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Significance of home environments as proxy indicators for early childhood care and education

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Significance of Home Environments as Proxy Indicators for Early Childhood Care and Education

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Introduction

For most children, interior of the home and its immediate surroundings are the first environments they experience throughout their early years. Young children, spend the majority of their time in the home. Home environments have been shown to be a major factor that influences the overall development of children. Within the home, children also have their early interactions with the members of their family, and availability and quality of resources for learning and playing largely determine the nature of these interactions. Availability of stimulating objects, books and play materials within the home are critical indicators for the overall quality of the home environment. In the past, research on the physical environment of homes and communities primarily focused on environmental hazards, environmental stress and impacts of poverty. This body of research strongly indicated that physical aspects of the home such as cleanliness, water, noise and pollution influence the overall health and development of children. (Evans, 2003; Guo & Harris, 2000). Recently, there has been increasing interest among researchers on the quality of home environments and their impact on child development (Ansell & van Blerk 2005; Evans, 2006; Flores, 2004; Leventhal, 2004; Rodrigues, Saraiva & Gabbard, 2005).

The significance of proxy indicators

Young children use all their senses, vision, touch, smell, hearing, etc. while interacting with and learning in a physical environment. This multi-sensory experience combined with the complexity of the home environment creates conceptual and practical problems in the analysis and categorization of homes as developmental settings. Therefore, in large-scale research, it becomes necessary that the most significant and relevant dimensions of a child's home environment need to be identified and used as proxies for actual child development indicators.

Why are indicators important? Because obtaining data on children – especially young children – is hard. It has to be done either by applying IQ tests or other intelligence-measuring instruments whose cross-cultural validity are in question. Another option is to conduct longitudinal research to measure the long-term child outcomes such as school performance. However, these research studies are costly, hard to implement and not suitable for monitoring progress or conducting situation analyses. By using more simple and reliable proxy indicators for the home environment, it is possible to collect local, national and regional data and track the progress of physical and behavioral changes as they relate to the development of the children.

Theoretical foundations of the home as a setting to support child development

Home environments and their immediate surroundings in every sense are “total environments” that bring together physical, social and organizational components. Ecological psychologist Roger Barker (1968) described such complex environments as “behavior settings.”¹ Building on the same concept, Gibson’s (1979) concept of “affordances” describes a setting in terms of its functional possibilities that are extended to the user.²

A more commonly used concept in the field of developmental psychology where teaching and learning occurs is the “activity setting”. According to Vygotsky within the activity setting, people develop “the Zone of Proximal Development” or ZPD. ZPD is defined as the distance of capabilities displayed by the child independently and with support from others.³

The Home Observation for Measurement of the Environment (HOME) Inventory

The most widely recognized and commonly used instrument to evaluate the quality of the home environment is the HOME scale.⁴ HOME scale has been shown to predict child IQ and competence, language performance and later school success.

The applicability of the HOME inventory in developing countries has been widely discussed and remains a controversial issue. Still, the scale has been adopted and used in more than 100 countries (Bradley et. al. 1998) and have been validated in many countries including Bangladesh, Brazil and China.

¹ Ecological psychologist Roger Barker argued that it is not possible to predict human behavior unless the context or setting in which the behavior takes place is understood. He also argued that behaviors of people in similar “Behavior Settings” are also likely to be similar. Based on his theory, it is possible to argue for example that in order to have desirable literacy-related interactions between parents and children in the home, the “behavior setting” must provide all the necessary physical (books, space), human (parental attitudes, knowledge) and organizational (quality of interaction) components.

² The relational character of the affordances is what makes them a useful concept in understanding physical environment of the home in relation to the activities engaged by the parent and the child. For example, having books in the home does not simply satisfy the conditions for a desired set of actions. In order for the books to provide the necessary affordances, they need to be accessible to the child, must include pictures that are attractive to the child and most importantly they require a supporting set of actions (flipping pages, reading to the child) to be performed by the parent. “With the concept of affordances in hand, one can describe environments in terms of the functional possibilities that they extend to particular individuals, and contemplate the functional implications of particular design decisions” (Chawla & Heft, 2002).

³ According to the ZPD the range of behaviors exercised by the child with no support from others constitute independent performance while assisted performance is the maximum that the child can achieve with help from others. From this perspective, the goal of early literacy interventions should be to close the gap in the ZPD through the manipulation of the activity setting of the home.

⁴ Home Observations for the Measurement of the Environment (HOME) Inventory is the most widely used instrument to measure the quality of home environments. It is developed by Caldwell and Bradley in 1967, and revised and adapted since then. The items in this instrument include observation of mother-child interactions, mothers’ descriptions of family living patterns and habits and observational measures on orderliness and enrichment potential of the physical home environment.

Home environment gains even more significance in countries where preschool institutions are few, inaccessible, or lacking in terms of quality and resources. In many of the poor countries, preschool enrollment rates are extremely low. For example, in 1995 preschool coverage was 20% in the Dominican Republic, 36% in Peru and 17% in Nicaragua.⁵ The numbers are low, even in many of the Central Independent States (CIS) countries and in Eastern Europe where an established preschool system exists. The rates are 7% in the Kyrgyz Republic, 21% in Turkmenistan and 31% in Moldova.⁶ Based on these numbers, it is possible to see that the home environment is the only alternative location for intellectual development, stimulation and learning for most children.

Proxy indicators reviewed in this paper

Specific home environment and parental interaction indicators have been selected for review in this paper. The first environmental indicator is the availability of reading materials and children's books in the home. Many studies demonstrated the importance of exposure to books in early ages. Availability of books is also a requirement for the parents to engage in joint reading activity with their children. At the minimum, it has been theorized that children observing their parents reading will have a lasting impression on them (Bus, Van Lizendoorn & Pellegrini 1995).

The second environmental indicator is the availability of drawing and art supplies (such as pencils, crayons, paper and paint) in the home. Unfortunately, there are very few studies that look at this variable. However, being able to hold a pencil and ability to manipulate it for writing and drawing is considered a critical skill and a good indicator of school readiness.⁷

Availability of toys, especially home-made toys created by adults and older siblings is also a good indicator of parental concern and sensitivity towards play. They help create a stimulating environment within the home that encourages exploration and problem solving.

In addition to the physical indicators, two parental behavior indicators are also reviewed. The first and the most important one is parents engaging in joint reading with their child. Parents reading aloud to their children is an important prerequisite for early language development. Parents use more language and differentiated words while reading to their children compared to the way they talk to the children during regular everyday activities. Even at very early ages, looking at picture books together with the parent, pointing at pictures while the parent names them, stimulates the child in many ways (Neuman, 1996; Zuckerman and Kahn, 2000).

Finally, the frequency of the parents engaging in play activities directly with their children will be discussed as a critical indicator for physical and cognitive development, as well as an indicator of parental responsiveness.

⁵ For children aged 3-6. Source: World Education Report 1995.

⁶ For children aged 3-6. Source UNICEF/CDC TransMONEE Database 2000.

