

Reading First Literacy Program: Evidence from a Quasi-Experimental Evaluation in Chile

Programa de Alfabetización Primero LEE: Evidencia de una evaluación cuasi-experimental en Chile

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Abstract

This study evaluates Reading First literacy program that aims to significantly reduce the reading comprehension gap of students from vulnerable contexts in Chile. The program has in its DNA to be scalable at a sustainable cost. The results from a quasi-experimental evaluation (propensity score matching and difference in differences) finds that the program has a positive impact of 0.4 standard deviations (S.D.) on reading comprehension and text production results after 1 year and of 0.37 S.D. after 2 years in management of language results. Students with the program were more likely to have favorable feelings towards reading (pleasure for reading questionnaire). These results show that an expansion of the program is cost-effective and would improve the reading comprehension results in the short term.

Keywords: quasi-experimental evaluation, comprehensive reading, pleasure for reading questionnaire.

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Resumen

Este estudio evalúa el programa de alfabetización Primero LEE, que tiene como objetivo reducir la brecha en comprensión lectora de estudiantes en contextos de vulnerabilidad en Chile. El programa tiene en su ADN ser escalable a un costo sostenible. Los resultados de una evaluación cuasi-experimental (propensity score matching y diferencia en diferencias) revelan que el programa tiene un impacto positivo de 0,4 desviaciones estándar (D.E.) sobre la comprensión lectora y producción de texto después de 1 año y de 0,37 D.E. después de 2 años en manejo de la lengua. Además, estudiantes con el programa están más propensos a tener sentimientos favorables hacia la lectura (cuestionario de gusto por la lectura). Los resultados muestran que una expansión del programa es rentable y mejoraría los resultados de comprensión de lectura a corto plazo. Códigos JEL: I21, I26, I28, O15.

Palabras clave: evaluación cuasi-experimental, comprensión lectora, cuestionario gusto por la lectura.

How can the quality of education for children from vulnerable contexts be improved? This is one of the most important public policy questions in Chile. Results on the SIMCE test of language for 2015 show that 60% of students do not have basic reading skills and this percentage rises to 78% among children of low socioeconomic status. Even those who develop public policies understand that reading comprehension from an early age is essential for the development of cognitive skills such as language (Coates et al., 2017) and may have a positive impact on various aspects of everyday life (ranging from positive externalities in other areas such as mathematics to improvements in social and soft skills). However, progress on this issue has been relatively unsuccessful.

There are alarming figures on functional illiteracy among adults in Chile. Recent data (PIAAC 2016, Bravo, 2013) show that 53% of the population aged between 16 and 65 do not understand what they read, while only 15% can make complex inferences. The most worrying aspect of this is that there has been no significant variation compared to measurements taken in 1998, which shows that it has not been possible to generate significant changes in the last 15 years. The lack of these basic skills is also more pronounced in vulnerable and less educated groups of society.

The vast majority of Chile's adult population is unable to compare and integrate information or make inferences. The repercussions of this are significant, since it can affect their performance in terms of productivity and income (Cunha et al., 2006) and other non-cognitive and everyday skills (Heckman et al., 2012; Grantham et al., 2007). Therefore, early educational problems persist over time, showing that the education received by students at an early age is a fundamental element of inequality. A segregated educational system such as that in Chile leads to unequal distribution of reading comprehension skills, which in turn leads to inequalities in working conditions, income, and access to opportunities, which become accentuated over time.

This study suggests that early interventions focused on the development of comprehensive literacy are of particular interest to improve the country's educational performance. The objective of this study is to conduct an assessment of the impact of the educational program Primero LEE (in English, Reading First). This program is a contextualization of "Effective Core Reading Programs" (the most effective readership programs internationally) and focuses on current theory regarding teaching of reading and writing, considering a balanced model that works on the different components of language within the classroom in a balanced manner, with a special focus on reading comprehension and vocabulary.

