure reveals substantial differences between public and private schools. According to this Census, only 41 percent of public schools have an environmentally safe surrounding, fire insurance, good sanitation standards and good building maintenance, whereas this proportion reaches 65 percent of private schools. These differences between public and private schools are also likely to be present at the preschool level, since the majority of preschool services are provided within the premises of previously existing primary and secondary schools.

In terms of teachers' linguistic skills, the vast majority of preschool teachers in Argentina can be presumed to have the skills required to enhance young children's development, because certification as a preschool teacher requires at least a post-secondary, non-college degree, obtained after the completion of two years of study and four months of practice (*Organización de Estados Iberoamericanos* 2002). However, the 2004 National Census of Teachers reveals two subtle educational differences between public and private preschool teachers. First, private preschool teachers are more likely than public preschool teachers to have a college degree, and they are also more likely to have post-college studies. Second, there are substantial differences

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between the educational backgrounds of public and private preschool teachers: 43 percent of public preschool teachers were raised by parents who never went beyond primary school, and only 20 percent of them had parents with at least some years of tertiary education; in private preschools, only 26 percent of teachers were raised by parents who never went beyond primary school, and 33 percent were raised by parents with at least some tertiary education.

Moreover, teachers' motivations also seem to be a potential source of differences in the quality of education provided by public and private preschools. The 2004 National Census of Teachers included questions about the motivations to become a preschool teacher. In both the public and the private sector, fondness of teaching and pleasure in working with young children were the main reasons identified by preschool teachers for doing that job. However, the emphasis on these two reasons was stronger in the case of the teachers who work in private preschools[16], while public preschool teachers put a relatively higher emphasis on the fact that being a preschool teacher represented a convenient job option for them[17]. The "convenience" of the job might be related to both the relatively higher salaries paid by the public sector and the relatively bigger financial constraints faced by the families to which public preschool teachers belong[18]. This might support the view that teachers in the public sector, compared to teachers in the private sector, do their work more because they need it rather than because they enjoy it.

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[16] 73 percent of preschool teachers in the private sector said that an important motivation to do that job was their fondness of teaching, compared to 69 percent of those in the public sector. In addition, 60 percent of preschool teachers in the private sector said that another motivation to do that job was the pleasure in working with young children, compared to 56 percent of those in the public sector (*Censo Nacional de Docentes* 2004).

[17] 28 percent of preschool teachers in the public sector, compared to 17 percent of those in the private sector, said that an important motivation to do that job was its convenience as a work option (*Censo Nacional de Docentes* 2004).

[18] Self-calculations based on data from Argentina's household survey reveal that public preschool teachers earn around 14 percent more than private preschool teachers. In addition, public preschool teachers tend to live in poorer households, and they are more likely to be the main source of family income than teachers in the private sector.

The structure of incentives faced by teachers might also explain why motivation is lower among preschool teachers in the public sector than among those in the private sector. In the public sector, the decision to hire and fire teachers is made by provincial authorities; in the private sector, these decisions are made by each school or preschool. Moreover, firing of teachers rarely takes place in the public sector, even if they show high levels of absenteeism; indeed, employment stability has been one of the ways in which the government has historically tried to appease teachers' unions and their claim for an increase in salaries (Murillo 2005; Stein et.al. 2006). Similarly, job promotion and salary levels in the public sector are determined by seniority; that is, evaluations of performance by supervisors do not count for this matter. All this means that public preschool teachers have fewer institutional incentives to care about the quality of the learning environment that they create for young children. In addition, public preschool managers have very little power to ensure that teachers care about the quality of their job, that they adhere to the school's pedagogical approach and comply with established learning objectives (Montoya 2001), or that they show up at school instead of becoming involved in strikes or being absent from school for no good reason (Rivas 2004; Murillo 2005).

Finally, the extent to which preschool teachers are responsive to children's needs is also affected by the number of children that a teacher has to take care of, and by the extent to which the teacher in charge of the classroom receives support from others in the school. The 2004 National Census of Teachers showed that private preschools have relatively more support staff to help teachers in the classroom than public preschools. In addition, the National Census of School Infrastructure revealed that only 8 percent of public schools had expert staff dedicated to coordinate the contents of the curriculum across different levels of preschool and school, to supervise that children were actually learning, and to align teachers' annual plans for the class with the school's pedagogical approach. This proportion reached 20 percent among private schools. Last but not

least, as shown in Figures 5 and 6 and in Table 1, the pupil-teacher ratio is higher in the poorest regions of the country (i.e. in the NW and the NE)[19]. Also, in these poor regions, the relative disadvantage of public preschools teachers in terms of the number of children that they have to take care of compared to their private counterparts, is higher than in the rest of the regions[20].

In summary, public preschools are less likely to comply with *basic safety standards* than private preschools. In addition, there are reasons to suspect that the linguistic interactions between a child and the preschool teacher are less frequent and less enriching in public preschools than in private ones, and that teachers in public preschools are not as motivated as teachers in private preschools to understand and address each child's developmental needs. Furthermore, there are reasons to expect bigger differences between the quality of public and private preschools in the poorer regions of the country, such as the NW and the NE, and lower differences in the City of Buenos Aires and the Patagonia region.

Participation of families and communities in ECE

There is evidence from interviews and focus groups conducted by sociologists that, on average, family interactions with public preschools are not nearly as intense as family interactions with private preschools (Narodowski and Gómez-Schettini 2007). This observation is present at all levels of socio-economic status. In particular, poor parents and parents of middle-to-low income families claim that the teachers and principals of private preschools tend to have a better dialogue with parents than those of public preschools, in the sense that they listen more to parents' concerns and suggestions.

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[19] The pupil-teacher ratio in public preschools is 20.3 in the NW and 21.6 in the NE, compared to 10.4 in the City of Buenos Aires and 12.4 in the Southern Patagonia region (see Table 1).

[20] On average, public preschool teachers in the NW and the NE have to take care of 3 children more than private preschool teachers in those regions. In the Patagonia region and in the Province , the pupil-teacher ratio is very similar between public

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From intervention to provision of public ECE

The provision of public ECE –and of public education in general- is mainly funded and managed at the provincial level. This is one of the reasons why we observe large regional disparities in the quality of public education, which the federal government has been unable to bridge despite an increasing amount of transfers to the poorer provinces (Rivas 2004). As mentioned before, public school principals have no power to decide on a wide range of issues that affect the quality of education that they provide, including the hiring, firing and promotion of teachers; teachers' salaries; the extension of the academic year, and the contents of the curriculum. These decisions are made by provincial authorities, which in turn need to comply with national regulations[21]. The quality of education in a province will depend on the quality of the policy choices made at that level. Policy choices will in turn depend on the resources that the province can allocate to public education, the extent to which the bureaucracy exhibits a technocratic profile, and the extent to which election of the provincial Minister of Education is selected on the basis of merit and experience in the education sector, rather than on the basis of political connections. This generally implies that the poorer provinces show not only lower resources but also a higher politicization in the formulation and implementation of policies, and thus a lower-quality education.

Public expenditure in pre-primary education reached US$1,158 per pupil in 2004, almost four times what the average Latin American government spends in early childhood education[22]. On the other hand, Argentina's expenditure in ECE seems to be quite low when compared to aggregate public expenditure in education and to the country's income. In fact, among a group of Latin American countries that have similar levels of public expenditure in education and similar

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[21] Public school principals can only establish the institution's learning approach, choose books and design the evaluation system. They cannot set the incentives for teachers to care about the quality of education that they provide, to align their teaching to the institution's learning approach or, for that matter, to attend class.
[22] Expenditures are compared based on their PPP value at constant 2003 dollars.

levels of human development, Argentina appears at the bottom of the list in terms of public expenditure in pre-primary education[23]. The government spends around two thirds of what governments in comparable Latin American countries spend for this purpose, and only one third of what developed countries spend on early childhood education (UNESCO 2006).

The other side of the picture is that the private sector spends proportionately more on ECE than on other levels of education: the amount of private expenditure in pre-primary education is half of public expenditure at this level, whereas private expenditure in primary, secondary and tertiary education is just a fifth of public expenditure at these levels. In fact, the private sector is responsible for 35 percent of total expenditures in ECE, but only funds 18 percent of total expenditures at the primary, secondary and tertiary levels.

The role of the private sector in ECE is comparatively higher than its role at other levels of education not only in terms of funding but also in terms of provision. While the private sector provides education services for 21 percent of the children enrolled in primary, secondary or tertiary education, it provides care and education services for 30 percent of children ages 3 to 5 years who are enrolled in early childhood education –and this proportion increases to 40 percent among enrolled 3-year olds (*Censo Nacional* 2001).

Perhaps the more obvious difference between public and private preschools is the degree to which the provision of education services for young children is affected by political struggles rather than by informed debate. One of the main sources of political struggle in the education sector is the strong role of teachers' unions. Teaching is the most unionized profession in the country, and the national teachers' union, CTERA, frequently uses its power to strike in order to bargain for an

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[23] This group of countries includes Barbados, Chile, Costa Rica and Mexico. This group was chosen based on, first, the 2005 Human Development Index value (UNDP 2007) and, second, the availability of comparable information about public expenditures in ECE (UNESCO 2006).

increase in salaries. When this occurs, classes are usually cut in the public and not in the private sector. Many have argued that the decline in the quality of Argentina's public education has been, at least in part, the result of an increase in the power of teachers' unions, combined with governments' short-sightedness in responding to unions' claims. To address unions' claims, the government has often responded by expanding the quantity of public education, which ensures more employment opportunities for teachers, at the expense of educational quality (Murillo 2005; Stein et.al. 2006).

In the particular case of ECE policy, the influence of teachers' unions is mirrored by the changes in the scope of ECE policy between 1993 and 2006. While the 1993 Federal Law of Education confined ECE policy to the provision of education services for children of ages 3 to 5 years, and universal provision to 5-year olds, the 2006 National Law of Education extended the role of the government to the provision of care and education services for children of ages 0 to 5 years, and mandated the universal provision of public services to 4-year olds, and eventually, to 3-year olds. This expansion in the scope of government intervention reflects at least in part the demand from teachers' unions that the public school system provide universal services to children from ages 0 to 5 years (CTERA 2007). When political objectives guide the formulation of policy much more than informed debate, there is reason to suspect that the results of public policy will not be in the best interests of children.

4 Conceptual Framework and Hypotheses

The set of cognitive and non-cognitive skills acquired by an individual determine the ability to achieve the things that he or she values in life. In turn, an individual's acquisition of skills depends on the dynamic interaction between genetic and environmental factors. The

characteristics of the environment that affect the acquisition of skills include cultural and community values; the extent to which others are responsive to the individual's emotional, material and physical needs; the safety of the surroundings; and the cognitive and non-cognitive skills of those with whom the individual interacts.

The acquisition of skills during early childhood sets the basis for the acquisition of skills later in life, because of the dynamic brain-molding process that takes place from birth to age 6 years. Environmental and genetic factors are particularly important in shaping this process and the acquisition of skills that takes place during the first years of life. In any given period, the skills acquired will depend on the characteristics of the environment and on the genetic material, but also on the set of cognitive and non-cognitive skills acquired during previous periods. Hence, the environment in which a young child is raised is important not only because it enhances or hinders the acquisition of skills during early childhood, but also because it affects the successive acquisition of skills and the ability to achieve things that are considered valuable later on. In other words, a good start will contribute to a good continuation in the process of acquiring skills, but a bad start will be costly, and in some cases impossible, to revert.

Communication skills are one of the most basic skills that individuals need in order to achieve things that they value. They include the ability to express ideas orally and in written form, and to understand others' ideas by listening or reading about them. Moreover, the ability to communicate with others is important not only for the transmission of ideas, but also for the expression of feelings, needs, fears, desires, and for the exercise of individual rights, including personal freedom. Communication skills –or the lack of them- are central for the achievement of self-awareness, self-realization and individual freedom. Talking, listening, reading and writing are among the most important means by which human beings communicate with each other.

Early childhood experiences and environments are particularly relevant for the development of linguistic skills, which takes place most rapidly during ages 3-6 years. The linguistic skills acquired during early childhood are important not only because they are part of the important set of communication tools that an individual has, but also because they affect the subsequent acquisition of cognitive and non-cognitive skills. For instance, children who develop good linguistic abilities early in life will be more able to participate in class, to integrate with their peers and to interact with teachers when they reach primary school. Conversely, children who have been raised in an environment where linguistic abilities were not promoted will tend to be more distrustful of their surroundings and less communicative, features which will hinder the development of their socio-emotional skills.

The ease of learning how to read and write will depend positively on the value given to education in the child's family and community; the level of safety at home and in the neighborhood; family income; health status; parents' educational attainment; parental affection, and innate ability. In addition, the probability that a child can read by the end of first grade will depend positively on the safety at pre-primary and primary school; preschool and primary teachers' motivation, as well as preschool and primary teachers' linguistic skills. The relationship between a child's literacy readiness and the amount of time that his or her parents devote to work is probably non-linear: on one hand, unemployed parents might be more depressed than employed parents, and hence less motivated to engage with their children in stimulating activities, but on the other hand, full-time employed parents might be too tired to do so. Similarly, the relationship between a child's literacy readiness and the number of siblings that live with him or her is also probably non-linear: on one hand, an only child might be prevented from the constant development-enhancing interaction with other children, but on the other hand, too many siblings might mean that each child gets a very small portion of parents' time and attention.

In order to assess whether public and private preschool environments affect differently the probability that a child learns how to read and write by the end of first grade, public and private preschool environments need to be isolated from other environments with which they might be related. Because children who go to private preschools tend to come from families with better opportunities and resources, which can provide an overall better environment for the acquisition of cognitive and non-cognitive skills, failure to account for these characteristics would lead to overestimating the positive effect of private preschools compared to public ones. Hence, taking into account all the differences in non-preschool environmental characteristics (including housing safety, household income, health status, parental education, parental status of employment, siblings, community values and safety in the neighborhood) is an important part of disentangling how children's ability to read and write by the end of first grade is affected by different preschool environments (i.e., public vs. private).

Ideally, differences in biological factors should also be accounted for in order to determine more accurately how much of differences in reading and writing skills are the result of differences in the early childhood environment as opposed to differences in genetic characteristics. While the data set available precludes this kind of analysis, this is not a major limitation for this study, given that the main objective is to disentangle the difference in the effects of public and private preschool environments, and not the difference in the effects of the environmental and genetic factors. Moreover, an estimation strategy that arguably accounts for innate ability and genetically determined characteristics is discussed in Section 8. The results of that estimation strategy are consistent with the results of a simpler model that does not account for biological factors.

5   Data

This study relies on the data provided by the urban household survey (EPH, for its name in Spanish[24]) administered by the National Institute of Statistics and Census (INDEC, for its name in Spanish[25]). The EPH has been in place since 1974 with the purpose of providing an official way to monitor the evolution of national and regional socio-economic indicators (poverty, extreme poverty, total income, labor income, unemployment, under-employment and labor informality), and to relate these to other socio-economic and demographic indicators (e.g. housing conditions, educational attainment, health coverage, industry in which the person works, family size, household composition by age and gender, migration status, relationship to the head of the household, etc.). In addition to its official use, this survey provides the most important source of information used by scholars, think-tanks and international organizations to address questions related to poverty, inequality, education, income and labor issues in Argentina.

Since 2003, the EPH has been administered continuously throughout the year[26], and data is currently available for each quarter between the third quarter of 2003 and the first quarter of 2007[27]. The EPH collects household- and individual-level data in 31 urban areas (all the urban areas with more than 100,000 inhabitants), which are home to 71 percent of the Argentine urban population. Since the share of urban areas in Argentina is 87.1 percent, the EPH sample represents around 62 percent of the total population of the country.

Households are selected through a random stratified sampling process that selects, first, a number of urban areas, and then, a number of households within those urban areas, so as to ensure that the

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[24] EPH stands for *Encuesta Permanente de Hogares*.
[25] INDEC stands for *Instituto Nacional de Estadística y Censos*.
[26] Before 2003, the EPH was only administered during two months of the year (May and October).
[27] The availability of quarterly data was last checked on March 9, 2008.

sample is representative of various social, economic and demographic characteristics of the population, as revealed by census data[28].

Data is collected then for each selected household and for each member of that household during six non-consecutive quarters. More specifically, when a household enters the EPH, it is surveyed for two consecutive quarters, it is not surveyed for the next two quarters, and it is surveyed once again for the following two quarters. Then it is no longer surveyed. This is a crucial feature for the purpose of this study. It means that, for each 5-year old child surveyed during the third quarter of 2004 and 2005, the EPH provides information on whether the child was attending a public preschool, a private preschool or no preschool at all, as well as information about parental education and employment, family income and external sources of financial support, health coverage, the presence and educational attainment of siblings, and the urban area in which they lived. A year later, in the third quarter of 2005 and 2006, the EPH collects information of *50 percent of these children*, who are now 6 years old and are at the end of first grade. In particular, the EPH provides data about whether these children had learnt how to read and write by the third quarter of first grade.

The number of individual-level observations in the sample is large enough to ensure the precision of the relevant estimated coefficients. The relevant sub-sample (children who were surveyed at ages 5 and 6, either in the third quarter of 2004 and 2005 or in the third quarter of 2005 and 2006) contains 648 observations.

While the EPH provides the most comprehensive data set available to analyze how different preschool experiences affect the acquisition of literacy skills at the beginning of primary school,

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[28] The INDEC carries out a national census of the population every ten years. The most recent one was carried out in 2001. Whenever new census data becomes available, the EPH is accommodated to ensure that the stratified sample remains representative of the population it covers.

the survey was not designed to address this issue, and thus it presents various limitations which must be acknowledged.

First, as already mentioned, the data set does not provide information about underlying genetic or biological factors that could affect children's acquisition of literacy skills. As indicated previously, this is a potential source of bias, but it does not represent a serious limitation for this particular study for two reasons: (i) because the objective is not to measure how environmental and genetic factors contribute to the acquisition of literacy skills, but to measure how public vs. private preschool environments affect early literacy; and (ii) because the estimation strategy discussed in Section 8 nets out the effect of fixed characteristics such as genetic factors.

A second limitation concerns the absence of data regarding children's health status. However, the survey does collect information on whether children have health coverage or not, and when they do, it provides information about the type of coverage they have. This information is used as a proxy for children's health status.

Third, the data does not provide information about the specific characteristics of public and private preschool environments. In particular, the data does not provide information regarding whether children attended a formal or a non-formal pre-primary program at age 5, nor does it provide information regarding whether children attended part-day or full-day kindergartens. Thus, while the EPH can help elucidate whether public or private preschools are doing a better job in ensuring that children have a good start, it cannot provide the tools to understand what are the particular characteristics that make these environments have different effects on children's development. Despite these limitations, the results of this study are still very relevant for policymaking, for the set of reasons previously mentioned.

A fourth limitation of the EPH is that it only provides information about the same child during 1.5 years. This means that the survey cannot be used to analyze how differential preschool experiences affect development in the long-term. Moreover, the survey only provides data about each individual's educational attainment, the type of preschool or school that he or she attends (public or private), and whether he or she knows how to read and write. This means that, except for literacy skills, the survey cannot be used to analyze how differential preschool experiences affect the acquisition of cognitive and non-cognitive skills. And even in terms of literacy skills, the survey only provides a "yes" or "no" answer to whether individuals know how to read and write, but no information is provided about spelling skills, the level of reading comprehension skills, the richness of the vocabulary, or the complexity of sentence structures.

