

Evaluation of Early Childhood Preschool Programs of PLAN Bangladesh

Frances E. Aboud
ICDDR,B, Bangladesh
McGill University, Canada

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Executive Summary

PLAN Bangladesh has a series of programs designed to support children from birth to the end of elementary school. This report focuses on the preschool program for children of 5 years of age. The objectives of the research were: 1. to examine the impact of the preschool intervention on children and their mothers, and 2. to assess the method of implementation of preschool activities along with the relevance and appropriateness of materials and training of field-level implementers. To this end, 401 preschool children and matched controls from three sites were randomly selected and compared on indicators of cognitive, social and physical development. They were administered four cognitive tests to assess their vocabulary, verbal reasoning, non-verbal reasoning and school readiness skills. Social development was observed in the context of play. Physical growth was examined in terms of nutritional status, disabilities, and preventive health practices. Mothers were interviewed for information on the family's socio-demographic status, her decision-making power, and knowledge about her child's needs and child development more generally. Finally, the quality of the preschool program was assessed using the international Early Childhood Environment Rating Scale and a South Asian version of the scale along with more detailed observations of materials and child-adult communication. Teachers, supervisors, and PLAN staff were interviewed to gather information on the curriculum, teacher guides and training.

The main findings indicated that the preschool children had considerably higher skills related to school readiness than control children, after controlling for socioeconomic and nutritional differences. Preschool children also showed better vocabularies and reasoning and more social skills. However, scores on these latter measures were generally low, and differences between the two groups were significant but small. The cognitive level of preschool play was not more sophisticated than that of control children. Concerning physical indicators of health, preschool children had better weights and heights though they did not eat a more diversified diet than controls on the previous day. The level of infection may be partly to blame for low nutritional status in that 25% of the children were sick in the previous week and few used a latrine, according to their mothers' reports. Preschool children were twice as likely to have one of the ten inquired disabilities, but all children seemed to have received the usual preventive health measures. Mothers in both groups demonstrated a reasonable level of knowledge about their child's need for stimulation and play but not about the causes of illness or the expected ages for child competencies. Preschool mothers had infrequently attended parenting sessions and so did not exceed control mothers on these measures. However, preschool mothers knew what their children were learning in preschool and were positive about the experience.

The quality of the preschool program by international standards was low-middle but high according to South Asian standards. On the nine dimensions, it did well on literacy, math, and interpersonal interaction, and poor on activities and program. Independent observations of materials and communication confirmed these evaluations. The importance of these quality indicators was demonstrated by the statistical relation between the quality of a preschool and the cognitive performance of its students. Interviews with the teachers, supervisors, and other staff indicated that satisfaction with

the program was high. However, knowledge of important child-learning issues was low. A reading of the prepared curriculum material and teacher guide indicated that teachers were implementing the program as instructed. Consequently the quality could be improved through a re-writing of these materials and re-training the teachers.

Recommendations therefore focus on improving child cognitive and social outcomes by improving the quality of preschool materials and activities. Although the low-cost nature of the program is an important consideration for sustainability, the low cost is wasted if children do not show more benefits. With perhaps slightly higher financial inputs, the impact may increase exponentially. Free play time and materials need to be substantially improved to enhance children's active and individual learning; novel and complex materials, self-directed and sustained activity, and teachers' responsive communication with children should be emphasized during playtime. Story reading needs to be enhanced with the addition of storybooks and discussion time. Literacy and math need to concentrate more on reasoning than rote learning through the introduction of materials and hands-on activities. Ongoing evaluation of preschools would be useful especially if teachers were included in targeting specific items from the Early Childhood Environment Rating Scale and mapping their progress. Pilot preschools might be identified and outcomes evaluated before implementing the changes in all preschools.

Evaluation of Early Childhood Preschool Programs of PLAN Bangladesh

Recent reports on the education of Bangladeshi children show that almost 80% of boys and girls are attending primary school, and most of these reach fifth grade. However, very few are able to demonstrate the required competencies at the end of fifth grade (Bangladesh Education Sector Review, 2002). Interested parties are therefore examining both the child and educational inputs that are necessary for school achievement. The Early Childhood Care and Development (ECCD) initiative of UNICEF, which has been supported by the World Bank, along with national and international non-governmental organizations, seeks to address this problem by focusing on the kind of care required to prepare children mentally, physically, and socially to learn at school (Evans, Myers, & Ifield, 2000).

PLAN Bangladesh has developed an innovative model of early childhood interventions to tackle this problem in Bangladesh (PLAN Bangladesh, 2003). The model combines the development of community capacity with promotion of parenting skills and child learning centers. In this way, communities, parents, and children develop capacities. Although a number of different programs exist in South Asia, mother and child outcomes have not been systematically evaluated. If successful, this model could confidently be expanded to other areas of Bangladesh in conjunction with larger NGOs such as BRAC. If limitations are found, they can be addressed before a nationwide expansion. Furthermore, this evaluation of PLAN's programs will contribute to the current international debate about ECCD programs and useful indicators of their effectiveness.

PLAN Bangladesh has a series of programs designed to support children from birth to the end of elementary school. Currently there are 30,375 children involved in 870 centers (PLAN Bangladesh, 2003). This report deals with the evaluation of children in the preschool program. The preschools, for children of 5 years, focuses on school readiness skills as well as the usual play and story telling. Led by a teacher and four rotating volunteer mothers, children meet in groups of 25 to 30 for 2½ hours 6 days/week to engage in play and curricular activities such as learning letters and numbers.

The objectives of the preschool program include development of the physical, intellectual, social, and emotional aspects of the child, as well as a positive attitude toward learning and schooling. Also, the programs seek to enhance parents' understanding of child development and the demands of schooling, along with their child-rearing practices. A final objective is to promote sustainability of the programs in community settings through capacity building of organizations and individual volunteer mothers; parents pay from 5 to 30 taka per month depending on their income. Consequently, the purpose of this evaluation is to determine whether children who have attended preschool for the year surpass children who have not in their intellectual, social, and physical development.

A number of large- and small-scale evaluations of group care settings for young children have been carried out in the United States (e.g., Hubbs-Tait, Culp, Culp, & Miller, 2002; NICHD, 2000), the United Kingdom (e.g., Siraj-Blatchford et al., 2002), and Canada

(Howe & Jacobs, 1995) among other countries. Whether children demonstrate cognitive and language benefits depends on the quality of the care provided (Brooks-Gunn, 2003). This can be assessed through objective measures such as the adult:child ratio, the training of teachers, and the materials available for play. However, less concrete qualities such as language stimulation, responsiveness, and opportunities to learn through play are responsible for children's cognitive and language development (Engle & Ricciuti, 1995; Tamis-LeMonda, Bornstein, & Baumwell, 2001). Children learn through play, and their play is more cognitively mature in the presence of materials and peers (Eckerman & Whitehead, 1999). Consequently, preschools are thought to enhance cognitive, language, and social-emotional development to the extent that they provide opportunities for language stimulation, responsive interactions, and play.

Despite the difference in culture, stimulation through conversation and play are also essential for mental development of Bangladeshi children under 5 years (Hamadani, 2003). Many parents here are not aware of its value and provide their children few opportunities for exploration, initiative, and conversation (UNICEF, 2000, 2001). In India, one solution has been to promote preschools that provide stimulation for young children, often moving into formal learning well before first grade (World Bank, 2003). The government of Bangladesh has a well organized child health system offering preventive services such as immunization and rehabilitation services for severely malnourished children, but little in the way of pre-primary education. Youngsters of 4 and 5 years, who are sent by parents with their older siblings to government schools, have no organized activities (Bangladesh Education Sector Report, 2002). However, these 42,000 schools serve as a gathering place for over 1 million preschool children. Clearly there is a need for pre-primary learning activities that enrich the lives of young children and prepare them for more formal schooling.

A number of different models are available (Evans et al., 2000). Some in the Indian system use nutrition as a starting point while offering literacy and math teaching (World Bank, 2003). Caution is raised by reports from India that the too-early introduction of formal teaching in reading and arithmetic may be counter-productive (World Bank, 2003). The PLAN Bangladesh system is community based and offers a mix of unstructured learning activities such as play, songs, and story telling, and more formal literacy and math teaching in the preschool (kindergarten) program. It is directed toward, and designed for, underprivileged children whose parents have not attained high levels of education if any. It is not clear whether such a program is more or less beneficial for malnourished, underprivileged children, or whether a certain level of nutrition is required to learn from play and instruction. Nutrition and health issues are addressed only in the parenting sessions which may not be attended by all preschool mothers. At this point there seems to be a desire to make early childhood programs more available in Bangladesh; but without an evaluation of the effectiveness of existing programs, their wider implementation would be premature. Therefore, the objectives of the research were: 1. to examine the impact of the preschool intervention on children and their mothers, and 2. to assess the method of implementation of preschool activities along with the relevance and appropriateness of materials and training of field-level implementers.

Method

Study Design

The design was a cross-sectional comparison of preschool children and matched controls from nearby villages where preschools were not available. Children were randomly selected from preschools or control villages that in turn were randomly selected from three sites. Approval of the protocol was provided by the Research Review Committee and the Ethics Review Committee of the ICDDR,B. Funding was provided by PLAN Bangladesh.

Study Population, Recruitment and Sample

Three rural sites were chosen where PLAN had preschool programs in sufficient numbers: Gazipur, Chirirbandar, and Jaldhaka. Sample sizes were estimated according to expected mean cognitive scores of 10 out of 20 with a standard deviation of 1.5. Setting $\alpha = .05$ and power = .90, an n of 208 for each group provided enough power to detect a mean difference of half a standard deviation, with doubling to compensate for clustering.

