



Impact of school readiness program interventions on children's learning in Cambodia[☆]

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ABSTRACT

To reduce the high repetition rates in early years of primary school, the government of Cambodia piloted a school readiness program (SRP) in the first two months of Grade 1 of primary school. This study examines whether such intervention has effects on students' immediate acquisition of school readiness skills as well as students' longer term achievement of formal curriculum. The study finds that children who participated in SRP outperform children that did not participate in both outcomes, controlling for pretest score and background variables. The findings suggest that the intervention may be one alternative model to preschools in countries where access to pre-primary education is limited.

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1. Introduction

The issue of high repetition and drop out rates in many developing countries is widely known, and data has shown that the rate is especially high in early years of primary school. Cambodia is not an exception where time after time, Grade 1 children have had the worst rates of promotion of any grade grouping at primary school level (Bredenberg, 2000, 2005). Although the implementation of reforms at the turn of the decade (e.g., summer vacation remediation programs) led to a decline in repetition of about 50%, national repetition rates at Grade 1 have since remained relatively static at around 17–23% each year between 2000 and 2003 (EMIS, 2000–2005). Such rates are high even when compared to the median repetition rates of developing countries, which is about 7% (UNESCO, 2007).

In response to this situation, educators in Cambodia have explored a new strategy of introducing a school readiness program (hereafter referred as SRP) in the first two months of the academic year of Grade 1. The underlying theory behind the SRP is that children with a higher degree of "readiness" will acquire competencies outlined in the formal curriculum more successfully than children who do not pass through a structured readiness

phase, thereby making them less likely to repeat a grade or drop out of school. SRP focuses on building foundational skills in academic subjects, promoting learning friendly classroom environments, and strengthening learner confidence.

In addition to the high repetition rate, access to pre-primary education is extremely limited in Cambodia, due to the intense competition in the education sector for scarce resources, as is the case in many economically less-developed countries.¹ Under such a situation, a short school readiness course at the beginning of primary school may be a more realistic immediate option than a drastic expansion of preschool. By introducing a school readiness course in the first two months of child's formal education, the Cambodian Ministry of Education, Youth, and Sport sought to compensate for the lack of formal preschooling and generally poor early childhood development experiences that an under-resourced education sector in Cambodia is currently unable to overcome.

As part of the SRP implementation in Cambodia, a systematic monitoring and evaluation was undertaken by the government and local partners leading to a series of research reports on the program's effectiveness (Bredenberg, 2004, 2005). This study synthesizes these evaluations, highlighting the major findings in observed impacts of the SRP interventions on children's learning outcomes during the first year of implementation. Our research questions in this study are two-folds. What is the immediate effect

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¹ According to the Global Monitoring Report 2008 (UNESCO, 2007), the average gross enrollment ratio for pre-primary education of economically less-developed countries is less than half of that of developed countries, 28% and 73%, respectively.

of SRP on children's school readiness skills? What is the long-term impact of SRP on children's achievement? In other words, we investigate to what extent students acquired school readiness skills through participating in the intervention, and to what extent school readiness skills enhanced students' understanding of formal Grade 1 curriculum? An evaluation of an alternative program for preschool, such as school readiness programme, will have strong policy implications for many countries where a drastic expansion of preschool is not a realistic option due to scarce and competing resources.

2. Prior research

2.1. Importance of early intervention

The recent explosion of research in neurobiological, behavioral, and social sciences has led to major advances in understanding the importance of early childhood experiences. Based on an extensive review of existing science on early childhood in the United States, "From Neurons to Neighborhood" (Shonkoff and Phillips, 2000) underscored the importance of early intervention by synthesizing two areas of research that shows the power of environmental influences on early development. Brain development has been shown to be exquisitely attuned to environmental inputs that, in turn, shape its emerging architecture. Environment provided by the child's first caregivers has also been demonstrated to have profound effects on every domain of child's early development. The study suggests that early interventions that facilitate child's competence and his/her sense of personal efficacy have positive effects on later development.