In an effort to mitigate this problem, this study will seek to assess the extent to which not knowing how to read and write by the third quarter of first grade affects the probability of repeating that grade. This is not a minor question, given the high repetition rates observed among first-graders in Argentina.

In addition, to further address some of the limitations recognized here, recommendations for future research based on available data will be provided in a later section of this study. In particular, insight into the case of Argentina could be gained by looking at the case of its neighbor country, Uruguay, where the public school system is also very extensive and has also been expanded to include 5-year olds in order to address problems of school readiness.

6   Analysis Plan

As previously mentioned, this paper will embark on the study of two questions. First, how does the probability of knowing how to read and write by age 6 differ depending on whether a child

attended a public or a private kindergarten at age 5? Second, how does the inability to read and write by the end of first grade affect the probability that the child repeats that grade?

The specific regression methods that will be employed to answer these questions, as well as the variables that will be included in each model, are described in what follows.

6.1 Analysis of how the probability of knowing how to read and write by age 6 varies depending on whether a child attended a public or a private kindergarten at age 5

Around 50 percent of the 5-year old children who were surveyed by the EPH in the third quarter of 2004 or 2005 were surveyed once again when they were 6 years old, in the third quarter of 2005 and 2006, respectively. This is exactly what enables the study of this question: information is available for the *same* child at ages 5 and 6. To retain only the information about these children (and about their families) collected in the two years in which they were surveyed, the following process needs to be done. First, the 2004 and 2005 third-quarter data sets have to be pooled into a new data set, and the 2005 and 2006 third-quarter data sets have to be pooled into another new data set. Within these new data sets, individuals who were not surveyed in both years have to be dropped. Then, individuals who were neither 5 years old in the first year in which they were surveyed *nor* relatives of the 5-year olds who *were* surveyed in the first year of the new data set, have to be dropped. This leaves us with two data sets: in one, we have information about the children who were 5 years old in 2004 and who were surveyed again in 2005, as well as information about the relatives who live with these children; in the other, we have information about 5-year olds who were surveyed in 2005 and then again in 2006, and information about their relatives. The last step needed to obtain the sub-sample used for this analysis is to merge these

two data sets. This is mainly done to increase the degrees of freedom of the regression model. It leaves us with a sample of 648 children.

The choice to conduct the analysis based on third quarter surveys is not casual. Data is available for all quarters throughout the year. The first and second quarters of the year represent the first semester of the academic calendar (since classes begin in early March), while the third and fourth quarters represent the second semester (since classes finish in December). Variations in the ability to read during the first semester of first grade are likely to be small. Indeed, most children are likely to be unable to read and write by that time. On the other hand, most children are likely to be able to read and write by the very end of first grade, so variation in literacy development is also expected to be small during the fourth quarter. This is where the choice of the third quarter comes in. If a similar proportion of children who went to public or private kindergartens have learned to read and write by the fourth quarter of first grade, but a bigger proportion of children who went to a private kindergarten have learnt to do so by the third quarter of first grade, then these children will have an advantage in terms of subsequent learning. Once they've learnt how to read and write, they can devote the rest of the school year to expand their vocabulary, learn punctuation, or construct relatively more complex sentence structures. And this is where the literacy achievement gap between children who went to public and private kindergartens will come to be more noticeable.

With the new data set, a logit model can be estimated, with the dependent variable being a binary variable which measures whether or not the child can read and write in the third quarter of first grade, when he is 6 years old. The independent variables include separate dummies for whether the child attended a public or a private kindergarten at age 5; a group of variables capturing the child's health status as well as family, community and geographic characteristics when the child

was 5 years old; a variable controlling for whether the child attended a public or a private school in first grade; and a variable controlling for whether the child already knew how to read and write by the time he was in the third quarter of kindergarten, at age 5 years. Specific definitions of the variables included in this analysis are described in Table 2 of Appendix II.

To see if the gap between public and private kindergartens differs between geographic regions and between families of different socio-economic status, the general model will also be estimated in separate groups of regions (the NE, NW and Cuyo regions; the Province of Buenos Aires and the Center region; the City of Buenos Aires and the Patagonia region), as well as in separate quintiles of income.

6.2   Analysis of how the inability to read and write by the end of first grade affects the probability that a child repeats that grade

The analysis of this question, like in the previous case, takes advantage of the fact that 50 percent of the 6-year old children that were surveyed by the EPH in the third quarter of 2004 or 2005 were surveyed once again when they were 7 years old, in the third quarter of 2005 or 2006, respectively. To obtain this sub-sample, a process analogous to the one described for the analysis of question 1 needs to be done, but this time the objective is to keep in the sample those children who were 6 years old when they were first surveyed and 7 years old when they were surveyed a year later, together with these children's relatives. Again, the combined data sets for 2004-2005 and 2005-2006 can be merged into one, in order to increase the degrees of freedom of the regression model. This leaves us with a sub-sample of 537 children.

A model similar to the one used to analyze question 1 can be estimated, only in this case there will no longer be information about the child's preschool experience (because information is only

available for children at ages 6 and 7), and the ability to read and write by age 6 will no longer be a dependent variable. On the contrary, a child's ability to read and write by age 6 will be one of the explanatory variables of repeating first grade, which is the dependent variable of interest. A logit model can be estimated, with the new dependent variable being whether or not the child repeated first grade between ages 6 and 7. The independent variables include a dummy for whether the child knew how to read and write by the third quarter of first grade; the same group of variables described before, capturing health, family, community and geographic characteristics, but now measured as levels when the child was 6 years old; and a variable controlling for whether the child attended a public or a private school in first grade.

7   Results

7.1   Descriptive Statistics

7.1.1   Analysis of how the probability of knowing how to read and write by age 6 varies depending on whether a child attended a public or a private kindergarten at age 5

To answer the question concerning how the probability of knowing how to read and write by the third quarter of first grade varies between children who attended a public or a private kindergarten, a sub-sample of 648 children was analyzed. This sub-sample includes all children who were 5 years old in the third quarter of 2004 or of 2005, and who were surveyed once again a year later. The characteristics of these children are summarized in Table 3a.

Three specific features of this sub-sample are important to note, that confirm its resemblance to the population covered by the 2001 National Census. First, there are more children enrolled in

public than in private kindergartens, and there is a non-negligible fraction of children who attend no kindergarten at all, even if enrollment for 5-year olds is mandatory. More specifically, in the analyzed sub-sample, 60 percent of children age 5 attended a public kindergarten, 33 percent attended a private one, and 7 percent attended no kindergarten at all[29]. Second, the poorer the family, the greater the chances that the child will have attended a public kindergarten instead of a private one. For example, 76 percent of the children in the poorest 60 percent of the population attended a public kindergarten, and only 15 percent attended a private kindergarten. Among children in the richest 40 percent of the population, only 36 percent attended a public kindergarten, while 58 percent attended a private one[30]. Interestingly, the majority of children who do not attend any kindergarten at age 5 belong to the poorest 20 percent of the population[31]. Third, in the poorer regions of the country, enrollment rates in kindergarten are lower, and children are more likely to attend a public kindergarten than a private one. For example, in the NW and NE regions, 11 percent of 5-year olds do not go to kindergarten; in Buenos Aires, this proportion reaches only 4 percent, and 0 percent in the specific case of Buenos Aires City. Also, in the NW and NE, 75 percent of children attend a public kindergarten, compared to 50 percent in Buenos Aires[32].

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[29] The third column in Table 3a shows that, at age 5 years, 60 percent of children attended a public kindergarten and 33 percent of children attended a private kindergarten. By construction, the remaining 7 percent of 5-year olds attended no kindergarten at all.

[30] These statistics can be inferred from Table 3b. For instance, among those children in the poorest 60 percent of the population (quintiles 1, 2 and 3), 370 children attended a public kindergarten (224 from quintile 1, 94 from quintile 2, and 52 from quintile 3); 75 attended a private kindergarten (17 from quintile 1, 32 from quintile 2, and 26 from quintile 3); and 40 attended no kindergarten at all (27 from quintile 1, 7 from quintile 2, and 6 from quintile 3). This means that out of 485 children in the poorest 60 percent of the population, 76 percent attended a public kindergarten, 15 percent attended a private one, and the remaining 8 percent attended no kindergarten at all.

[31] Table 3b shows that, out of the 45 children who attended no kindergarten at all, 27 children (or 60 percent) belong to quintile 1.

[32] In Table 3b, note that 232 children lived in the NW or NE regions at age 5, and another 125 children lived in Buenos Aires at that age. Among those who lived in the NW or NE region, 175 children (or 75 percent) attended a public kindergarten, 31 children (or 13 percent) attended a private one, and 26 children (or 11 percent) attended no kindergarten at all. Among those who lived in Buenos Aires, 63 children (or 50

More important for the purpose of this research, a preliminary look at the characteristics of the analyzed sub-sample suggests that the intuition that private kindergartens contribute more to children's literacy development than public kindergartens appears to be correct. While, on average, 73 percent of the children in the sub-sample had learnt how to read and write by the third quarter of first grade[33], this proportion reached 80 percent among those who had attended a private kindergarten, but only 71 percent among those who had attended a public kindergarten[34].

However, the fact that a smaller proportion of the children who went to a public kindergarten knew how to read and write by age 6 is by no means proof that the quality of education provided by public kindergartens is lower than the one provided by private kindergartens. As already noted, children in public kindergartens tend to be poorer than children who go to private kindergartens, they are more likely to come from single-parent homes, and their mothers tend to have less education. These factors are likely to explain at least part of the deficit in literacy skills shown by the group of children who went to a public kindergarten. Table 3b in Appendix II illustrates these differences. For instance, 80 percent of the children who attend a public kindergarten belong to the poorest 40 percent of the population, while only 40 percent of children in private kindergartens come from that socio-economic group. Among the children who went to a public kindergarten, only 46 percent come from a two-parent family, a proportion that reaches 70 percent among those who went to a private kindergarten. And as much as 69 percent of public-kindergarten children have mothers who have not completed secondary school, and only 16

percent) attended a public kindergarten, 57 children (or 46 percent) attended a private one, and 5 children (or 4 percent) attended no kindergarten at all.

[33] This is shown in Table 3a.

[34] This can be inferred from Table 3c. Notice that there are 448 children who attended a public kindergarten at age 5: 128 children (or 29 percent) who had not learnt how to read and write by the end of first grade, and 320 children (or 71 percent) who *had* learnt how to read and write by that time. Notice also that there are 152 children who attended a private kindergarten at age 5: 30 children (or 20 percent) who had not learnt how to read and write by the end of first grade, and 122 children (or 80 percent) who *had* learnt how to read and write by that time.

percent have mothers with at least some tertiary education, as opposed to 31 percent and 44 percent, respectively, for the group of private-kindergarten children.

On the other hand, children who go to a public kindergarten are likely to benefit from a number of factors, including the fact that they tend to have more siblings with whom they can interact, and their mothers will tend to spend more time at home than the mothers of children who go to private kindergartens. Again, Table 3b shows these differences.

It is therefore important to net out the influence of these family-related environmental factors in order to capture the *pure* effect that going to a public or a private kindergarten has on the ability to read and write by age 6.

Taking into account community- and geography-related environmental factors is also important in order to avoid misleading results. In particular, children who live in small urban areas, as well as children who live in the poorer regions of the country such as the NW and NE, are more likely to be enrolled in a public kindergarten than in a private one. In turn, the probability that a child will have learnt how to read and write by age 6 is lower in small urban areas and in the poorer regions of the country, as shown by Table 3c. Failure to include these variables in the regression analyses would lead us to underestimate the effect of going to a public kindergarten, and to overestimate the effect of going to a private one.

A proper analysis must also take into account that children who go to private kindergartens tend to have better health than those who go to public ones. As Table 3b shows, 58 percent of children who attended a public kindergarten had no health coverage at all, as opposed to 21 percent among children who attended a private kindergarten.

Last but not least, in order to measure only the impact of kindergarten –and not of educational experiences that occur before or after kindergarten-, the regression analyses control for whether a child already knew how to read and write by age 5, and for the type of educational establishment that he or she attended in first grade. As expected, 32 percent of the children who went to a private kindergarten knew how to read and write by age 5, compared to only 22 percent among those who went to a public kindergarten[35]. Also, 88 percent of those who had attended a public kindergarten were in a public school during first grade, while only 20 percent of children who had attended a private kindergarten went on to a public school[36].

7.1.2 Analysis of how the inability to read and write by the end of first grade affects the probability that a child repeats that grade

If public kindergartens are less conducive than private kindergartens to literacy development in first grade, and if literacy underdevelopment –and in particular, the inability to read and write- is one of the causal factors of repetition in first grade, then addressing the disparity in the quality of pre-primary education might help reduce not only the developmental gap between children from different socio-economic backgrounds, but also repetition rates among first-graders.

The question concerning how the inability to read and write by the third quarter of first grade affects the probability that a child repeats that grade was answered by analyzing a sub-sample of 537 children. This sub-sample includes all 6-year old children who were in first grade in the third quarter of 2004 or of 2005, and who were surveyed once again a year later. The characteristics of these children are summarized in Table 10a.

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[35] These statistics are shown in Table 3b. Out of 152 children who attended a private kindergarten, 48 children (or 32 percent) knew how to read and write already by age 5. On the other hand, out of 448 children who attended a public kindergarten, only 99 children (or 22 percent) knew how to read and write by age 5 years.
[36] These statistics are shown in Table 3b.

A preliminary look at the characteristics of this sub-sample seems to support the conjecture that knowing how to read and write is an important determinant of repetition in first grade. While 18 percent of the children in the sample repeated first grade[37], this proportion increased to 28 percent among those who couldn't read and write by the third quarter of first grade[38].

Of course, the inability to read and write is not the only reason why we would expect a child to repeat first grade. A variety of individual, family, community, geographic and school factors might also be contributing to a child's repetition of first grade. More important, these characteristics are likely to be related to a child's inability to read and write by the end of first grade, and so failure to include them in the analysis will contaminate (i.e., underestimate or overestimate) the magnitude of the effect that we attribute to reading and writing.

In particular, the proportion of children who don't know how to read and write is higher among those who have no health coverage (25 percent of that group, compared to 14 percent of the group of children who have health coverage); among those who come from single-parent families (22 percent, compared to 16 percent of children from two-parent families); among children whose mothers have not finished secondary school (24 percent, compared to 10 percent of children whose mothers have finished secondary school); and among those whose mothers work less than 20 hours per week (21 percent, compared to 14 percent among children whose mothers work more than 20 hours a day). Also, the proportion of children who don't know how to read and write decreases as we move from the lower to the upper quintiles of the income distribution. And children who live in small urban areas, or who go to a public school, as well as those who live in the NW and NE regions of the country, exhibit a higher tendency to be unable to read and write

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[37] See Table 10a.
[38] See Table 10b.

by the end of first grade. Table 10b shows the relationship between the ability to read and write and individual, family, community, geographic and school characteristics. Table 10c describes the relationship between these characteristics and a child's progress or repetition of first grade.

7.2   Regression results

7.2.1   Analysis of how the probability of knowing how to read and write by age 6 varies depending on whether a child attended a public or a private kindergarten at age 5

The analyses conducted reveal that, on average, attending a public kindergarten *does not affect* the probability that a child will know how to read and write by the time he is in the third quarter of first grade. On the other hand, attending a private kindergarten *increases* that probability by roughly 15 percentage points[39]. In other words, going to a public kindergarten does not matter for the development of early literacy skills (it makes no difference compared to not going to any kindergarten at all), but going to a private kindergarten does. The results are shown on Table 5.

The level of confidence with which we can say that attending a private kindergarten *affects* the probability that a child will know how to read and write by the time he is in the third quarter of first grade is over 80 percent[40]. While this level of confidence is below the conventional level preferred by researchers, it is worth noting that it was obtained through a more conservative method of estimation than the one typically used by researchers that work with the EPH survey.

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[39] All percentage-point effects are calculated using the following formula: $B.y_{avg}.(1-y_{avg})$, where B is the coefficient on the corresponding variable (shown on the corresponding Table of the Appendices), and y_{avg} is the mean value of the binary dependent variable. For question 1, y_{avg} is equal to 0.7317, but this value is different in sub-samples chosen on the basis of geographical region or quintile of income to which the family belongs. For question 2, y_{avg} is equal to 0.1781.

[40] In other words, if a two-tailed test is conducted to address the validity of the hypothesis that attending a private kindergarten has no effect on the ability to read and write by the end of first grade, this hypothesis can be rejected with an 80 percent level of confidence or a 20 percent level of statistical significance.

In our case, the logit model estimated was adjusted for complex survey designs –in other words, the logit model takes into account that the sample was not selected at random, but through a two-step stratification process, first selecting urban areas, and then selecting households. If instead we looked at the results obtained through the method that is more commonly applied by researchers who work with the EPH survey, the level of confidence with which we could say that attending a private kindergarten *affects* the probability that a child will know how to read and write increases to almost 99 percent[41]. However, while this commonly used method of estimation (a logit model that computes robust standard errors) takes into account that the sample was not selected at random, it doesn't account for the specific stratification process through which the sample was obtained.

The "on average" conclusion that, when compared to attending no kindergarten at all, public kindergartens make no difference in terms of early literacy development, but private kindergartens do, hides important insights that are revealed when the analysis is disaggregated by quintile of income and by geographic region. We now turn to look at these results.

The effect of public and private kindergartens by quintile of income[42]

When the analysis is disaggregated by quintile of income, important observations come to light.

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[41] The results obtained by applying the estimation method commonly used by researchers who work with the EPH survey are shown in Table 8, under the column titled "Logit with robust standard errors (non-weighted)". In that case, the p-value for "private kindergarten" is 0.011 and the p-value for "public kindergarten" is 0.069. Thus, if the methodological approach conventionally used by researchers who work with the EPH were employed, the conclusion would be that *both* public and private kindergartens have a positive, statistically significant effect on a child's ability to read and write by the end of first grade. Even in that case, researchers would conclude that the positive effect of attending a private kindergarten is more substantial than the positive effect of attending a public one, given the magnitude of the coefficients. Notice, on the other hand, that if the observations are *weighted*, a logit model with robust standard errors will yield coefficients and p-values very similar to those obtained with the complex survey design method. This can be seen on Table 8 by comparing the columns titled "Logit with robust standard errors (weighted)" and "Logit for complex survey design (weighted)".

[42] The results discussed in this sub-section are shown on Table 6. The results for quintile 3 and for quintiles 4 and 5 should be taken with caution, given that estimations are based on a a relatively small smaple size.