Children were recruited from preschools or control villages in the following manner. First, 8 villages (6 from Chirirbandar) were randomly selected from among all those that had or did not have a preschool in the same or adjacent unions. In preschool villages, research assistants went to the preschool and randomly selected 10 children from the class list; if a child did not show up or was clearly out of the age range, the eleventh randomly selected child was substituted. In control villages, research assistants started from four different points in the village, asking families if they had a child within the 5-year age range. If they did, their names were taken and they were asked to show up for a play session later that afternoon. Ten of the children who showed up were randomly selected for inclusion. Consent was obtained from mothers when they were interviewed. All mothers agreed to participate. The sample included 219 preschool children and 208 controls for a total of 427.

We were looking for children born in 1998 who at testing would be between 4 years 11 months and 5 years, 10 months. These children were likely to have been in the preschool program for 10 months and preparing to enter first grade at the beginning of the January 2004 school session. However, exact ages were sometimes not discovered until after cognitive and social development data had been collected. Consequently, it was necessary to identify and analyze only children between the ages of 4.5 and 6.5 in the analysis of cognitive and social development. This resulted in a sample size of 401: 213 preschool children (G: 74, C: 60, J: 79) and 188 controls (G: 50, C: 58, J: 80).

Measurement of Child

Cognitive development was measured with three WPPSI-III (2002) subtests appropriate for children in the 4 to 7.25 age range: Vocabulary, a measure of verbal knowledge and verbal expression, Matrix Reasoning which measures nonverbal analytic reasoning, and Similarities which measures verbal reasoning to identify abstract concepts. Preparation for primary school was assessed with a School Readiness measure. The standard instructions for administration and scoring were translated into Bangla. Social

development was assessed with the Play Observation Scale (Rubin, 2003). Finally, nutritional status was based on the child's weight, height, age, and gender. Greater detail on the measures follow:

1. WPPSI Vocabulary. This subtest assesses children's knowledge of words and their ability to express the word's meaning. Of the 25 items, four items require only that the child name the picture and the remainder ask for the meaning of a word. A probing question is allowed if the child's answer is partially accurate or vague. Seven items were changed from the original in order to maintain the level of difficulty: e.g. banana instead of clock, cow instead of goat, taka instead of letter, leader instead of hero, hospital instead of castle, gentle instead of polite, and binoculars instead of microscope. Answers were scored out of 0, 1 or 2 according to the item, for a maximum of 43. Scores standardized for age and ranging from 0 to 19 were used in analyses. Inter-tester reliabilities comparing assistants' scores with those of a Bangladeshi professional were $r(18) = .65, p < .01$, and the raw score difference across two testings 1-2 days apart was $M = 1.00, t = 1.04, ns$. Validity in this setting was determined by correlating the raw score with age ($r = .19, n = 425, p < .001$); vocabulary scores were also found to correlate with verbal reasoning ($r = .51, p < .0001$).

2. WPPSI Matrix Reasoning was used to assess visual, analytic reasoning in the completion of patterns and analogies. Three practice items provide children the rationale for choosing one out of 4 or 5 options. Five items out of 29 were changed, though the analogy was maintained in each case. The maximum score was 29; the age standardized score out of 19 was analyzed. Inter-tester reliability was $r(18) = .51, p < .03$ and the difference of $M = 0.22, t = .25$ was nonsignificant. Matrix scores correlated with age ($r = .18, p < .001$).

3. WPPSI Similarities. This subtest assesses children's ability to form concepts that capture the similarities between two objects or attributes. On the first 2 items, the tester provides the correct answer if the child does not, in order to clarify what kind of answer is required. Of the 24 items, several were changed to provide ones more familiar in the Bangladesh setting: pants and shirts replaced socks and shirts, mango and guava for apples and oranges, flutes and drums for guitars and drums, bicycles and motorcycles for cars and trucks; rain and ice for rain and snow, sacks and baskets for buttons and zippers. The maximum score was 46, but again age standardized scores were used in analyses. Inter-tester reliability was $r(18) = .64, p < .01$, and the difference in mean raw score was $M = .72, t = .76, ns$. Correlations of raw scores with age were $r = .31, p < .0001$.

4. A School Readiness Scale was developed to assess skills similar to other readiness scales, namely, colours, shapes, letters, numbers, math concepts (taken from the earlier WPPSI-revised), and nature/health (NICHD, 1996-99). The maximum score was 30. Readiness scores correlated with age, $r = .31, p < .001$, and with raw scores of the three WPPSI measures: Vocabulary $r = .43$, Matrix Reasoning $r = .42$, Similarities $r = .42, ps < .0001$, controlling for age. Consequently there is some evidence that these school concepts utilize verbal and nonverbal skills assessed by the WPPSI measures.

5. Social development was measured within the context of free play using the Play Observation Measure (Rubin, 2003). This observational measure assesses 3 levels of sociability (solitary, parallel, interactive) for 4 cognitive levels of play (functional, constructive, dramatic, games with rules). Additional play codes include: unoccupied, onlooker, exploration, reading, peer conversation, adult conversation, and aggression. Children are observed during a 40-minute period of free play on two separate days. Each observer is responsible for 5 children, observing each for 10 seconds and recording the play category before moving on to the next child, and finally back to the first again for another round. This way, 20 10-sec play episodes were observed and coded per day for each child. On the second day, the child was observed by a different observer. The number of 10-sec units during which the child was engaged in each of the play codes was tallied and expressed as a percent of the total. For example, if the child was building a block tower for 10 of the 40 units, he/she received a score of 25% for the category of solitary constructive play.

6. Nutritional status. Children were weighed on a Uniscale and heights were taken with a meter stick following the usual guidelines concerning head angle and body posture. These were converted to weight-for-age, height-for-age and weight-for-height z-scores using both the WHO 1983 and CDC 2000 guidelines; only the latter will be analyzed. Age was determined from the immunization card if possible, from a birth registration card, or from parental report with the help of a Bangla calendar and notable events.

Mother-reported Variables

The mothers reported on their children's health including diet and disabilities, on their own knowledge of child development and their child's needs, and on the family's sociodemographic status.

1. Child's health status. Mothers reported on preventive health behaviours related to the child. A sum of the following 5 practices constituted the preventive practice scores: measles immunization (a good indicator of full immunization), vitamin A drops, iodized salt, safe water, and child's latrine use. A screening measure of 10 disabilities (Zaman, et al., 1990) provided scores from 0 to 10 to indicate the number of motor, sensory, speech and learning disabilities. Mothers were asked if their child had been ill in the past week (diarrhea, cough, and fever were questioned if illness was reported). Food eaten during the previous morning, afternoon and evening were recorded followed by a probe as to whether other foods were usual though not eaten yesterday.

2. The mother's knowledge of her own child's needs was assessed with six open-ended questions scored from 0 to 3. These asked what the child played, topics he/she liked to talk to the mother about, questions asked of the mother, what the mother would say to prepare her child for school, causes of child sickness, and ways to soothe a crying child. Any good answer was given a point for a total of 18. The alpha coefficient for these was .54. The mother's knowledge of child development was assessed by asking at what age she expected a child to be able to perform certain milestone behaviors, such as feed him/herself, want to play with other children, start to read a book, start to count money, and visit relatives in another village alone. The alpha coefficient was .58. Knowledge of

the child's needs and expectations for attainment were uncorrelated ($r = .07$). Identical questions were asked of the father though only 187 were available to complete it.

3. Family sociodemographic status. Mothers reported on the household members, their age, gender, educational attainment, and occupation, and the family's religion. Economic status was assessed with questions about the ownership of 11 assets commonly included in the Bangladesh Health and Demographic Surveys (e.g. table, chair, wardrobe, bed, watch, latrine, bicycle, tube well, radio, electricity and television), ownership of a homestead and of land for production, and household income per month. The sum of all assets had an alpha of .82 and correlated highly with income, owning land for production, mother's education and father's education: $r_s = .39, .33, .59, .55$, respectively, $n = 427$, $p_s < .0001$. As it was less likely to have missing data, assets was used as the economic status indicator of the family. The mother's decision-making status was determined with 3 questions about whether she alone (scored 2), or jointly (scored 1) or never (0) decided what food to give the children, what medical care to seek if someone was sick, and whether to send her children to school; the composite with an alpha of .73 was the mean of the three items and could range from 0 to 2.

4. The length of time the target child had attended any early schooling was recorded, along with the mother's attendance at parenting sessions held by PLAN. Families whose child attended the PLAN preschool were asked their opinion on the program: what new they had learned, what their child had learned, whether they now did anything differently with their child, and their evaluation of the preschool experience as very good (3), good, more or less good, or not good (0).

Measurement of Preschool Quality

An internationally used observational measure, the Early Childhood Environment Rating Scale – Revised (ECERS-R), was used along with observations of materials and teacher-child verbal interaction, and an interview conducted with teachers and supervisors.

1. The Early Childhood Environment Rating Scale – Revised (ECERS-R Harms, Clifford, & Cryer, 1998), an observational measure, assesses the quality of the program offered in terms of 7 subscales plus 2 concerning literacy and math (Sylva & Siraj-Blatchford, 1998). Because the preschool offered a half-day program, certain items concerning meals and naps were excluded. Three other items automatically received zero scores because there were no TVs, videos, soft toys, or cozy areas, and little attempt to protect privacy. On other items, qualitative terms were defined quantitatively for this context, e.g. enough blocks meant 20 per child so 40 were enough for two children, enough space meant 1.5 m² per child, a variety of water toys meant 5 differently shaped objects, and some books meant 10. Inter-observer reliabilities were calculated on 7 preschools, comparing ratings made by pairs of assistants over three mornings with those of the PI made on one morning. Across all items, there was full agreement on the 1-7 score assigned on 74.5% of the items, a rating difference of 1 on 18.1% and a difference of 2 on 7.4% of the items. The alpha coefficient indicated high internal consistency across 7 and 9 subscales (alpha = .81 for the 7 subscales and .83 for the 9 subscales). The Tamil Nadu measure (Isely, 2001) derived from the ECERS, with its 56 items (52 used

here as 4 did not apply) scored on a 0 to 2 scale was used on only 6 preschools because it did not yield enough variability or identify areas for improvement.