⁷ Focus groups conducted by UNICEF with first grade teachers and school principals in Armenia (2006), Moldova (2004), Georgia (2005) and Azerbaijan (2005) revealed that ability to manipulate a pencil and ability to draw are considered as a very important skill for children starting first grade by the educators.

In addition to overwhelming research findings regarding their influence on child outcomes, these proxy indicators were also selected due to their overlap with key questions in HOME scale and UNICEF's ECD module for the Multiple Indicator Cluster Surveys (MICS). Availability of books and availability of objects for play are key indicators under "opportunities for stimulation" and "learning materials" in the HOME inventory. The indicators developed by UNICEF for MICS also include presence of books in the home, sources of play materials and a total score of adult activities with the children, including play.

Starting in 2005, MICS3 (the latest version of MICS including ECD indicators) has been systematically executed in more than 50 developing countries and the number will increase significantly in 2006. Availability of this data worldwide will increase the possibility of monitoring the conditions of the home environment as it relates to child development.

The following section of this paper will review the existing literature that demonstrates the influence of the home environment and parental interactions on child development. It will look at studies that focus on the quality of the physical environment of the home as well as the frequency and quality of parental interactions with the child. Especially when combined, these two factors have been proven to influence the cognitive and social development, intelligence and literacy skills of the child in a positive way.

Review of the existing literature related to the selected proxy indicators

Studies based on the HOME inventory

There are a significant number of studies that look at both the qualities of the physical environment, as well as the parental behavior on child outcomes. Many of these studies use the HOME scale to assess the physical as well as the social environment of the home. A number of studies conducted in the United States using the HOME scale found significant relationships between the home environment and development of language skills, reading and the growth of vocabulary.

A national study by the NICHD Early Child Care Research Network assessed 700 first graders to see the extent to which stimulation and sensitive care in the family and childcare environments predict cognitive outcomes like attention memory and planning. The results showed that the cumulative quality of these environments had an effect on both attention and memory but not on planning. And that the quality of family environment measured on the HOME scale was more strongly related to these outcomes than the institutional child care environments (NICHD, 2005).

A four-year longitudinal study conducted among 193 working and middle-class mothers in Seattle, Washington showed that measures of environmental quality (orderliness, enrichment and overall stimulating quality) and of parent-infant interaction (mother-child interaction patterns, family habits, living patterns as described by the mother), taken in the first year of life are the best predictors of later IQ or language performance (Bee et al, 1982).

Another study (Lee, Super, Harkness, 2003) resonated similar findings with a sample of 750 children from kindergarten through seventh grade. Findings showed that on the HOME scale, particularly accessibility of materials (play objects, reading books, musical instruments, picture decorations, other educational material) was found to be a significant predictor of children's perceived competence. Similarly, a study examining the home environment of adolescent mothers in white, black and Hispanic families found that the cognitive stimulation in the child's early home environment was positively associated with the child's cognitive attainment (Edwards, 1992).

Examining three ethnic groups across the first three years of a child's life Bradley (1989) found that measures of particular aspects of the child's home environment, such as parental response, and availability of stimulating play materials were strongly related to children's developmental status.

In a 3-year longitudinal study conducted with 119 children in the 1 to 4-year age group, findings indicated a positive correlation between cognitive development and the home stimulation variables measured on the HOME scale. The variables included parent involvement (reading, playing, warmth and affection, responsiveness) and availability of stimulating materials such as toys, reading materials, craft materials and games (Gottfried & Gottfried, 1984).

Effects of various environmental measures on individual growth patterns were examined in 105 young children participating in a longitudinal study. Intelligence (Stanford-Binet, 4th edition) was measured at ages 3 through 6, and child's environment (HOME and SES) was assessed at the age of three years. Growth curve analysis revealed that HOME scores exerted a constant influence on the expected composite, verbal, and non verbal intellectual skills at each age (Espy, Molfese & DiLalla, 2001).

In a research study the home environments of 72 children were assessed when they were 6 and 12 months old to examine the relation between home environment (HOME scores), cognitive competence and IQ among males and females. The findings revealed that IQ in boys was best predicted using the 6-month and 12-month scores on play materials and the child's language competence at age 1. For girls the most efficient model included 12-month scores on play materials and maternal responsiveness (Bradley & Cadwell 1980).

Research has also shown that the quality of home environment is related to children's mathematical achievement. A study, examining children in the 5 – 9yr age group, showed that while controlling for SES (socioeconomic status) and maternal cognitive test scores, the effect of home environment (HOME scale) on children's mathematical test scores was large (Crane, 1996).

Similar research conducted in developing countries showed comparable results. In these countries, some cultural adaptation of the scale was necessary. For example in Jamaica, Hayes (1997) looked at both the physical environment items and the parental interaction in HOME scale and found that items related to direct cognitive stimulation by the caregiver were cross-culturally more relevant than physical environment items.

Research conducted among impoverished South African Families examined the relationship between home environment, mental development and socioeconomic status. The study involving 305 children aged 2 to 30 months found the home environment scores to be significantly related to mental development, independent of socioeconomic status. These findings support the generalizability of the importance of the quality of home environment for infant development (Richter& Grieve, 1991).

A Korean study (Lee, 2003) reported that children's self-perceived competence and the home environment stimulation were positively correlated, especially HOME were important variables that affected children's perceived competence in cognitive, social and physical domains.

In India, Mohite (1987) conducted a two stage study to determine if HOME variables make a difference in school performance and learning difficulties of children aged 6 to 9 years. The findings indicated that, based on the HOME scores, it was possible to distinguish homes of children who were having learning difficulties from those of children who were successful in school.

Home environment and Social and Cognitive development of Children

Research conducted with a socially heterogeneous sample of 215 four-year-old children showed that their verbal IQ scores were highly related to a cumulative risk index composed of maternal, family, and cultural variables. This study was important in demonstrating that environmental factors were more significant than early characteristics of the child in predicting preschool intelligence (Sameroff et.al, 1987).

Alternatively, a study conducted by NICHD (2001) following more than 1300 children from birth unto school age years, findings revealed that children who spent more time in front of the TV showed more behavioral problems, had smaller vocabularies and did less well on math problems. The same study also revealed that when home environments which were more stimulating and well organized, children had better vocabularies, advanced attention and memory skills and got along better with peers (NICHD, 2001).

In developing countries, research consistently demonstrated that the assessment of home environments positively correlated with children's cognitive and social development. In Pakistan, home environments were found to relate positively to the cognitive competence of children (Masud, et al., 1994). In Philippines, home environments of 177 five and six-year-old preschool children were found to be related to intellectual development (Church & Katigbak, 1991). A Nigerian study by Odebunmi (1980) also demonstrated that the environmental factors and the home have significant influences on personality development.

Anne and Segal (2003) evaluated the impact of extended child-care on 648 young Japanese children. The study looked at the development of children after two-years of attendance and indicated that, factors in the home environment, not center-based care explained developmental risks two years later.

In Brazil, a study among 70 families of first-grade children showed that school achievement and social competence at school are mediated by family support and child resources in the home environment (Marturano, de Cássia Trivellato and D'Avila Bacarji, 2005). The study used the Home Environment Resources Scale a Brazilian scale that measures aspects of support for school achievement, made available to the child at home.