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For the children who belong to the poorest 20 percent of the population, as well as for the children who belong to the richest 40 percent, attending a kindergarten (be it public or private) does not matter. What does matter for these two groups of children is *where* they are raised –but it matters in opposite ways. For those in the poorest 20 percent of the population, being raised in the City of Buenos Aires, in the Patagonia region, in the Center region, or even in the NW and NE regions, is *better* than being raised in the Province of Buenos Aires. Conversely, for those in the richest 40 percent of the population, being raised in any of these regions is *worse* than being raised in the Province of Buenos Aires. These results might suggest that the socio-economic segregation in the Province of Buenos Aires is marked compared to the segregation in the rest of the country. Furthermore, these results suggest that this segregation does not arise from differential opportunities to access high-quality pre-primary education, but that they might arise from access to public services in general, or from access to educational opportunities at subsequent stages of life. In fact, while the type of school that a poor child attends in first grade does not affect the chances that he or she will know how to read and write in first grade, this does make a difference for the children in the wealthier 40 percent of the population. For this latter group, attending a public school (compared to attending a private one) decreases the probability that a child will learn how to read and write by 92 percentage points. However, only 17% of the children in the richest 40 percent of the population attend a public school instead of a private one.

For those who belong to the second quintile, the probability of knowing how to read and write doesn't increase as a result of having attended a public kindergarten, but it does increase as a result of having attended a private kindergarten –and it increases by 53 percentage points.

Finally, attending a public kindergarten does make a difference for those who belong to the third quintile. For these children, the probability of knowing how to read and write by age 6 increases

by 134 percentage points as a result of having attended a public kindergarten. Moreover, while attending a private kindergarten also contributes to a child's early literacy development, the effects of attending one or the other type of kindergarten are not significantly different.

In summary, attending a public kindergarten makes a difference for those in the middle of the income distribution. However, for those children who are being raised in wealthier families, the ECE services provided by public kindergartens do not add anything to the already enriching environments in which these children are being raised. More worryingly, for those children who are being raised in poor families, public kindergartens don't provide sufficiently good ECE services to revert the negative effects that their home and community environments have on their early literacy development.

The effect of public and private kindergartens by geographic region[43]

Among those children who are raised in the NW, NE or Cuyo regions, attending a public kindergarten increases by 16 percentage points the probability of knowing how to read and write by age 6, and attending a public school during first grade increases this probability by another 14 percentage points. However, the effect of attending a private kindergarten is greater than the combined effect of public kindergarten and public school, since it increases by 40 percentage points the probability of learning how to read and write by the end of first grade.

In the Province of Buenos Aires or in the Center region, the situation is quite different. Neither attending a public kindergarten nor a private one adds anything to a child's ability to read and write by the end of first grade. In addition, attending a public school during first grade does not add anything compared to attending a private school.

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[43] The results discussed in this sub-section are shown on Table 7. The results for Buenos Aires City and Patagonia should be taken with caution, given that estimations are based on a a relatively small smaple size.

Finally, attending a public kindergarten is better than attending a private kindergarten for those who live in the City of Buenos Aires or in the Patagonia region; attendance to a public kindergarten (compared to attendance to a private one) increases by 56 percentage points the probability of knowing how to read and write by age 6.

These results confirm some of our initial intuitions. First, public education –and in particular, public pre-primary education- is relatively good in the metropolitan area of the City of Buenos Aires, as well as in the Southern Patagonia region. Second, public kindergartens are not as good as private kindergartens in the NW, NE and Cuyo regions. Furthermore, the analysis disaggregated by region reveals that in the Province of Buenos Aires and in the Center region, a child's early literacy development is not affected by whether he or she attended a public, a private or no kindergarten at all.

7.2.2 Analysis of how the inability to read and write by the end of first grade affects the probability that a child repeats that grade

By now we have established that, on average, public kindergartens do not affect the probability that a child will know how to read and write by the third quarter of first grade, whereas private kindergartens improve this probability by roughly 15 percentage points. Why should this matter? In particular, why should we care specifically about a child's ability to read and write by the third quarter of first grade, and not by the end of the school year? The results of the analysis of how the inability to read and write by the third quarter of first grade affects the probability of repeating that grade are the reason why the previously described results should matter. The results are shown on Table 12.

On average, the probability of repeating first grade is 12 percentage points higher among children who have not learnt how to read and write by the third quarter of first grade than among those who have.

In other words, these results confirm that attending a private kindergarten is better than attending a public one in terms of its effects on early literacy development, and that early literacy development contributes to a child's progress in school. In particular, a child's ability to read and write by the third quarter of first grade decreases the probability that the child will repeat that grade by 12 percentage points. In turn, the probability that a child will be able to read and write by the end of first grade increases by 15 percentage points as a result of attending a private kindergarten (compared to attending no kindergarten at all), but it is unaffected by attendance to a public kindergarten.

8   Discussion

8.1   Addressing concerns about selection bias: A first-differencing approach and other empirical considerations

In the past ten years, there has been an increasing emphasis in the econometric and impact evaluation literature about the importance of comparing the post-policy outcomes between a group that was affected by the policy and another group with the same observable and unobservable characteristics but that was not affected by the policy. Because the only difference between these groups is whether they were affected or not by the policy, the difference between the post-policy outcomes of these groups is interpreted as the causal effect of the policy.

It is humanly impossible for the exact same person to be, at the same time, affected and unaffected by the same policy or program. What researchers typically do is to choose two groups, one that was affected by the program and another one that wasn't. To net out the effect of the program, they account for as many characteristics as possible that might affect both a person's participation in that program and the outcome of interest.

In this study, we control for a large set of individual, family, community and geographic characteristics that are expected to affect both a child's early literacy development and the decision made by parents to enroll that child in a public, a private or no kindergarten at all. The importance of including these variables in the analysis is described in Table 2 and confirmed in Table 4. As the reader may notice from Table 4, including each of these variables in the analysis alters the estimated effect of public kindergartens and of private kindergartens in the way anticipated in Table 2. While including all these variables reduces the chances that the results will be statistically significant, this study chose to include all these variables in the model, thus prioritizing the effort to reduce the potential size of omitted variable bias and of selection bias.

Even if we account for relevant observable characteristics, there might still be *unobservable* characteristics that affect both a child's enrollment in kindergarten and that child's early literacy development. If it's true that there are relevant unobservable characteristics that we have failed to account for, the results described in the previous section would still be somewhat biased.

How do researchers solve the problem of selection bias that arises when relevant unobservable characteristics are not taken into consideration? This is where the random selection of who will be affected by the policy and who will not comes into play. If these groups are selected at random then, *on average*, their observable *and* unobservable characteristics will be the same. Their

outcomes can then be observed and compared after the policy has been in place for a while, and the difference between these outcomes can be interpreted as the *on average* effect of the policy.

It is not common to find a random assignment of ECE programs and policies, because of moral considerations and because of political constraints. In addition, in the specific case of ECE policy in Argentina, it is virtually impossible to think of a random assignment of the program, given that the 1993 Federal Law of Education mandated the *universal* provision of public education for 5-year olds. So how should an appropriate comparison group be identified in the absence of a randomized assignment of the program?

A number of quasi-experimental econometric techniques can be used to construct an appropriate comparison group –one that hopefully has similar observed and unobserved characteristics[44]. Some of these techniques include the instrumental variables approach used by Attanasio and Vera-Hernández (2006) for the evaluation of the *Hogares Comunitarios de Bienestar Familiar* program in Colombia, and the differences-in-differences approach used by Berlinski and Galiani (2005) and Berlinski, Galiani and Gertler (2006) to assess the impact of the expansion of public preschools in Argentina.

When panel data is available, a quasi-experimental technique that can be used is the first-differencing approach. A first-differencing model estimates how *changes over time* in the dependent variable are affected by *changes over time* in the independent variables. The model assumes that, for a given individual, unobservable characteristics remain constant over time (their change is equal to zero), and hence they are eliminated from the model. Once the relationship between the *changes* in the dependent variable and the *changes* in the independent variables are

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[44] It is important to note that all quasi-experimental techniques have certain limitations in terms of internal validity, given the number of assumptions that have to be made when applying these techniques.

estimated, the coefficients are interpreted to be the same as those that would have been obtained if a level-level model had been estimated in the first place[45].

Because panel data is available, we use a first-differencing approach to see if the results commented in Section 8 are consistent once unobserved characteristics are taken into account. It is worth noting three things. First, the estimated model is a *multinomial* logit model, because there are three possible ways in which a child's ability to read and write may change between kindergarten and first grade: the child may know how to read and write already at age 5 and also at age 6; he may not know how to read and write either at age 5 or at age 6; or she may not know how to read and write at age 5 but learn how to do so by age 6[46]. Second, the estimated model is not a typical first-differencing model, since we need to include at least two fixed variables whose impact we are interested in measuring –the variables that capture whether a child attended a public or a private kindergarten. Third, in these models, the sample size becomes more important in terms of statistical significance. For this reason, a bigger sub-sample is used, which includes not only the 5-year olds surveyed in the third quarter of 2004 or 2005 and then again a year later, but also 5-year olds surveyed in the third quarter of 2003 and then again in the third quarter of 2004[47]. This bigger sub-sample includes 877 children instead of 648.

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[45] The underlying assumption is that the relationship between the dependent and the independent variables does not change over time.

[46] In the sub-sample used to estimate the multinomial logit model, 21 percent of children could read and write already by age 5, another 23 percent had not learnt how to read and write by age 6, and the remaining 56 percent of children couldn't read and write when they were in kindergarten but they had learnt how to do so by the end of first grade.

[47] This last group was excluded from the previous analyses because the information collected by the EPH in the third quarter of 2003 did not include information about the child's per capita family income variable, or about the family's reception of external support from the government, friends, or other social actors.

In the multinomial logit model estimated with the bigger sub-sample, the real per capita family income variable is replaced by the real total family income.

Before doing the analysis with the bigger sub-sample, two different models were estimated with the smaller sample: one that includes real per capita family income and external help, and another one which uses total family income and does not include the help variable. The coefficients on the variables that capture if a

The results of this model suggest that public kindergartens do have some effect on the probability that a child will learn how to read and write between ages 5 and 6, but that private kindergartens have a larger positive impact on this probability (see Table 9). These results are robust to consideration of unobservable characteristics such as genetic factors, motivation, family values, innate ability, and other factors, as long as we accept the assumption that these remain unchanged between ages 5 and 6 years.

These new results point out an important issue. The "unobserved heterogeneity" criticism is, ultimately, subject to empirical verification. In other words, whether the unobserved characteristics matter or not for an individual's choice to participate in a program is not a conceptual issue, it is an empirical question. When the observable characteristics included in the analysis are strong, as is the case of this model, the chance that the unobservable characteristics are biasing the interpretation of the results in a way that leads us to mistaken results is low. In this particular case, the characteristics included in the estimated model coincide with what sociologists and other social scientists involved in field work in Argentina have identified to be the determinants of a family's choice of school –the level of family income, the parents' education, their employment situation, and their place of residence. Furthermore, sociological research shows that it is not true that poor families value education less than wealthier ones, which in turn leads them to choose a public school for their children. *In fact*, poor parents strongly value education and they see it as the only way for their children to have a better living. For this reason, most of them would want their children to go to a private school, but they simply can't afford it (Narodowski and Gómez-Schettini 2007).

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child attended a public, a private, or no kindergarten at all did not change significantly between one model and the other.

8.2   Implications for further research

This study provides new knowledge about the state of education policy in Argentina. In particular, we know that private kindergartens are better than public kindergartens in terms of their effect on literacy development during first grade. And we know that early literacy development is an important determinant of school progress, as well as an important goal of education during the early years (Jarvis de Oteiza 2006; Kaufman 2006).

However, this study only provides hypotheses about the reasons why private kindergartens are better than public kindergartens. Is it because the teachers in private kindergartens are more likely to work exclusively at that establishment, or because children's attendance to private kindergartens is more likely to be full-time –or maybe both? Is it because private kindergarten teachers are more motivated to respond to children's needs in the first place, or because they tend to have a lower number of children under their responsibility, as well as less frustration about the system in which they work? Is it because of a superior linguistic capability by private kindergarten teachers, or because private kindergartens exhibit a stronger institutional capacity to provide a personalized education? Or is it because parents and private preschools work more closely than parents and public preschools? Moreover, if all of these factors matter, *how much* does each of them matter, and *what else* matters that we are failing to consider?

Thus, an important task for researchers is to understand what factors determine the quality of education *at the preschool level*. Understanding this will help policymakers to prioritize specific aspects within the ample set of reforms that they could envision to improve the quality of preschool education.

In addition, further research should also assess if public and private kindergartens differ in terms of their effects on longer-term outcomes, including measures of school progress and completion, measures of social behavior, measures of employability, and measures of parenting skills. It is also important to understand if, in the short term, public and private kindergartens have different effects on outcomes other than literacy skills, including measures of social integration and emotional development. The lack of research in these aspects tends to derive from the lack of data. Still, researchers should try to make efforts to find creative ways to understand these issues.

For instance, it might be useful to examine Uruguay's experience in order to gain a better understanding of the factors that affect the quality of education. In particular, retrospective data collected by Uruguay's household survey can tell us not only whether a student attended some kind of pre-primary educational establishment, but also whether the education received was formal or non-formal. Understanding how the formal and non-formal forms of ECE compare in terms of their effects on children's early literacy development might help policymakers think about how to reform the pedagogical approach of public preschools in Argentina –whether to move towards a more formal or a more non-formal approach to ECE. Furthermore, the Uruguayan data can also be exploited to look at how formal and non-formal ECE services compare in terms of their longer-term effects on school attendance, progress and completion[48].

For researchers interested in understanding ECE in Argentina, looking into ECE in Uruguay may be particularly relevant given the similarities between the two countries' educational systems, cultures, histories and socio-economic patterns.

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[48] A study by Cueto and Diaz (1999) compares how formal and non-formal preschool programs in the City of Lima affect children's performance in math and language during first grade. However, the study has serious problems of internal validity. The groups of children compared are different, and these differences in their observable and unobservable characteristics are not taken into consideration by the authors.

Furthermore, Argentine policymaking would also be enriched by understanding what ECE programs and policies have worked in other countries of Latin America and which ones haven't, as well as the reasons why they worked or not.

8.3   Policy implications

The results of this study confirm the intuition that led to conducting it: public preschools are not as good as private ones. This implies that there is a need to invest in improving the *quality* of public ECE, and not just in the expansion of its coverage, in order to serve the main purpose of education policy –to reduce inequality of opportunity among children. The relatively lower quality of public preschools translates into lower chances that the children who attend these preschools will know how to read and write by the end of first grade, which in turn translates into higher chances of repeating that grade.

Efforts to improve the quality of public ECE services could focus on improving the following aspects:

- The linguistic and teaching skills of public preschool teachers.

- The structure of incentives that affect public preschool teachers' motivation.

- The interactions between public preschool teachers and parents.

- The number of children for whom the preschool teacher is responsible and the availability of staff to support the preschool teacher who is in charge of the class.

- The coordination of activities conducted in preschool with those conducted in first grade.

- The reparation of buildings to comply with basic safety standards.

However, the profound reform of most of these aspects would need a political consensus that is not present in Argentina, especially in the context of the strong influence from teachers' unions.

Because of the politics of the policymaking process, policies that expand the coverage of education (and the quantity of employment in this sector) are easier to approve, whereas policies that improve the quality of education (and reduce the stability of employment in this sector) are subject to strong opposition. For instance, actions such as the reparation of buildings or the construction of new preschools are less subject to political debate, and hence they are gradually being addressed. Similarly, the hiring of more teachers and support staff for public preschools would not face opposition from teachers' unions –although efforts should be made so that that the newly-hired teachers and staff have a stronger background in psychology and pedagogy, as well as more solid linguistic skills.

But when reforms meddle with any aspect related to the quality of teaching, opposition from teachers' unions tends to rise, because an obvious part of a reform that seeks to improve the quality of teaching would entail the better measurement of teachers' performance –and this might put at risk the credibility, the employment or the wages of many teachers. Similarly, reforms that change the current structure of incentives (which is based on seniority and not on performance), would put at risk the labor status of many teachers, as well as reduce the employment stability for all teachers and the "convenience" of the job that drives them to that occupation in the first place.

This said, the State can still intervene in ways that improve the interactions between public preschool teachers and parents; the structure of incentives that affect public preschool teachers' motivation; and the linguistic and teaching skills of public preschool teachers. The recommendations that follow take into consideration the current political constraints faced by teachers, schools, citizens and policymakers seeking to improve the quality of ECE in Argentina.

Increasing the participation of families and communities in public ECE

While it is difficult to envision a greater interaction between public preschool teachers and parents without a previous change in the structure of incentives faced by teachers, there are some options that can be made available to increase teachers' responsiveness to parents. One of these is to empower parents, by educating them about the developmental needs of their children and about their right to demand that these needs be addressed by preschools, and by helping them develop communication skills as well as organization skills to voice their interests collectively. To empower parents, the State could partner with local or national NGOs, existing community groups or Parents' Associations, and other relevant social actors. Sub-components of community-based programs in Latin America could serve as models for this type of intervention, including the *Hogares Comunitarios de Bienestar Familiar* program in Colombia, the *Madres Guías* in Honduras, and the *Conozca a Su Hijo* in Chile.

In addition, the State could partner with NGOs and with universities to organize structured interactions between families and teachers, in which role play and other activities could help parents express their concerns, and in which the subsequent discussion of these activities could help teachers identify important constraints for children's development. Furthermore, these interactions could be supplemented by seminars and workshops for teachers, where they would share their own experiences in terms of how they have incorporated parents into preschools, as well as learn about others' approaches –in the rest of the country and in other countries of the region, and in the public and private sectors[49].

Indeed, there are cases in which universities have gone a step further, to provide three-year training for teachers, in pedagogical, organization and management tools that can help them

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[49] These seminars are currently organized in Porto Alegre, Brazil.

fulfill the learning objectives of ECE (Gvirtz and de Podestá 2006). The State could further promote these interactions, by creating a platform (perhaps on the Internet) where preschools would be able to express their interest in receiving external support, and where universities would be able to identify the schools that they could help the most.

Increasing the interaction between public and private preschools

Children in public preschools could profit from interactions with children in private preschools. These interactions could take the form of joint visits to a park or a public museum, sports or musical activities, picnics, painting activities, etc. In addition, teachers in both public and private preschools could benefit from these interactions, by learning from each other's actions, discussing pedagogical approaches, and forming a bond that reinforces the sense of purpose of their profession.

Strengthening leadership in public preschools

Leadership is essential for profound changes to take place in the culture and practices of an organization. In general, teachers feel that, in order for changes to take place, these changes need to come from above (Gvirtz and Abregú 2006). In turn, many preschool principals have also become demoralized by their profession, given the limited power that the institutional structure gives them to make decisions that will improve the functioning of the schools that they manage. However, programs that empower preschool principals could be put in place, to recuperate the sense of social purpose of their profession as well as their role as leaders of this mission. Where possible, incentives should be put in place to encourage principals to make transformative changes in schools and to encourage teachers to make transformative changes in the classroom.

Such incentives may occur in the form of social recognition, which could arise from wide dissemination of innovative practices on the Internet as well as in newspapers, radio and TV.

Targeting improvements in quality to low-income families and poor regions

Improving the quality of the ECE services received by poor families requires all of the above and more. The Ministry of Education should work in close collaboration with the Ministry of Health, the Ministry of Labor, and the Ministry of Social Development, to ensure that a package of holistic services is provided in a timely manner to the most disadvantaged families. In Chile, the coordination of efforts between government agencies has led to the formulation and implementation of *Chile Solidario*. In Argentina, the Ministry of Education could look at who are the families that benefit from the *Plan Familias* conditional cash transfer program administered by the Ministry of Social Development, and what are the kindergartens in which the 5-year olds of those families are enrolled. Then, interventions could be targeted to improve the quality of those preschools.