2. Ratings were made on the presence, repair and use of 13 materials: picture posters, books, story pictures, blocks with numbers (dice), blocks, bamboo, puzzles, water/sand containers, colored pencils, dress-up clothes, dolls, toy kitchen items. The rating format was 0 (absent), 1 (poor repair, unused), 2 (poor repair, used), 3 (good repair, unused), 4 (good repair, used). Ratings were averaged; this average correlated highly with both the 7-subscale and the 9-subscale ECERS-R ($r_s = .67$ and $.63$, respectively, $df=22$, $ps < .001$).

3. Communications between individual children and the two adults (teacher and volunteer mother) were observed and tallied for each activity except play, which was scored using the Rubin play measure (see above). During seven different activities, each verbal communication made by a child was noted as well as whether or not it received a direct response. The proportion of child speech that received a reply was calculated.

4. Teachers were individually and privately interviewed. They were asked about their time in this position, educational attainment, total days of training, supervised days per year, refresher course days per year, who decides what they teach, their pay in the past month and what proportion came from parents and from PLAN. Ten open-ended questions about preschool issues were asked and later scored for number of reasonably correct answers: what children learn during free play, what they learn from guided play, how to arouse a positive attitude toward learning, what to do with a slower learner, how to handle a frequently absent child, how to handle an inattentive child, what to do with a child who does not want to pretend play, what children learn from blocks and puzzles, child-friendly actions and reasons for using a child-friendly approach. Supervisors of these teachers were also interviewed with the same questions.

Eligible but Non-participating Mothers

Mothers who had children in the eligible age range but who did not send their children to the preschool were identified through village mothers and interviewed. The sample is obviously not representative and there were different numbers from each village. However, questions were posed to determine if they had ever heard of the PLAN early childhood activities, knew someone who attended, ever attended themselves, and their reasons for not attending now. Reasons were inquired in an open-ended fashion at first and then by proposing 10 possible reasons, such as child too sick or young, no time or money, prevented by family or neighbours.

Procedure

Twelve research assistants, with university degrees, were trained for five days to conduct the testing. The training was conducted by the PI and a Bangladeshi research colleague. The cognitive, social, nutritional, and ECERS measures were practiced at nearby preschools. At this time, inter-observer reliabilities were obtained for the cognitive tests. The assistants were also observed by trainers during their first few days of data collection

and on at least one other occasion during the 6-week conduct of the study, at which time inter-observer reliabilities were obtained for the ECERS-R.

Data were collected from mid-September to mid-November. Pairs of research assistants spent 3 days in each village collecting the interview and observational data. They rated ECERS-R items on the first and third morning, and communication and materials on the second morning. The play measure of social development was conducted on the first and third mornings; cognitive tests were administered to the children at their homes in the afternoons, when mothers and fathers were interviewed. Teachers and supervisors were interviewed in a private place outside of preschool hours. The PI interviewed from each site the Unit Manager, Learning Coordinator, and Technical Officer, and from Head Office the ECCD specialist who designed and coordinated the program and training of implementers. Three manuals prepared for the preschool program were read to determine the objectives, the activities implemented to achieve these objectives, and teacher training (PLAN Bangladesh, 2002). Consent was obtained from all those interviewed except children whose parents vouched for them.

Method of Analysis

Preliminary tests were conducted to determine differences between preschool and control children on variables related to demographic and socioeconomic status. Frequencies and mean scores were therefore calculated for the two groups. Correlations of these variables with the cognitive and social outcomes were used to identify ones that required covariation in the final analyses. The major analyses examined differences between preschool and control children on the vocabulary, matrix, similarities and school readiness scores, and on the social and cognitive levels of play. Analysis of covariance (ANCOVA) was used to examine group differences covarying SES and other variables, such as age and height for age, found to correlate with both group and the dependent variables. Means rather than adjusted means will be presented as the two were almost identical. Additional analyses examined whether preschool benefited one gender over the other, one SES group over the other, and one nutritional status group over others. The most complete analysis included a design looking at site, group, and villages nested within site x group, but although there were some site differences, there were no Site x Group interactions. Consequently, sites were combined. Secondary analyses were conducted on the preschool data alone to examine the quality of the program and whether this correlated with child outcomes.

Results

Description of Sample

Table 1 provides frequency distributions for the categorized data for preschool and control children (Appendix A and B show distributions for the three sites separately). Table 2 provides means and standard deviations for continuous variables along with t-test comparisons of the preschool and control groups. Preliminary analyses indicated that there were no gender differences on outcome variables such as cognitive and social development, nutritional status, and mothers' knowledge, except that girls engaged in more dramatic play and boys more constructive play. Consequently data for boys and girls have been combined.

Differences between preschool and control children were not found on preventive health behavior (e.g. immunization, vitamin A, iodized salt), current malnutrition (weight for height), mothers' knowledge about her child's needs or the age when competencies are acquired. However, there were significant differences in the children's ages (preschool were 2 months older on average), mother's education, assets, weight for age and height for age. These differences favored preschool children. However, more preschool children had disabilities (see Table 3). To identify variables that required covarying in the child outcome analyses, correlations were performed with the WPPSI and readiness scores (see Table 4). Standardized WPPSI scores correlated negatively with age indicating that with age children declined in relation to age norms (however their unstandardized scores correlated positively with age). They correlated positively with chronic, but not acute, malnutrition. Readiness scores, which were not standardized for age, correlated positively with age, as expected, and positively with mother's and father's education and family assets. The four covariates in subsequent analyses were therefore age, assets, mother's education, and height for age. Assets correlated highly with all other SES indicators, namely income, parent education, and home and land ownership; it was therefore chosen as the indicator of SES. Mother's education and nutritional status are typically considered as important protective factors for child health and survival.

Cognitive and Social Outcomes

ANCOVAs were conducted on the four cognitive scores standardized for age, while covarying age, height for age, mother's education and assets. The results are presented in Table 5. On vocabulary, matrix reasoning, and similarities, preschool children performed significantly better than controls. On the School Readiness test, preschool children performed quite a bit better than controls. The effect sizes for the WPPSI measures were consistent and significant, yet small ($d = .20$); whereas the effect size for readiness was very large.

ANCOVAs were similarly conducted on play using group (preschool, control) as a between-groups factor and the three levels of sociability during play (solitary, parallel, and interactive) as a repeated factor. Group yielded a significant main effect, as did the Group x Sociability interaction. T-tests on each social level indicated that groups differed

only on the third level, in that preschool children showed more interactive play than controls (see Table 6).

Similarly a 2 (group) x 3 (level) ANCOVA was conducted on the three cognitive levels of play, namely functional, constructive, and dramatic. There were too few game episodes to include this fourth level. Again the Group x Cognitive interaction was significant. T-tests showed higher levels of functional and constructive play, and lower levels of dramatic play, among preschool children. Conversation episodes with peers and adults were compared and in both cases preschool children showed more conversation than controls; there was no interaction. The differences were not particularly large, especially given that preschool children had spent six mornings a week for 10 months with the peers and adults.

T-tests conducted on other play categories indicated that control children engaged in more onlooker behavior namely watching others play, more time exploring the materials, and more time looking at books; children commonly use these visual behaviors when they find the material novel. Control children did not show more unoccupied or wandering behavior. Nutritional status, in terms of height for age but not wasting, correlated significantly with several forms of play indicating that stunted children were less likely to engage in interactive play ($r = .16, p = .002$), and constructive play ($r = .16, p = .002$), and more likely to be onlookers ($r = -.25, p = .0001$). This analysis controlled for mother's education and family assets.

Separate ANCOVA analyses were conducted to examine whether gender, assets, and height for age interacted with preschool experience. None produced a significant interaction. Thus, all children benefited equally from the preschool experience. Only height-for-age category (moderate/severe, mild, normal) yielded a main effect greater than the preschool effect and this was on vocabulary. There was a small but non-significant gender x preschool interaction: control girls performed worse than boys, but girls in the preschool group obtained scores equal to or higher than boys. Thus, both benefited, but girls slightly more so because of their lower non-intervention levels.

Children's Physical Health

A large portion of both preschool and control children were underweight (see Tables 1 and 2) though the preschool children had better weights and heights for their age and gender. Still, almost half were moderately to severely underweight and one-quarter stunted. Fourteen percent of our sample were severely wasted. Although stunting but not wasting correlated with cognitive and some social scores, neither was associated with expected sociodemographic variables, such as mother's or father's education, family assets, income, mother's decision making power, health prevention, past-week illness, or mother's knowledge about child development. However, children ate more food on the previous day, especially protein, fruit, milk and bread, if the mother's education was higher ($r_s = .17$ to $.28, p < .001$) and the family had more assets ($r = .21$ to $.32, p < .001$), though not higher income.

ECERS-R: Quality of Preschool

Table 7 shows descriptive statistics for the 9 subscales and the totals. The mean for the total 9-subscale score was 3.16 out of 7 with a range of 1.8 to 3.7. The highest scores were obtained for the mathematics, literacy, and interpersonal interaction subscales where some preschools scored above 5. The Tamil Nadu ECERS, which was scored on a more restrictive range from 0 to 2, yielded a mean score of 74.8%, and a range of 70% to 82%. When transposed onto a scale from 1 to 7, the mean was 5.48 and range 5.2 to 5.9. The restricted scoring system thus led to a very narrow range and scores that were close to ceiling. Thus, by South Asian standards, the preschools have very high quality; whereas by international standards the quality is mid-range.