Availability of books and play materials in the home

Focusing on books and reading, results from a study by Cornell et al. (1988) showed that children pointing while reading picture books did not correlate with their power of recall but proved to be an effective tool in teaching the content.

In Slovenia, four to six year-old children who were exposed to two selected books per week showed significant competencies in language development compared to children exposed only to the national curriculum, demonstrating that quality of education at home is related to language development and storytelling skills (Umek, et al. 2003).

Another investigation examined the relation between features of the home environment (HOME scale) and domains of development (Griffiths scale) in 6 month-olds. The sample consisted of 155 families from diverse backgrounds, analysis of the data showed that more favorable eye-hand development was associated with more availability of appropriate play materials. The interaction of appropriate play material and maternal involvement was related to both social and hearing-speech development (Parks & Bradley, 1991).

Importance of a stimulating home environment

Some studies used a range of specific indicators to measure how “stimulating” the home environments of the children are. For example, Williams & Rask (2003) in their research, set out to identify factors that enable children to improve their literacy by looking at family environment and functioning in a deeper way. They used the presence and utilization of rhyming and phonic games, letter and alphabet jigsaws, informal games that become a part of family rituals, play inspired by stories or poetry and parental planning for imaginary play. The findings showed the significance of preschool home influences on the emergence of literacy. It underlined the importance of phonemic awareness, acquired through frequently playing games and hearing nursery rhymes, which led to their early success with reading. It also suggested a relationship between children’s ability to plan their imaginative play and their ability to learn aspects of literacy on entering school

In a study exploring the interrelations among attachment, home stimulation and language development in 58 toddlers, 2-yrs of age, results indicated that mothers who had established secure relationships and provided stimulating home environments had children with the highest language scores (Murray & Yingling, 2000).

In a longitudinal study with 130 children, Gottfried, Fleming and Gottfried (1998) revealed that children whose homes had a greater emphasis on learning opportunities and activities were more

academically intrinsically motivated. The effects of home environment were significant beyond and over SES.

Research supporting the influence of parental interactions within the home - Reading to children

One of the most critical components of a supportive environment is the practice of parents reading aloud to children from very early ages. As the child grows, the parents should start interacting with children using the pictures in the books or magazines. Research has determined that the nature of the interaction is much more critical than the content of the book or magazine (Klass, Needleman and Zuckerman, 2003). This raises the interesting possibility that even the illiterate mothers can engage in this activity, by using their imagination and story-telling skills, if provided with culturally-appropriate picture books.

Several studies in the USA have revealed that almost all children who know how to read prior to entering school, are read to frequently by parents or older siblings (Cornell et al, 1988; Clark, 1976;Teale, 1978). Teale (1981) summarized the main findings of his research as follows: children being read to at home is positively correlated with their language development, growth of vocabulary, eagerness to read, and success in beginning reading in school.

In a study relating parents knowledge of storybooks and children's language skills (Senechal, 1996), the findings show that variance in children's vocabulary scores could be explained by parent's knowledge of storybooks while controlling for children's analytic intelligence, parents exposure to adult reading material and parents education.

A 6-year longitudinal study involving 67 mothers and their children 5 to 6-years old, which examined the relationship between maternal behavior and children's cognitive development found that maternal measures taken during preschool years (expectations of child's achievement, performance on a referential communication task, strategies for controlling child's behavior, affective tone of mother-child interaction) predicted at significant levels both school readiness and performance at grade 6 (Hess, 1984). It has also been argued that, reading to children is likely to have significant and lasting long-term affects, even if the effects look small in the short-term (Lonigan, 1994).

Another study conducted with 137 first-grade students in five schools, in poor neighborhoods of Lima, Peru found that parents who have higher expectations of success for their children have their children scoring significantly higher on picture vocabulary, verbal analogies, letter-word identification and reading comprehension tests (Castro, et. al. 2002). The same study also found that parental expectations and consistent reading to children at home are significantly related.

Just having books and having them read aloud to the children is only part of the story. Many researchers argued that the style of reading and interaction between the child and the parent during the reading makes a big difference. For example, Masahiko (1999) argues that one important reason that Japanese-American children differ in their reading skills from home to school is due to the 3-part sequence (mother questions-child responds-mother provides feedback) adopted by the Japanese mothers during book reading.

Play and parental interaction

A recent one-year long study examined the nature of joint (parent-child) pre-school activities (play, shared reading, craft activities etc.) at home and their relationship to 4-yr olds early reading skills. The findings showed that the frequency of these activities had an impact on reading attainment, vocabulary, memory and aspects of phonological awareness. The importance of shared storybook reading for later independent reading ability was reiterated by this study (Wood, 2002).

A study based on the Vygotskian model was conducted with 120 families, 60 of which included a communicatively handicapped child (CH) and 60 of which included a non-communicatively handicapped child (NCH). The results showed that low-level strategies (e.g., use statements, lower cognitive demand strategies, and nonverbal direction) were related to the IQ scores of the CH children, whereas the high-level strategies (e.g., use high cognitive demand strategies) were more effective with the NCH children (Pellegrini, Brody and Sigel, 1985).

In a study conducted with 53 families in Northern Thailand, Tulananda (1999) found that there were significant associations between parental involvement in play and discipline and children's social skills in preschool.

Proxy indicators and child development: Research from Moldova

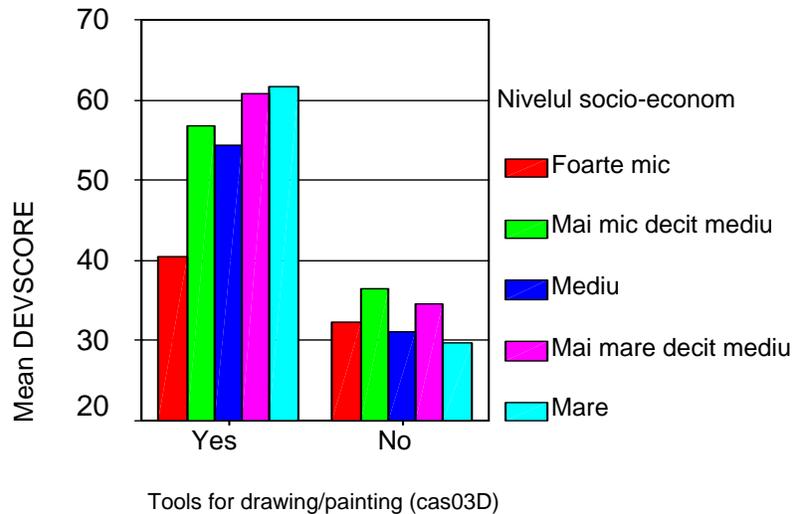
One of the more comprehensive studies that looked at the relationship of home environment variables and physical and cognitive child outcomes is conducted in Moldova.⁸ The study included a nationally representative sample of 1,184 households with children under 7 year of age (42.5% urban and 57.5% rural). Two sets of tools were administered – a questionnaire for the main caregiver (which usually is the mother) and a set of tests/measurements for the child coupled with age specific questionnaires for older children. The results demonstrated the importance of having educational and developmental resources in the home as well as the importance of parents talking to, playing with and reading to their children.