In addition, the State could provide incentives to further encourage the establishment of affordable private preschools in low-income areas. Tax deductions and subsidies could be used to encourage the building of more private preschools in marginalized areas.

Targeted programs and policies by no means rule out the universal provision of ECE services. What targeted approaches simply do is to recognize that, while universal ECE services may be desirable for the construction of a cohesive and democratic society, universally-provided ECE services tend to favor those in the middle of the income distribution, and not the poorest children. Poor children need more support and more personalized interactions for ECE services to effectively address and compensate their developmental deficits. In other words, targeted

approaches should *complement* the universal provision of ECE services in order to ensure that poor children receive a rich education.

Regulation of private preschools

Another way in which the State could intervene to ensure that *all* preschools, and not just those in the public sector, work towards the goal of achieving equity would be to regulate private institutions so that a fraction of the children that they accept into preschools corresponds to children from low-income families. Alternatively, the State could provide incentives to those private preschools that follow this principle.

This form of intervention would entail substantial costs derived from the monitoring of private preschools, which would be necessary to ensure their compliance with the new regulations. Conversations with policymakers in other countries could help to think about how to tackle these costs. The recent reform of education in Chile provides a special opportunity to learn about the mechanisms used by other countries to ensure the effective enforcement of regulations.

Formulating regional strategies of ECE policy

Some geographic regions are in special need of an improvement in the quality of education. In general, these are also the regions where public ECE has the lowest coverage: the NE, NW and Cuyo regions of the country. Initiatives that prioritize the construction of preschools in these areas are already underway. But what about the initiatives to improve the quality of ECE services in these regions? Many things come to mind, including provincial programs that seek to enhance families' empowerment in order to increase preschools' accountability, or provincial programs that encourage parents and teachers to work together in the decision about how the curriculum will be taught so as to incorporate the child's culture and background. In addition, child

assessments in the poorer regions and provinces should be expanded, strengthened, and used to identify each child's particular developmental needs at the time of entry into preschool, as well as to monitor the child's subsequent development relative to that initial assessment.

8.4   Concluding remarks

The suggested policy recommendations are only a starting point. They derive from looking at some of the things that have worked in other countries to improve young children's educational experiences, as well as from a non-rigorous comparison between public and private preschools in Argentina, in aspects such as basic infrastructure, teachers' motivations and educational background, the set of institutional incentives faced by teachers, pupil-teacher ratios, and the degree of politicization of education. The list of recommendations does not exhaust the set of changes that can be introduced in order to improve the quality of public ECE in Argentina. However, specific recommendations are provided to highlight that, despite the political limitations of education reform, there *is* room to make changes and to gradually improve the quality and the equity of education in Argentina.

The first step to make the necessary changes is to recognize that, even if we expand the coverage of ECE services, there is a fundamental problem of unequal opportunities among children in terms of access to *high-quality* early childhood education.

Appendix I: Background

Figure 1. Poverty Rate, Q3 and Q4 of 2004

Buenos Aires City, 14.7%
Patagonia, 24.7%
Center, 37.4%
Cuyo, 41.4%
Buenos Aires Province, 44.4%
NW, 53.4%
NE, 59.5%
Average: 40.2%
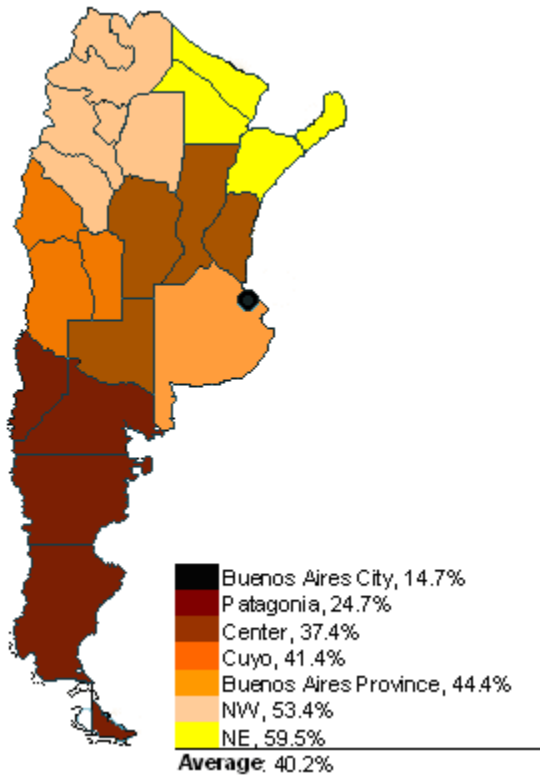
Source: INDEC, *EPH* second semester of 2004.

Figure 2. Childhood Poverty Rate (children younger than 14 years old), Q3 and Q4 of 2004

Buenos Aires City, 25.9%
Patagonia, 32.7%
Cuyo, 52.4%
Center, 54.5%
Buenos Aires Province, 60.7%
NW, 66.5%
NE, 70.8%
Average: 56.4%
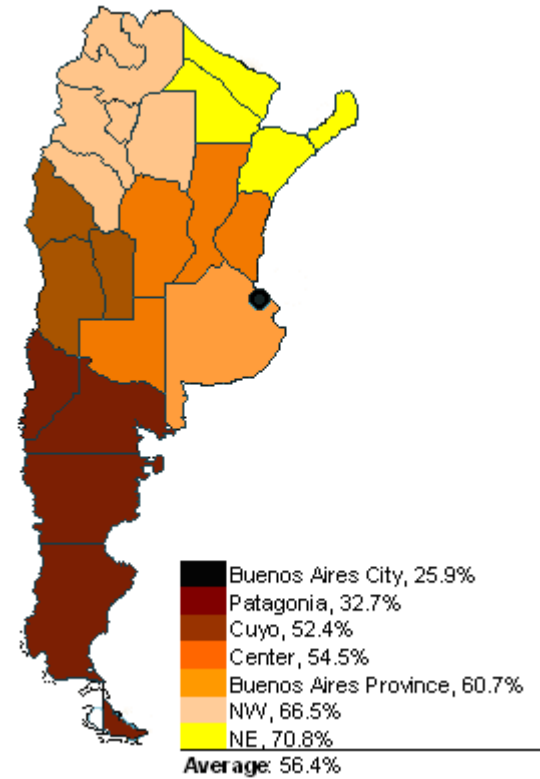
Source: INDEC, *EPH* second semester of 2004.

Figure 3. Gross Enrollment Rate in pre-primary school (children ages 3 to 5 years), 2001

>90%
81-90%
71-80%
61-70%
51-60%
40-50%
Average: 64%
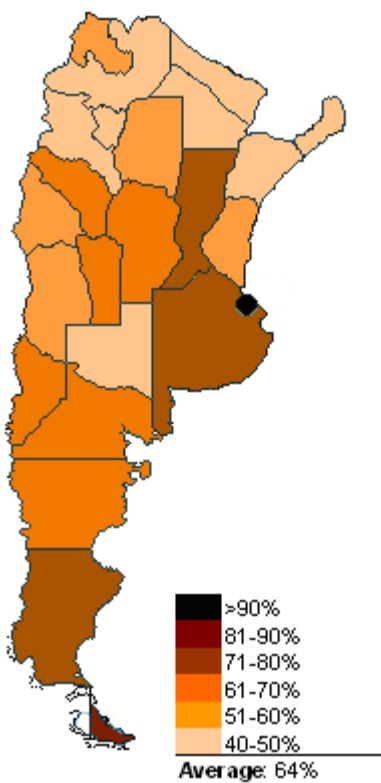
Source: INDEC, *Censo Nacional* 2001.

Figure 4. Number of children enrolled in private pre-primary school for every 1 child enrolled in public pre-primary school (children ages 3-5 years), 2006

>1.00
0.51-1.00
0.41-0.50
0.31-0.40
0.21-0.30
0.11-0.20
Average: 0.44
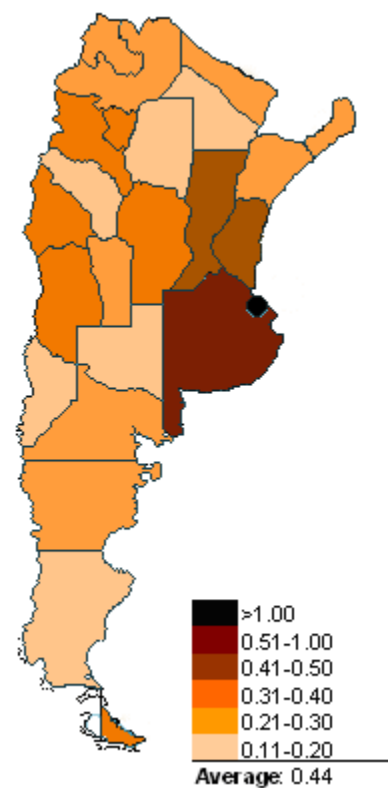
Source: DINIECE, *Anuario Estadístico Educativo* 2006.

Figure 5. Number of children per teacher in public pre-primary schools, 2006
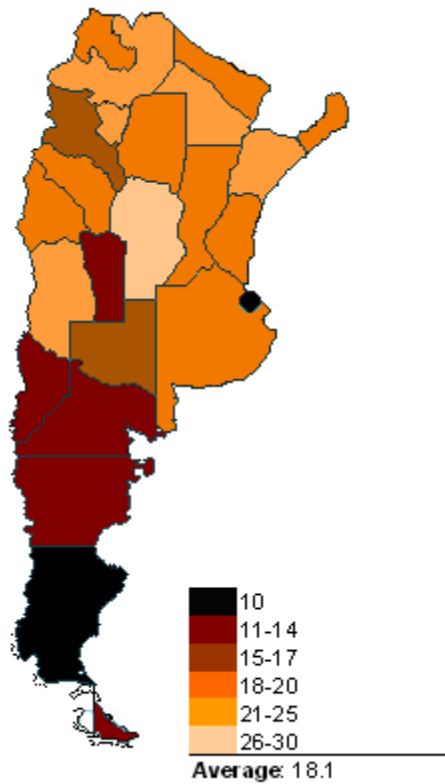
Source: DINIECE, *Anuario Estadístico Educativo* 2006.

Figure 6. Number of children per teacher in private pre-primary schools, 2006
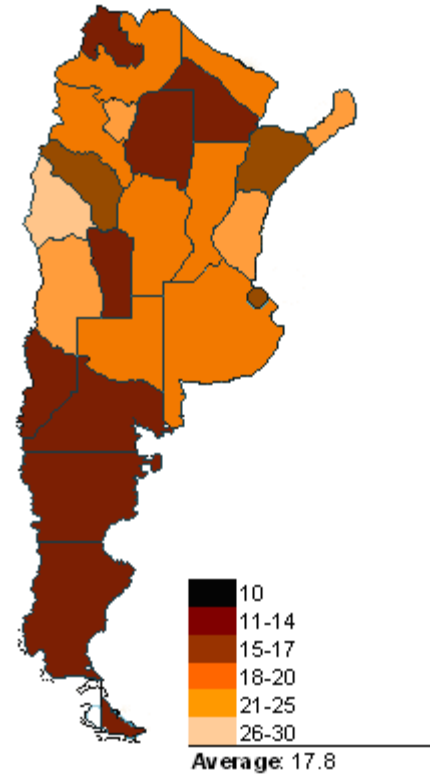
Source: DINIECE, *Anuario Estadístico Educativo* 2006.

Table 1. Summary of statistics by geographic region

	Poverty Rate, 2004 (%)	Childhood Poverty Rate, 2004 (%)	GER, 2001 (%)	Children in Private Pre-Primary/ Children in Public Pre-Primary, 2006	Students per Teacher in Public Pre-Primary, 2006	Students per Teacher in Private Pre-Primary, 2006
	(1)	(2)	(3)	(4)	(5)	(6)
Buenos Aires City	14.7	25.9	93	1.16	10.4	15.4
Buenos Aires Province	44.4	60.7	76	0.58	18.1	18.3
Center	37.4	54.5	62	0.40	21.1	19.0
Cuyo	41.4	52.4	53	0.29	18.9	20.1
NW	53.4	66.5	51	0.23	20.3	17.5
NE	59.5	70.8	43	0.20	21.6	18.4
Patagonia	24.7	32.7	68	0.22	12.4	11.7
Total	**40.2**	**56.4**	**64**	**0.44**	**18.1**	**17.8**

Sources: INDEC, *EPH* second semester of 2004 (columns 1 and 2); INDEC, *Censo Nacional* 2001 (column 3); DINIECE, *Anuario Estadístico Educativo* 2006 (columns 4, 5 and 6).

Appendix II: Analysis and Results of question 1

Table 2. Definition of the variables used for the analysis of question 1

Variable	Motivation for its inclusion	Values it can take
Dependent variable		
Read and write in first grade	The development of literacy skills during early childhood is important not only *per se*, but also because early literacy is related to other cognitive skills, as well as to a varied set of social and emotional skills that are important to the individual in general, and that affect school achievement in particular. Information about the level and kind of literacy skills acquired would be welcome, but the EPH only provides information about whether an individual can read and write or not.	1 if the child knows how to read and write by the Q3 of first grade; 0 if he/she doesn't.
Independent variables		
Policy-related variables		
Public kinder *Private kinder* The base category is the group of 5-year old children who attend no kindergarten at all.	These are the two variables of interest for policymaking purposes. The coefficients on these variables tell us how going to a public or a private kindergarten compares to going to no kindergarten at all, in terms of their effects on children's development of literacy skills. By comparing the magnitude and sign of these coefficients, we can compare public kindergartens to private ones, in terms of their causal effect on children's literacy development. This comparison also informs us of the extent to which public kindergartens are really closing the opportunity *and* the achievement gaps between children of family and socioeconomic backgrounds.	1 if the child attends a public kindergarten in the Q3 of the year when he/she is 5 years old; 0 if he/she doesn't attend a public kinder at that time. 1 if the child attends a private kindergarten in the Q3 of the year when he/she is 5 years old; 0 if he/she doesn't attend a private kinder at that time.
Individual and health characteristics		
Female		1 if the child is female; 0 if the child is male.
Public health *Private health* The base category is the group of 5-year old children who have no health insurance.	Other things equal, a child's health status is likely to be worse if he/she is publicly-insured than if he is privately-insured, because public insurance tends to be of a lower quality than private insurance. A worse health status, in turn, is likely to lead to lower cognitive development. In addition, people who have public health insurance are more likely to send their children to a public kindergarten instead of a private one, than people who have private health insurance. But children's cognitive development in public kindergartens might be the result of their health and not of the quality of kindergarten education. Failure to account for the type of health coverage that children have can lead to a negative bias on the coefficient on "Public kinder", and a positive bias on the coefficient on "Private kinder".	1 if variable's name describes the child's health insurance in the Q3 of the year when he/she is 5 years old; 0 if it doesn't.

Variable	Motivation for its inclusion	Values it can take
Read and write in kinder	Children who go to a private kindergarten are more likely to know how to read and write already when they are 5 years old. Failure to account for this will produce a positive bias on the coefficient on "Private kinder" and a negative bias on the coefficient on "Public kinder".	1 if the child already knows how to read and write in the Q3 of the year when he/she is 5 years old; 0 if he/she doesn't know how to read and write \at that time.
Public school in first grade	Children who go to a public kindergarten are more likely to go to a public school also. Failure to account for this will produce a positive bias on the coefficient on "Private kinder" and a negative bias on the coefficient on "Public kinder".	1 if the child attends a public school in the Q3 of the year when he/she is 6 years old; 0 if he/she attends a private school at that time.
Family characteristics		
Real per capita family income *Quintile 2* *Quintile 3* *Quintile 4* *Quintile 5* The base category is the group of 5-year old children who belong to the first quintile of income.	Children from low-income families are more likely to go to a public kindergarten instead of a private kindergarten than children from wealthier families; and family income is positively correlated with a child's cognitive development. Hence, if we don't control for family income we would expect the coefficient on "Public kinder" to be negatively biased, and the coefficient on "Private kinder" to be positively biased.	Continuous variable, measured when the child is in the Q3 of the year when he/she is 5 years old. 1 if variable's name describes the quintile of income to which the child belongs in the Q3 of the year when he/she is 5 years old; 0 if he/she doesn't belong to this quintile at that time.
Mother's age	Everything else equal, very young mothers may not be as good for a child's development as less young mothers (because they have less experience in parenting), and they are more likely to send their children to a public kindergarten instead of a private kindergarten. Hence, if we don't control for mother's age we would expect the coefficient on "Public kinder" to be negatively biased, and the coefficient on "Private kinder" to be positively biased.	Continuous variable, measured when the child is in the Q3 of the year when he/she is 5 years old.
Just complete secondary *More than complete secondary* The base category is the group of 5 year old children whose mothers have not completed secondary education.	The lower the level of parental education (especially that of the mother), the higher the chances that the child will attend a public kindergarten instead of a private one, and the lower the prospects for early childhood cognitive development. Hence, if we fail to control for parental education, we can expect the coefficient on "Public kinder" to be negatively biased, and the coefficient on "Private kinder" to be positively biased.	1 variable's name describes the highest level of education attained by the child's mother (or father, in the case the mother does not live wit the child) when the child is 5 years old; 0 if this is not the highest level of education attained by the child's mother.
Unemployed	Children whose parents are employed are likely to value education more than children whose parents are unemployed (because education is perceived to be a guarantee for employment). In addition, children whose parents are employed are likely to be subject to a less stressful environment than children whose parents are unemployed. Thus, cognitive development is likely to the higher among children with employed parents. At the same time, children whose parents are employed are more likely to attend a private kindergarten instead of a public	1 if the child's mother (or father, in the case the mother does not live wit the child) is unemployed when the child is 5 years old; 0 if the child's mother is not unemployed.

Variable	Motivation for its inclusion	Values it can take
	one than children whose parents are unemployed (because they can afford it). If we fail to control for parental employment status, the coefficient on "Public kinder" will be negatively biased, and the coefficient on "Private kinder" will be positively biased.	
Hours of work per week, and squared term	Everything else equal, young children whose parents spend a long time working away from home are likely to grow up in an environment that is relatively less conducive to early childhood development than children whose parents spend a lot of time at home. On the other hand, parents who spend a lot of time at home for involuntary reasons may become depressed, affecting negatively the child's development. The number of hours that parents devote to work is thus thought to affect children's cognitive (and literacy) development in a non-linear way.	Positive integer number or 0, measured as the number of hours that the child's mother works when the child is 5 years old.
Married	Children whose parents are married (for divorce, separation, decision of not to marry in the first place, death, abandonment, etc.) are likely to experience less traumatic situations and/or a less stressful environment while early childhood development is taking place. They are also more likely to attend a private kindergarten instead of a public one. Hence, if we fail to control for parents' marital status, we can expect the coefficient on "Public kinder" to be negatively biased, and the coefficient on "Private kinder" to be positively biased.	1 if the child's mother is married in the Q3 of the year when the child is 5 years old; 0 if the child's mother is not married at that time.
Siblings, and squared term	Other things equal, a big number of siblings can be correlated with attendance to public kindergartens (because there is less money available to be spent in the education of each child), as well as with a lower cognitive development (because parents have less time and energy to respond to each of their children's needs). Hence, excluding the number of siblings from the model is likely to produce a negative bias on the coefficient on "Public kinder", and a positive bias on the coefficient on "Private kinder".	Positive integer number or 0, measured as the number of sibling who live with the child in the Q3 of the year when the child is 5 years old.
Old siblings	Other things equal, living with older siblings is likely to affect cognitive, social and emotional development in a positive manner, vis-à-vis having no older siblings.	1 if the child has older siblings who live with him in the Q3 of the year when the child is 5 years old; 0 if the child doesn't have older siblings who live with him at that time.
Old siblings in school	Other things equal, having older siblings who go to school is likely to imprint a greater value of education, hence affecting cognitive, social and emotional development in a positive manner.	1 if the child has older siblings who live with him and go to school in the Q3 of the year when the child is 5 years old; 0 if the child doesn't have older siblings who live with him and go to school at that time.
Community characteristics		
Big area	In big (non-metropolitan) urban communities, children are more likely to be exposed to an environment conducive to their cognitive development than in	1 if urban area of residence in the Q3 of the year when the child is 5 years old has more than 500,000 inhabitants; 0 if it has less than 500,000 inhabitants.