The mean score for materials was 2.83 out of 4 indicating most of the expected materials were present and in good repair but not always used. It was noticed, for example, that teachers did not often use the colored posters and children did not often use the puzzles or story books. Absent were dress-up clothes and colored pencils in many cases. The fact that the material score correlated so highly with the ECERS-R ($r = .63, p < .001$) may indicate one of two things: either the ECERS below midpoint depends largely on the presence and use of materials, or higher levels of quality were not reached because of a lack of sufficient variety of materials.

The number of child-to-adult communications totaled on average 25.27 over a 2 hour period (excluding the free play time). Most came during the literacy, math and environmental science classes. Approximately 35% of these spontaneous remarks received an adult response. The responsiveness ranged from 0 to 52%, and was positively associated with enrolment ($r = .73, p < .01$). These data came from 14 preschools only.

Although the number of preschools was small ($n=22$), correlations were performed between quality indicators and group cognitive scores. That is, for each cognitive test, a standardized mean was calculated for each preschool class and this was correlated with the 9-subscale ECERS, materials and responsiveness. The correlations for Vocabulary were: ECERS $r = .00$; Materials $r = -.10, ns$; Responsiveness $r = .57, p < .03$. For Matrix Reasoning they were: ECERS $r = .47, p = .03$; Materials $r = .41, p = .06$; Responsiveness $r = .53, p = .05$; for Similarities they were: ECERS $r = .35, p = .10$; Materials $r = .23, p = .30$; Responsiveness $r = .25, p = .40$ (p s are high here because of the small number of preschools). Thus, ECERS score was associated with verbal and nonverbal reasoning, materials more with nonverbal reasoning, and responsiveness with vocabulary and nonverbal reasoning.

Time spent in early childhood classes among preschool children only (6 to 36 months) was associated positively with school readiness ($r = .20, p = .004$) and positively but nonsignificantly with matrix reasoning ($r = .11$) and similarities ($r = .12$). Children who had spent more months in early childhood programs also showed less solitary play ($r = -.23, p = .009$) and more time in parallel play ($r = .24, p = .004$) though months in the program did not affect the cognitive level of their play. These analyses controlled for age, as older children had spent more time in the programs.

Teachers and Supervisors

There were 22 preschool teachers and only 13 supervisors who generally supervise more than one preschool. Comparisons of the two groups indicated that they were similar except with respect to education attainment, days trained by PLAN, and pay. On these dimensions, supervisors exceeded teachers (see Table 8). Knowledge on how to deal with specific child problems and the application of concepts such as child-friendly teaching was similar in the two groups and not as high as might be hoped. For example, on the question of what is learned from block/puzzle play and why one uses the child-friendly approach, teachers scored below the 1.5 midpoint and supervisors were not much higher. The question on what is learned from free play was poorly answered and excluded from the composite. Except for access to latrines, teachers and supervisors uniformly were very positive when evaluating aspects of the program.

Mothers' Child-Rearing Practices and Knowledge

Information obtained from the mothers concerned preventive health practices for their child, such as immunization and use of a latrine, as well as what food they fed their child yesterday and usually. Mothers in the preschool and control villages had fulfilled on average 4 out of 5 preventive measures, yet 25% of their children had been sick in the previous week. Of the three preschool sites, Gazipur mothers were most likely to have taken their children to a clinic (77%), use a latrine, and have an immunization card though both Gazipur and Chirirbandar had over 90% immunization rates. Over half the children in Chirirbandar did not use a latrine for defecation; in Jaldhaka both sanitary defecation and regular use of iodized salt were problems (see Table 1 and Appendices).

Concerning food, most children usually ate rice, protein and vegetables. Fewer were served dal, fruit or milk. Approximately half the children were moderately or severely underweight; somewhat fewer were stunted, and 14% were severely wasted (z score less than -3.00 on weight for height). Although Preschool children had significantly higher nutritional status according to their weight- and height-for-age, they did not differ in the proportion who were severely wasted (weight for age < -3.00) or in the variety of foods out of the 7 usually eaten ($M_s = 4.58$ Controls and 4.50 Preschool), or the frequency of eating these foods yesterday ($M_s = 6.5$ Controls and 6.6 Preschool where 7 foods were questioned for 3 time periods during the day). Most children ate two food items at each of the three time periods.

Mothers' knowledge about child development and child needs was equivalent in the preschool and control groups with an overall mean of close to 11 out of 18 on the six items. Table 9 shows the means for the composite and each separate item. These were open-ended questions where mothers were encouraged to provide as much information as they could with probes such as "What else?" They knew most about how their child played and topics the child wanted to talk about. They were least informed about causes of child sickness where the most common answers were bad food and cold weather. Preschool mothers differed from control mothers on one item only, namely on what they would say to prepare their children for school. A significant difference among the three

sites ($F= 110.83$, $df = 2,394$, $p < .0001$) along with a Group x Site interaction ($F = 8.19$, $p = .0003$) pointed to higher knowledge among preschool mothers in Gazipur only.

Mothers were not very aware of how early children develop competencies to function independently. For example, on the questions where they were asked the ages when children could perform certain activities, they were generally late relative to children's actual competencies. On average they expected children to be able to feed themselves only after 2 years of age (at least 12 months too late), and to begin to want to play with others at slightly under 3 years (again, at least 12 months too late). Mothers with children in preschool expected earlier ages for two items: starting to read a book (4.5 years) and count money (6.5 years). This clearly arose from knowing that their children were reading books and learning to count in preschool. Most mothers had personally visited the preschool (84%) and could list close to three new things their child had learned at preschool. However only 20% attended parenting sessions and so they were less aware of what they might have learned.

Evaluation of the preschool program by mothers was very positive with an overall mean of 2.16 on a scale from 0 to 3. Thus, the majority evaluated it as good to very good. The most positive response came from Gazipur where 42% rated the program very good. However, the ANOVA showed no significant difference by site.

Reasons for not Participating

Seventy-four mothers with non-participating children were not randomly selected from with preschool villages, but it happened that half were boys and half girls. Most had heard about PLAN's ECD activities and two-thirds knew someone who participated. Three-quarters had not ever participated themselves. Most of the mothers had a reason for not participating when asked with an open-ended question. Of the ten reasons we offered, the most likely were that they had no time or money to devote to the activities, that their child was too young or they lived too far away from the preschool. Very few mentioned a negative impression of the activities or thought it unnecessary.

Discussion

The objectives of the research were: 1. to examine the impact of the preschool intervention on children and their mothers, and 2. to assess the method of implementation of preschool activities along with the relevance and appropriateness of materials and training of field-level implementers. This discussion will therefore be organized into two sections to deal with each objective. Recommendations follow.

1. Child and Mother Outcomes

Children in the preschool were very successfully prepared for first grade as evidenced by their significantly higher scores on the School Readiness Test in comparison to control children. The Readiness test assessed not only writing skills but also math concepts and arithmetic operations. The preschool children also performed better than controls on tests of vocabulary, verbal reasoning and nonverbal reasoning. Several findings were notable and require a more nuanced interpretation. One is that levels of vocabulary and reasoning were generally low in all children, and were lower than expected in preschool children given their 10 months in an early childhood program. This suggests that better use of time and materials would enhance these language and cognitive skills more. Children almost reached ceiling on the Readiness Test and perhaps are spending too much time on language and math instruction and not enough on cognitive development. There is the possibility that children are overlearning material by rote and not by reason; the latter would benefit them more in the long-term because higher math and science require conceptualization.

Social-emotional development was also enhanced in the preschool children compared to controls. Of the three levels of social sophistication, preschool children showed more of the highest, namely interactive play. They also had more conversations with peers and adults during play, but not as much as expected. Of the three levels of cognitive sophistication, preschool children's play was not consistently better: they showed more of the lowest (functional) and less of the highest (dramatic) cognitive levels, but also more of the middle level, namely constructive play, which can be very beneficial. Preschool children were less likely to be simply watching another's play, but like control children they spent on average 10% of their time unoccupied. As play is one of the most important ways for children to acquire hands-on cognitive development and the emotional confidence to initiate and sustain their own goal-directed behavior, improvements could be made here. It was noticed during the observation of activities and evaluation of training that teachers were not aware of the purpose of free play or its proper implementation. Sufficient novel and age-appropriate materials were also lacking. Preschool children may have done more functional and less dramatic play because they were bored with the materials, and they lacked stimulating conversation with adults to help them find new challenges.

Preschool children came from the kinds of homes that PLAN hopes to engage. On average, their parents had not reached fifth grade and many had no formal schooling at all. Two-thirds owned their own land for production but did not own many assets beyond home furniture and a tubewell. Fewer than half had a latrine, bicycle, wardrobe, radio or

electricity. Almost half the preschool children were underweight and 23% were stunted; these rates were lower than control children but it is not clear whether the less poor nutritional status of preschool children was due to the program. Current diet did not seem to be any better for preschool children, in that most usually ate rice, protein and vegetables, but not milk, dal or fruit. Children with better educated mothers and more family assets ate more of the food groups but this did not translate into greater height or weight. However, height-for-age was importantly associated with vocabulary, reasoning, and play. Children who were taller had better vocabularies, better verbal and nonverbal reasoning, better school readiness skills, more group and constructive play, and less onlooker behavior. Current nutritional status, indicated by weight-for-height, was not associated with any of the cognitive or social outcomes, thus minimizing our concerns that children experiencing current lack of food would perform worse.

Mothers in both preschool and control groups had attended to the health preventive measures available to them, namely immunization, micronutrient supplements, and safe water. However, latrine use by children and iodized salt in the north could be improved. A higher percentage of preschool children had some disability according to their mothers – 38.2% vs 17.6% of control children. This may be due to PLAN's explicitly welcoming attitude toward children with disabilities (e.g. epilepsy), or because mothers were more aware of cognitive and sensory disabilities as a result of the preschool experience. This could be a positive, if unexpected, outcome if these children are not isolated and stereotyped by their families.