The program uses a methodology in which a trained tutor works with the teacher, supporting the implementation of participatory and innovative methodologies and modeling teaching practices. The final objective of the program is to implant skills in the teacher after three years of classroom tutoring. It can be scaled up quickly because it works with tutors who are local residents of the region where it is implemented.

The results obtained from a quasi-experimental methodology show that Primero LEE has a positive impact of 0.4 SD and 0.37 SD on results for reading comprehension and text production (RC-TP) after one and two years, respectively.

A matching technique was used to compare students in the treatment group from the municipalities of Arica and Pedro Aguirre Cerda (PAC) with students in the control group from the municipality of San Joaquín (SJ). The total sample consisted of 40 schools and 1,569 students, where all the schools considered were municipal-run. The measurements began in March 2015, that is, at the beginning of the school year, and lasted until December 2016, allowing the impact of the program to be assessed after two years using the difference in differences technique.

The results reflect the process of implementing the program in two different municipalities and the mechanisms to support it. The cost-effectiveness analysis presented is useful to improve public policy decision-making where Primero LEE seems to be a low-cost, high-impact program that has great potential to be scaled.

The relevance of this study is that it provides guidelines regarding the decision-making process for educational investment. On the other hand, it seeks to analyze the details of the mechanisms by which the program has an effect. This is valuable both in order to understand the final impact of the program on the future development of Chile's children and for reasons of fairness: How can a child learn history or biology if they do not understand what they read? How can a child who does not understand what they read solve a mathematics exercise? A student who does not understand what they read lags behind for the rest of their school life and, as expected, a larger proportion of children from the middle and lower middle classes are left behind, thus reproducing the cycle of poverty. In addition, this study also has value as an internal assessment of the Crecer con Todos Foundation (the foundation responsible for implementing the program). This is particularly relevant in the current context of Chile, where important education reforms are being carried out and resources that could be directed to this kind of impact initiatives are rarely evaluated and are very limited.

Literature Review

A large proportion of the literature on the effects of early childhood interventions is based on international data. In Chile, there is little research on the effects of early literacy programs (Bedregal et al., 2007). Bedregal and Villalon (2008) argue that early literacy is critical for lifelong learning and complete development of individuals, a task that is beyond the limits of formal education, and that the evidence available for the country comes from a few scattered studies and with no impact. The literature on early development is guided by studies such as Contreras and Thievos (2014), Contreras and González (2015), or Urzúa (2011), which focus, for example, on the effect of a child's enrollment in day care centers. Both studies find that enrollment in day care centers or preschools during the first three years of life have a significant role in their psychomotor development.

Our study was carried out at the subsequent educational level, that is, with children 6 years old and, therefore, it contributes to the analysis of the effectiveness of interventions that occur later, within the limits of the so-called "window of opportunity". In this regard, there is an assessment of the Country Service Program for Education (Programa de Servicio País en Educación) (Cabezas et al., 2011), which is intended to improve the reading skills of fourth grade students, who worked with volunteer tutors who formed support groups for reading. After three months on the program, positive and significant results were observed in cognitive and non-cognitive tests (reading enjoyment questionnaire, the same instrument used in our research), but only in one of the research regions (Metropolitan Region).

International studies also emphasize the effectiveness of these interventions and their ability to reduce inequalities of origin. Literature such as Cunha et al. (2006) or Carneiro and Heckman (2003) underline the productive role, particularly in terms of cognitive and non-cognitive results. The link between cognitive abilities and income is summarized in that a one standard deviation increase in the scores on adult tests corresponds to an increase in income ranging between 17% and 22% on average.

Along the same lines, World Bank researchers such as Patrinos (2016) highlight the importance of literacy in order to access information and increase productivity, particularly for the poorest people. He also analyzes its possible impact on the dissemination of new technologies and, therefore, its high economic returns. His assessment is based on programs such as "READ PNG" in Papua New Guinea, where reading scores increased 0.51 SD and the costs are USD 60 per student. This program assumes there is continuous support for the teacher, with the provision of institutional material and tools to identify students who are lagging behind (the same guidelines as the Primer LEE program studied in this paper and detailed in the next section).