Although a majority of the evidence on the efficacy and effectiveness of early interventions comes from economically developed countries, increasingly, evaluation studies conducted in economically less-developed countries have shown similar results. In Cape Verde and Guinea, children who participated in preschool scored approximately half a standard deviation higher on cognitive development at age five than children who did not participate in preschool (Jaramillo and Tietjen, 2001). In Myanmar, the primary school enrollment was 13% higher for children who had attended early childhood development (ECD) centers compared to those who had not attended (Save the Children, 2004). In Nepal, the repetition rate in first grade for children who attended ECD centers was 5.5%, which was one-fifteenth of the national norm (Save the Children, 2003).

2.2. Critical period

Entwisle and Alexander's (1989) work on the "critical period" is important in studying the efficacy of SRP, as they highlight that the first-grade transition constitutes a "critical period" for children's academic and social development. They argue that events during the earliest years of school provide a "particular" kind of stimulation. This refers to the observation that primary schools are socially organized in ways children have not previously experienced. An unrelated adult (teacher) is in control, and children meet and remain in often rigid classroom environments for several hours each weekday. The presence of other children who are at about the same level of competence provides an incentive to do well because human beings seek social approval. In addition, human beings are strongly rewarded by positive reinforcement from an authority figure (i.e., a teacher). All these "particulars" provide a social context that is unique to this life stage (Entwisle and Alexander, 1998). In other words, such early learning opportunities provide a critical transition period from the familiar home to a formal instructional setting, i.e., schools.

2.3. School readiness

This transition period described above is a "critical period" for acquisition of "school readiness," defined as the behaviors and skills needed to adjust to the formal learning structure found in school. For example, a qualitative study in Nepal showed that teachers often commented that children who have been to early learning centers are "very different [from other children]; they know how to be in a group of others, they are less timid, able to respond" (Arnold, 2004). Today, school readiness is recognized as a multi-faceted construct (Scott-little et al., 2006). As noted above, one of these dimensions refers to children's readiness for school, which focuses on learning and developmental outcomes. A second dimension is the schools' readiness for children, which focuses on school-level outcomes and practices that foster and support a smooth transition into primary school and promote the learning of all children. Finally, a third dimension refers to families' readiness for school, which focuses on parental and caregiver attitudes and involvement in children's early learning as well as development and transition to school.

Although it is widely recognized that school readiness has these three dimensions, much of the research conducted in this area has focused on children's and families' readiness for school. Research in the area of assessment has produced heated debate on the domains and techniques of assessing children's readiness for school (National Education Goals Panel, 1995; Meisels, 1999; La Paro and Pianta, 2000). Numerous studies on parenting programs have highlighted the roles parents can play in children's school readiness (Rouse et al., 2005; Aboud, 2007). However, there is scant research on a schools' readiness for children, which sheds light on how educational institutions can modify the learning environment in order to better accommodate children's diverse level of readiness. In this end, the ready schools (Shore, 2000) was prepared to highlight the importance of ensuring that schools are ready for children, in addition to ensuring that children start school ready to learn. The report delineates the essential attributes of "ready school" in the United States, with the transition period defined as kindergarten through Grade 3. More research and empirical data on the effectiveness of schools' readiness is needed, especially in economically less-developed countries. The SRP builds upon some of the recommended characteristics of the "ready school." The program's curriculum and instruction is based on the recognition that self-esteem stems from competence, by doing tasks that are engaging and with instruction at the appropriate levels of pace and content. The program also builds upon the strategy of giving teachers time to improve their skills and knowledge. The 14-day teacher training program to orient new teachers to the program and a regular monitoring regimen to support teachers in their implementation is one of the main components of SRP.

This study focuses on schools' readiness for children by evaluating a school-based intervention in Cambodia, which introduced a readiness course in the first two months of children's formal education, Grade 1. By doing so, the study will contribute to filling a research gap in schools' readiness, particularly in the context of economically less-developed countries, and provide some practical implications for the modification of learning programs to support children's smooth transition into primary school and to promote the learning of all children.

3. Context of Cambodia

3.1. Demographic characteristics and economy

Cambodia is a relatively small country of about 13,000,000 people in Southeast Asia. The country consists of 24 provinces and

municipalities, which are broken down into discrete districts that in turn consist of communes. The country's economy is primarily agricultural and 84% of the population lives in rural areas (National Institute for Statistics, 2001). Cambodia's age structure is rather unique stemming from nearly two decades of constant warfare and "class cleansing." The high mortality experienced among men and women (who are now in their 40s) during the 1970s and 1980s has led to a depressed birth rate among these individuals resulting in an unusually smaller age cohort of individuals in the 20–24 age range. Because this is a prime child bearing time for Cambodian women, the effects of war have in turn led to a smaller age cohort of children aged 0–4 during the current decade. Expected declines in school intake after 2004, therefore, present important opportunities within the education system to shift focus from expanding physical capacity to more qualitative concerns such as the SRP.