The mothers generally were very positive about the preschool experience, especially in terms of what their child had learned. They were not aware of learning new things themselves, perhaps because 80% did not attend parenting sessions. A six-item test of what they knew about their child's needs showed knowledge above the midpoint but no higher than control mothers, except in how they would talk to their child about starting school. They were particularly ill-informed about causes of child illness. Mothers were also late in the ages they expected for certain developmental milestones, such as self-feeding and playing with others. It appears that most mothers had visited the preschool, and this opportunity could be taken to provide pictorial information about child development.

Quality of Preschool Activities and Materials

The quality of the preschool intervention was assessed using several indices which tended to intercorrelate. The sole exception was the Tamil Nadu quality measure on which all the six preschools I observed were performing well above the midpoint at 5.48 out of 7. It was apparent when using this measure that the nature of the items and the range of ratings were too narrow (0 to 2) to reflect the variability among preschools. It was also unable to identify areas for improvement.

On the international ECERS-R measure, the preschools were providing a program that scored 3.16 on a 1 to 7 scale, though some scored close to 4 on average and 7 on particular items. They looked especially good on subscales concerned with literacy, mathematics, and interpersonal interaction. They looked poorer on subscales concerned

with activities and program structure, mainly because they lacked a variety of challenging materials and because the adults did not facilitate individual progress through hands-on activity. Independent ratings of the materials and of individual child-adult communication confirmed the ECERS findings. The importance of these three indicators is strengthened by their significant association with group cognitive scores; preschools with better ECERS, materials and adult verbal responsiveness tended to have children with higher vocabulary and reasoning scores. Thus, one critical tool for improvement will be the ECERS and plotting preschools' progress as they move from a score of 3 to a score of 5 on most of the subscales.

It became clear when examining the Teacher Manuals that the teachers were performing as expected. They followed the syllabus closely and used the materials given to them as they were taught. They tended to evaluate the program and materials very positively, and the technical officers offered few suggestions on needed improvements to the program. It was my observation that the implementing staff were thoughtful, energetic, conscientious, and dedicated. They enjoyed working with the children and performed their instructional responsibilities in a professional way. There was a great deal of consistency in the way teachers taught, the materials they used, and the unfolding of each daily activity. By implication, the best route for improvement would be through the Curriculum & Syllabus and Teachers' Guide which every teacher and trainer used to implement the program. This is perhaps the best place to start making changes which can then be passed on to technical officers, who need to understand the rationale behind the changes, and to teachers who will see immediately how they impact on children.

A few examples highlight changes to activities and program that would impact vocabulary and reasoning as well as the social and cognitive levels of play. Children's vocabulary and verbal reasoning would improve if teachers read a story every day and had 50 storybooks to discuss instead of 10. Verbal Reasoning would improve if there were more imaginative play themes and rule games. Matrix Reasoning would improve if there were more numerous and complicated construction materials to play with, including blocks, puzzles, and artwork. Free play is a difficult concept for teachers to grasp and they need help understanding what cognitive and social skills are learned through play that cannot be learned through instruction. The current practice, which we altered to conduct the Rubin play observation, is to tell children where to play and move them to another corner at the teacher's discretion. This stifles the development of self-directed and goal-oriented behavior, limits the social level of play as children are not with friends who like those activities, and prevents children from learning through the activities at which they excel. Teachers also have not acquired the skills to use non-instructional talk when helping a child to expand his/her communication and attempt a more challenging task. These changes in materials and communication would be a good start as they are known to impact children's language and cognition.

Finally, here as elsewhere the pivotal person in the program is the preschool teacher. The children, parents, volunteer mother, and PLAN look to her to provide quality activities. The role of the volunteer mother was not specifically assessed, but in most cases it was clear that this person played a useful and supportive role handling disruptive children,

interacting with small groups of children during a learning activity, and drawing lines on children's slates. With 25 children in a classroom, the teacher needed help in providing more individualized attention when she was instructing. In addition, the volunteer mothers could play a greater role during free play. This would entail being available to watch individual or groups of children and converse with them. If this is the case, then volunteer mothers may require more training in how to interact with children during play. This would be a good take-home skill. Non-instructional talk is largely missing from the preschools and the best time for this is during free play. Reasoning is developed through words and perceptions that accompany personal actions on materials. These words and perceptions later become internalized as thought (Vygotsky, 1962). Rote repetitions never tell you what the child knows; furthermore during rote repetitions, the child is not forced to stop, struggle and understand. Teachers and volunteer mothers typically worked well as a team, but both need to learn about facilitating and expanding children's ongoing activity with non-instructional talk.

Recommendations

The following recommendations are made in the spirit of improving what is already a very good program, with personnel who have the competence and commitment to take it forward.

1. Expand considerably the importance attached to Free Play.

This is the most important activity of the day, and implements the objectives of the program in terms developing a hands-on learning process that builds on the strengths of each individual child. It is an important opportunity to enhance all the domains of development. It should therefore be held every day. A greater quantity of materials should be bought or made so that children can sustain an activity without running out of materials, and so they can be rotated to introduce novelty. More complex materials are needed to be challenging for this age group, e.g. up to 16-piece puzzles. Teachers should be involved helping children to expand on their play and language.

2. Stories with new vocabulary, character development and a story line should be read every day, followed by discussion.

Children need at least one new book read to them each week. Books can be re-read on the other days of the week. Books should have an exciting story line, with a variety of themes. Half-page coloured pictures and half-page words with approximately 12-15 pages per book would be good for this age group. The teachers are good at reading the books, but they all need more training in how to discuss the meaning of words in the story context and how to encourage children to talk about the causes and consequences of story events.

3. More child-directed activity is required in the literacy and math classes.

Children spend a lot of time in these classes, and the focus should be on giving them less of the first grade curriculum and more of the skills to develop and use literacy and math in the coming years. This requires bringing language and math from the community into the classroom, and teaching the reasoning behind words and math operations through hands-on manipulation of words and shapes. Variety in the methods of teaching would also provide more excitement to these classes.

4. Novelty in methods and materials would help children to learn something through multiple means and this strengthens future application.

A greater variety of materials are needed in all the courses in addition to Free Play. Teachers could then rotate materials for increased novelty. Methods should likewise be more variable rather than using the same large group, small group and individual methods to teach the same language and math skills. Children may like to work with friends in a dyad, tell a story to the class, describe their artwork, or keep their own diary of drawings, words, and numbers.

5. Re-write the Curriculum, Syllabus, Teachers' Guide and Training Manual to take into account these changes.

Teachers, technical officers, and supervisors work from these books, so it is important to institute changes through these documents.

6. Teachers need training in non-instructional talk.

Most of teacher talk is instructional in that it is one-directional with the intent of telling children what to do or what to learn. There will be lots of this in primary school, so preschool is the place to help children expand on their language and cognitive skills through non-instructional talk. Teachers need to learn how to "expand" on children's speech and provide a framework from which children can develop more sophisticated language and cognition. This is difficult and needs to be modeled and rehearsed.

7. A health program could be introduced into the early childhood program.

Children are able to perform certain health behaviors, such as hand-washing and eating the foods available at home. They are also able to provide stimulating play activities for younger siblings, and to inform their parents about diseases and sanitation. The Environmental Sciences class could use more hands-on activities to reinforce these practices.

8. Parenting sessions could be expanded and made more attractive and convenient.

Parents do not realize that they can learn about their own child's needs from their child's preschool experience. Maybe another format needs to be tried to encourage parental participation, such as having afternoon meetings in a village home and letting parents decide on the topic of discussion. Keeping the meetings to a minimum and introducing a few important ideas would be good at this stage.

9. The job description of supervisors could be changed so that they are not simply less experienced middle-men.

Compared to preschool teachers, they now have less experience, equal knowledge, and more education and pay. Perhaps with the introduction of novel materials and methods, they could become resource people, helping teachers to implement novelty.

10. Ongoing evaluation using action research would keep the program improving.

Changes are now being introduced and should be evaluated by the teachers and technical officers. Child outcomes must also be included. Currently the child assessment focuses most on literacy and math competencies as they are addressed through literacy and math instruction. Greater awareness of language, cognitive, and social competencies is needed in order to know if these, too, are being addressed and enhanced. Commitment to continuous research will need to be discussed at all levels.