Variable	Motivation for its inclusion	Values it can take
	small urban communities. Also, children in big urban communities are less likely to go to a public kindergarten instead of a private one, compared to children in small urban communities. Failure to account for the size of the community in which a child grows up is likely to produce a negative bias on the coefficient on "Public kinder" and a positive bias on the coefficient on "Private kinder".	
Help	For children in poor households, the negative impact of the home environment may be mitigated if the household receives monetary or in-kind help from the government, religious or civil organizations, family friends or relatives. Because more children in public preschools are likely to be in households that receive this kind of help, the coefficient on "Public kinder" is likely to be biased negatively unless the presence of community help is accounted for.	1 if household received monetary or in-kind help from the government, religious or civil organizations, friends, or relatives who don't live in the household, residence in the Q3 of the year when the child is 5 years old; 0 if household didn't receive help from any of these sources at that time.
Geographic characteristics		
Metropolitan	In the particular case of the City of Buenos Aires, there tends to be an insignificant gap between public and private education. Because a very small proportion of children live in the big metropolitan areas, the coefficient on "Public kindergarten at age 5" is likely to be biased negatively unless this is accounted for.	1 if urban area of residence in the Q3 of the year when the child is 5 years old is the City of Buenos Aires; 0 if area of residence at that time is not the City of Buenos Aires.
NWNE *Cuyo* *Center* *Patagonia* The base category is the group of 5 year old children who live in the Province of Buenos Aires.	The gap between public and private education tends to be bigger in the NE, NW, Cuyo and Center regions of the country than in the South region or in the City or Province of Buenos Aires. Because only around 23 percent of children live in the South or Great Buenos Aires, the coefficient on "Public kindergarten at age 5" is likely to be negatively biased unless the region of residence is accounted for.	1 if dummy's name describes the region where the child lives in the Q3 of the year when the child is 5 years old; 0 if it doesn't.
Year effects		
2004 The base category is the group of 5 year old children who are 5 years old in the Q3 of 2005.	A year dummy must be included to account for any fixed effects that may have affected children's cognitive development in one year but not in the other years.	1 if dummy's name describes the year in which the child is 5 years old in the Q3; 0 if it doesn't.

Table 3a. Descriptive statistics of the sample used to analyze question 1

Variable	Frequency	Percent	Mean	Standard Deviation
Dependent variable				
Read and write in first grade				
0	179	26.83	0.7317	0.0257
1	469	73.17		
Independent variables				
Policy-related variables				
Public kinder				
0	200	39.63	0.6037	0.0281
1	448	60.37		
Private kinder				
0	496	66.54	0.3346	0.0274
1	152	33.46		
Individual and health characteristics				
Female				
0	318	46.37	0.5363	0.0280
1	330	53.63		
Read and write in kinder				
0	497	72.10	0.2790	0.0255
1	151	27.90		
Public health				
0	385	58.85	0.4115	0.0282
1	263	41.15		
Private health				
0	580	90.35	0.0965	0.0145
1	68	9.65		
Public school in first grade				
0	186	37.62	0.6238	0.0278
1	462	62.38		
Family characteristics				
Real per capita family income			261.12	21.6214
Quintile 1				
0	380	57.31	0.4269	0.0316
1	268	42.69		
Quintile 2				
0	515	75.82	0.2418	0.0277
1	133	24.18		
Quintile 3				
0	564	80.89	0.1911	0.0259
1	84	19.11		
Quintile 4				
0	596	91.73	0.0827	0.0162
1	52	8.27		
Quintile 5				
0	617	94.24	0.0576	0.0165
1	31	5.76		
Mother's age			36.56	0.5503
Incomplete primary				
0	579	90.42	0.0958	0.0160
1	69	9.58		
Complete primary				
0	457	68.71	0.3129	0.0279
1	191	31.29		
Incomplete secondary				
0	523	82.79	0.1721	0.0209
1	125	17.21		

Variable	Frequency	Percent	Mean	Standard Deviation
Complete secondary				
0	542	82.06	0.1794	0.0224
1	106	17.94		
Incomplete tertiary				
0	587	91.30	0.0870	0.0147
1	61	8.70		
Complete tertiary				
0	561	85.42	0.1458	0.0192
1	87	14.58		
Less than complete secondary				
0	263	41.93	0.5807	0.0276
1	385	58.07		
Just complete secondary				
0	542	82.06	0.1794	0.0224
1	106	17.94		
More than complete secondary				
0	500	76.72	0.2328	0.0224
1	148	23.28		
Unemployed				
0	610	93.82	0.0618	0.0139
1	38	6.18		
Hours of work per week			14.0910	1.0801
0-20	473	72.59		
21-40	104	17.10		
41-60	51	8.98		
More than 60	20	1.33		
Married				
0	312	46.94	0.5306	0.0285
1	336	53.06		
Siblings				
0	72	11.97	2.0542	0.1006
1	198	31.85		
2	175	26.23		
3	97	14.81		
4	52	7.47		
5	29	3.11		
6	14	1.85		
7	7	1.98		
8	3	0.24		
9	1	0.48		
Old siblings				
0	168	26.95	0.7305	0.0254
1	480	73.05		
Old siblings in school				
0	301	48.24	0.5176	0.0289
1	347	51.76		
Community characteristics				
Big area				
0	383	26.25	0.7375	0.0062
1	265	73.75		
Help				
0	534	81.30	0.1870	0.0241
1	114	18.70		
Geography characteristics				
Metropolitan				
0	624	90.46	0.0954	0.0053
1	24	9.54		
Buenos Aires				
0	523	43.62	0.5638	0.0080
1	125	56.38		
NWNE				
0	416	83.20	0.1680	0.0078
1	232	16.80		

Variable	Frequency	Percent	Mean	Standard Deviation
Cuyo				
0	592	94.56	0.0544	0.0053
1	56	5.44		
Center				
0	473	81.73	0.1827	0.0084
1	175	18.27		
Patagonia				
0	588	96.89	0.0311	0.0043
1	60	3.11		

Number of observations: 648.
Source: INDEC, *Encuesta Permanente de Hogares*, Q3 of 2004, Q3 of 2005 and Q3 of 2006.

Standard deviations were obtained through a procedure that accounts for the fact that the EPH does not survey a random sample, but a sample that is stratified in two steps, first into urban conglomerates and then into households.

In the case of binary variables that take a value of 0 or a value of 1, a value of 0 means that the observation *does not* fit into the category described by the variable's name, and a value of 1 means that the observation *does* fit into the category described by the variable's name. All binary variables are measured in Q3 of the year when the child is 5 years old, except for "Read and write in first grade" and "Public school in first grade", which are measured in Q3 of the year when the child is 6 years old. For example, Table 3a shows that 588 children *did not* live in the Patagonia region at age 5, while 60 children *did* live in that region at age 5, and that 186 children *did not* go to a public school at age 6, while 462 children *did* go to a public school at age 6.

Table 3b. Descriptive statistics of the sample used to analyze question 1

Variable	Public kinder	Private kinder	No kinder
Dependent variable			
Read and write in first grade			
0	128	30	21
	(29%)	(20%)	(44%)
1	320	122	27
	(71%)	(80%)	(56%)
Independent variables			
Individual and health characteristics			
Female			
0	214	78	26
	(48%)	(51%)	(54%)
1	234	74	22
	(52%)	(49%)	(46%)
Read and write in kinder			
0	349	104	44
	(78%)	(68%)	(92%)
1	99	48	4
	(22%)	(32%)	(8%)
Public health			
0	289	61	35
	(65%)	(40%)	(73%)
1	159	91	13
	(35%)	(60%)	(27%)
Private health			
0	415	123	42
	(93%)	(81%)	(88%)
1	33	29	6
	(7%)	(19%)	(13%)
Public school in first grade			
0	55	121	10
	(12%)	(80%)	(21%)
1	393	31	38
	(88%)	(20%)	(79%)
Family characteristics			
Real per capita family income	173.17	443.29	199.62
Quintile 1			
0	224	135	21
	(50%)	(89%)	(44%)
1	224	17	27
	(50%)	(11%)	(56%)
Quintile 2			
0	354	120	41
	(79%)	(79%)	(85%)
1	94	32	7
	(21%)	(21%)	(15%)
Quintile 3			
0	396	126	42
	(88%)	(83%)	(88%)
1	52	26	6
	(12%)	(17%)	(12%)
Quintile 4			
0	431	120	45
	(96%)	(79%)	(94%)
1	17	32	3
	(4%)	(21%)	(6%)
Quintile 5			
0	435	136	46
	(97%)	(89%)	(96%)
1	13	16	2
	(3%)	(11%)	(4%)

Variable	Public kinder	Private kinder	No kinder
Mother's age	36.62	36.25	37.69
Less than complete secondary			
0	138	105	20
	(31%)	(69%)	(42%)
1	310	47	28
	(69%)	(31%)	(58%)
Just complete secondary			
0	389	114	39
	(87%)	(75%)	(81%)
1	59	38	9
	(13%)	(25%)	(19%)
More than complete secondary			
0	376	85	39
	(84%)	(56%)	(81%)
1	72	67	9
	(16%)	(44%)	(19%)
Unemployed			
0	423	144	43
	(94%)	(95%)	(90%)
1	25	8	5
	(6%)	(5%)	(10%)
Hours of work per week			
0-20	340	91	42
	(76%)	(60%)	(88%)
21-40	62	37	5
	(14%)	(24%)	(10%)
41-60	29	21	1
	(6%)	(14%)	(2%)
More than 60	17	3	0
	(4%)	(2%)	(0%)
Married			
0	241	45	26
	(54%)	(30%)	(54%)
1	207	107	22
	(46%)	(70%)	(46%)
Siblings	2.47	1.18	2.73
Old siblings			
0	96	61	11
	(21%)	(40%)	(23%)
1	352	91	37
	(79%)	(60%)	(77%)
Old siblings in school			
0	190	83	28
	(42%)	(55%)	(58%)
1	258	69	20
	(58%)	(45%)	(42%)
Community characteristics			
Big area			
0	294	64	25
	(66%)	(42%)	(52%)
1	154	88	23
	(34%)	(58%)	(48%)
Help			
0	358	135	41
	(80%)	(89%)	(85%)
1	90	17	7
	(20%)	(11%)	(15%)

Variable	Public kinder	Private kinder	No kinder
Geography characteristics			
Metropolitan			
0	438	138	48
	(98%)	(91%)	(100%)
1	10	14	0
	(2%)	(9%)	(0%)
Buenos Aires			
0	385	95	43
	(86%)	(63%)	(90%)
1	63	57	5
	(14%)	(38%)	(10%)
NWNE			
0	273	121	22
	(61%)	(80%)	(46%)
1	175	31	26
	(39%)	(20%)	(54%)
Cuyo			
0	408	140	44
	(91%)	(92%)	(92%)
1	40	12	4
	(9%)	(8%)	(8%)
Center			
0	330	107	36
	(74%)	(70%)	(75%)
1	118	45	12
	(26%)	(30%)	(25%)
Patagonia			
0	396	145	47
	(88%)	(95%)	(98%)
1	52	7	1
	(12%)	(5%)	(2%)

Number of observations: 648.

Source: INDEC, *Encuesta Permanente de Hogares*, Q3 of 2004, Q3 of 2005 and Q3 of 2006.

In the case of binary variables that take a value of 0 or a value of 1, a value of 0 means that the observation *does not* fit into the category described by the variable's name, and a value of 1 means that the observation *does* fit into the category described by the variable's name. All binary variables are measured in Q3 of the year when the child is 5 years old, except for "Read and write in first grade" and "Public school in first grade", which are measured in Q3 of the year when the child is 6 years old. For example, Table 3b shows that, among those who went to a public kindergarten at age 5, 396 children *did not* live in the Patagonia region at age 5, while 52 children *did* live in the Patagonia region at age 5.

Table 3c. Descriptive statistics of the sample used to analyze question 1

Variable	Doesn't read and write in first grade	Does read and write in first grade
Independent variables		
Policy-related variables		
Public Kinder		
0	51	149
	(28%)	(32%)
1	128	320
	(72%)	(68%)
Private kinder		
0	149	347
	(83%)	(74%)
1	30	122
	(17%)	(26%)
Individual and health characteristics		
Female		
0	91	227
	(51%)	(48%)
1	88	242
	(49%)	(52%)
Read and write in kinder		
0	141	356
	(79%)	(76%)
1	38	113
	(21%)	(24%)
Public health		
0	104	281
	(58%)	(60%)
1	75	188
	(42%)	(40%)
Private health		
0	164	416
	(92%)	(89%)
1	15	53
	(8%)	(11%)
Public school in first grade		
0	44	142
	(25%)	(30%)
1	135	327
	(75%)	(70%)
Family characteristics		
Real per capita family income	232.58	271.82
Quintile 1		
0	102	278
	(57%)	(59%)
1	77	191
	(43%)	(41%)
Quintile 2		
0	147	368
	(82%)	(78%)
1	32	101
	(18%)	(22%)
Quintile 3		
0	149	415
	(83%)	(88%)
1	30	54
	(17%)	(12%)

Variable	Doesn't read and write in first grade	Does read and write in first grade
Quintile 4		
0	167	429
	(93%)	(91%)
1	12	40
	(7%)	(9%)
Quintile 5		
0	168	449
	(94%)	(96%)
1	11	20
	(6%)	(4%)
Mother's age	37.30	36.29
Less than complete secondary		
0	65	198
	(36%)	(42%)
1	114	271
	(64%)	(58%)
Just complete secondary		
0	151	391
	(84%)	(83%)
1	28	78
	(16%)	(17%)
More than complete secondary		
0	146	354
	(82%)	(75%)
1	33	115
	(18%)	(25%)
Unemployed		
0	168	442
	(94%)	(94%)
1	11	27
	(6%)	(6%)
Hours of work per week		
0-20	132	341
	(74%)	(73%)
21-40	31	73
	(17%)	(16%)
41-60	11	40
	(6%)	(9%)
More than 60	5	15
	(3%)	(3%)
Married		
0	97	254
	(54%)	(54%)
1	82	107
	(46%)	(23%)
Siblings	2.28	1.97
Old siblings		
0	48	120
	(27%)	(26%)
1	131	349
	(73%)	(74%)
Old siblings in school		
0	83	218
	(46%)	(46%)
1	96	251
	(54%)	(54%)

Variable	Doesn't read and write in first grade	Does read and write in first grade
Community characteristics		
Big area		
0	114 (64%)	269 (57%)
1	65 (36%)	200 (43%)
Help		
0	144 (80%)	390 (83%)
1	35 (20%)	79 (17%)
Geography characteristics		
Metropolitan		
0	176 (98%)	448 (96%)
1	3 (2%)	21 (4%)
Buenos Aires		
0	147 (82%)	376 (80%)
1	32 (18%)	93 (20%)
NWNE		
0	98 (55%)	318 (68%)
1	81 (45%)	151 (32%)
Cuyo		
0	165 (92%)	427 (91%)
1	14 (8%)	42 (9%)
Center		
0	143 (80%)	330 (70%)
1	36 (20%)	139 (30%)
Patagonia		
0	163 (91%)	425 (91%)
1	16 (9%)	44 (9%)

Number of observations: 648.
Source: INDEC, *Encuesta Permanente de Hogares*, Q3 of 2004, Q3 of 2005 and Q3 of 2006.

In the case of binary variables that take a value of 0 or a value of 1, a value of 0 means that the observation *does not* fit into the category described by the variable's name, and a value of 1 means that the observation *does* fit into the category described by the variable's name. All binary variables are measured in Q3 of the year when the child is 5 years old, except for "Read and write in first grade" and "Public school in first grade", which are measured in Q3 of the year when the child is 6 years old. For example, Table 3c shows that, among those 6-year olds who didn't know how to read and write in first grade, 163 children *did not* live in the Patagonia region at age 5, while 16 children *did* live in the Patagonia region at age 5.

Table 4. Analysis of question 1
Dependent binary variable: Read and write in first grade

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.527*	0.697**	0.671	0.815**	0.777	0.887
	(0.391) [0.178]	(0.463) [0.132]	(0.473) [0.155]	(0.509) [0.109]	(0.636) [0.221]	(0.684) [0.195]
Public kinder	0.172	0.160	0.165	0.049	0.101	0.145
	(0.404) [0.671]	(0.403) [0.691]	(0.411) [0.689]	(0.427) [0.909]	(0.426) [0.812]	(0.435) [0.740]
Private kinder	0.676**	0.671**	0.527	0.414	0.385	0.547
	(0.457) [0.139]	(0.456) [0.141]	(0.477) [0.270]	(0.499) [0.407]	(0.528) [0.467]	(0.547) [0.318]
Real p.c. family income	---	-0.038	-0.055	-0.053	-0.072	-0.059
		(0.061) [0.540]	(0.065) [0.395]	(0.066) [0.422]	(0.066) [0.277]	(0.069) [0.394]
Just secondary education	---	---	0.164	0.178	0.022	0.035
			(0.392) [0.675]	(0.395) [0.653]	(0.432) [0.960]	(0.436) [0.936]
More than secondary education	---	---	0.481*	0.488*	0.379	0.335
			(0.357) [0.178]	(0.359) [0.174]	(0.402) [0.346]	(0.417) [0.421]
Unemployed	---	---	---	-0.336	-0.354	-0.372
				(0.556) [0.546]	(0.535) [0.509]	(0.539) [0.490]
Hs. of work	---	---	---	-0.004	-0.003	-0.005
				(0.017) [0.822]	(0.017) [0.884]	(0.018) [0.790]
Hs. of work sq.	---	---	---	0.000	0.000	0.000
				(0.000) [0.781]	(0.000) [0.854]	(0.000) [0.752]
Married	---	---	---	---	0.339	0.408*
					(0.292) [0.246]	(0.313) [0.193]
Siblings	---	---	---	---	0.271	0.205
					(0.311) [0.384]	(0.319) [0.521]
Siblings sq.	---	---	---	---	-0.041	-0.034
					(0.039) [0.292]	(0.040) [0.405]
Old siblings	---	---	---	---	-0.480	-0.453
					(0.559) [0.391]	(0.561) [0.420]
Old siblings in school	---	---	---	---	0.095	0.143
					(0.391) [0.808]	(0.394) [0.716]

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Public health insurance	---	---	---	---	---	-0.515* (0.375) [0.169]
Private health insurance	---	---	---	---	---	0.540 (0.469) [0.250]
2004	0.336 (0.272) [0.217]	0.333 (0.272) [0.221]	0.357* (0.269) [0.184]	0.342 (0.276) [0.215]	0.348 (0.280) [0.214]	0.270 (0.292) [0.356]
Observations	648	648	648	639	639	639
Likelihood Ratio	4939.13 [<0.0001]	5256.09 [<0.0001]	7000.79 [<0.0001]	7019.45 [<0.0001]	10500.93 [<0.0001]	15242.39 [<0.0001]
T-test p-value	2.504 [0.114]	2.358 [0.125]	1.372 [0.241]	1.082 [0.298]	0.623 [0.430]	1.109 [0.292]

Number of observations: 648.