As regards the effectiveness of programs using mentors, such as Primero LEE, an empirical study by Burley et al. (2007) studies the effect of mentoring on the reading achievement of basic education students with cognitive deficits and specific students who are included in the MORE program (Mentoring in Ohio for

Reading Excellence). This study highlights the importance of tutoring for early reading, reading work, and one-on-one instruction. Students were assessed before and after interventions with standard reading performance measurements and students who received treatment were matched with students in the control group at similar schools in the district. The results showed significant positive effects of the intervention. In general terms, the treated students showed improvements every month compared to the students in the control group during the six months of the intervention.

Following the same line of research, Borman et al. (2007) used a randomization design at the cluster level, where schools were randomly assigned to implement a program called “Success for All”. The program focused on schools and consisted of early prevention and intensive intervention to detect and solve reading problems as early as possible. The solutions established by the program included: improving the management of teachers in the classroom and increasing the participation of parents in both the learning of children and the school in general. Each school received a tutor or facilitator, who was responsible for overseeing the daily operation of the program, providing assistance and coordination. The program lasted for three years and was implemented from pre-school to second grade. The results were statistically significant at the school level and improved reading comprehension in treated children versus the control by one third of a standard deviation.

In short, there is a set of literature that shows that literacy programs can have significant short-term effects. These studies are international in scope, so it is necessary to discover what takes place in Chile. This study is intended to contribute to this challenge.

Primero LEE Program

Primero LEE is a contextualization of the Effective Core Reading Program (ERP) and is focused on teaching literacy. The objective of the program is to ensure that all students attending public or private schools can read and write comprehensively from first grade. The main pillars of the program are:

1. Innovative and interactive methodology: based on the most effective international evidence (ERP) with a special focus on reading comprehension and vocabulary. Oral communication is also a focus of the program, since good oral language development is key for the child to be motivated to develop written language.
2. Model of professional development: the importance of methodological appropriation and literacy strategies on the part of the teacher.
3. Support for the management team.
4. Assessment and monitoring of learning: performance assessments in each unit of the program to monitor the development of reading-writing skills (set of controls and standardized tests as part of the assessment instruments).
5. Work with lagging students: through “Primero LEE+”, a program that establishes systematic work with Differential Educators for students that require additional support.
6. Participation of parents.

Primero LEE is implemented in the language class (10 hours per week) throughout the academic year (from March to December), and it is approved and coordinated with the Language and Communication Plans and Programs of the national curriculum. The program is planned to be implemented from pre-kinder through third grade. In the case of pre-kinder and kindergarten, the program is applied throughout the day. Each day is divided into three periods of effective teaching and learning. Work is done on all areas of the current Pre-school Education curriculum, with a focus on language skills. The three periods help the teacher systematize the teaching of the curricular contents required by the Chilean Ministry of Education (MINEDUC).

The work methodology is based on continuous support for the teacher through tutors or mentors. The tutors must be teachers and have at least three years of work experience. They receive 120 hours of training that enable them to become better qualified in the Primero LEE methodology so they can guide teachers, help them anticipate problems, make decisions, and understand the meaning of each specific activity. One of the most important aspects is that the program can be scaled quickly because it works with tutors who are residents of the region/municipality where the program is being implemented.

The role of the tutor is to work with the teacher and provide them with feedback with the purpose of favoring the implementation of participatory and innovative methodologies and modeling of pedagogical practices. A set of materials is also provided to facilitate the work: daily lesson plans, student work guides, student assessments, and a classroom library. The ultimate goal is to instill skills in the teacher after two years of accompaniment in the classroom.