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Table 1. Frequency distribution for categorized health and SES data (n = 401)

	Preschool (n=213)		Control (n=188)	
	Number	%	Number	%
Gender: boys	98	46.0	100	53.2
girls	115	54.0	88	46.8
Clinic attendance: yes	98	46.0	62	33.2
Immuniz card: yes	86	40.4	99	52.9
BCG: yes	203	95.3	179	95.7
DPT: 0	16	7.5	9	4.8
1-2	20	9.4	5	2.7
3	177	83.1	173	92.5
Polio: 0	8	3.8	10	5.4
1-2	15	7.0	4	2.1
3	190	89.2	173	92.5
Measles: yes	183	85.9	171	91.4
Vitamin A: yes	201	94.4	181	96.8
Iodine Knowledge	188	88.3	163	87.2
Iodized salt	184	86.4	149	79.7
Safe water	208	97.6	186	99.5
Sanitary defecation	108	50.7	76	40.6
Sick past week	54	25.3	47	25.1
No Disability	131	61.8	154	82.4
1 and 2	69	32.5	27	14.4
3 or more	12	5.7	6	3.2
Weight for age: z < -2.0	104	48.8	112	59.9
-2.0 < z < -1.0	64	30.0	53	28.3
-1.0 < z < +.47	45	21.2	22	11.8
Height for age: z < -2.0	50	23.5	86	46.0
-2.0 < z < -1.0	79	37.0	56	29.9
-.99 < z < + 1.0	84	39.4	45	24.1
Weight for height: z < -2.0	76	35.7	70	37.4
-2.0 < z < -1.0	66	31.0	69	36.9
-1.0 < z < + 1.8	71	33.3	48	25.7

Usual Food:	rice	212	99.5	186	99.5
	dal	94	44.1	62	33.2
	protein	165	77.5	162	86.6
	fruit	117	54.9	116	62.0
	vegetable	171	80.3	140	74.9
	milk	82	38.5	64	34.2
	bread	116	54.5	126	67.4
Mother's education:	none	104	50.7	118	63.1
	primary school	35	17.1	33	17.6
	secondary +	66	32.2	36	19.3
Father's education:	none	86	43.0	97	52.7
	primary school	43	21.5	36	19.6
	secondary +	71	35.5	51	27.7
Live with grandparents		43	20.2	17	9.1
Religion:	Muslim	135	63.4	146	78.1
	Hindu	78	36.6	41	21.9
Own home		195	91.6	145	77.5
Own land for production		145	68.1	97	51.9
Preschool	<12 mo	155	73.7	1	.5
	12+ mo	58	27.3	0	0

Table 2. Means (sd) and t-values comparing Preschool and Control Children (n=401)

Variable	Preschool	Control	t (399)	p
Child's age	65.90 (5.2)	63.78 (5.2)	4.00	<.001
Mother's education	2.94 (4.1)	1.79 (3.5)	3.13	.0019
Father's education	3.81 (4.7)	2.96 (4.5)	1.82	ns
11 Assets	5.67 (3.0)	4.58 (2.9)	3.66	.0003
Income	2631.0 (2767.5)	2275.6 (1907.4)	1.88	ns
Decision-making (0-2)	1.24 (.43)	1.26 (.43)	.60	ns
Preventive health (0-5)	4.03 (.86)	3.96 (.84)	.81	ns
Child disability (0-10)	.62 (1.0)	.28 (.73)	3.71	.0002
Weight/age	-2.13 (1.1)	-2.57 (1.30)	3.44	.0006
Height/age	-1.44 (1.1)	-1.93 (1.20)	4.25	<.0001
weight/height	-1.85 (1.3)	-1.89 (1.30)	.27	ns
Mother's knowledge (0-18)	10.7 (3.2)	11.0 (3.0)	.49	ns
Mother's age expt (in mos.)	54.46 (13.6)	55.74 (11.9)	1.00	ns

Table 3. Number and percent of children with disabilities

Disability	Preschool (n=212)		Control (n=187)	
	No.	%	No.	%
1. Delay in motor milestones	23	10.8	11	5.9
2. Difficulty seeing	6	2.8	7	3.7
3. Hearing difficulty	14	6.6	6	3.2
4. Comprehending instructions	10	4.7	5	2.7
5. Weakness in limbs	16	7.5	5	2.7
6. Epilepsy	8	3.8	0	0.0
7. Difficulty learning	11	5.2	3	1.6
8. Speech	2	0.9	1	0.5
9. Articulation	23	10.9	7	3.7
10. Mentally delayed	19	9.0	9	4.8
Total with more than one disability	81	38.2	33	17.6

Table 4. Intercorrelations among standardized cognitive scores and child health and SES

	<u>std Vocab</u>	<u>std Matrix</u>	<u>std Similar</u>	<u>Readiness</u>
Gender	-.09	-.04	-.01	-.04
Age	-.26 *	-.33 *	-.28 *	.31 *
Mother's education	.07	.11	.10	.14 *
Father's education	.08	.13 *	.09	.09
Assets	.10	.09	.08	.17 *
Disability	-.06	.01	-.01	.01
Weight/age	.17 *	.16 *	.15 *	.26 *
Height/age	.29 *	.24 *	.21 *	.31 *
Weight/height	-.05	-.01	.01	.05
Intercorrelations among unstd scores partialling out age				
vocab		.27 **	.47 **	.43 **
matrix			.29 **	.42 **
similarities				.42 **

* $p < .01$; ** $p < .0001$

Table 5. Means (sd) and ANCOVA Statistics on Cognitive and Social Indicators of children 4.5-6.5 yrs

Indicator	Preschool ($n = 203$)	Control ($n = 185$)	Source	F	df	p
Vocab std	8.10 (1.8)	7.71 (2.2)	Group	4.98	386	.026
Matrix std	5.24 (2.2)	4.99 (1.9)	Group	3.96	385	.047
Similar std	9.22 (1.5)	9.00 (1.6)	Group	3.78	387	.05
Readiness	21.75 (5.5)	13.07 (5.9)	Group	50.26	386	<.0001
Solitary	30.9 (16.6)	31.4 (17.8)	Group	10.51	1,385	.001
Parallel	7.15 (9.5)	8.14 (11.5)	Social	1.96	2,770	ns
Interactive	17.63 (14.6)	6.56 (9.6)	Gp × Soc	17.24		<.0001
Functional	17.90 (14.2)	12.46 (12.9)	Group	7.88	1,385	.005
Constructive	22.47 (17.5)	14.45 (18.4)	Cognitive	.22	2,770	ns
Dramatic	13.98 (14.9)	18.89 (18.4)	Gp × Cog	11.46		<.0001
Peer Conversation	10.58 (7.3)	8.38 (9.3)	Group	13.72	1,385	.0002
Adult Conversation	3.56 (4.3)	1.41 (3.3)	Person	.18	1,385	ns
			Gp × Per	.53	1,385	ns

Table 6. Means (sd) of preschool and control children on all play categories as a percentage of total play units observed.

Play category	Preschool	Control	t(397)	p	Overall M	Range
Solitary	30.8 (16.6)	31.32 (17.8)	.30	ns	31.04 (12.2)	0-80
Parallel	7.43 (9.5)	8.113 (11.4)	.67	ns	7.76 (10.5)	0-65
Interactive	17.71 (14.8)	6.63 (9.6)	8.73	<.0001	12.52 (13.8)	0-69
Functional	17.77 (13.8)	12.39 (12.9)	4.01	<.0001	15.25 (13.6)	0-63
Constructive	22.92 (17.5)	14.37 (18.2)	4.77	<.0001	18.91 (18.3)	0-84
Dramatic	13.94 (14.9)	18.98 (18.4)	3.02	.0027	16.30 (16.8)	0-88
Games	1.31 (3.7)	0.33 (1.4)	3.43	.0007	0.85 (2.9)	0-35
Unoccup + Wander	11.84 (9.6)	10.27 (14.1)	1.32		11.10 (11.9)	0-70
Onlooker	13.33 (10.1)	22.17 (17.3)	6.32	<.0001	17.50 (14.6)	0-100
Explore	1.34 (2.4)	2.17 (3.7)	2.67	.008	1.72 (3.1)	0-20
Read	4.86 (7.7)	10.08 (11.3)	5.44	<.0001	7.31 (9.9)	0-58
Peer conversation	10.46 (7.3)	8.48 (9.4)	2.37	.018	9.53 (8.4)	0-45
Adult conversation	3.47 (4.2)	1.45 (3.4)	5.26	<.0001	2.52 (4.0)	0-22

Table 7. Mean (sd) scores (1-7) of preschools on the ECERS (Early Childhood Environment Rating Scale – Revised), Repair and use of Materials, and Adult-Child Communication

Subscales	Mean	(sd)	Range
1. Space & Furnishings	2.23	.53	1-3
2. Personal care routines	2.21	.49	1-2
3. Language-Reasoning	3.40	.92	1-5
4. Activities	2.47	.45	1-3
5. Interaction	4.06	1.09	1-6
6. Program Structure	2.64	.53	1-3.75
7. Parents & Staff	3.25	.20	2.8-3.5
8. Literacy	3.81	.71	2.3-5.3
9. Mathematics	4.35	.82	2.7-5.3
ECERS-7	2.90	.45	1.4-3.5
ECERS-9	3.16	.45	1.8-3.7
Enrolment	24.90	6.00	15-35
Attendance	18.36	5.44	10-31
13 Materials (0-4)	2.83	.47	1.77-3.54
Child-Adult talk	25.3		
Responsiveness (%)	35.0	14.0	0 – 52

Table 8. Teacher & Supervisor Means (sd), t-test comparison, overall mean (sd) and range of scores