Source: INDEC, *Encuesta Permanente de Hogares*, Q3 of 2004, Q3 of 2005 and Q3 of 2006.

The reference category is the group of boys who, at age 5, attended no kindergarten; had no health insurance; had single, working mothers whose level of education was less than complete secondary school; and had no older siblings in school.

Coefficients, standard deviations and P-values were obtained by performing a logistic regression adjusted for complex survey designs, to account for the fact that the EPH does not survey a random sample, but a sample that is stratified in two steps, first into urban conglomerates and then into households.
Standards errors are reported in parenthesis. P-values are reported between brackets.
For Likelihood Ratio and T-tests, the corresponding statistics are reported, and p-values are reported between brackets.
Significant *at 20%; **at 15%; ***at 10%; ****at 5%; *****at 1%.

Table 5. Results of the analysis of question 1
Dependent binary variable: Read and write in first grade

Variable	Preschool, family, health and community variables	Preschool, family, health, community and geography variables	Preschool, family, health, community, geography and school variables (**complete model**)
Intercept	0.883 (0.712) [0.215]	0.609 (0.806) [0.450]	0.378 (0.843) [0.654]
Public kinder	0.166 (0.439) [0.706]	0.111 (0.449) [0.805]	0.199 (0.443) [0.653]
Private kinder	0.548 (0.553) [0.322]	0.575 (0.569) [0.312]	0.781* (0.607) [0.198]
Real p.c. family income	-0.058 (0.069) [0.401]	-0.065 (0.073) [0.369]	-0.060 (0.071) [0.396]
Just secondary education	0.018 (0.436) [0.967]	-0.000 (0.436) [0.999]	0.033 (0.431) [0.939]
More than secondary education	0.333 (0.413) [0.420]	0.211 (0.423) [0.617]	0.189 (0.435) [0.664]
Unemployed	-0.396 (0.541) [0.465]	-0.335 (0.532) [0.529]	-0.352 (0.513) [0.494]
Hs. of work	-0.006 (0.018) [0.749]	-0.003 (0.019) [0.858]	-0.005 (0.019) [0.807]
Hs. of work sq.	0.000 (0.000) [0.718]	0.000 (0.000) [0.816]	0.000 (0.000) [0.798]
Married	0.385 (0.317) [0.225]	0.340 (0.321) [0.290]	0.312 (0.325) [0.338]
Siblings	0.214 (0.324) [0.509]	0.256 (0.332) [0.441]	0.221 (0.339) [0.514]
Siblings sq.	-0.034 (0.041) [0.407]	-0.042 (0.041) [0.305]	-0.038 (0.043) [0.367]
Old siblings	-0.464 (0.565) [0.411]	-0.499 (0.573) [0.384]	-0.412 (0.562) [0.463]
Old siblings in school	0.140 (0.397) [0.724]	0.164 (0.398) [0.680]	0.200 (0.390) [0.609]
Public health insurance	-0.539* (0.377) [0.153]	-0.635*** (0.364) [0.081]	-0.530* (0.371) [0.153]
Private health insurance	0.533 (0.469) [0.255]	0.359 (0.483) [0.456]	0.534 (0.510) [0.290]
Help	-0.210 (0.393) [0.593]	-0.247 (0.388) [0.525]	-0.227 (0.402) [0.572]
Big area	0.080 (0.230) [0.728]	0.251 (0.288) [0.384]	0.362 (0.299) [0.225]
Metropolitan	---	1.172* (0.823) [0.154]	1.207* (0.879) [0.170]
NWNE	---	0.183 (0.384) [0.634]	0.186 (0.390) [0.634]

Variable	Preschool, family, health and community variables	Preschool, family, health, community and geography variables	Preschool, family, health, community, geography and school variables (complete model)
Center	---	0.521* (0.373) [0.162]	0.619** (0.387) [0.110]
Cuyo	---	0.530 (0.443) [0.232]	0.529 (0.460) [0.250]
Patagonia	---	0.910*** (0.549) [0.097]	0.956*** (0.557) [0.086]
Read and write in kinder[†]	---	---	-0.632**** (0.316) [0.046]
Public School	---	---	0.092 (0.420) [0.827]
2004	0.267 (0.290) [0.359]	0.309 (0.289) [0.285]	0.417** (0.280) [0.136]
Observations used	639	629	629
Likelihood Ratio	15649.68 [<0.0001]	21259.25 [<0.0001]	25219.45 [<0.0001]
T-test for H$_o$: PublicK=PrivateK	0.960 [0.327]	1.358 [0.244]	1.548 [0.213]

Number of observations: 648.
Source: INDEC, *Encuesta Permanente de Hogares*, Q3 of 2004, Q3 of 2005 and Q3 of 2006.

The reference category is the group of boys who, at age 5, attended no kindergarten; did not know how to read and write; had no health insurance; had single, working mothers whose level of education was less than complete secondary school; had no older siblings in school; lived in a small urban areas in the Province of Buenos Aires; lived in families that had no external support; and who, at age 6, where in a private school.

Coefficients, standard deviations and P-values were obtained by performing a logistic regression adjusted for complex survey designs, to account for the fact that the EPH does not survey a random sample, but a sample that is stratified in two steps, first into urban conglomerates and then into households.
Standards errors are reported in parenthesis. P-values are reported between brackets.
For Likelihood Ratio and T-tests, the corresponding statistics are reported, and p-values are reported between brackets.
Significant *at 20%; **at 15%; ***at 10%; ****at 5%; *****at 1%.

[†] A negative coefficient on the variable "read and write in kinder" is unexpected and counterintuitive.

Table 6. Results of the analysis of question 1 by quintile of income
Dependent binary variable: Read and write in first grade

	Preschool, family, health, community, geography and school variables (**complete model**)			
Variable	Quintile 1	Quintile 2	Quintile 3[†]	Quintiles 4 & 5[†]
Intercept	-2.270	-9.054	-12.452	33.146****
	(1.863) [0.223]	(12.328) [0.463]	(17.845) [0.485]	(15.405) [0.031]
Public kinder	-0.162	0.832	5.820*****	1.294
	(0.670) [0.809]	(1.405) [0.554]	(2.219) [0.009]	(3.052) [0.672]
Private kinder	-1.039	2.919****	5.902****	1.738
	(1.172) [0.375]	(1.448) [0.044]	(2.543) [0.020]	(1.864) [0.351]
Real p.c. family income	0.255	1.866	2.200	-1.859
	(0.251) [0.310]	(2.171) [0.390]	(3.173) [0.488]	(1.566) [0.235]
Just secondary education	0.327	0.026	-1.808	1.503
	(0.772) [0.672]	(0.893) [0.977]	(1.919) [0.346]	(3.698) [0.685]
More than secondary education	0.398	2.015***	-1.427	2.494
	(1.013) [0.694]	(1.032) [0.051]	(1.402) [0.309]	(1.991) [0.210]
Unemployed	-0.111	0.570	-4.478*****	3.805
	(0.826) [0.893]	(1.710) [0.739]	(1.254) [0.000]	(4.180) [0.363]
Hs. of work	0.017	0.058	-0.164****	-0.061
	(0.038) [0.666]	(0.053) [0.275]	(0.065) [0.011]	(0.085) [0.474]
Hs. of work sq.	-0.000	-0.001**	0.001***	0.001
	(0.001) [0.613]	(0.001) [0.128]	(0.001) [0.085]	(0.002) [0.611]
Married	-0.400	1.776****	1.939***	0.136
	(0.521) [0.443]	(0.898) [0.048]	(1.130) [0.086]	(2.170) [0.950]
Siblings	1.042***	-0.729	-0.989	-3.763
	(0.543) [0.055]	(0.966) [0.451]	(1.366) [0.469]	(3.525) [0.286]
Siblings sq.	-0.171****	0.303*	0.198	0.882
	(0.075) [0.023]	(0.236) [0.198]	(0.230) [0.390]	(0.798) [0.269]
Old siblings	-0.126	-0.783	1.777	4.223***
	(0.897) [0.888]	(1.398) [0.575]	(2.461) [0.470]	(2.543) [0.097]
Old siblings in school	0.057	-0.395	-1.037	-3.731
	(0.738) [0.939]	(1.263) [0.755]	(1.814) [0.567]	(2.408) [0.121]
Public health insurance	-1.382****	-2.107***	0.642	1.944
	(0.581) [0.017]	(1.171) [0.072]	(1.357) [0.636]	(5.904) [0.742]
Private health insurance	-1.143	-1.177	1.250	4.801
	(1.035) [0.270]	(1.087) [0.279]	(1.714) [0.466]	(6.669) [0.472]
Help	-0.967***	1.593	-1.924	-2.479
	(0.535) [0.070]	(1.286) [0.215]	(2.681) [0.473]	(4.352) [0.569]
Big area	0.437	0.896	-2.035	-3.837***
	(0.561) [0.436]	(1.280) [0.484]	(1.831) [0.266]	(2.209) [0.082]
Metropolitan	19.865*****	17.080*****	-0.481	-25.666*****
	(1.803) [<0.0001]	(1.926) [<0.0001]	(1.622) [0.767]	(2.736) [<0.0001]
NWNE	1.341****	-0.659	-0.179	-26.571*****
	(0.668) [0.045]	(1.137) [0.562]	(1.902) [0.925]	(3.007) [<0.0001]

Variable	Quintile 1	Quintile 2	Quintile 3[†]	Quintiles 4 & 5[†]
Center	2.313*****	0.065	-1.154	-21.367*****
	(0.847) [0.006]	(1.423) [0.964]	(1.451) [0.427]	(2.161) [<0.0001]
Cuyo	1.243	0.090	0.525	0.551
	(0.980) [0.205]	(1.320) [0.946]	(1.533) [0.732]	(4.846) [0.906]
Patagonia	2.584****	-0.586	-0.952	-20.475*****
	(1.275) [0.043]	(2.429) [0.809]	(2.673) [0.722]	(4.598) [<0.0001]
Read and write in kinder[††]	-0.316	-1.326*	-1.267*	3.864**
	(0.623) [0.612]	(0.971) [0.172]	(0.988) [0.1969]	(2.686)
Public School	0.411	0.252	-0.628	-4.603****
	(0.761) [0.590]	(1.205) [0.834]	(1.136) [0.581]	(2.235) [0.039]
2004	0.342	0.116	-1.883*	2.612****
	(0.496) [0.491]	(1.018) [0.909]	(1.315) [0.152]	(1.039) [0.012]
Observations used	264	129	83	82
Likelihood Ratio	33509.63	17722.61	22504.72	22775.90
	[<0.0001]	[<0.0001]	[<0.0001]	[<0.0001]
T-test for H_o: *PublicK=PrivateK*	0.915	2.770	0.0031	0.015
	[0.339]	[0.096]	[0.956]	[0.904]

Source: INDEC, *Encuesta Permanente de Hogares*, Q3 of 2004, Q3 of 2005 and Q3 of 2006.

The reference category is the group of boys who, at age 5, attended no kindergarten; did not know how to read and write; had no health insurance; had single, working mothers whose level of education was less than complete secondary school; had no older siblings in school; lived in a small urban areas in the Province of Buenos Aires; lived in families that had no external support; and who, at age 6, where in a private school.

Coefficients, standard deviations and P-values were obtained by performing a logistic regression adjusted for complex survey designs, to account for the fact that the EPH does not survey a random sample, but a sample that is stratified in two steps, first into urban conglomerates and then into households.
Standards errors are reported in parenthesis. P-values are reported between brackets.
For Likelihood Ratio and T-tests, the corresponding statistics are reported, and p-values are reported between brackets.
Significant *at 20%; **at 15%; ***at 10%; ****at 5%; *****at 1%.

[†] The results shown in the columns titled "Quintile 3" and "Quintiles 4 & 5" should be taken with caution, given that the estimations are based on a relatively small sample size.

[††] A negative coefficient on the variable "read and write in kinder" is unexpected and counterintuitive.

Table 7. Results of the analysis of question 1 by geographic region
Dependent binary variable: Read and write in first grade

Variable	Preschool, family, health, community, geography and school variables (**complete model**)		
	NW, NE and Cuyo	Buenos Aires Province and Center	Buenos Aires City and Patagonia[†]
Intercept	-1.196	1.395	20.257*
	(0.992) [0.228]	(1.164) [0.231]	(14.935) [0.175]
Public kinder	0.838**	0.250	5.354*
	(0.488) [0.086]	(0.725) [0.730]	(3.896) [0.169]
Private kinder	2.149*****	0.668	---
	(0.749) [0.004]	(0.909) [0.462]	
Real p.c. family income	-0.062	-0.047	-4.635*
	(0.119) [0.603]	(0.090) [0.598]	(3.417) [0.175]
Just secondary education	0.529	0.051	1.974
	(0.484) [0.275]	(0.588) [0.931]	(2.813) [0.483]
More than secondary education	0.653**	0.388	4.450
	(0.445) [0.143]	(0.620) [0.531]	(4.956) [0.369]
Unemployed	-0.377	-0.611	33.898*****
	(0.700) [0.591]	(0.706) [0.387]	(9.477) [0.000]
Hs. of work	0.014	-0.017	-0.365
	(0.018) [0.447]	(0.032) [0.594]	(0.362) [0.312]
Hs. of work sq.	-0.000	0.000	0.008
	(0.000) [0.244]	(0.001) [0.573]	(0.008) [0.325]
Married	0.103	0.371	-2.313
	(0.356) [0.772]	(0.441) [0.401]	(3.258) [0.478]
Siblings	0.363	0.216	-3.483
	(0.354) [0.305]	(0.457) [0.636]	(2.150) [0.105]
Siblings sq.	-0.058	-0.034	0.432
	(0.051) [0.253]	(0.057) [0.551]	(0.431) [0.316]
Old siblings	0.535	-0.586	3.359
	(0.595) [0.368]	(0.801) [0.464]	(4.820) [0.486]
Old siblings in school	-0.326	0.233	1.615
	(0.455) [0.473]	(0.530) [0.660]	(3.658) [0.659]
Public health insurance	-0.629**	-0.358	5.892
	(0.397) [0.113]	(0.801) [0.464]	(4.835) [0.223]
Private health insurance	-0.448	1.243**	21.441*****
	(0.513) [0.382]	(0.834) [0.137]	(4.727) [<0.0001]
Help	0.018	-0.307	-0.634
	(0.435) [0.968]	(0.539) [0.569]	(1.602) [0.692]
Big area	1.201****	-0.559	4.514
	(0.487) [0.014]	(0.468) [0.232]	(4.216) [0.284]
Read and write in kinder[††]	1.140****	-0.836****	-0.444
	(0.521) [0.029]	(0.384) [0.030]	(1.642) [0.787]
Public School	0.762*	0.128	-0.109
	(0.554) [0.169]	(0.581) [0.826]	(1.827) [0.953]

Variable	NW, NE and Cuyo	Buenos Aires Province and Center	Buenos Aires City and Patagonia
2004	-0.398	0.606**	0.657
	(0.320) [0.213]	(0.395) [0.125]	(1.651) [0.691]
Observations used	282	294	81
Likelihood Ratio	8360.65	24929.75	22031.24
	(<0.0001)	(<0.0001)	(<0.0001)
T-test for H$_o$: *PublicK=PrivateK*	4.097	0.459	---
	(0.043)	(0.498)	

Source: INDEC, *Encuesta Permanente de Hogares*, Q3 of 2004, Q3 of 2005 and Q3 of 2006.

The reference category is the group of boys who, at age 5, attended no kindergarten; did not know how to read and write; had no health insurance; had single, working mothers whose level of education was less than complete secondary school; had no older siblings in school; lived in a small urban areas and in a family that had no external support; and who, at age 6, where in a private school.

Coefficients, standard deviations and P-values were obtained by performing a logistic regression adjusted for complex survey designs, to account for the fact that the EPH does not survey a random sample, but a sample that is stratified in two steps, first into urban conglomerates and then into households.
Standards errors are reported in parenthesis. P-values are reported between brackets.
For Likelihood Ratio and T-tests, the corresponding statistics are reported, and p-values are reported between brackets.
Significant *at 20%; **at 15%; ***at 10%; ****at 5%; *****at 1%.

[†] The results shown in the column titled "Buenos Aires City and Patagonia" should be taken with caution, given that the estimations are based on a relatively small sample size.

[††] A negative coefficient on the variable "read and write in kinder" is unexpected and counterintuitive.