Primero LEE is currently being implemented in 22 municipalities across the country (more than 100 schools) and the Crecer con Todos Foundation is in talks with the government to scale Primero LEE nationwide. The aim of this work is to evaluate the impact of the program in just two of these municipalities; Arica, in the north of the country, and Pedro Aguirre Cerda (PAC), in central Chile, where the program was implemented as a pilot thanks to a partnership with MINEDUC. MINEDUC wanted to evaluate the impact of the program in two municipalities in extreme locations with different pedagogical management capacities in order to verify its scalability.

Comparing the two municipalities in the CASEN survey (2015 household survey), Arica has a poverty rate of 8.9% (average family income of CLP 991,364), while PAC has a rate of 11% (average family income of CLP 941,276). Some 76% of the population can read and write in Arica, while that figure is 78% in PAC. Arica also has 8,812 students enrolled in primary education, while PAC has 2,434 students. Average municipal school attendance is 88% for Arica and 80% for PAC. One of the major differences between the municipalities is the presence of ethnic groups, where Arica has an ethnic population of 26% (mostly the Aymara indigenous group) and PAC only 6.3%.

Data and Sample Design

The treatment group consists of a total of 1,297 students from 33 public schools in 2 municipalities of Chile: Arica and Pedro Aguirre Cerda (PAC). Table 1 shows the detail of the sample size:

Table 1.

Size of Sample of Treatment and Control Groups

Variable/Municipality	Treatment		TOTAL	Control				Total
	Arica	PAC		San Joaquín	Quilicura	Cerro Navia	Puente Alto	
N Schools	20	13	33	7	4	13	16	40
N Classes	31	13	44	10	9	17	30	66
N Students	937	360	1297	272	343	568	1183	2366

Source: Prepared by the authors based on implementation data.

To measure the impact of the program, a control group was created with 272 students from 7 public schools in the Municipality of San Joaquin (SJ). After both groups were formed (treated: Arica and PAC, control: SJ), in March 2015 a diagnostic test was applied (carried out by MINEDUC and the Crecer con Todos Foundation) to create the baseline, and after one year another two instruments were applied to measure the impact of the program: a standardized test of reading comprehension and text production (“RC-TP”, which is a validated instrument, see Gajardo & Medina, 2009) and a test of reading enjoyment (instrument used in previous research but which is not validated) for first grade students. Then, in order to measure the impact after two years of implementation of the program, a second assessment was carried out with the aforementioned instruments (RC-TP and reading enjoyment test) of the same children who were now in second grade.

It is important to provide details of the process in which the assessment is initiated and designed. The researchers arrived at the intervention after MINEDUC and the Foundation formed a working partnership to intervene in all the municipal schools of Arica and PAC. The government’s argument was based on the fact that they were interested in looking at the performance of the program in districts of Santiago and districts far from the center of the country (selection criteria were consulted in detail and the response was negative). Given this, the researchers used a matching technique to define which schools would be “control schools”. The strategy identified SJ and Copiapó as control districts. However, due to the occurrence of disastrous floods during the field activities, this option was discarded, since it was not possible to continue with the original design. In view of this, other municipalities were eventually added, in addition to SJ, as part of the control sample in Table 1 (Quilicura, Cerro Navia, and Puente Alto).

In light of this, a control group was sought that had similar characteristics and would allow a match with the treated group. The variables considered for the matching process were: years of education of the mother and father, average family income, household stimulation, number of children per class, and ethnicity, among others.). Through this procedure, it was possible to obtain robust results with respect to this control group formed by Cerro Navia, Quilicura, and Puente Alto. Finally, the total sample consisted of 3,278 students from 73 municipal schools in the country.