	Teacher n=22	Supervisor n=13	t(33)	Overall M(sd)	Range
Months on Job	24.8 (23.4)	22.5 (14.1)	ns	24.0 (21.7)	1-48
Years education	10.4 (1.1)	13.0 (4.2)	2.16*	11.4 (2.9)	0-16
Days trained	26.6 (24.5)	44.5 (12.2)	2.88**	33.3 (22.4)	0-60
Days Sup./yr.	15.3 (18.5)	37.0 (19.3)	3.27**	23.3 (21.3)	0-60
Days Refresh/yr.	15.9 (6.6)	8.6 (7.8)	2.82**	13.2 (7.8)	0-24
Teachers' Knowledge:	1.4	1.4	ns	1.4	
Child positive attitude	1.5 (.7)	1.2 (.7)	ns	1.4 (.69)	0-3
Help slow learner	1.3 (.6)	1.3 (.5)	ns	1.3 (.53)	1-3
Reduce absence	1.4 (.5)	1.3 (.6)	ns	1.3 (.54)	1-3
Inattentiveness	1.3 (.5)	1.1 (.3)	ns	1.2 (.69)	1-2
Avoid pretend play	1.0 (.4)	1.0 (.0)	ns	.97 (30)	0-2
Learn from Block play	1.1 (.7)	1.5 (.5)	ns	1.2 (.69)	0-3
How to be Ch.friendly	1.5 (.8)	1.6 (.6)	ns	1.5 (.74)	0-3
Why Ch.friendly	1.2 (.5)	1.4 (.5)	ns	1.3 (.51)	0-2
Evaluation of space	7.5 (1.7)	7.2 (1.6)	ns	7.4 (1.7)	3-9
cleanliness	7.5 (1.1)	7.5 (1.0)	ns	7.5 (1.0)	5-9
sex integrated	8.0 (1.4)	7.5 (1.0)	ns	7.2 (1.2)	4-9
quality play materials	7.4 (1.6)	7.4 (1.6)	ns	7.4 (1.6)	3-9
quality of books	8.0 (1.1)	7.8 (1.2)	ns	7.9 (1.1)	5-9
quality of math	7.7 (1.5)	8.0 (.9)	ns	7.8 (1.3)	3-9
access to water	7.0 (3.1)	7.5 (1.8)	ns	7.2 (2.7)	0-9
access to latrine	3.4 (3.9)	5.6 (2.9)	ns	4.2 (3.7)	0-9
child-adult converv	6.5 (1.7)	6.3 (1.8)	ns	6.5 (1.7)	3-9
child assessment	7.6 (2.6)	7.8 (1.0)	ns	7.7 (2.1)	0-9
Overall evaluation	7.1 (1.0)	7.1 (.9)	ns	7.2 (.98)	5-88
Pay	492 (814.5)	2578(765.7)	7.61**	1267 (1290)	0-4001
Parent contrib.	107.3 (138.8)	0	3.63**	67 (21)	0-425
Plan contrib.	595.4 (1292.6)	2578(765.7)	5.70**	1332 (1478)	0-5001

Table 9. Means (sd) on Mother Knowledge Measures

Measure: Item	Preschool	Control	Difference	Combined
Mother's Knowledge	11.18 (3.2)	11.03 (3.0)	ns	11.11 (3.1)
What child played	2.73 (1.1)	2.65 (1.0)	ns	2.70 (1.1)
Topics ch talked about	2.49 (.79)	2.50 (.84)	ns	2.50 (.81)
Questions ch asked	2.07 (1.1)	2.24 (1.1)	ns	2.15 (1.1)
Preparation for school	1.55 (.91)	1.26 (.97)	p < .01	1.41 (.95)
Causes of ch sickness	.61 (.68)	.73 (.63)	ns	.66 (.65)
Soothe an upset child	1.73 (.86)	1.65 (.76)	ns	1.69 (.81)
Expected age for action	54.46 (13.6)	55.74 (11.9)	ns	55.05 (12.8)
Self-feeding	26.31 (17.6)	26.08 (15.6)	ns	26.20 (16.7)
Begin to play with others	34.46 (17.2)	34.62 (15.7)	ns	34.54 (16.5)
Start to read a book	54.73 (18.7)	59.18 (14.9)	p < .01	56.81 (17.1)
Start to count money	77.75 (24.0)	82.77 (25.0)	p < .05	80.09 (24.5)
Visit alone in nearby village	79.03 (28.8)	76.03 (26.3)	ns	77.63 (27.7)
Months in early childhood	12.01 (7.0)			
Attended Parenting session	20%			
Visited preschool	84%			
List what mother learned	.97 (.97) range 0 – 5			
List what child learned	2.69 (1.19) range 0 – 6			
What mother does differently	.71 (1.2) range 0 – 3			
Evaluation of Plan Preschool:				
poor	00.0%			
more or less good	10.3%			
good	62.9%			
very good	26.8%			

Table 10. Frequency distribution of responses by mothers with eligible but non-participating children found in preschool villages

Interview Question	No		Yes	
	Number	%	Number	%
Have heard of Plan ECD	14	19	60	81
Know ECD participants	25	34	49	66
Ever attend ECD	54	74	20	26
parenting			2	3
Shishu Bekash			10	13
preschool			8	11
Reasons for not attending:				
Child Sick	56	70	8	24
Child too Young	47	64	27	36
Not necessary at this age	64	86	10	14
Dislike activities	61	82	13	18
No time	40	54	34	46
Family prevents	68	92	6	8
Other villagers prevent	73	99	1	1
Can't afford	45	61	29	39
Heard bad things	73	99	1	1
Live too far away	53	72	21	28

Appendix A. Frequencies (%) of Preschool Children by Site n = 219

	Gazipur		Chirirbandar		Jaldhaka	
	No.	%	No.	%	No.	%
sex: boys	34	43	32	53	36	45
girls	45	57	28	47	44	55
age: 48-59	11	14	6	10	00	00
60-71	40	51	51	85	79	99
72+	28	35	3	5	1	1
clinic: yes	61	77	23	38	19	24
immcard: yes	56	71	30	50	4	5
bcg: yes	78	99	59	98	72	90
dpt: 0	2	3	1	2	13	16
1-2	7	9	0	0	13	16
3	70	87	59	98	54	68
polio: 0	0	0	0	0	7	9
1-2	2	3	0	0	13	16
3	76	96	60	100	60	75
measles: yes	74	94	59	98	56	70
Vitamin A: yes	77	98	59	98	71	89
Iodine Knowledge	71	90	57	95	65	81
Iodized salt	79	100	52	87	59	74
Safe water	79	100	57	95	78	98
Sanitary defecation	61	77	25	42	25	31
Sick past week	19	24	20	33	16	20
Parenting sessions	9	11	16	27	18	23
No Disability	47	60	45	76	41	51
3 or more	5	6	1	2	6	8
Weight for age: z < -2.0	46	59	30	50	32	40
-1.99 < z < -1.0	20	25	18	30	27	34
-0.99 < z < + .47	12	15	12	20	21	26
Height for age: z < -2.0	27	35	12	20	13	16
-1.99 < z < -1.0	29	37	26	46	27	34
-.99 < z < + 1.0	22	28	22	34	40	50

Appendix A continued

Weight for height: $z < -2.0$	34	44	19	32	27	34
$-1.99 < z < -1.0$	18	23	25	41	24	30
$-.99 < z < + 1.8$	25	33	16	27	29	36
Vocabulary std: 4 to 6	26	33	3	5	76	1
7 to 9	42	53	44	73	61	76
10 to 19	11	14	13	22	12	15
Matrix Reason std: 0 to 3	22	28	9	15	15	19
4 to 7	49	62	42	70	53	66
8 to 19	7	9	9	15	7	9
Similarities std: 0 to 8	27	34	13	22	16	20
9 to 11	46	58	45	75	60	75
12 to 19	6	8	2	3	4	5
School Readiness: 0 to 15	12	15	9	15	5	6
16 to 20	19	24	12	20	14	18
21 to 25	37	47	26	43	34	42
26 to 30	11	14	13	22	27	34
Usual Food: rice	78	99	60	100	80	100
dal	46	88	23	38	29	36
protein	74	94	44	73	52	65
fruit	57	72	31	52	34	42
vegetable	67	85	43	72	67	84
milk	42	53	23	38	22	28
biscuit	53	67	32	53	?	
Primary school: no	1	1	2	3	4	5
yes	5	6	2	3	30	38
yes, know name	73	93	56	94	46	57
Sickness causes: none	31	39	24	40	54	68
know 1	33	13	29	48	25	31
know 2	15	19	7	12	1	1
Visited primary sch	43	54	35	58	43	54
Visit preschool	65	82	50	83	68	85
You learned something	53	67	35	58	46	57
Child learned > 1 thing	69	87	53	88	65	81
You do things differently	32	41	28	38	6	8

Appendix A continued

Evaluation of Plan:

1 more or less good	14	18	3	5	6	7
good	32	40	50	83	55	69
very good	33	42	7	12	19	24
Mother's education: none	15	19	27	45	64	90
primary school	20	25	13	22	4	6
secondary +	44	56	20	33	3	4
Father's education: none	17	22	15	26	54	79
primary school	19	24	16	28	11	16
secondary +	43	54	27	46	3	5
Live with grandparents	22	28	10	17	14	18
Religion: Muslim	57	72	42	70	39	49
Hindu	22	28	18	30	41	51
Own home	76	96	56	93	69	86
Own land for production	59	78	37	62	51	64
Income: under 1000	8	10	0	0	41	57
1000 to 1999	15	19	17	28	13	18
2000 to 3900	16	20	30	50	8	11
4000 +	40	51	13	22	10	14

Appendix B. Frequencies (%) of Control Children by Site n=208

	Gazipur		Chirirbandar		Jaldhaka	
	No.	%	No	%	No.	%
sex: boys	33	49	36	60	42	52
girls	35	51	24	40	38	48
age: 48-59	33	49	16	27	0	0
60-71	26	38	43	72	78	96
72+	9	13	1	2	2	3
clinic: yes	42	63	21	65	14	18
immcard: yes	58	87	43	72	17	21
bcg: yes	64	95	60	100	75	94
dpt: 0	4	6			6	8
1-2	7	10	0	0	1	1
3	56	84	60	98	73	91
polio: 0	6	9	0	0	6	7
1-2	6	9	0	0	0	0
3	55	82	60	100	74	93
measles: yes	61	91	60	100	69	86
Vitamin A: yes	62	93	60	100	77	96
Iodine Knowledge	50	75	56	93	72	90
Iodized salt	65	97	43	72	60	75
Safe water	67	100	60	100	79	99
Sanitary defecation	52	76	3	5	34	42
Sick past week	17	25	12	20	23	29
Parenting sessions	2	3	3	5	1	1
No Disability	44	66	57	95	65	81
3 or more	6	9	0	0	1	1
Weight for age: $z < -2.0$	36	55	41	68	43	55
$-1.99 < z < -1.0$	20	31	15	25	24	31
$-0.99 < z < + 2.0$	9	14	4	7	11	14
Height for age: $z < -2.0$	26	38	36	60	32	40
$-1.99 < z < -1.0$	22	32	15	25	27	34
$-.99 < z < + 2.0$	20	29	9	15	21	26