Especially, for young children aged one to three, availability of toys and play materials in the home was a good predictor of a high developmental score. For example, the mean score for children between one and two years old in homes with age-appropriate toys was 72 (out of 100) while it was 57 in the homes with no toys. Similarly, having pencils, paint, crayons and drawing paper was equally important for the same age group. 2 to 3 year-old children who have these resources in the home performed significantly better (mean = 62 vs. 46) than the ones who have no access to such resources.

⁸ Influence of Parental and Family Factors on Child Development: Secondary Analysis of Data from the National Baseline Study on Family KAP (Knowledge, Attitude and Practices) in the Area of Early Childhood Care and Development (ECCD). UNICEF Moldova Country Office, 2005.

The results were consistent regardless of the SES. *Figure 1* compares the families in different SES categories who do and do not have art-related materials in the home. As it can be clearly seen from the chart, children in homes that have paper, crayons and paint consistently scored better in each SES category, when compared to the children from homes that lack these resources. The results are illustrated in *Figure 2*.

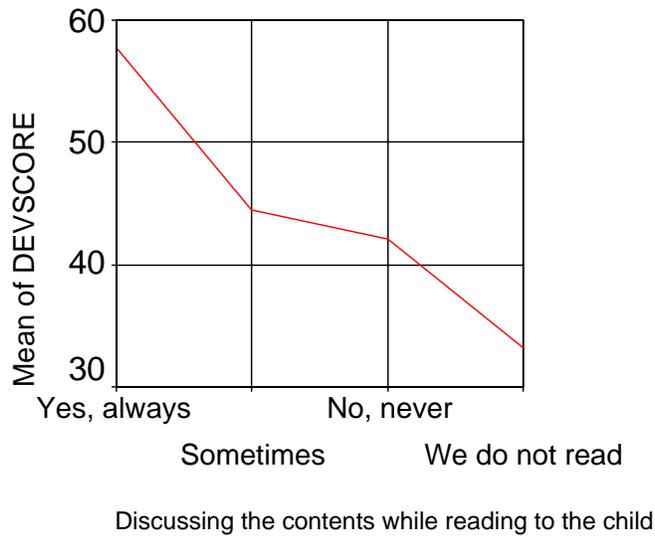
Figure 1: Comparison of Developmental scores in homes who do and do not have art materials by SES



Reading to children on a regular basis was also a very important predictor of the developmental score. For example, children in families who has the practice of reading stories to their children during bedtime performed much better in the developmental tests, compared to children who do not go through such a ritual (ANOVA, $F=11.4$, $p<.001$).

One of the most critical questions that was asked to the mothers was if they were engaged in talking, discussing and explaining the pictures and stories in the books while they are reading to their children. The ones who do this regularly, had the children with highest developmental scores (ANOVA, $F= 58.4$, $p<.001$).

Figure 2: Developmental score by discussing with the child the contents of the book during the reading activity (Ages 3 to 7)



Critique

Inevitably, the majority of the studies that establish a link between the above mentioned proxy indicators are based on studies mostly conducted in the United States and other western countries. It is possible to argue that these studies are mostly based on western, middle-class parent child model and that their generalizability to developing countries is questionable. While there is some merit to this argument, a closer look at the studies quoted above will show that, while limited in numbers, research conducted in developing countries show findings similar to that of the western countries. Furthermore, in recent years, in the US, more and more family and child research has been conducted with families with low SES and among ethnic minorities in this country.

Regional and Country data on the current state of home environments on selected indicators

The last section of this paper will investigate the status of the above-mentioned indicators in developing countries with some comparisons with developed ones, in order to establish and monitor country and regional progress in this area. Currently, country data on these indicators are extremely limited. The lack of consistency in targeted age groups and the way the questions were asked differently in each country makes cross-country comparisons less than ideal. However, the results still reveal a good overall picture regarding the state of the homes with respect to the selected indicators.

Availability of Books and Children's Books in the Home

Studies show that, wide-scale availability of books and especially picture books within the home is a major problem in many countries. For example, a study done in Pemba (Mozambique) revealed that 92% of the homes in the bottom quartile of SES group families do not have any children's books in the home.⁹ This number drops only to 81% in the highest quartile of SES. Availability of books for the adults however, presents a different picture. In the bottom SES quartile, 96% of the homes have some adult books in the home. *Figure 3* summarizes the availability of reading materials (both children and adults) in Pemba households.

Figure 3: Availability of child and adult books in the Pemba (Mozambique) households

		SES			
		Bottom Quartile	2nd Quartile	3rd Quartile	Top Quartile
Children's Books (% Available)		8	5	12	19
Adult books (% Available)	None	4	8	3	2
	1-5	72	62	68	50
	6+	23	30	28	47

The same study conducted in Nepal produced very similar findings.¹⁰ In Nepal, based on SES, homes that have children's books range from 7% (bottom SES quartile) to 30% (top SES quartile).

Figure 4: Availability of child and adult books in the Nepal households

		SES			
		Bottom Quartile	2nd Quartile	3rd Quartile	Top Quartile
Children's Books (% Available)		7	6	13	30
Adult books (% Available)	None	70	52	38	18
	1-5	22	26	28	20
	6+	8	22	33	62

Interestingly in some countries, there seems to be more children's books than there are adult reading materials. For example in Uganda 62% of the homes have child reading materials, while other books are available in only 43% of the homes.¹¹ The same study showed that availability of newspapers and magazines in Ugandan homes are just 22%. Similarly in Malawi, child books

⁹ N = 807.

¹⁰ Nepal. N = 525.

¹¹ Source: Baseline data from Uganda NECD Project 2002. Ages 3 to 7. Data from household surveys in 75 parishes. N-5000 households.

are available in 58% of the homes while other (adult) books are available only in 38%.¹² Only 22% of the homes in Malawi have newspapers.

The situation in countries that were part of the former Soviet Union, are somewhat better. These countries used to have a culture and tradition of printing books, and some study results reflect this. For example in Turkmenistan, only 6.7% of the homes have no books, and three quarter of them have child reading materials.¹³ *Figure 5* illustrates the availability of various reading materials found in Turkmen homes.

Figure 3: Availability of Child and adult reading materials found in Turkmenistan households (%).

Child Reading materials	% of homes
not available	24
few	42
many	34
Books for Adults	% of homes
not available	7
few	69
many	25
Newspapers or Magazines	% of homes
not available	9
few	65
many	26

Studies from two other countries in the Caucasus region show that in this region, less than half of all the homes have children's books available. For example, in Georgia 59% of homes have any type of books and 40% have newspapers or magazines. Homes that have children's books are 44%.¹⁴ In Azerbaijan, 48% of homes have books, 40% have newspapers and magazines and 40% have children's books.¹⁵ The only exception to this pattern is Tajikistan, one of the poorest countries in the region. In Tajikistan, 38% of the homes have adult reading materials, but 98% have no children's books for children under three years old.¹⁶ In comparison, in a country like Moldova, the percentage of households with no child books for children under three is 55%.¹⁷

¹² Source: Review of Early Childhood Development Baseline Study in Selected Districts of Malawi (Representative sample from 5 districts). 2003. N = 600. Ages: 0-6 year olds.