Identification Strategy

Test of Reading Comprehension and Text Production (RC-TP)

In order to compare the evolution of the treated and control groups before and after the implementation of the program, the Propensity Score Matching (PSM) methodology was used and then Difference in Differences. Following Rosenbaum and Rubin (1983), the average treatment effect (ATE) of the program is defined as follows:

$$\Delta_i = Y_i^A - Y_i^N \quad (1)$$

Where Y_i^A defines the result of the RC-TP test for each student i with the program and Y_i^N for the control group.

The problem of estimating the impact with the equation (1) is that it is not possible to observe the same student with and without the program, so what we observe is:

$$Y_i = D_i Y_i^A - (1 - D_i) Y_i^N \quad \text{con } D = 0,1 \quad (2)$$

With P representing the probability of observing the student with $D = 1$, the ATE is:

$$ATE = P[E(Y_A/D = 1) - E(Y_N/D = 1)] + (1 - P)[E(Y_N/D = 0) - E(Y_N/D = 0)] \quad (3)$$

The main problem to obtain causal conclusions is that it is not possible to observe the estimated value of a treated student if they had not received the program, and the estimated value of a student in the control group if they had received the program. Therefore, this research addresses this problem by using the PSM method, which summarizes the characteristics before the treatment of each subject in a variable and based on this a match is made with similar individuals. The PSM can be represented by:

$$p(X) = Pr[D = 1/X] = E[D/X]; p(X) = F\{h(X_i)\} \quad (4)$$

Where F is represented by a normal cumulative distribution and X is a set of treatment characteristics (result of the diagnosis test, gender, education of the parents, income, and number of books in the home).

Once the PSM is calculated, the ATT can be estimated thus:

$$ATT = E\{Y_i^A - Y_i^N / D = 1\} \quad (5)$$

$$ATT = E[E\{Y_i^A - Y_i^N / D = 1, p(X)\}] \quad (6)$$

$$ATT = E[E\{Y_i^A\}/D = 1, p(X)] - E[E\{Y_i^N / D = 0, p(X)\}/D = 1] \quad (7)$$

Continuing with the methodology and after having used the PSM, we use the difference in differences technique, where the ATT is obtained as a difference of differences of the total average results:

$$ATT = (after - before)_A - (after - before)_N \quad (8)$$

Therefore, the simplified version of the main equation is represented thus:

$$Y_{ijt} = \alpha + \beta_1 Treat_{ij} + \beta_2 Time_t + \beta_3 Treat * Time_{ijt} + \sum \phi X_i + \epsilon_{ijt} \tag{9}$$

Where Y_{ijt} is the result of the test of student i from group j at time t . $Treat_{ij}$ is a binary variable that has a value of 1 if the student is treated. $Time_t$ is a time variable that has a value of 1 in December (at the end of the year) and 0 in March (at the start of the year). Finally, X_i are control variables.

Questionnaire on reading enjoyment

The questionnaire on reading enjoyment contains 10 questions that can be classified into 4 sections (interest in reading, self-perception as a reader, reading enjoyment, and perception of reading at school).