Appendix B continued

Weight for height: $z < -2.0$	27	40	19	32	31	39
-2.00 < $z < -1.0$	26	38	25	47	26	32
-1.0 < $z < + 1.8$	15	22	16	26	23	29
Vocabulary std: 4 to 6	29	43	17	28	8	10
7 to 9	32	48	36	60	55	67
10 to 19	6	9	7	12	17	17
Matrix Reason std: 0 to 3	24	36	8	13	7	9
4 to 7	30	46	46	87	66	83
8 to 19	12	18	6	10	6	8
Similarities std: 0 to 8	30	45	15	25	19	24
9 to 11	33	49	41	68	58	72
12 to 19	4	6	4	7	3	4
School Readiness: 0 to 15	53	80	47	78	46	58
16 to 20	9	14	10	17	22	28
21 to 25	4	6	3	5	6	7
26 to 30	0	0	0	0	6	7
Usual Food: rice	67	100	60	100	79	99
dal	33	49	26	43	13	16
protein	60	90	46	77	71	89
fruit	39	58	48	80	42	52
vegetable	53	79	46	77	56	70
milk	27	40	26	43	18	22
biscuit	54	81	42	70	44	55
Primary school: no	2	3	1	2	7	9
yes	9	13	4	7	43	54
yes, know name	56	84	55	94	30	37
Sickness causes: none	31	46	7	12	42	52
know 1	31	46	41	68	37	46
know 2	5	8	12	20	1	1
Visited primary sch	34	51	30	50	30	37
Visit preschool	1	1	9	15	0	0
Mother's education: none	26	38	33	55	65	81
primary school	16	24	19	32	5	6
secondary +	25	38	8	13	10	13

Appendix B continued

Father's education: none	22	34	22	37	57	71
primary school	20	31	24	40	8	10
secondary +	22	34	14	23	15	19
Live with grandparents	9	14	5	8	6	8
Religion: Muslim	63	94	25	42	76	95
Hindu	4	6	35	58	3	4
Own home	34	51	57	95	69	86
Own land for production	27	40	28	47	51	64
Income: under 1000	11	17	2	3	14	18
1000 to 1999	13	20	27	45	25	32
2000 to 3900	21	32	28	47	21	27
4000 +	20	31	3	5	18	23

Appendix C. Gazipur M (sd) Comparison of Control (n=68) and Preschool (n=79)

	Control	Preschool	t	df(144)	p
Ch age	59.4(9.6)	66.8(7.9)	5.08*		<.0001
Moedu	4.3(4.0)	6.1(3.8)	2.70		.008
Faedu	5.5(5.0)	6.9(4.9)	1.63		ns
11assets	6.5(3.0)	8.0(2.8)	3.15		.002
income	3038.2(2400)	3957.0(2891.1)	2.05		.04
3decide	1.2(.55)	1.2(.49)	.51		ns
5prev	4.6(.76)	4.7(.52)	.95		ns
wt/age	-2.3(1.2)	-2.3(1.3)	.04		ns
ht/age	-1.6(1.2)	-1.6(1.0)	.31		ns
wt/ht	-1.8(1.2)	-1.8(1.4)	.25		ns
mother K	11.5(2.6)	12.9(3.6)	2.53		.013
indage	52.7(13.4)	51.1(11.9)	.62		ns
vocabst	6.72(2.2)	7.46(2.0)	2.13		.035
matrixst	4.76(2.4)	4.85(2.0)	.25		ns
similarst	8.51(2.0)	9.20(1.5)	2.37		.019
ready	10.68(5.7)	20.85(4.8)	11.7		.0001
psoltot	22.3(15.2)	27.6(15.1)	3.48		ns
pgrtot	11.3(119)	18.9(14.0)	12.01		.0007
pfuntot	12.8(12.8)	22.1(16.7)	13.56		.0003
pcontot	8.2(14.8)	17.3(17.4)	11.17		.001
pdratot	19.3(20.1)	14.0(14.8)	3.41		.067
pconvp	11.0 (11.7)	12.5 (8.2)	.084		ns
pconva	2.4 (4.9)	2.8 (3.8)	.023		ns

Appendix D. Chirirbandar M (sd) Comparison of Control (n=60) and Preschool (n=60)

	Control	Preschool	t	df(118)	p
Ch age	63.6(5.04)	65.2(4.6)	1.86		.07
Moedu	2.2(3.1)	3.8(4.1)	2.48		.015
Faedu	5.3(4.1)	5.4(4.3)	1.38		ns
11assets	3.7(2.5)	5.6(2.9)	3.95		.0001
income	2075(991.8)	3301.6(2560.4)	3.46		.0008
3decide	1.3(.18)	1.3(.26)	.28		ns
5prev	3.8(.53)	4.2(.71)	3.79		.0002
wt/age	-2.59(1.17)	-1.98(.89)	3.20		.0018
ht/age	-2.15(1.03)	-1.35(.91)	4.53		.0001
wt/ht	-1.53(1.09)	-1.62(1.2)	.48		ns
mother K	16.70(1.6)	15.3(2.8)	3.42		.0009
indage	59.6(9.6)	56.0 (14.3)	1.63		ns
vocabst	7.63(1.6)	8.57(1.4)	3.35		.001
matrixst	5.10(1.8)	5.55 (2.3)	1.19		ns
similarst	9.35(1.2)	9.07(1.6)	1.08		ns
ready	11.9(4.8)	21.3(5.6)	9.87		.0001
psoltot	28.0(15.8)	31.5(20.2)	1.05		
ppartot	6.3(9.3)	4.0(5.3)	1.67		
pgrtot	3.5(5.8)	14.6(15.9)	5.07		
pfuntot	15.5(12.4)	11.7(9.7)	1.91		
pcontot	8.5(11.3)	22.5(16.3)	5.44		
pdratot	13.8(13.7)	15.4(15.7)	.60		
pconvp	8.4(7.2)	11.3(6.4)	2.32		
pconva	1.1(2.1)	4.8(4.1)	6.31		

Appendix E. Jaldhaka M (sd) Comparison of Control (n=80) and Preschool (n=80)

	Control	Preschool	t	df(158)	p
Ch age	65.9(3.5)	67.3(3.7)	2.39		.018
Moedu	1.4(3.1)	0.5(1.6)	2.24		.027
Faedu	2.4(4.1)	1.1(2.4)	2.40		.018
11assets	5.0(2.6)	4.5(2.3)	1.32		ns
income	2670.5(2212.2)	1692.7(2220.5)	2.70		.008
3decide	1.4(.43)	1.4(.47)	.41		ns
5prev	4.0(.89)	3.6(.92)	2.61		.0098
wt/age	-2.19(1.30)	-1.73(.98)	2.53		.0125
ht/age	-1.53(1.12)	-1.05(.85)	3.07		.002
wt/ht	-1.68(1.30)	-1.61(1.27)	.33		ns
mother k	11.9(2.2)	11.9(2.8)	.25		ns
indage	54.6(11.8)	53.8(12.7)	.40		ns
vocabst	8.4(2.3)	8.3(1.5)	.15		ns
matrixst	5.2(1.9)	5.4(2.3)	.62		ns
similarst	9.1(1.7)	9.3(1.2)	1.07		ns
ready	14.5(6.5)	22.7(6.2)	8.18		<.0001
psoltot	39.4(18.2)	32.6(14.7)	2.58		.01
ppartot	10.2(13.1)	9.8(11.4)	.20		ns
pgrtot	5.8(9.1)	19.3((14.7)	6.96		<.0001
pfuntot	10.2(13.1)	18.7(12.6)	4.13		<.0001
pcontot	21.7(20.7)	28.5(17.2)	2.23		.023
pdratot	22.7(19.1)	12.5(14.0)	3.85		.0002
pconvp	6.8(8.9)	7.9(6.5)	.92		ns
pconva	1.4(2.8)	3.2(4.5)	3.03		.003

Appendix F. Teacher (n=22) and Supervisor (n=13) Frequency Distribution

Item	Answer	Number	%
Months on Job:	1-11	15	43
	12-35	11	31
	36+	9	26
Prior Plan contact:	none	25	71
	sponsored child	1	2
	child in ECD	7	20
	Others	2	6
Grade completed:	8-10	17	51
	12	7	20
	14-16	10	29
	17-20	10	29
Days of training:	0	5	14
	4-8	5	14
	12-20	2	6
	24,36,45	3	9
	48-60	20	57
Supervision days:	0,5	11	31
	per year 12-23	7	2
	24-60	17	49
Refresher days/yr:	0,2	6	17
	12	19	54
	16-24	10	29
Who decides what you teach/learn:	You	12	34
	Joint	19	54
	Other	4	12
<u>Scored questions:</u>			
How to arouse positive attitude	0	1	3
	1	23	66
	2	8	23
	3	3	9
Do for slow learner learners	1	25	71
	2	9	26
	3	1	3
Do for absent child	1	24	69
	2	10	28
	3	1	3

Appendix F cont'd

Item	Answer	Number	%
Do for unattentive child	1	28	80
	2	7	20
	3	0	0
For child who not want to pretend play	0	2	6
	1	32	91
	2	1	3
What learn from blocks/puzzles	0	4	11
	1	20	57
	2	10	29
	3	1	3
Ch friendly acts	0	2	6
	1	16	46
	2	14	40
	3	3	9
Why ch-friendly	0	1	3
	1	24	69
	2	10	29
	3	0	0
Pay last month:	0-100	6	17
	130-595	13	37
	700-4000	16	46
Is this usual		9	26
	less than usual	24	68
	more than usual	2	6
Parent contrib.	0	19	54
	10-425	16	46
Plan's contrib.	0	11	31
	400-5000	24	69