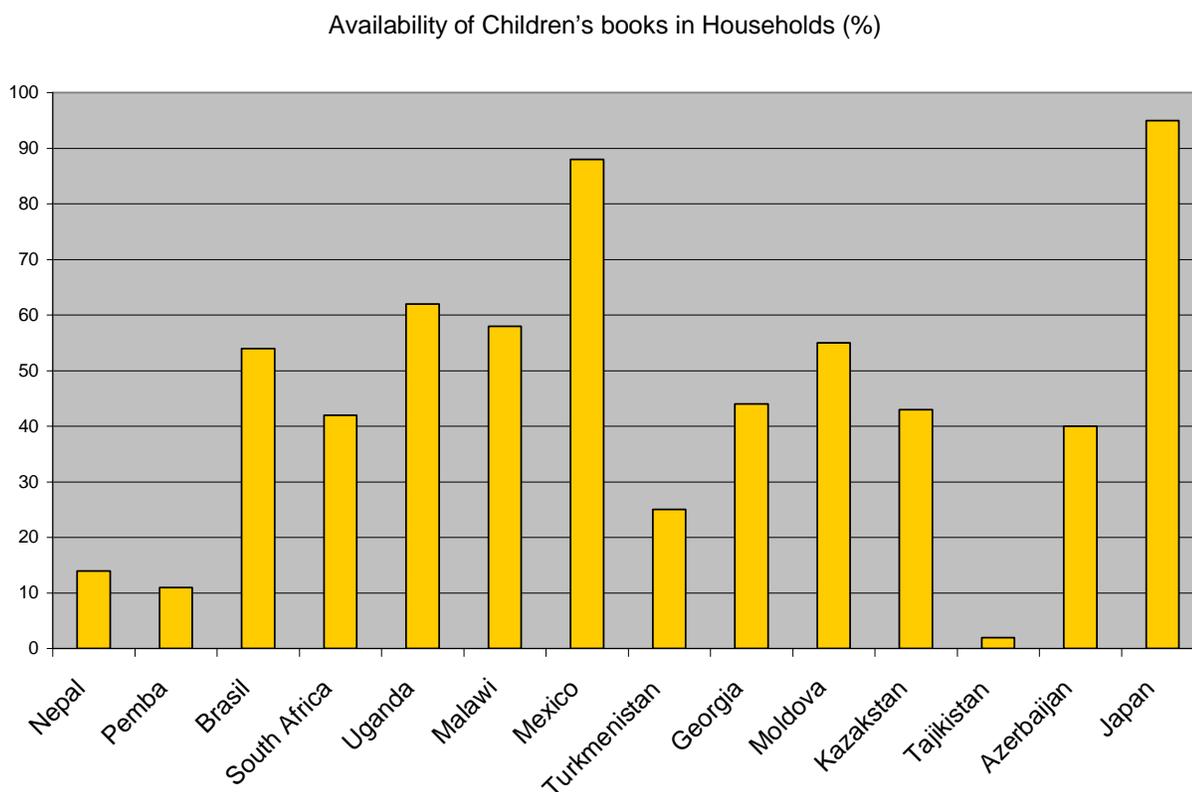
¹³ Source: Childrearing Research and Participatory Planning for ECD in Turkmenistan. UNICEF 2003. Ages 0-7. N=180. Conducted in Dashoguz Region.

¹⁴ Early Childhood Development and Preschool Education in Georgia. UNICEF 2005. Nationally representative sample. N= 741. Ages 0-7.

¹⁵ Parental Knowledge, Attitudes and Practices (KAP) for Child Care and Rearing in Azerbaijan. UNICEF 2005. Data from all regions. N=1041. Ages 0-6.

These findings sharply contrast with conditions in countries who are richer and more developed. In Mexico, children's books are available in 88% of the homes and 58% have newspapers and magazines,¹⁸ and in an industrialized country such as Japan, 95.6% of the homes with children 18-months-old have picture books available.¹⁹ *Figure 4* compares the availability of children's books in the households in all of the countries mentioned above.

*Figure 4: Percent of Households where Children's Books are Available in 14 countries.*²⁰



¹⁶ Early Childhood Development in Tajikistan: Findings and Implications from the National Survey. UNICEF 2005. Representative sample from three districts. N=900. Ages 0-3.

¹⁷ National Baseline Study on Family KAP in the Area of Early Childhood Care and Development (ECCD) in Moldova. UNICEF 2004. Nationally representative sample. N=1184. Ages 0-7.

¹⁸ Source: Field Trial of Family Psychosocial Care Practice Measures Questionnaire in Mexico. UNICEF 2003. N=118. Ages 3-5.

¹⁹ Source: Tokie Anme. Home Environment as a Predictor of Child Development: Japanese Experiences. N= 381 (6-month olds) and n= 388 (18-month olds).

²⁰ It should be noted that this chart compares results from studies that targeted homes with children in slightly different age categories. Most of the studies targeted homes with children 0-6. Since original raw data was not available, it was not possible to standardize the ages across the countries.

Another good source of information on children’s books within the homes is the IEA PIRLS²¹ data. According to this data set, percent of families with children in grade 4, who have indicated that they have less than 11 children’s books in their home shows great variability. *Figure 5* compares 10 countries covered by this data.

Figure 5: Percent of families who have stated that they have less than 11 children’s books in the home.

COUNTRY	%
Israel	15.8%
Argentina	64%
Belize	46.7%
Bulgaria	26%
Colombia	72.7%
Greece	16.8%
Iran	64.3%
Kuwait	42.2%
Romania	39.6%
Turkey	55.6%

Availability of drawing and art supplies

Very few studies looked at the availability of art and drawing supplies such as pencils, crayons, paper and coloring books in the home. Moldova is one of the exceptions. A study in this country indicated that coloring books are in short supply. 78% of the homes with children under seven have no coloring books available. On the other hand, homes with no art materials is only 19%.²²

Figure 6: Availability of art supplies and drawing materials in the homes of Moldova