Table 8. Results of the analysis of question 1 by method of estimation
Dependent binary variable: Read and write in first grade

Variable	Preschool, family, health, community, geography and school variables (**complete model**)					
	OLS (weighted)	LOGIT (weighted)	LOGIT with robust std. errors (non-weighted)	LOGIT with robust std. errors (weighted)	LOGIT for complex survey design (non-weighted)	LOGIT for complex survey design (weighted)
Intercept	0.603***** (0.127)[<0.0001]	0.378***** (0.032) [<0.0001]	0.384 (0.848) [0.646]	0.406 (0.815) [0.618]	0.037 (0.671) [0.956]	0.378 (0.843) [0.654]
Public kinder	0.031 (0.076) [0.678]	0.199***** (0.018) [<0.0001]	0.616*** (0.339) [0.069]	0.218 (0.428) [0.610]	0.613*** (0.347) [0.077]	0.199 (0.443) [0.653]
Private kinder	0.130** (0.086) [0.132]	0.781***** (0.021) [<0.0001]	1.096**** (0.428) [0.011]	0.790* (0.586) [0.178]	1.090**** (0.438) [0.013]	0.781* (0.607) [0.198]
Real p.c. family income	-0.007 (0.009) [0.423]	-0.060***** (0.002) [<0.0001]	-0.057 (0.558) [0.304]	-0.060 (0.067) [0.367]	-0.056 (0.057) [0.326]	-0.060 (0.071) [0.396]
Just secondary education	0.011 (0.052) [0.830]	0.033**** (0.013) [0.012]	0.111 (0.275) [0.688]	0.064 (0.405) [0.874]	0.107 (0.283) [0.706]	0.033 (0.431) [0.939]
More than secondary education	0.035 (0.056) [0.528]	0.189***** (0.014) [<0.0001]	0.399** (0.272) [0.142]	0.266 (0.414) [0.521]	0.393 (0.276) [0.154]	0.189 (0.435) [0.664]
Unemployed	-0.082 (0.075) [0.275]	-0.352***** (0.018) [<0.0001]	-0.150 (0.378) [0.691]	-0.363 (0.502) [0.469]	-0.158 (0.387) [0.683]	-0.352 (0.513) [0.494]
Hs. of work	-0.001 (0.002) [0.648]	-0.005***** (0.001) [<0.0001]	-0.011 (0.012) [0.361]	-0.006 (0.018) [0.742]	-0.011 (0.012) [0.370]	-0.005 (0.019) [0.807]
Hs. of work sq.	0.000 (0.000) [0.657]	0.000***** (0.000) [<0.0001]	0.000 (0.000) [0.427]	0.000 (0.000) [0.679]	0.001 (0.000) [0.434]	0.000 (0.000) [0.798]
Married	0.057 (0.040) [0.149]	0.312***** (0.010) [<0.0001]	0.180 (0.216) [0.405]	0.312 (0.307) [0.310]	0.182 (0.222) [0.414]	0.312 (0.325) [0.338]
Siblings	0.037 (0.037) [0.312]	0.221***** (0.009) [<0.0001]	0.122 (0.205) [0.551]	0.164 (0.325) [0.614]	0.119 (0.209) [0.569]	0.221 (0.339) [0.514]
Siblings sq.	-0.007* (0.005) [0.160]	-0.038***** (0.001) [<0.0001]	-0.028 (0.029) [0.331]	-0.031 (0.041) [0.455]	-0.028 (0.030) [0.342]	-0.038 (0.043) [0.367]

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Variable	OLS	LOGIT	LOGIT with robust std. errors	LOGIT with robust std. errors	LOGIT for complex survey design	LOGIT for complex survey design
	(weighted)	(weighted)	(non-weighted)	(weighted)	(non-weighted)	(weighted)
Old siblings	-0.074	-0.412*****	0.371	-0.290	0.377	-0.412
	(0.064) [0.245]	(0.016) [<0.0001]	(0.347) [0.286]	(0.528) [0.583]	(0.354) [0.288]	(0.562) [0.463]
Old siblings in school	0.035	0.200*****	-0.275	0.144	-0.275	0.200
	(0.049) [0.482]	(0.012) [<0.0001]	(0.262) [0.296]	(0.369) [0.696]	(0.269) [0.308]	(0.390) [0.609]
Public health insurance	-0.099****	-0.530*****	-0.383**	-0.508**	-0.378*	-0.530*
	(0.044) [0.026]	(0.010) [<0.0001]	(0.237) [0.105]	(0.346) [0.143]	(0.241) [0.117]	(0.371) [0.153]
Private health insurance	0.030	0.540*****	-0.075	0.538	-0.063	0.534
	(0.072) [0.684]	(0.023) [<0.0001]	(0.355) [0.833]	(0.487) [0.269]	(0.372) [0.864]	(0.510) [0.290]
Help	-0.036	-0.227*****	-0.164	-0.202	-0.168	-0.227
	(0.048) [0.456]	(0.012) [<0.0001]	(0.261) [0.531]	(0.382) [0.597]	(0.272) [0.536]	(0.402) [0.572]
Big area	0.068	0.362*****	0.206	0.275	0.169	0.362
	(0.061) [0.264]	(0.016) [<0.0001]	(0.264) [0.435]	(0.291) [0.344]	(0.254) [0.506]	(0.299) [0.225]
Metropolitan	0.167*****	1.207 *****	0.911*	1.166*	0.966*	1.207*
	(0.064) [0.010]	(0.020) [<0.0001]	(0.711) [0.200]	(0.826) [0.158]	(0.744) [0.196]	(0.879) [0.170]
NWNE	0.039	0.186*****	-0.347	-0.137	-0.050	0.186
	(0.071) [0.583]	(0.018) [<0.0001]	(0.568) [0.541]	(0.380) [0.719]	(0.355) [0.889]	(0.390) [0.634]
Center	0.116****	0.619*****	0.281	0.649***	0.562**	0.619**
	(0.055) [0.035]	(0.014) [<0.0001]	(0.553) [0.611]	(0.384) [0.091]	(0.357) [0.116]	(0.387) [0.110]
Cuyo	0.108	0.529*****	0.142	0.489	0.424	0.529
	(0.085) [0.207]	(0.022) [<0.0001]	(0.597) [0.812]	(0.439) [0.266]	(0.422) [0.314]	(0.460) [0.250]
Patagonia	0.170*	0.956*****	0.209	0.875***	0.516***	0.956***
	(0.129) [0.187]	(0.034) [<0.0001]	(0.664) [0.753]	(0.527) [0.097]	(0.492) [0.294]	(0.557) [0.086]
Read and write in kinder[†]	-0.113*****	-0.632*****	-0.074	-0.595***	-0.071****	-0.632****
	(0.041) [0.006]	(0.010) [<0.0001]	(0.230) [0.749]	(0.310) [0.055]	(0.231) [0.760]	(0.316) [0.046]
Public School	0.015	0.092*****	0.147	0.124	0.142	0.092
	(0.050) [0.768]	(0.013) [<0.0001]	(0.288) [0.609]	(0.399) [0.756]	(0.294) [0.631]	(0.420) [0.827]
2004	0.072	0.417*****	0.067	0.390**	0.066**	0.417**
	(0.036) [0.048]	(0.009) [<0.0001]	(0.186) [0.717]	(0.267) [0.144]	(0.189) [0.727]	(0.280) [0.136]

Variable	OLS (weighted)	LOGIT (weighted)	LOGIT with robust std. errors (non-weighted)	LOGIT with robust std. errors (weighted)	LOGIT for complex survey design (non-weighted)	LOGIT for complex survey design (weighted)
Observations used	629	629	629	629	629	629
Likelihood Ratio	0.0382 (0.0026)	25219.45 [<0.0001]	---	---	31.67 [0.168]	25219.45 [<0.0001]
T-test for H_o: PublicK=PrivateK	3.57 (0.060)	1843.32 [<0.0001]	---	---	2.083 [0.149]	1.548 [0.213]

Number of observations: 648.

Source: INDEC, *Encuesta Permanente de Hogares*, Q3 of 2004, Q3 of 2005 and Q3 of 2006.

The reference category is the group of boys who, at age 5, attended no kindergarten; did not know how to read and write; had no health insurance; had single, working mothers whose level of education was less than complete secondary school; had no older siblings in school; lived in a small urban areas in the Province of Buenos Aires; lived in families that had no external support; and who, at age 6, where in a private school.

When coefficients, standard deviations and P-values were obtained by performing a logistic regression adjusted for complex survey designs, the procedure takes account of the fact that the EPH does not survey a random sample, but a sample that is stratified in two steps, first into urban conglomerates and then into households.
Standards errors are reported in parenthesis. P-values are reported between brackets.
For Likelihood Ratio and T-tests, the corresponding statistics are reported, and p-values are reported between brackets.
Significant *at 20%; **at 15%; ***at 10%; ****at 5%; *****at 1%.

[†] A negative coefficient on the variable "read and write in kinder" is unexpected and counterintuitive.

Table 9. Results of the analysis of question 1 by method of estimation
Multi-categorical dependent variable:
Change in ability to read and write between kindergarten and first grade[†]

Children who don't read and write at age 5 but do so at age 6	Preschool, family, health, community, geography and school variables (**complete model**)			
Variable	Multinomial LOGIT (weighted, smaller sub-sample)	Multinomial LOGIT with robust std. errors (weighted, smaller sub-sample)	Multinomial LOGIT for complex survey design (weighted, smaller sub-sample)	Multinomial LOGIT for complex survey design (weighted, bigger sub-sample)
Intercept	0.948***** (0.038) [<0.0001]	0.803 (1.004) [0.424]	0.901 (0.901) [0.318]	0.191 (0.727) [0.793]
Public kinder	0.230***** (0.019) [<0.0001]	0.733**** (0.360) [0.041]	0.281 (0.466) [0.547]	0.469* (0.355) [0.186]
Private kinder	0.560***** (0.024) [<0.0001]	1.114**** (0.473) [0.018]	0.617 (0.672) [0.359]	0.696* (0.507) [0.170]
Real p.c. family income[††]	-0.139***** (0.003) [<0.0001]	-0.122*** (0.068) [0.074]	-0.135*** (0.081) [0.095]	-0.101**** (0.049) [0.040]
Just secondary education	0.216**** (0.017) [0.012]	0.265 (0.316) [0.403]	0.240 (0.469) [0.609]	-0.097 (0.395) [0.805]
More than secondary education	0.163***** (0.017) [<0.0001]	0.445* (0.316) [0.160]	0.278 (0.521) [0.594]	-0.166 (0.383) [0.665]
Unemployed	-0.125***** (0.024) [<0.0001]	-0.113 (0.438) [0.796]	-0.117 (0.641) [0.855]	-0.039 (0.492) [0.936]
Hs. of work	-0.011***** (0.000) [<0.0001]	-0.004 (0.005) [0.487]	-0.010 (0.008) [0.252]	-0.004* (0.003) [0.178]
Married	0.460***** (0.012) [<0.0001]	0.145 (0.253) [0.566]	0.440 (0.383) [0.251]	0.709**** (0.286) [0.013]
Siblings	-0.068***** (0.004) [<0.0001]	-0.101 (0.090) [0.262]	-0.655 (0.157) [0.672]	-0.118 (0.101) [0.245]
Old siblings	-0.324***** (0.019) [<0.0001]	0.507* (0.371) [0.171]	-0.202 (0.545) [0.710]	-0.093 (0.480) [0.847]
Old siblings in school	-0.434***** (0.014) [<0.0001]	-0.215 (0.298) [0.471]	0.343 (0.411) [0.404]	0.490* (0.364) [0.179]
Public health insurance	-0.328***** (0.013) [<0.0001]	-0.382* (0.272) [0.160]	-0.292 (0.431) [0.499]	-0.122 (0.319) [0.702]
Private health insurance	0.235***** (0.026) [<0.0001]	-0.278 (0.389) [0.474]	0.230 (0.540) [0.670]	0.699** (0.472) [0.139]
Help	-0.663***** (0.013) [<0.0001]	-0.303 (0.303) [0.317]	-0.623* (0.477) [0.192]	---
Big area	0.687***** (0.019) [<0.0001]	0.508** (0.333) [0.127]	0.567** (0.364) [0.119]	0.512*** (0.283) [0.070]
Metropolitan	0.050**** (0.022) [0.019]	-0.075 (0.753) [0.921]	0.017 (0.821) [0.984]	0.285 (0.612) [0.642]

Variable	Multinomial LOGIT (weighted, smaller sub-sample)	Multinomial LOGIT with robust std. errors (weighted, smaller sub-sample)	Multinomial LOGIT for complex survey design (weighted, smaller sub-sample)	Multinomial LOGIT for complex survey design (weighted, bigger sub-sample)
NWNE	0.060*****	-0.451	-0.029	0.179
	(0.004) [<0.0001]	(0.739) [0.542]	(0.498) [0.954]	(0.393) [0.650]
Center	0.433*****	0.306	0.436	0.726***
	(0.019) [<0.0001]	(0.732) [0.674]	(0.500) [0.384]	(0.394) [0.066]
Cuyo	0.000	-0.198	-0.041	0.308
	(0.025) [0.990]	(0.755) [0.793]	(0.528) [0.939]	(0.425) [0.468]
Patagonia	1.133*****	0.318	0.917*	0.831**
	(0.041) [<0.0001]	(0.840) [0.705]	(0.640) [0.153]	(0.525) [0.114]
Public School	-0.032****	0.051	-0.003	-0.130
	(0.015) [0.034]	(0.333) [0.877]	(0.466) [0.995]	(0.364) [0.721]
2004	0.417*****	0.016	0.524	0.784*****
	(0.009) [<0.0001]	(0.212) [0.941]	(0.310) [0.091]	(0.285) [0.006]
Observations used	601	601	601	862

[†] Dependent variable equals: 2 if the child does not how to read and write at age 5 but does know at age 6; 1 if the child knows how to read and write already at age 5 as well as at age 6; and 0 if the child knows how to read and write neither at age 5 nor at age 6.

[†] In the last column, the income variable is *real total family income* instead of *real per capita family income*.

Number of observations: 648 in the "smaller sub-sample" and 877 in the "bigger sub-sample".
Source: INDEC, *Encuesta Permanente de Hogares*, Q3 of 2004, Q3 of 2005 and Q3 of 2006.

The reference category is the group of boys who did not know how to read and write at neither age 5 nor age 6; who, at age 5, attended no kindergarten; had no health insurance; had single, working mothers whose level of education was less than complete secondary school; had no older siblings in school; lived in a small urban areas in the Province of Buenos Aires; and who, at age 6, where in a private school.

When coefficients, standard deviations and P-values were obtained by performing a logistic regression adjusted for complex survey designs, the procedure takes account of the fact that the EPH does not survey a random sample, but a sample that is stratified in two steps, first into urban conglomerates and then into households.
Standards errors are reported in parenthesis. P-values are reported between brackets.
For Likelihood Ratio and T-tests, the corresponding statistics are reported, and p-values are reported between brackets.
Significant *at 20%; **at 15%; ***at 10%; ****at 5%; *****at 1%.
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Appendix III: Analysis and Results of question 2

Table 10a. Descriptive statistics of the sample used to analyze question 2

Variable	Frequency	Percent	Mean	Standard Deviation
Dependent variable				
Repeated first grade				
0	434	82.19	0.1781	0.0227
1	103	17.81		
Independent variables				
Policy-related variables				
Read and write in first grade				
0	101	17.94	0.8206	0.0256
1	436	82.06		
Individual and health characteristics				
Female				
0	284	52.58	0.4742	0.0298
1	253	47.42		
Public health				
0	313	62.75	0.3725	0.0297
1	224	37.25		
Private health				
.0	494	90.16	0.0984	0.0181
1	43	9.84		
Public school in first grade				
0	121	27.90	0.7210	0.0286
1	416	72.10		
Family characteristics				
Real per capita family income			256.56	17.0004
Quintile 1				
0	288	49.42	0.5058	0.0333
1	249	50.58		
Quintile 2				
0	445	83.54	0.1646	0.0235
1	92	16.46		
Quintile 3				
0	483	88.60	0.1140	0.0207
1	54	11.40		
Quintile 4				
0	491	84.74	0.1526	0.1526
1	46	15.26		
Quintile 5				
0	516	93.70	0.0630	0.0158
1	21	6.30		
Mother's age			38.53	0.6888
Incomplete primary				
0	476	88.27	0.1173	0.0215
1	61	11.73		
Complete primary				
0	362	66.82	0.3318	0.0296
1	175	33.18		
Incomplete secondary				
0	447	84.80	0.1520	0.0211
1	90	15.20		
Complete secondary				
0	448	85.41	0.1459	0.0200
1	89	14.59		

Variable	Frequency	Percent	Mean	Standard Deviation
Incomplete tertiary				
0	490	90.40	0.0960	0.0207
1	47	9.60		
Complete tertiary				
0	470	85.58	0.1442	0.0220
1	67	14.42		
Less than complete secondary				
0	211	39.89	0.6011	0.0296
1	326	60.11		
Just complete secondary				
0	448	85.41	0.1459	0.0200
1	89	14.59		
More than complete secondary				
0	423	75.98	0.2402	0.0272
1	114	24.02		
Unemployed				
0	504	93.18	0.0682	0.0188
1	33	6.82		
Hours of work per week				
0-20	386	69.45	15.97	1.5078
21-40	95	19.09		
41-60	39	8.30		
More than 60	17	3.16		
Married				
0	248	46.89	0.5311	0.0316
1	289	53.11		
Siblings				
0	54	13.05	1.9896	0.1004
1	180	34.06		
2	131	24.81		
3	83	13.11		
4	42	6.99		
5	23	4.05		
6	10	1.13		
7	10	2.03		
8	2	0.16		
9	2	0.61		
Old siblings				
0	149	29.86	0.7014	0.0288
1	388	70.14		
Old siblings in school				
0	271	51.91	0.4809	0.0309
1	266	48.09		
Community characteristics				
Big area				
0	294	27.47	0.7235	0.0081
1	243	72.53		
Help				
0	433	82.89	0.1711	0.0229
1	104	17.11		
Geography characteristics				
Metropolitan				
0	519	91.10	0.0890	0.0055
1	18	8.90		
Buenos Aires				
0	456	53.31	0.4669	0.0106
1	81	46.69		
NWNE				
0	338	81.05	0.1219	0.0095
1	199	18.95		
Cuyo				
0	469	90.89	0.0911	0.0077
1	68	9.11		

Variable	Frequency	Percent	Mean	Standard Deviation
Center				
0	393	78.03	0.2197	0.0104
1	144	21.97		
Patagonia				
0	492	96.73	0.0327	0.0054
1	45	3.27		

Number of observations: 537.

Source: INDEC, *Encuesta Permanente de Hogares*, Q3 of 2004, Q3 of 2005 and Q3 of 2006.

Standard deviations were obtained through a procedure that accounts for the fact that the EPH does not survey a random sample, but a sample that is stratified in two steps, first into urban conglomerates and then into households.

In the case of binary variables that take a value of 0 or a value of 1, a value of 0 means that the observation *does not* fit into the category described by the variable's name, and a value of 1 means that the observation *does* fit into the category described by the variable's name. All binary variables are measured in Q3 of the year when the child is 6 years old, except for "Repeated first grade", which is measured in Q3 of the year when the child is 7 years old. For example, Table 10a shows that 492 children *did not* live in the Patagonia region at age 6, while 45 children *did* live in that region at age 6, and that 434 children *had not* repeated first grade by age 7, while 103 children *had* repeated first grade by age 7.

Table 10b. Descriptive statistics of the sample used to analyze question 2

Variable	Reads and writes in first grade	Doesn't read and write in first grade
Dependent variable		
Repeated first grade		
0	361	73
	(83%)	(72%)
1	75	28
	(17%)	(28%)
Independent variables		
Individual and health characteristics		
Female		
0	228	56
	(52%)	(55%)
1	208	45
	(48%)	(45%)
Public health		
0	242	71
	(56%)	(70%)
1	194	30
	(44%)	(30%)
Private health		
0	398	96
	(91%)	(95%)
1	38	5
	(9%)	(5%)
Public school in first grade		
0	107	14
	(25%)	(14%)
1	329	87
	(75%)	(86%)
Family characteristics		
Real per capita family income	275.37	157.21
Quintile 1		
0	248	40
	(57%)	(40%)
1	188	61
	(43%)	(60%)
Quintile 2		
0	358	87
	(82%)	(86%)
1	78	14
	(18%)	(14%)
Quintile 3		
0	388	95
	(89%)	(94%)
1	48	6
	(11%)	(6%)
Quintile 4		
0	392	99
	(90%)	(98%)
1	44	2
	(10%)	(2%)
Quintile 5		
0	420	96
	(96%)	(95%)
1	16	5
	(4%)	(5%)
Mother's age	38.92	36.75

Variable	Reads and writes in first grade	Doesn't read and write in first grade
Less than complete secondary		
0	187 (43%)	24 (24%)
1	249 (57%)	77 (76%)
Just complete secondary		
0	356 (82%)	92 (91%)
1	80 (18%)	9 (9%)
More than complete secondary		
0	335 (77%)	88 (87%)
1	101 (23%)	13 (13%)
Unemployed		
0	409 (94%)	95 (94%)
1	27 (6%)	6 (6%)
Hours of work per week		
0-20	306 (70%)	80 (79%)
21-40	82 (19%)	13 (13%)
41-60	33 (8%)	6 (6%)
More than 60	15 (3%)	2 (2%)
Married		
0	193 (44%)	55 (54%)
1	243 (56%)	46 (46%)
Siblings	1.96	2.13
Old siblings		
0	118 (27%)	31 (31%)
1	318 (73%)	70 (69%)
Old siblings in school		
0	217 (50%)	54 (53%)
1	219 (50%)	47 (47%)
Community characteristics		
Big area		
0	226 (52%)	68 (67%)
1	210 (48%)	33 (33%)
Help		
0	353 (81%)	80 (79%)
1	83 (19%)	21 (21%)
Geography characteristics		
Metropolitan		
0	419 (96%)	100 (99%)
1	17 (4%)	1 (1%)

Variable	Reads and writes in first grade	Doesn't read and write in first grade
Buenos Aires		
0	368	88
	(84%)	(87%)
1	68	13
	(16%)	(13%)
NWNE		
0	288	50
	(66%)	(50%)
1	148	51
	(34%)	(50%)
Cuyo		
0	374	95
	(86%)	(94%)
1	62	6
	(14%)	(6%)
Center		
0	312	81
	(72%)	(80%)
1	124	20
	(28%)	(20%)
Patagonia		
0	402	90
	(92%)	(89%)
1	34	11
	(8%)	(11%)

Number of observations: 537.
Source: INDEC, *Encuesta Permanente de Hogares*, Q3 of 2004, Q3 of 2005 and Q3 of 2006.