According to the World Food Program (WFP), about 38% of the population lived below the poverty line in 2002, defined as expenditure of less than \$1 per day (WFP, 2002). Although the country has recorded average GDP growth of about 5.5% during the last decade, GDP per capita continues to be very low at about \$300 per person (National Institute for Statistics, 2001). Low levels of economic development and inadequate means to distribute national wealth from social elites to rural dwellers continue to present a significant challenge to the government.

3.2. Educational system

Education in Cambodia continues to be the primary realm of the public sector with only 2.5% and 2.2% of preschools and primary schools operated privately, respectively (EFA Secretariat, 1999). Funding provisions of the educational system greatly favor primary education, which absorbed 37.4% of government and donor educational investment at the end of the last decade. This is followed by secondary education, vocational training, and tertiary education. Preschool education absorbed only 1.1% of total investment in 1999 (EFA Secretariat), a situation that has not changed substantially over the past several years.

The most important change in the education system in recent years has been the introduction in 2001 of a broadly based reform program that provides special funds for interventions designed to promote *equity, quality, and efficiency of education financing*. The reform program is implemented by the government as an integrated, sector-wide program that is reviewed annually with the stakeholders. In general, reform efforts have been highly successful in increasing participation rates, particularly among the poorest quintiles of the population. The net enrollment rate for primary education was reported to be 91% in 2005, up from 85% in 1996 (EMIS, 2006). Enrollment in pre-primary education has doubled since the last decade, but gross enrollment rate is still estimated to be 10.6% (UNESCO-IBE, 2006).

While educational reform has dramatically increased participation rates among children, efficiency and qualitative indicators continue to pose a major challenge for policy-makers. Dropout levels have remained static throughout the decade and repetition rates have been increasing, particularly in Grade 1 (EMIS, 2006). Government reports that national repetition rates at Grade 1 reached 23.6% in 2004, whereas such rates were only 17.5% at the beginning of the decade (Bredenberg, 2005). To a large extent, these trends are results of reform efforts to increase enrollment at a time when capacity, particularly in the area of teacher numbers, has remained largely static. The result has been overcrowded classrooms, textbook shortages, an overtaxed teaching force, and declining levels of instructional quality. In this context, the SRP has been an important initiative to address quality issues as well as the textbook shortages, as SRP teaching methodologies emphasize

moving away from traditionally high levels of dependency on textbook usage.

4. School readiness program

4.1. Rationale

The primary aim of school readiness curriculum is to provide a bridge between a child's state of knowledge at the time of entry into primary school and the Grade 1 curriculum, which in Cambodia has been frequently criticized for being too academic. The introduction of this curriculum, therefore, was based on the assumption that the acquisition of readiness skills would enhance learning achievement when children encountered the Grade 1 curriculum.

The SRP was seen as a superior alternative to the reception class, which is another method widely used to provide readiness skills to children entering primary school. The reception class differs from SRP in that it usually occurs during the summer vacation, which poses three challenges. First, it requires extra payment to teachers. Second, it requires teachers to take the additional load of work during the summer vacation, when many teachers are farmers and are occupied with planting during this season in Cambodia. Third, it assumes that parents would be willing to send their children to school during the summer, which is clearly not the case in most situations. In addition to overcoming these challenges, SRP has the advantage of being taught by the same teacher as the one who teaches the regular grade 1 class, ensuring that there is a greater continuity between what children learn under the readiness program and Grade 1.

4.2. School readiness program in Cambodia

The SRP implementation included various components, from the development of special curricular documentation, a 14-day teacher training program to orient new teachers to the program, a regular monitoring regimen to support teachers in their implementation, physical upgrading of classrooms, to formalized student assessment for monitoring and reporting purposes. Although the program was implemented as a pilot, its initial scope was still significant for a small country like Cambodia. 544 Grade 1 teachers and approximately 25,000 children across three provinces participated in the pilot in 2004.