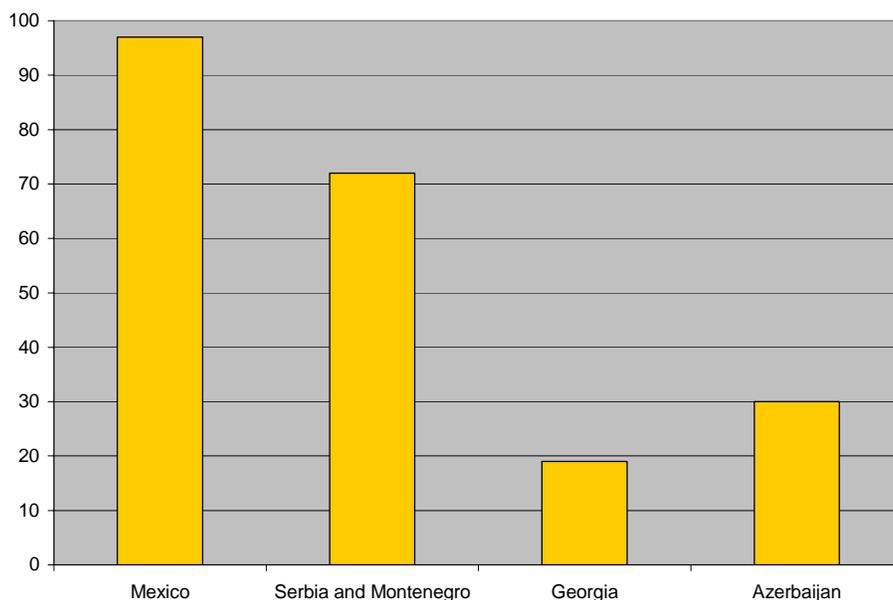
Art supplies and drawing materials	% of homes
not available	18.9
few	28.3
many	52.8

²¹ PIRLS 2001 is part of a five-year cycle of assessments that measures trends in children’s reading literacy achievement and policy and practices related to literacy with participating countries around the world.. For details, see: <http://timss.bc.edu/index.html>.

²² National Baseline Study on Family KAP in the Area of Early Childhood Care and Development (ECCD) in Moldova. UNICEF 2004. Nationally representative sample. N=1184. Ages 0-7.

Figure 7 shows the comparison of four countries Mexico²³, Serbia and Montenegro²⁴, Georgia²⁵ and Azerbaijan²⁶ in terms of availability of art and drawing supplies for the children in the home.

Figure 7: Availability of art and drawing materials in the home



Availability of toys

Availability of toys within the home is closely related to the economic conditions within the country. A study from Azerbaijan shows 73% of the homes in Azerbaijan have manufactured toys.

Studies from Pemba (Mozambique) and Nepal show that the differences between SES groups are not as wide as in the case of books. Following figures compare for SES groups in Pemba and Nepal in terms of the number of toys that are found in the home.

²³ Source: Field Trial of Family Psychosocial Care Practice Measures Questionnaire in Mexico. UNICEF 2003. N=118. Ages 3-5.

²⁴ UNICEF Early Childhood Care and Development (ECD) Research on Family Beliefs and Care Practices in Serbia and Montenegro. UNICEF 2006. Nationally representative sample. N=900. Ages 0-6.

²⁵ Early Childhood Development and Preschool Education in Georgia. UNICEF 2005. Nationally representative sample. N= 741. Ages 0-7.

²⁶ Parental Knowledge, Attitudes and Practices (KAP) for Child Care and Rearing in Azerbaijan. UNICEF 2005. Data from all regions. N=1041. Ages 0-6.

Figure 8: Number of toys available in the homes in Pemba by SES

Number of Toys (% of households)	SES			
	Bottom Quartile	2nd Quartile	3rd Quartile	Top Quartile
LT 5	28	26	22	14
6	26	17	17	15
7	20	23	28	25
8+	14	35	36	46

Figure 8a: Number of toys available in the homes in Nepal by SES

Number of Toys (% of households)	SES			
	Bottom Quartile	2nd Quartile	3rd Quartile	Top Quartile
0-3	36	34	36	52
4	30	31	28	28
5+	34	35	37	20

In countries where caring families cannot afford store-bought toys, they compensate by making home-made toys for their children. For example in Malawi, while only 0.3% of homes have store-bought toys, the number of homes with home made toys is 38%.²⁷ Similarly in Uganda, 6.5% of the homes have manufactured toys, and 14.5% of the homes have hand-made toys.

²⁷ Source: Review of Early Childhood Development Baseline Study in Selected Districts of Malawi (Representative sample from 5 districts). 2003. N = 600. Ages: 0-6 year olds.

Figures 9 and 10 compare countries in terms of manufactured and homemade toys available in the home.

Figure 9: Availability of manufactured toys in the home; comparison of six countries

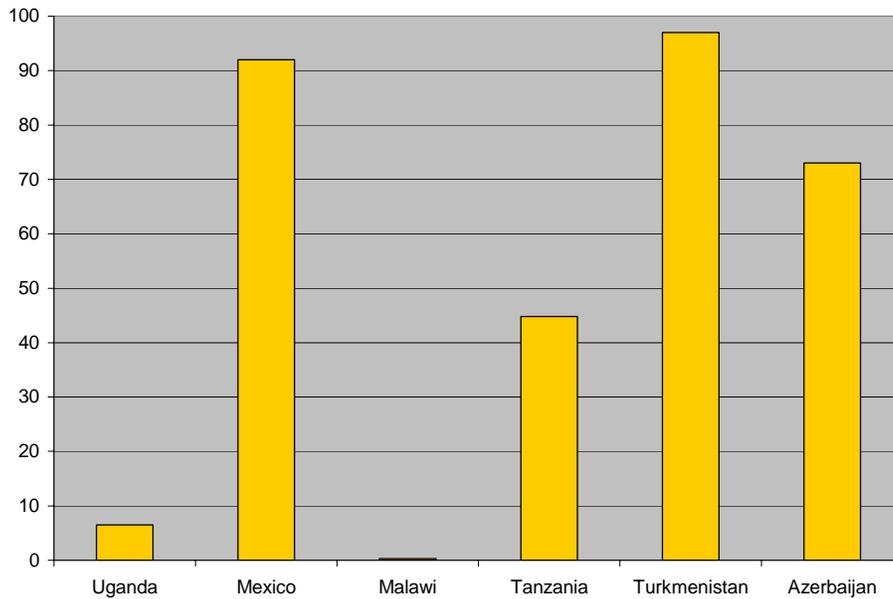
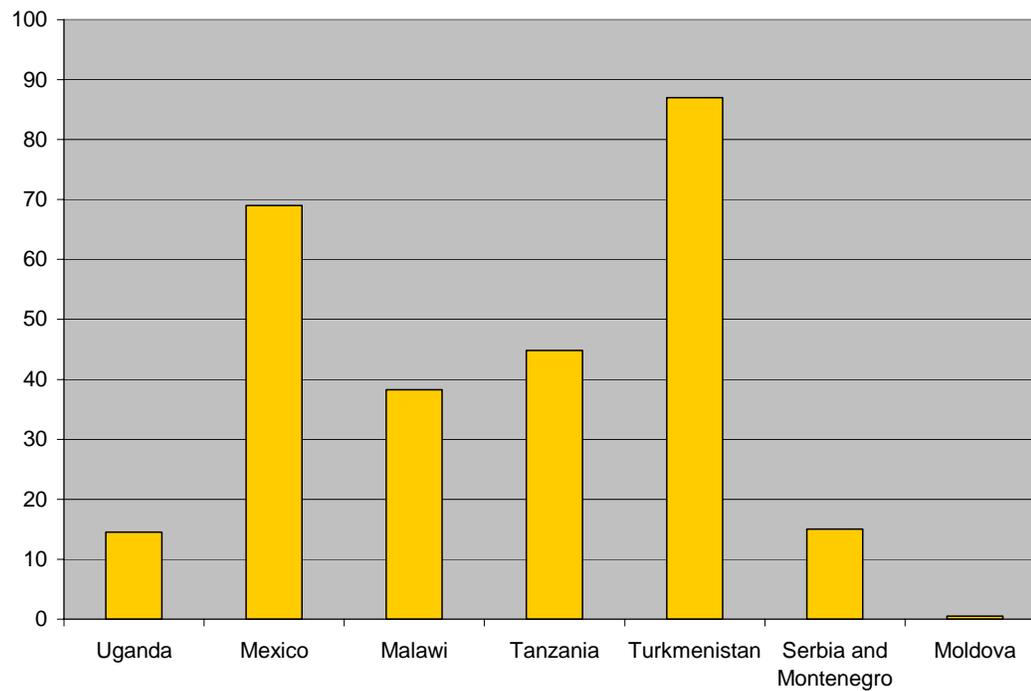