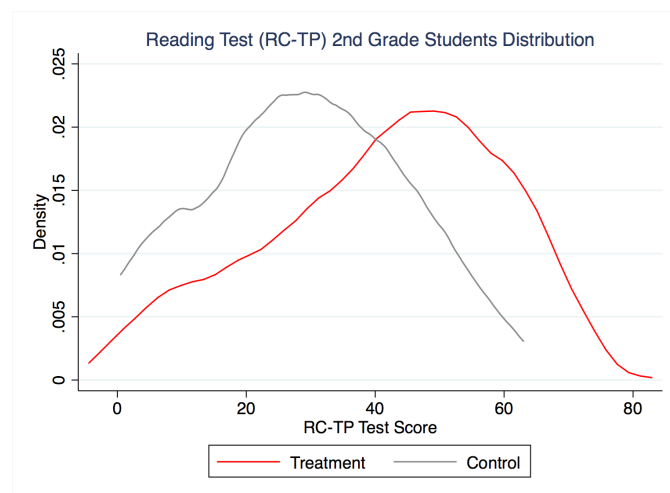
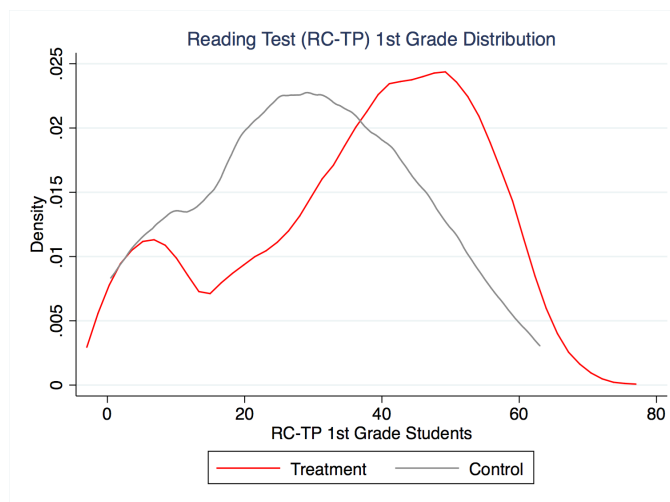
Within each section, the answers are evaluated with between 0 and 3 points. A value of 0 indicates little affinity with reading and 3 three the opposite. Since these are ordered variables, the correct methodology in this case is to use an ordered logit regression model. This model is used to observe the impact of the program in four dimensions and for each equation a binary treatment variable is included that represents the ATT.

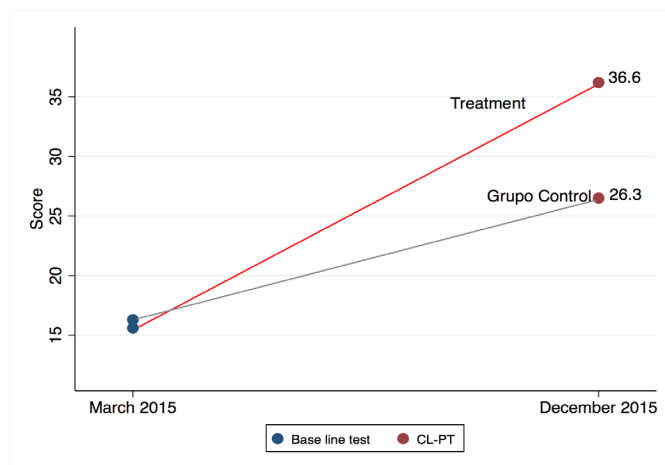
Results

Reading Comprehension and Text Production (RC-TP)

Graphs 1, 2, and 3 summarize the results in terms of the total RC-TP score. In each graph the red line represents the treated group in Arica and PAC and the grey line the SJ control group. The difference between the distribution of the groups and their evolution can be observed.

Graphs 1, 2, and 3: Reading Test (RC-TP): Results in Treatment and Control Groups





Graphs 1 and 2 show that the distribution of the scores of the treated students after one and two years, is more “to the right”, that is, they obtained higher scores than the control group. Figure 3 shows the evolution of both groups before and after the program. The results for December 2015 show that students receiving the program obtain an average of 7-10 additional points on the RC-TP test. The literature (Cabezas et al., 2011) shows that, for students in fourth grade, 1.5 points on the RC-TP test are equivalent to 6 points on the SIMCE test. Considering this, in our case, the effect of the program would be to increase SIMCE scores by 28-40 points. In practical terms, this means improving from an emerging performance level to an adequate level (or more than 20% difference in the total score). Considering the average historical scores on the RC-TP test (only available prior to 2012), the additional points allow the public schools treated to reach the average total score of private schools in the country. This difference is substantially reduced during the second year (2 points difference and is not statistically significant for the total RC-TP score), which reflects the fading effect of the program after one year of implementation.