In preparation for the implementation, multiple government departments and advisors worked to develop a specialized bridging curriculum that prepares children for eventual exposure to the formal curriculum. Learning areas in SRP curriculum include basic language skills (e.g., speaking, listening, and reading), the concept of number, time and space, hygiene, working in groups, etc. This bridging curriculum consciously avoids many official curriculum competencies that tend to be highly premature in their presentation. The most conspicuous example is the omission of "writing," which in the formal curriculum begins during the first week of school. In general, the SRP curriculum was designed to have a much stronger focus on both fine and gross motor skills. This stands in contrast to traditional academic methods, which emphasize verbal and visual abstractions. The rationale underlying these approaches is that psychomotor-based learning modes are especially suited for children in rural areas over abstract and picto-verbal modes that have such prominence in existing textbooks.

Before the beginning of the school year, teachers received intensive training in using the bridging curriculum as well as the need for certain desired changes in classroom practice. For example, teachers were asked to plan their instruction so that each lesson was taught with at least two to four activities that used

multiple sensory channels. Teachers acquired a repertoire of numerous activities involving songs, role plays, drawing, games, and other activities for teaching designated lessons. It was believed that providing instruction in this way would prove to be more engaging for children, build their confidence, and provide positive reinforcement for being in a school environment over a 4-h period each day. The use of multiple activities also encouraged teachers to rely less on textbooks, which was quite a novel experience to many teachers. In order to facilitate these changes in classroom practice, physical classroom environments also underwent a certain amount of upgrading. This usually included the provision of copious amounts of stationery and raw materials for the production of teaching aids as well as decorations to make classroom environments more interesting.

5. Methods

5.1. Research design

The design of this study is a comparison between an experimental group, children who participated in the SRP, and a control group, children who did not participate in the SRP. Given the challenges that emerge in implementing an experimental design in developing countries, the study is based on a nonequivalent control group pretest–posttest design that introduces both between-subjects and within-subjects comparisons.

Analysis of covariance (ANCOVA) is used, with posttest and terminal test scores as the response, treatment as the design factor, and pretest score as a covariate, to determine whether the perceived difference in mean test scores between the experimental group and control group is statistically significant, controlling for pretest score differences. Multivariate analysis is also used to control for imperfection in matching of the two groups.

5.2. Sample

Three provinces were chosen where there were a small handful of schools participating in SRP in each province.² Ten schools participating in the SRP program were randomly chosen from various districts in those three provinces in order to include both rural and urban schools and represent both affluent and poor communes. Another 10 schools, where SRP interventions had not occurred, were assigned to the control group and matched to SRP schools according to demographic setting and poverty ratings³, as shown in Table 1. Thus, the total number of schools participating in the sample was 20. The number of children selected in each school was proportional to the school size. The sample was not matched by school size, which resulted in larger number of children from rural and poor area in the control group. Therefore, in our analyses, we conduct multivariate analyses to control for these demographic background differences between the treatment and control groups. The actual selection of children in each test site was not determined by school staff, but by proctors using a simple random sampling technique. These samples were constructed on site from name lists provided by schools. These safeguards were put in place to minimize possible bias in the selection of children.

² It should be noted that there are several hundred schools in each province. Therefore, the SRP schools and non-SRP schools were usually not in proximity and we did not anticipate spill-over effects.

³ The poverty rating was based on the National Census data, in which poverty was defined as expenditure of less than \$1 per day. In order to assign schools to a poverty ranking, three tiers were created which defined the number of people living in poverty in a particular commune. Poverty tiers were designated as follows: Tier 1 = under 30% living in poverty; Tier 2 = 30–50% living poverty; 3 = over 50% living in poverty.

Table 1
Characteristics and sample size of experimental and control groups

Background characteristics (school context)	Experimental group		Control group	
	Schools	Students	Schools	Students
Urban/rural				
Urban	2	91	2	31
Rural	8	382	8	427
SES				
Less than 30% poor	2	91	2	31
30–50% poor	4	191	3	191
50% of more poor	4	191	5	236
Total number of school/students	10	473	10	458

It should be noted that dropout and absenteeism led to a loss of test subjects during the year ($n = 931$ in pretest, $n = 861$ in posttest, $n = 851$ in terminal test). At terminal achievement test, the experimental group sample had dropped from 473 to 415, a loss of 12% of the sample, and the control group sample had dropped from 458 to 436, a loss of 5%. The higher loss of subjects in the experimental group, who are also more likely to be the most vulnerable children, may have contributed to a potential spiraling up of mean scores for this group. This possibility suggests that caution is needed in interpreting the results of this study. The proportion of boys and girls was approximately equal in each group.