Figure 10: Availability of manufactured toys in the home; comparison of seven countries

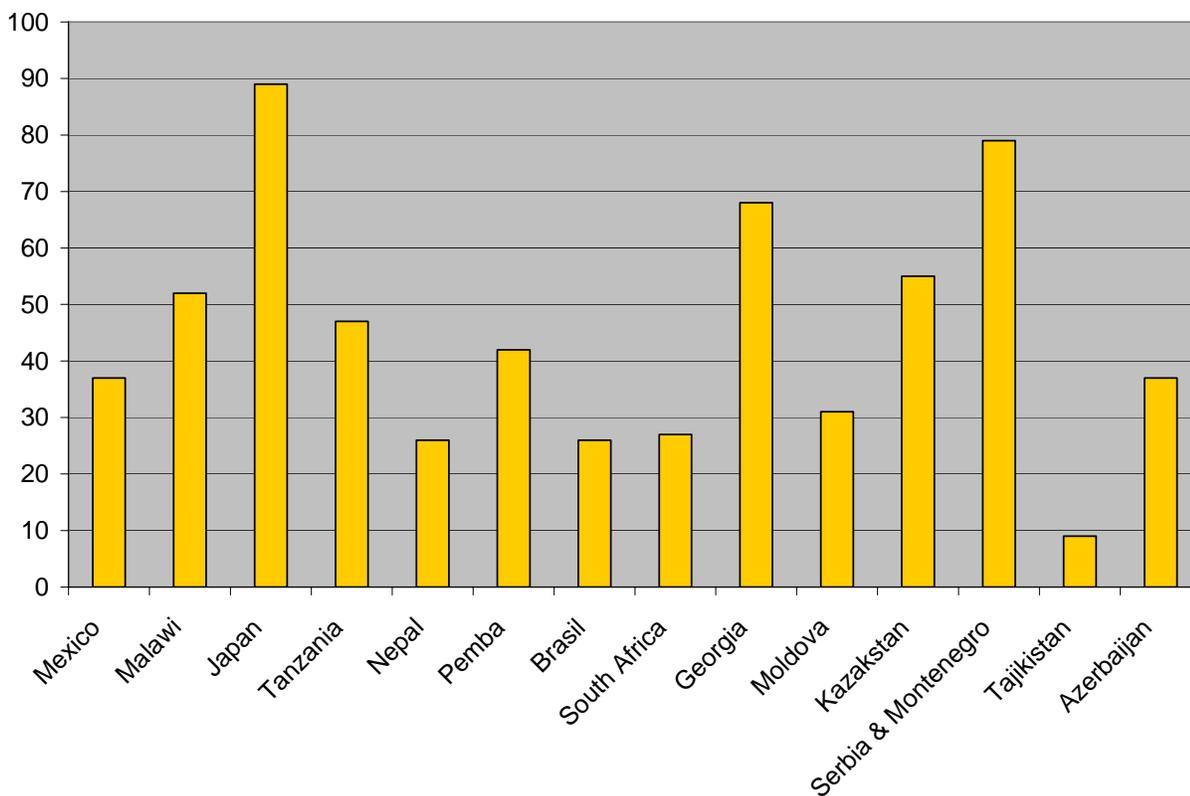


Another issue is how early parents start providing their children with toys. For example, research in Senegal²⁸ showed 80% of the children are not given a toy before they are six months old.

Parents reading to children and/or looking at picture books with them

Data regarding the very important indicator of parents reading to children is quite limited for developing countries. Somewhat limited data reveals that the practice of reading to children, especially before the ages of 5 or 6 is quite uncommon. *Figure 11* presents data from 13 country studies regarding parents reading to their children on a regular basis.

Figure 11: Percent of families who read to or look at picture books with their child on a regular basis



Practice of not reading to children on a regular basis can also be seen in more affluent societies. For example, Mee and Gan (1998) found that, reading aloud to children happens only in one-third of Singaporean homes.

²⁸ Source: Study on Young Children Care Practices. UNICEF 2003. Covers seven rural and urban zones. N= 311 children.

Another source of data on parents reading to their preschool-aged children is found in the IEA PIRLS²⁹ databases. The following chart shows the percentage of families who have responded “Never” or “Almost Never” to the question, “Before your child began primary school, how often did you or someone else in your home read books with him or her?”

Figure 12: Percent of caregivers who have never or almost never read to their children prior to school

COUNTRY	%
Israel	3.9%
Argentina	11.4%
Belize	11.2%
Bulgaria	8.5%
Colombia	13.5%
Greece	11.9%
Iran	28.5%
Kuwait	22.8%
Romania	6.9%
Turkey	25.4%

Parents playing with children

Parents playing with their children is an important indicator for parental attitudes and behavior towards child development. The cross-country data on this issue is quite difficult to summarize. One of the problems arises from the definition of “play”. The open-ended question “did you play with your child today?” can generate different responses from different caregivers, based on their understanding of what “play” is. Similarly, almost none of the studies concentrate on the “duration” of the play activity, so a very brief encounter with the child can be coded the same way as an interactive play activity that lasts two to three hours.

All these complexities aside, available data on play from various studies indicate that playing with children, especially in early ages is much more common than reading, singing or telling stories to the child. For example, 86% of the caregivers from Uganda³⁰ report that they regularly play with their children. In comparison, this number is 82% in Japan³¹ and 81% in Malawi.³²

²⁹ PIRLS 2001 is part of a five-year cycle of assessments that measures trends in children’s reading literacy achievement and policy and practices related to literacy with participating countries around the world.. For details, see: <http://timss.bc.edu/index.html>.