The results of the main regressions for the RC-TP test and each of its sections (Reading Comprehension (RC), Text Production (TP) and Language Management (LM) can be seen in the following table:

Tabla 2

PSM + Diferencias en Diferencias

Variable	Muestra	Tratamiento	Control	Diff.	S.E	T-stat	Obs.
R C T P	Unmatched	0,35	-0,20	0,55	0,12	4,65	537
- 1ero	ATT	0,35	-0,05	0,40	0,15	2,71	537
básico							
RC - 1ero	Unmatched	0,27	-0,30	0,57	0,11	5,23	537
básico	ATT	0,27	-0,19	0,46	0,14	3,2	537
TP - 1ero	Unmatched	0,39	-0,22	0,61	0,12	4,96	537
básico	ATT	0,39	-0,14	0,53	0,16	3,22	537
ML - 1ero	Unmatched	0,29	-0,03	0,33	0,11	3,05	537
básico	ATT	0,29	0,05	0,24	0,14	1,67	537
R C T P	Unmatched	0,03	-0,22	0,25	0,12	2,05	438
- 2do	ATT	0,03	-0,22	0,25	0,16	1,55	438
básico							
RC - 2do	Unmatched	0,05	-0,24	0,29	0,13	2,3	438
básico	ATT	0,05	-0,18	0,23	0,17	1,33	438
TP - 2do	Unmatched	-0,13	-0,19	0,06	0,14	0,43	438
básico	ATT	-0,13	-0,25	0,12	0,17	0,7	438
ML - 2do	Unmatched	0,10	-0,30	0,40	0,12	3,37	438
básico	ATT	0,10	-0,27	0,37	0,15	2,51	438

The results show that there is a significant effect at a 1% confidence interval during the first year, measured by the total score on the RC-TP test. The magnitude of the effect ranges from 0.4 SD in the total score after one year of implementation to 0.46 SD in the RC section and 0.53 SD in the TP section. However, this effect fades after the second year and is only significant for the Language Management section (LM), the magnitude of which is 0.37 SD. However, if we divide our sample of the treated group between Arica and PAC, it can be observed that the program has a heterogeneous impact: there is a significant effect in Arica (0.27 SD in the total score of RC-TP in second grade with a level of significance of 10%), while no effect is seen in PAC.

One possible explanation for the fading of the effect is that there were clear differences in implementation between the municipalities treated. On the one hand, Arica is considered a well-run municipality with aligned stakeholders (school directors, heads of the technical-pedagogical unit (UTP), and regional educational directors). On the other hand, PAC has severe teaching management problems. We explored these differences using two sources of data: first, we used administrative data to analyze the turnover and education of teachers and the management team; then daily measurements of teacher motivation were studied in various everyday activities (class preparation, teaching, student assessments, class management, administrative tasks, and complementary tasks). The unit of analysis used in both strategies is the classroom. In this study there were only 44 classrooms (one response per teacher), so we do not have enough variation to include this factor as an interactive variable in our regressions.

Following our first strategy (administrative data) we see that only 60% of the teachers in the PAC district were hired at the beginning of the school year (Mineduc Docentes). This made it impossible to train some teachers in the program before the classes began. The same problem occurred with principals at three schools in this district. Another indicator of managerial performance was the rotation of teachers and the incidence of short-term medical leave with no replacements, with 30% of lost classes due to this factor. In addition, the “Primero LEE+” program was not implemented in PAC because the necessary meetings with the management teams were not held. Finally, although their educational backgrounds were similar, the UTP heads in Arica had worked for fewer years in schools (12 years on average) than those in PAC (17 years on average).

In summary, there are significant differences in the internal organization of each district, which directly affect the impact of the program. As mentioned above, the fundamental pillars of Primero LEE include the active involvement of teachers and management teams, so these results confirm the importance of effective teaching management by these actors.