5.3. Measures

A number of formal assessments of SRP activities were undertaken since the program was first piloted in 2004. First, a pretest was administered before the school year to provide baseline data. Second, a posttest was administered at the end of the eight-week intervention period to determine the acquisition of school readiness skills. Third, a terminal achievement test was administered at the end of the school year to determine whether the SRP had any long-term effect. In all the assessments, children were tested in the core subjects of Khmer Language and Mathematics. For this study, we only report findings from Khmer Language, because the gap between children's language skills at the entry of primary school and the Grade 1 curriculum was seen to be the most problematic and of high concerns for policy-makers in Cambodia.⁴ For both pretest and posttest, the selection of competencies was guided by the SRP curriculum, whereas for the terminal achievement test, the selection of competencies was guided by the formal Grade 1 curriculum. The assessment used an interview method, one proctor per student. Although this assessment approach proved to be highly labor-intensive, it enabled the research team to avoid the use of written tests, which would have been highly inappropriate at the very young age of test subjects.

Khmer Language covered 10 sub-topical areas outlined in the curriculum (see Table 2). The breakdown of skill areas borrowed heavily from the typology developed by Bloom and his associates. The items consisted primarily of tasks requiring oral responses or psychokinetic manipulations of test materials, such as letter cards. These characteristics allowed the test content to be covered quickly. Test developers tried to formulate questions in a way that both isolated specific skills and also minimized the confounding influence of associated skills that might block or hinder assessment of the target area. For example, students were asked to spell out

⁴ The main findings are similar for mathematics, although in general, the score for language was lower than mathematics for both groups.

Table 2
Test content specifications in Khmer Language

Topical area	Sub-topical area	Weighting in post-test (%)	Weighting in terminal test (%)
Listening and speaking	Counting syllabus	28	28
	Syntax		
	Oral word usage		
Reading	Word meanings	33	32
	Sound letter discrimination		
	Reading aloud		
	Reading comprehension		
Writing	Spelling	39	40
	Writing words		
	Sentence composition		

Table 3
Difference in language scores by topical areas between experimental group and control group

Topical area	Experimental group			Control group		
	Posttest (n = 473)	Posttest (n = 430)	Terminal test (n = 415)	Pretest (n = 458)	Posttest (n = 431)	Terminal test (n = 436)
Listening and Speaking	10% (22%)	48% (37%)	40% (27%)	8% (17%)	23% (31%)	26% (21%)
Reading	5% (19%)	25% (39%)	49% (31%)	3% (12%)	20% (35%)	37% (28%)
Writing	5% (18%)	25% (35%)	24% (29%)	8% (20%)	15% (30%)	13% (21%)
Total	8% (18%)	40% (30%)	37% (26%)	6% (14%)	21% (29%)	24% (20%)

Note: Standard deviations are shown in parentheses.

words not by writing out the words but by arranging letter cards in meaningful strings. Thus, even if a child had limited writing skills, s/he could still arrange letters in meaningful groupings simply by manipulating the letter cards provided.

The items were field-tested on a sample of children who had completed Grade 1 the previous year. The outcomes were analyzed with respect to levels of difficulty and discrimination using classical true score test theory models. The final tests retained items of moderate difficulty and high discrimination. Tests were also reviewed in terms of administration time for each child, the clarity of directions, and the effectiveness of examples.

Interviewers were recruited locally to administer subject tests in each provincial site. All proctors received one-day training from the visiting research team in an explicit behavioral protocol to ensure standardized testing conditions in each site. This protocol included guidelines on the set-up of test stations that were suitably separate from each other to prevent cuing, greetings to be used with children to put them at ease, guidelines that prohibited any commentary on student performance that might inhibit future responding, and other behaviors that might affect children's ability to answer to the best of their knowledge. Adherence to protocols was monitored by spot checks during the testing by the research team. Each subject test lasted for 15 min requiring a total of 30 min of testing for each child.