In the case of binary variables that take a value of 0 or a value of 1, a value of 0 means that the observation *does not* fit into the category described by the variable's name, and a value of 1 means that the observation *does* fit into the category described by the variable's name. All binary variables are measured in Q3 of the year when the child is 6 years old, except for "Repeated first grade", which is measured in Q3 of the year when the child is 7 years old. For example, Table 10b shows that, among those 6-year olds who knew how to read and write in first grade, 402 children *did not* live in the Patagonia region at age 6, while 34 children *did* live in the Patagonia region at age 6.

Table 10c. Descriptive statistics of the sample used to analyze question 2

Variable	Didn't repeat first grade	Repeated first grade
Policy-related variables		
Read and write in first grade		
0	73	28
	(17%)	(27%)
1	361	75
	(83%)	(73%)
Independent variables		
Individual and health characteristics		
Female		
0	229	55
	(53%)	(53%)
1	205	48
	(47%)	(47%)
Public health		
0	250	63
	(58%)	(61%)
1	184	40
	(42%)	(39%)
Private health		
0	394	100
	(91%)	(97%)
1	40	3
	(9%)	(3%)
Public school in first grade		
0	103	18
	(24%)	(17%)
1	331	85
	(76%)	(83%)
Family characteristics		
Real per capita family income	232.58	271.82
Quintile 1		
0	237	51
	(55%)	(50%)
1	197	52
	(45%)	(50%)
Quintile 2		
0	357	88
	(82%)	(85%)
1	77	15
	(18%)	(15%)
Quintile 3		
0	387	96
	(89%)	(93%)
1	47	7
	(11%)	(7%)
Quintile 4		
0	392	99
	(90%)	(96%)
1	42	4
	(10%)	(4%)
Quintile 5		
0	419	97
	(97%)	(94%)
1	15	6
	(3%)	(6%)
Mother's age	37.30	36.29

Variable	Didn't repeat first grade	Repeated first grade
Less than complete secondary		
0	182	29
	(42%)	(28%)
1	252	74
	(58%)	(72%)
Just complete secondary		
0	360	88
	(83%)	(85%)
1	74	15
	(17%)	(15%)
More than complete secondary		
0	331	92
	(76%)	(89%)
1	103	11
	(24%)	(11%)
Unemployed		
0	410	94
	(94%)	(91%)
1	24	9
	(6%)	(9%)
Hours of work per week		
0-20	308	78
	(71%)	(76%)
21-40	78	17
	(18%)	(17%)
41-60	35	4
	(8%)	(4%)
More than 60	13	4
	(3%)	(4%)
Married		
0	205	43
	(47%)	(53%)
1	229	60
	(42%)	(58%)
Siblings	2.28	1.97
Old siblings		
0	127	22
	(29%)	(21%)
1	307	81
	(71%)	(79%)
Old siblings in school		
0	218	53
	(50%)	(51%)
1	216	50
	(50%)	(49%)
Community characteristics		
Big area		
0	232	62
	(53%)	(60%)
1	202	41
	(47%)	(40%)
Help		
0	345	88
	(79%)	(85%)
1	89	15
	(21%)	(15%)
Geography characteristics		
Metropolitan		
0	420	99
	(97%)	(96%)
1	14	4
	(3%)	(4%)

Variable	Didn't repeat first grade	Repeated first grade
Buenos Aires		
0	367	89
	(85%)	(86%)
1	67	14
	(15%)	(14%)
NWNE		
0	264	74
	(61%)	(72%)
1	170	29
	(39%)	(28%)
Cuyo		
0	386	83
	(89%)	(81%)
1	48	20
	(11%)	(19%)
Center		
0	313	80
	(72%)	(78%)
1	121	23
	(28%)	(22%)
Patagonia		
0	406	86
	(94%)	(83%)
1	28	17
	(6%)	(17%)

Number of observations: 537.
Source: INDEC, *Encuesta Permanente de Hogares*, Q3 of 2004, Q3 of 2005 and Q3 of 2006.

In the case of binary variables that take a value of 0 or a value of 1, a value of 0 means that the observation *does not* fit into the category described by the variable's name, and a value of 1 means that the observation *does* fit into the category described by the variable's name. All binary variables are measured in Q3 of the year when the child is 6 years old, except for "Repeated first grade", which is measured in Q3 of the year when the child is 7 years old. For example, Table 10c shows that, among those 7-year olds who didn't repeat first grade, 406 children *did not* live in the Patagonia region at age 6, while 28 children *did* live in the Patagonia region at age 6.

Table 11. Analysis of question 2
Dependent binary variable: Repeat first grade

Variable	Ability to read and write (R&W)	Ability to R&W, and family-related variables	Ability to R&W, and family and health variables	Ability to R&W, family, health and community variables	Ability to R&W, family, health, community and geography variables	Ability to R&W, family, health, community, geography and school variables (**complete model**)
Intercept	-1.369*****	-1.695*	-1.747****	-1.492****	-1.670****	-1.551***
	(0.409) [0.001]	(0.702) [0.156]	(0.718) [0.015]	(0.729) [0.041]	(0.781) [0.033]	(0.901) [0.085]
Read and write in first grade	-0.577**	-0.607**	-0.661***	-0.659***	-0.820****	-0.812****
	(0.386) [0.135]	(0.382) [0.112]	(0.387) [0.088]	(0.387) [0.089]	(0.395) [0.038]	(0.389) [0.037]
Real p.c. family income	---	-0.125**	-0.131**	-0.117**	-0.147***	-0.147***
		(0.081) [0.121]	(0.081) [0.104]	(0.081) [0.148]	(0.077) [0.057]	(0.077) [0.056]
Just secondary education	---	-0.183	-0.300	-0.303	-0.435	-0.438
		(0.471) [0.698]	(0.486) [0.538]	(0.490) [0.536]	(0.565) [0.441]	(0.567) [0.440]
More than secondary education	---	-0.546	-0.748	-0.755	-0.969**	0.988**
		(0.590) [0.355]	(0.601) [0.213]	(0.606) [0.213]	(0.607) [0.110]	(0.619) [0.110]
Unemployed	---	0.121	0.141	0.135	0.289	0.282
		(0.546) [0.824]	(0.545) [0.796]	(0.569) [0.812]	(0.598) [0.629]	(0.589) [0.632]
Hs. of work	---	0.010	0.012	0.010	0.007	0.006
		(0.019) [0.609]	(0.019) [0.525]	(0.019) [0.597]	(0.020) [0.735]	(0.019) [0.769]
Hs. of work sq.	---	-0.000	-0.000	-0.000	0.000	0.000
		(0.000) [0.649]	(0.000) [0.562]	(0.000) [0.712]	(0.000) [0.994]	(0.000) [0.985]
Married	---	0.351	0.301	0.255	0.297	0.284
		(0.317) [0.268]	(0.310) [0.331]	(0.315) [0.418]	(0.317) [0.349]	(0.317) [0.369]
Siblings	---	0.035	0.037	0.014	-0.046	-0.036
		(0.347) [0.920]	(0.343) [0.913]	(0.349) [0.968]	(0.350) [0.897]	(0.347) [0.919]
Siblings sq.	---	0.011	0.011	0.014	0.019	0.019
		(0.045) [0.818]	(0.045) [0.799]	(0.046) [0.764]	(0.045) [0.670]	(0.045) [0.679]
Old siblings	---	0.857**	0.864**	0.900**	1.219****	1.203****
		(0.538) [0.111]	(0.548) [0.115]	(0.549) [0.101]	(0.597) [0.041]	(0.594) [0.043]

Variable	Ability to read and write (R&W)	Ability to R&W, and family-related variables	Ability to R&W, and family and health variables	Ability to R&W, family, health and community variables	Ability to R&W, family, health, community and geography variables	Ability to R&W, family, health, community, geography and school variables (**complete model**)
Old siblings in school	---	-0. 452 (0.402) [0.261]	-0. 416 (0.390) [0.286]	-0. 409 (0.392) [0.296]	-0. 471 (0.402) [0.242]	-0.466 (0.402) [0.247]
Public health insurance	---	---	0. 311 (0.343) [0.365]	0. 212 (0.347) [0.542]	0. 025 (0.389) [0.948]	0.018 (0.389) [0.964]
Private health insurance	---	---	0. 447 (0.696) [0.521]	0. 355 (0.695) [0.610]	0. 353 (0.691) [0.610]	0.290 (0.666) [0.663]
Help	---	---	---	-0. 821**** (0.407) [0.044]	-0.984**** (0.441) [0.026]	-0. 996**** (0.442) [0.024]
Big area	---	---	---	-0. 161 (0.293) [0.583]	-0. 078 (0.350) [0.824]	-0. 086 (0.353) [0.809]
Metropolitan	---	---	---	---	1. 701**** (0.783) [0.030]	1. 701**** (0.777) [0.029]
NWNE	---	---	---	---	-0. 157 (0.514) [0.759]	-0. 142 (0.520) [0.785]
Center	---	---	---	---	0. 003 (0.511) [0.996]	-0. 003 (0.511) [0.995]
NWNE	---	---	---	---	-0. 157 (0.514) [0.759]	-0. 142 (0.520) [0.785]
Center	---	---	---	---	0. 003 (0.511) [0.996]	-0. 003 (0.511) [0.995]
Cuyo	---	---	---	---	0. 920*** (0.535) [0.086]	0. 934*** (0.546) [0.087]
Patagonia	---	---	---	---	1.901***** (0.659) [0.004]	1.920***** (0.673) [0.004]
Public School	---	---	---	---	---	-0. 128 (0.435) [0.768]
2004	0.540*** (0.313) [0.085]	0.684**** (0.329) [0.038]	0.678**** (0.323) [0.036]	0.666**** (0.328) [0.043]	0.702**** (0.338) [0.038]	0.692**** (0.345) [0.045]

Variable	Ability to read and write (R&W)	Ability to R&W, and family-related variables	Ability to R&W, and family and health variables	Ability to R&W, family, health and community variables	Ability to R&W, family, health, community and geography variables	Ability to R&W, family, health, community, geography and school variables (**complete model**)
Observations	537	529	529	529	529	529
Likelihood Ratio	3873.81 (<0.0001)	17066.46 (<0.0001)	16254.45 (<0.0001)	19828.52 (<0.0001)	30273.34 (<0.0001)	30336.78 (<0.0001)

Number of observations: 537.
Source: INDEC, *Encuesta Permanente de Hogares*, Q3 of 2004, Q3 of 2005 and Q3 of 2006.

The reference category is the group of boys who, at age 6, went to a private school; did not know how to read and write; had no health insurance; had single, working mothers whose level of education was less than complete secondary school; had no older siblings in school; lived in a small urban area of the Province of Buenos Aires; and whose families had no external support.

Coefficients, standard deviations and P-values were obtained by performing a logistic regression adjusted for complex survey designs, to account for the fact that the EPH does not survey a random sample, but a sample that is stratified in two steps, first into urban conglomerates and then into households.
Standards errors are reported in parenthesis. P-values are reported between brackets.
For Likelihood Ratio and T-tests, the corresponding statistics are reported, and p-values are reported between brackets.
Significant *at 20%; **at 15%; ***at 10%; ****at 5%; *****at 1%

Table 12. Results of the analysis of question 2 by method of estimation
Dependent binary variable: Read and write in first grade

	Preschool, family, health, community, geography and school variables (**complete model**)				
Variable	OLS	LOGIT	LOGIT with robust std. errors	LOGIT for complex survey design	LOGIT for complex survey design
	(weighted)	(weighted)	(non-weighted)	(non-weighted)	(weighted)
Intercept	0.210****	-1.551 *****	-0.060	-0.816	-1.551***
	(0.090) [0.021]	(0.036) [<0.0001]	(1.231) [0.961]	(0.728) [0.262]	(0.901) [0.085]
Read and write in first grade	-0.106****	-0.812*****	-0.715****	-0.712****	-0.812****
	(0.045) [0.018]	(0.016) [<0.0001]	(0.284) [0.012]	(0.300) [0.018]	(0.389) [0.037]
Real p.c. family income	-0.021****	-0.147*****	-0.131****	-0.132****	-0.147***
	(0.008) [0.011]	(0.003) [<0.0001]	(0.057) [0.023]	(0.061) [0.030]	(0.077) [0.056]
Just secondary education	-0.051	-0.438****	-0.339	-0.323	-0.438
	(0.050) [0.312]	(0.020) [<0.0001]	(0.393) [0.388]	(0.397) [0.416]	(0.567) [0.440]
More than secondary education	-0.102***	-0.988*****	-1.075****	-1.073****	0.988**
	(0.052) [0.053]	(0.022) [<0.0001]	(0.455) [0.018]	(0.489) [0.028]	(0.619) [0.110]
Unemployed	0.043	-0.282*****	0.864****	0.870****	0.282
	(0.066) [0.518]	(0.025) [<0.0001]	(0.423) [0.041]	(0.439) [0.047]	(0.589) [0.632]
Hs. of work	0.001	-0.006*****	0.008	0.008	0.006
	(0.002) [0.698]	(0.001) [<0.0001]	(0.013) [0.524]	(0.013) [0.556]	(0.019) [0.769]
Hs. of work sq.	-0.000	0.000	0.000	0.000	0.000
	(0.000) [0.998]	(0.000) [0.654]	(0.000) [0.965]	(0.000) [0.946]	(0.000) [0.985]
Married	0.032	0.284*****	0.449***	0.440**	0.284
	(0.036) [0.365]	(0.014) [<0.0001]	(0.262) [0.087]	(0.270) [0.103]	(0.317) [0.369]
Siblings	-0.007	-0.036*****	-0.036	-0.041	-0.036
	(0.032) [0.821]	(0.012) [0.003]	(0.218) [0.867]	(0.225) [0.854]	(0.347) [0.919]
Siblings sq.	0.004	0.019*****	0.016	0.017	0.019
	(0.004) [0.311]	(0.001) [<0.0001]	(0.028) [0.566]	(0.029) [0.555]	(0.045) [0.679]
Old siblings	0.143*****	1.203*****	0.447	0.460	1.203****
	(0.055) [0.010]	(0.022) [<0.0001]	(0.424) [0.291]	(0.434) [0.289]	(0.594) [0.043]

Variable	OLS (weighted)	LOGIT (weighted)	LOGIT with robust std. errors (non-weighted)	LOGIT for complex survey (non-weighted)	LOGIT for complex survey (weighted)
Old siblings in school	-0.070*** (0.044) [0.113]	-0.466***** (0.015) [<0.0001]	-0.360 (0.303) [0.234]	-0.367 (0.312) [0.239]	-0.466 (0.402) [0.247]
Public health insurance	0.002 (0.042) [0.955]	0.018 (0.016) [0.275]	-0.151 (0.296) [0.610]	-0.141 (0.301) [0.640]	0.018 (0.389) [0.964]
Private health insurance	0.028 (0.066) [0.673]	0.290***** (0.027) [<0.0001]	-0.783 (0.644) [0.224]	-0.768 (0.657) [0.242]	0.290 (0.666) [0.663]
Help	-0.105**** (0.045) [0.019]	-0.996***** (0.020) [<0.0001]	-0.506** (0.349) [0.147]	-0.510** (0.351) [0.146]	-0. 996**** (0.442) [0.024]
Big area	0.002 (0.051) [0.964]	-0.086***** (0.020) [<0.0001]	-0.230 (0.297) [0.438]	-0.291 (0.297) [0.328]	-0. 086 (0.353) [0.809]
Metropolitan	0.212***** (0.063) [0.001]	1.701***** (0.023) [<0.0001]	1.329*** (0.766) [0.083]	1.483*** (0.792) [0.061]	1. 701**** (0.777) [0.029]
NWNE	-0.001 (0.060) [0.983]	-0.142***** (0.024) [<0.0001]	-0.930 (0.904) [0.303]	-0.292 (0.486) [0.548]	-0. 142 (0.520) [0.785]
Center	0.009 (0.045) [0.837]	-0.003 (0.018) [0.859]	-0.489 (0.822) [0.552]	0.088 (0.488) [0.856]	-0. 003 (0.511) [0.995]
Cuyo	0.148**** (0.063) [0.019]	0.934***** (0.022) [<0.0001]	0.164 (0.849) [0.846]	0.769** (0.512) [0.133]	0. 934*** (0.546) [0.087]
Patagonia	0.323***** (0.112) [0.004]	1.920***** (0.037) [<0.0001]	0.671 (0.960) [0.485]	1.323**** (0.615) [0.031]	1.920***** (0.673) [0.004]
Public School in first grade	-0.018 (0.042) [0.661]	-0.128***** (0.016) [<0.0001]	-0.029 (0.329) [0.931]	-0.025 (0.341) [0.942]	-0. 128 (0.435) [0.768]
2004	0.086 (0.033) [0.009]	0.692***** (0.013) [<0.0001]	0.275* (0.242) [0.255]	0.281** (0.247) [0.256]	0.692**** (0.345) [0.045]
Observations used	529	529	529	529	529
Likelihood Ratio	0.0918 (<0.0001)	30336.78 [<0.0001]	---	60.33 [<0.0001]	30336.78 (<0.0001)

Number of observations: 537. Source: INDEC, *Encuesta Permanente de Hogares*, Q3 of 2004, Q3 of 2005 and Q3 of 2006.

The reference category is the group of boys who, at age 6, went to a private school; did not know how to read and write; had no health insurance; had single, working mothers whose level of education was less than complete secondary school; had no older siblings in school; lived in a small urban area of the Province of Buenos Aires; and whose families had no external support. Coefficients, standard deviations and P-values were obtained by performing a logistic regression adjusted for complex survey designs.

Standards errors are reported in parenthesis. P-values are reported between brackets. Significant *at 20%; **at 15%; ***at 10%; ****at 5%; *****at 1%..

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