Finally, although educational results in Chile are usually measured using other indicators (SIMCE test), we prefer to standardize the results to illustrate the relative performance of the programs. When the scores are standardized, Primero LEE has a value that ranges between 0.4 SD and 0.37 SD, depending on the year considered. In the literature, this is considered to be a large effect, particularly in comparison with other educational programs in the country (National Performance Assessment System [Sistema Nacional de Evaluación de Desempeño, SNED]; Full School Day [Jornada Completa Escolar, JEC]; Education Country Service [Educación Servicio País], among others) and the body of educational literature (0.05-0.2 SD).

B. Reading enjoyment questionnaire

As mentioned previously, the reading enjoyment questionnaire has 10 questions. For each question, the student must choose between three categories, from 0 to 3, which range from least to most affinity with reading.

The results show that a student in the control group is more likely to say that they do not like to read “at all”, and, on the other hand, a student in the treated group is more likely to say that they like to read “a lot”. This difference is statistically significant between groups.

Cost-effectiveness Analysis

To identify the cost-effectiveness ratio (CE) of the program, we base our calculation on Cabezas et al. (2011), where the key question to answer is: What is the necessary expense per student to obtain an impact of 0.1 SD after one year of implementation of the program?

To answer the above, we made the following assumptions:

- It is assumed that the annual cost of Primero LEE is CLP 107,000 per student (this is financed with SEP Law funds, the approximate amount of which per child per month is CLP 70,000).
- The RC-TP is used as an impact measurement since it is the most frequently used standardized test in the literature.

The results indicate that to achieve an increase of 0.1 SD, Primero LEE would require an annual cost of

CLP 27,000 or USD 40 per student after one year of implementation and CLP 29,000 or USD 43 after two years (considering the language management results). When the above is evaluated in terms of SEP Law funds, this means the cost is only approximately 4% of the annual funding.

Even if one considers that the cost-effectiveness calculations are not comparable between the programs, they help illustrate the relative performance. These results put the Primero LEE program above others such as: JEC (impact of 0.06 SD and a CE ratio of CLP 635). In terms of cost-effectiveness, Primero LEE would be between programs such as P-900 (impact of 0.2 SD and CE of USD 91.2) or SNED (impact of 0.16 SD and CE of USD 2).

Conclusion

The results of this research show that it is possible to create low-cost reading programs with a great impact. It is important that any program that uses public funds, especially for pre-school education and primary education, must be proven to be effective because, as mentioned above, reading comprehension has potential effects on quality of life, income, and overall productivity in the country.

Primero LEE has an impact after one year and even though the effect is reduced in the second year, it still has positive and significant effects: the program has an impact of 0.4 SD on reading comprehension and text production (RC-TP) after one year and 0.37 SD in language management (a specific section of the RC-TP test) after two years, and it increases the likelihood that students have favorable feelings about reading.

There is also a heterogeneous impact among the treated municipalities that is due to differences in teaching management skills between Arica and PAC: the program only has a positive effect in Arica after two years of implementation. This is a crucial factor for the future decisions of the Foundation, when considering expanding the program to any municipality. Finally, it was not possible to prove that the impact of the program is strongly correlated with motivational factors on the part of the teacher.

Finally, in terms of future research, it may be important to understand other factors that could influence the performance of the program (school environment, innovation within the school, relationship with the management teams, salary structure, etc.). This is particularly interesting to understand what kind of practices on the part of the tutor and teacher generate the results with the greatest impact, both in terms of student learning and in the types and degrees of motivation. In order to do this, it remains a future challenge to extend the previous analysis to the 500 teachers who currently participate in the Primero LEE program (and not only in the “treated” groups).

It should be noted that the objective of the Foundation is to continue with the assessments by continuing the initial control group (San Joaquín), to see what happens after a year of implementation of the program (is it possible to instill the skills?). There is also a plan to measure the results of the SIMCE standardized test in fourth grade to examine the long-term effects of the program. This would dictate the direction in which future research should be guided.

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