6. Findings

Overall, children in the experimental group significantly outperformed children in the control group in the language test. First, we eyeball the difference in the scores between the experimental group and control group for each topical area (Table 3).⁵ In all topical areas, the experimental group performed higher than the control group in both posttest and terminal test. In the posttest, which was administered immediately after the eight-

⁵ We do not conduct a formal significance test by each topical area, because multiple dependent variables may increase the probability of Type I error, and our primary interest is to examine the difference in the overall language score.

week SRP course, the difference between the experimental group and control group varies substantially by topical areas, whereas the difference becomes similar across the three topical areas by the end of the year. For example, the difference between the experimental group and control group is 25% for listening and speaking, 10% for writing, and 5% for reading in posttest, whereas the difference is 14%, 11%, and 12%, respectively in terminal test. The largest difference in listening and speaking in posttest may be a reflection of the nature of the SRP programme with its de-emphasis of traditional pedagogy. The consistent difference across topical areas in terminal test may suggest that the school readiness skills, once acquired, can be beneficial across all topical areas of the formal curriculum. The smallest gain in writing also reflects the fact that the SRP curriculum purposefully avoids the inclusion of writing tasks to evade perceptual overload for children in the first two months of school. It appears, however, that the rigorous emphasis on writing skills in the official curriculum presents a serious disjuncture between SRP and what children must eventually face when they are introduced to the Grade 1 textbook later in the school year.

Next, we conduct analysis of covariance (ANCOVA), with the pretest as a covariate, to determine whether the perceived difference in mean test scores between the experimental group and control group is significant at $p < .05$, controlling for pretest

Table 4
Analysis of covariance (ANCOVA) of posttest scores and terminal test scores as a function of treatment, with pretest scores as covariate

Source	d.f.	MS	F	η^2
Posttest				
Pretest (covariate)	1	10.93	142.85***	0.13
Treatment	1	6.38	83.42***	0.08
Error	858	0.08		
Terminal test				
Pretest (covariate)	1	1.31	25.27***	0.03
Treatment	1	3.10	59.75***	0.06
Error	848	0.05		

* $p < .05$; ** $p < .01$; *** $p < .001$.

Table 5
Regression analyses for posttest scores and terminal test scores

	Model 1: posttest (n = 858)		Model 2: terminal test (n = 849)	
	B	S.E.	B	S.E.
Constant	−0.19**	(.068)	−0.05	(.055)
Treatment	0.17***	(.019)	0.11***	(.015)
Pretest	0.65***	(.057)	0.24***	(.048)
Male	0.00	(.011)	−0.02	(.015)
Age	0.04***	(.009)	0.03***	(.008)
Medium SES	0.11***	(.020)	0.15***	(.024)
High SES	0.11***	(.029)	0.14***	(.016)

* $p < .05$; ** $p < .01$; *** $p < .001$.

score differences (Table 4). The results show that the experimental group significantly outperforms the control group in posttest [$F(1, 858) = 83.42, p = .000$]. Furthermore, this significant difference remains after a year [$F(1, 848) = 59.75, p = .000$]. That is, the SRP is not only successful in transmitting the school readiness skills as outlined in the programme, but also enables students to use those skills to better understand and pursue the formal Grade 1 curriculum. Using eta square as the measure of effect size, the treatment accounted for 8% of total variability in posttest score, and 6% of total variability in terminal test score.

Lastly, to account for the imperfection of our sample, that is, the sample not being matched by school size and resulting in larger number of children from rural and poor area in the control group, we conduct multivariate analyses to control for these demographic background differences. We employ an ordinary least squares (OLS) analyses, and control for SES, age and gender, in addition to pretest, to determine whether the abovementioned difference still remains.⁶ Table 5 shows that the effect of treatment is statistically significant in both posttest and terminal test. In other words, the SRP students outperform the non-SRP students in both posttest and terminal test, controlling for key background differences between the two groups. The adjusted R -square is .26 for Model 1 and .19 for Model 2; the larger percentage explained to predict the variance in posttest is expected due to the high correlation between pretest and posttest. The standardized coefficient of treatment is .27 for Model 1 and .23 for terminal test. Although this effect size is small,⁷ it is important to note that the effect is larger than that of SES, and that the reduction in the effect size during the year is minimal.