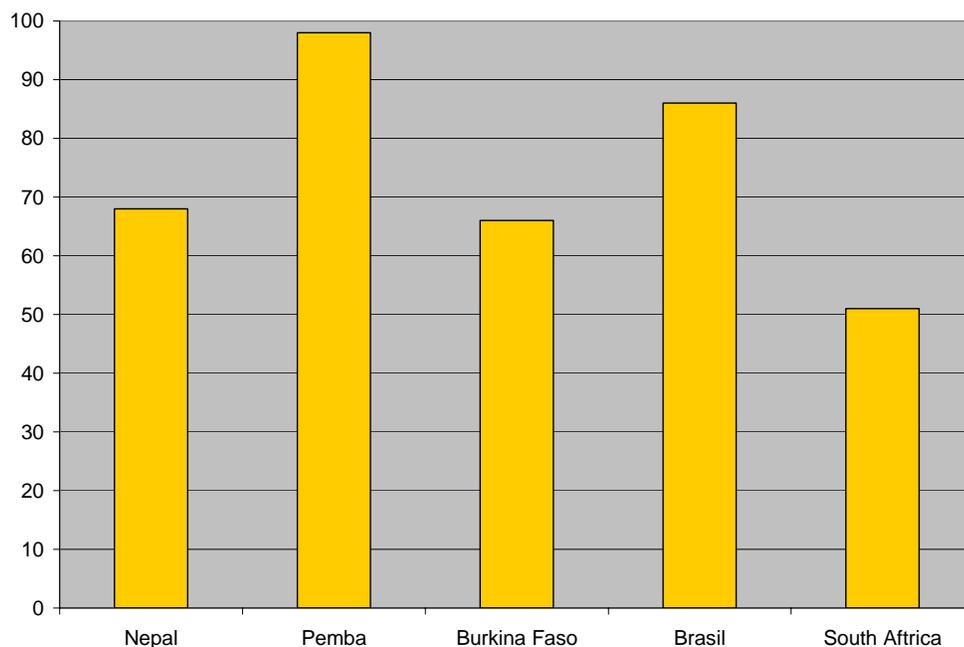
³⁰ Source: Baseline data from Uganda NECD Project 2002. Ages 3 to 7. Data from household surveys in 75 parishes. N-5000 households.

³¹ Source: Tokie Anme. Home Environment as a Predictor of Child Development: Japanese Experiences. N= 381 (6-month olds) and n= 388 (18-month olds).

³² Source: Review of Early Childhood Development Baseline Study in Selected Districts of Malawi (Representative sample from 5 districts). 2003. N = 600. Ages: 0-6 year olds.

In some of the studies, caregivers were asked if they have played with their child during the previous week. The results are shown in *Figure 13*.

Figure 13: Percent of caregivers who have reported that they have played with their child during the previous week.



The following are some additional results from research in other countries. In Turkmenistan, 71% of the caregivers were reported that they play with their child on a regular basis.³³ In Tajikistan³⁴ 41% of the mothers reported that they have played with the child the day before the interview.³⁵ In Serbia and Montenegro, 69% of the mothers reported that they do play with their child on a daily basis.³⁶ In Georgia, 63% of the caregivers report that they play with their 0-3 year-old children on a regular basis. This number drops to 50% for ages 3-6.³⁷ In Azerbaijan³⁸

³³ Source: Childrearing Research and Participatory Planning for ECD in Turkmenistan. UNICEF 2003. Ages 0-7. N=180. Conducted in Dashoguz Region.

³⁴ Early Childhood Development in Tajikistan: Findings and Implications from the National Survey. UNICEF 2005. Representative sample from three districts. N=900. Ages 0-3.

³⁵ Early Childhood Development in Tajikistan: Findings and Implications from the National Survey. UNICEF 2005. Representative sample from three districts. N=900. Ages 0-3.

³⁶ UNICEF Early Childhood Care and Development (ECD) Research on Family Beliefs and Care Practices in Serbia and Montenegro. UNICEF 2006. Nationally representative sample. N=900. Ages 0-6.

³⁷ Early Childhood Development and Preschool Education in Georgia. UNICEF 2005. Nationally representative sample. N= 741. Ages 0-7.

³⁸ Parental Knowledge, Attitudes and Practices (KAP) for Child Care and Rearing in Azerbaijan. UNICEF 2005. Data from all regions. N=1041. Ages 0-6.

69 % of the caregivers play with the children. 70% play on a daily basis. 80% of the caregivers play regularly with children aged 0-3. At ages 3-6 drops to 60%.³⁹

In Moldova 28% of the children aged 2-4 report that they do not play with their parents at all.⁴⁰

In some countries, gender and geographic location may become a factor in parental play with the children. For example, a study from Bangladesh⁴¹ shows that more parents play regularly with male children aged 1 to 3, compared to female children of the same age. In rural areas, while 9% of the mothers play regularly with girls, this number is 10% for boys. The gap is larger (9% versus 16%) in urban areas.⁴²

Discussion

This paper is an attempt to establish some selected environmental variables as proxy indicators for assessing the development of the child. Additional research, especially research that connects these proxy indicators to the actual child development variables is needed. However, preliminary results from quoted studies clearly indicate that the conditions in many of the developing countries need dramatic improvement. It should be noted that many of the studies cited in their paper are based on nationally representative data, and provide national averages. The environmental variables that may look good on a national scale are likely to show big differences once the data is analyzed across different SES categories.

While interpreting the results, it is important to look at the data from the perspective of vulnerable groups. For example, on average, 80% of caregivers regularly playing with their children may look like a positive statistic. However, it can be also interpreted as 20% of parents never or very rarely playing with their children. The major impact of such a finding, and its significance for children's cognitive development cannot be underestimated.

Research is also needed to focus how the selected indicators relate to each other and to additional variables that define patterns for family attitudes and behavior. For example, when the survey data from Turkmenistan was analyzed this way, many of the selected proxy indicators pointed strongly to a "type" of family. This positive and "supporting" type of family had a well-educated mother and a father who was heavily involved in child rearing. The family did not use traditional healing methods and they provide their children with a number of handmade toys. Corporal

³⁹ Parental Knowledge, Attitudes and Practices (KAP) for Child Care and Rearing in Azerbaijan. UNICEF 2005. Data from all regions. N=1041. Ages 0-6.

⁴⁰ National Baseline Study on Family KAP in the Area of Early Childhood Care and Development (ECCD) in Moldova. UNICEF 2004. Nationally representative sample. N=1184. Ages 0-7.

⁴¹ Source: Baseline Survey of Caregivers' KAP on Early Childhood development in Bangladesh. 2001. n = 9663 households (National. Excludes Chittagong Hill). Ages 0-5

⁴² Source: Baseline Survey of Caregivers' KAP on Early Childhood development in Bangladesh. 2001. n = 9663 households (National. Excludes Chittagong Hill). Ages 0-5

punishment was absent. An opposite family pattern also exists. These are the more traditional families, using physical punishment, the father is not involved with childcare and there are no handmade toys available to the child. While in this study it was not possible to relate these patterns to actual child outcomes, it is still important to understand if the family patterns are more critical than individual variables and if so how?

Biggest problem with the research cited in this paper was lack of standardization across different studies. The way the questions were asked and differing age categories of the children in targeted families made it impossible to compare the conditions in various countries with clarity. The large-scale implementation of the MICS3 will largely address the standardization issue. Through MICS3 studies, it would be possible to track the improvements that take place in the home environments of children and the proxy indicators that give a standardized basis for their cognitive and social development.

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