7. Conclusions

7.1. Summary of findings

Overall, the findings show that children who received the SRP intervention performed significantly higher than children who did not receive the intervention in both school readiness skills and achievement of formal curriculum. Although the effect size was small, approximately a quarter of a standard deviation, once controlling for pretest score and background variables, it is important to emphasize that children maintained their learning advantage after a year. Children who participated in the SRP intervention scored better than their peers in the control group in all topical areas of language, but the absolute scores were

⁶ Since all the high SES schools were in urban area, only the SES variable was used in our multivariate model.

⁷ Effect size at or above .5 standard deviation (S.D.) is considered as "large," .3–.5 S.D. as "moderate," and .1–.3 S.D. as "small," and those below .1 S.D. as "trivial" (Rosenthal and Rosnow, 1984).

perilously low in 'writing.' The SRP curriculum excludes writing tasks to avoid an overload for children at the beginning of their school life, but it needs to be highlighted that this might present a disjuncture when they are eventually introduced to the Grade 1 textbook.

Although the findings described above clearly demonstrate a long-term impact on learning among children who attend SRP classes, it is important to consider these findings in light of several constraints in the way that this study unfolded. This refers to the loss of more subjects in the experimental group than in the control group as a result of unforeseen circumstances, which affected the comparability of sample groupings in the terminal achievement tests. As noted earlier, the experimental group exhibited a loss of subjects that was almost double of that of the control group. This loss comprised of both dropouts and absences among students. There is a high probability that the students who were lost from the sample probably conform to a national profile of children who are poor, vulnerable, and weaker academically. An examination of 'lost' sample subjects within the experimental group found that 66% came from two schools within the same province. These schools were described by assisting program staff as poorly managed schools. Of the students who were absent in these schools on the day of the test, about a quarter had dropped out completely while the others were still enrolled but absent. Given the greater rate of loss in the experimental group and the likelihood that many of these were indeed more vulnerable children, this may have resulted in introducing sample bias, leading to some relative advantage for the experimental group.

Another constraint that needs to be taken into account is the school selection procedures that may have missed management considerations. As noted above, research team members reported that two of the schools included in the experimental group were driven by internal conflicts leading to poor management of teachers. Indeed, mean scores in these two schools were decidedly lower than the two schools in the control group with which they were paired. Surprisingly, however, these problems did not appear to affect overall experimental group performance in a way contrary to what we had expected, and indeed may have compensated for sample bias stemming from subject loss.

7.2. Policy implications

Research has repeatedly shown that children perform better in schools when they participate in pre-primary education, but the dearth of resources in many economically less-developed countries ensures that only a small minority of children has such opportunities. This situation contributes to poor school readiness among children when they first enter school, and hinders their smooth transition of the 'critical period,' which in turn leads to high rates of grade repetition.

The findings from this study suggest that specialized interventions which provide school readiness skills to children early in the school year, enhances children's learning performance in core curriculum areas such as Language when they move into more formalized schooling during their first year in school. School readiness interventions of this nature are to be distinguished from reception classes in that they are embedded in the primary school cycle at the beginning of the school year (for a period of several weeks), with the framework of making schools ready for children through emphasis on building children's self-esteem, engaging children in tasks, and instructing at appropriate levels of pace and content. In addition, the curricular design of such programs are directly linked to the official curriculum so that they act as a bridge between children's 'before' school experiences and the formal Grade 1 curriculum, which in many countries, such as Cambodia,

tends to be somewhat academic in nature. The SRP interventions, however, should not be treated as a panacea for the repetition problem in school systems. In many countries, as in Cambodia, repetition stems from a complex interplay of many factors that include crowded classrooms, poor parental supervision, direct educational costs, teacher shortages, and distance to schools. Nevertheless, such interventions may be effective in enhancing children's learning potential by providing them with readiness skills as well as in addressing school quality issues by modifying classroom practices.

Another important policy implication from this study is the potential of SRP interventions to help bridge the gap in the provision of preschool opportunities. The SRP may be one way to compensate for children's inability to participate in preschools or ECD centers before they start primary school, especially in societies where the prevalence of pre-primary education is still extremely low. SRP interventions may, therefore, serve as a surrogate for preschool attendance in some context.

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