Pakistan Journal of Psychological Research Vol. 6, Nos. 3-4. 1991, 103-115

ADAPTATION OF HOME INVENTORY (INFANT VERSION) FOR PAKISTANI CHILDREN

Sarwat Khan, Anila & Seema Pervez
National Institute of Psychology
Quaid-i-Azam University
Islamabad, Pakistan

The aim of this study was to adapt Caldwell and Bradley's (1984) Home Observation for Measurement of the Environment (HOME) Inventory (Infant version) for use in Pakistan. The study also explored the relation of different demographic variables with the home environment of children. The pilot study was done on 5 boys and 5 girls belonging to 10 different families. The sample for the main study included 25 boys and 25 girls of 50 different families from upper-middle and lower-middle socio-economic status (SES). Their age range was 4 to 36 months. The inventory appeared to be internally consistent (KR-20= .8293). Significant differences ($p < .05$) were found on the total and subscales of HOME Inventory scores for SES and fathers' occupations, and some of the subscales of farthers' and mothers' education, mothers' occupation, birth order of the child, and family type. No significant difference was found in gender, age, number of male and female siblings, language used in the family, current child caregiver, and family size.

Environment is generally used, rather loosely, to refer to conditions under which human beings live and develop (Stott, 1974). Home is a part of the environment which, at least partially, is in control if one wants to study human behavior. A home is something more than the physical structure that defines where one lives. Saegert (1985) suggests: "not only it is a place, but it has psychological resonance and social meaning. It is part of the experience of dwelling...something we do, a way of weaving up a life in particular geographic spaces" (p. 287).

According to Reynold and Lee (1991) the home environment is recognized as a powerful socializing force in children's lives. Encompassing an amalgamate of ways in which families influence their offsprings' development, the home environment is of central concern in human development research. Not surprisingly, a great

variety of measures of home environment has been used in previous researches. Among them are family status and demographics variables, parental attitudes and beliefs, parental expectations and parental behaviors toward and interactions with their children. Understandably, investigators are rarely, if ever, able to measure all relevant characteristics. Instead, they often study the effects of one or two indicators. For example socio-economic status (*SES*) is one of the popular indicator for studying parental influence and home environment. Bloom (1964) was among the pioneers who brought a significant change in the style of home environment measurement in which emphasis was placed upon individual family environment.

Since Hunt's (1961) review of the influence of early experience on mental development, not only has the importance of the general home environment been documented but so too the influence of other variables: maternal verbal behaviour; availability of play materials; maternal encouragement of developmental advance; and the responsiveness, complexity and variety of objects in the home (Clarke-Stewart, 1973; Gottlxied, 1984; Hess & Shipman, 1965; Parks & Bradley, 1991; Parks & Smeriglio, 1986; Pervez, 1992; Reynold & Lee, 1991; Yarrow, Rubenstein, & Pedersen, 1975).

The HOME Inventory first developed by Caldwell, Heider, and Kaplan (1966), and revised in 1984 by Caldwell and Bradley shows that the scales for infants and preschoolers predict children's cognitive development, language development, intellectual performance, and academic achievement (Bakeman & Brown, 1980; Bee, et al., 1982; Bradley & Caldwell, 1976, 1984; Bradley, Caldwell, & Elardo, 1979; Bradley, et al., 1989; Elardo, Bradley, & Caldwell, 1977; Gottfried, 1984; Gottfried & Gottfried, 1984; Pervez & Anila, 1991; Siegel, 1981; Wachs, Uzgiris, & Hunt, 1971; Wulbert, Inglis, Kriegsman, & Mills, 1975).

The purpose of the present study was: (i) to examine applicability of HOME Inventory (Infant version) in Pakistani culture; (ii) to measure the internal consistency between the six subscales of HOME Inventory; (iii) to determine the differences on HOME Inventory scores in relation to demographic variables, i.e., gender, age, birth order, parental *SES*, fathers' and mothers' education, fathers' and mothers' occupation, number of male and female siblings, language used in the family, current child caregiver, family size and family type.

METHOD

Pilot Study

A pilot study was carried out to tryout the HOME Inventory on a sample of 10 infants (5 boys, 5 girls) from 10 families of middle socio-economic status.

The results appeared to indicate that the inventory would be useful in a Pakistani context. Only a few changes in the demographic data sheet were made for the purpose of this study.

Main Study

Sample

A sample of 50 infants (25 boys, 25 girls) were taken at random from 50 different families of middle *SES*. Their age range was 4 to 36 months. The parents' jobs were of government grades divided equally into two *SES* categories: (i) Lower-middle: from grades 11 to 16, or income upto Rs. 5,000 for private income families, and (ii) Upper-middle: from grades 18 to 19, or income of Rs. 10,000 and above in case of non-salaried families such as business or private entrepreneurs.

Instrument

HOME Inventory

The HOME Inventory (Infant version) developed by Caldwell and Bradley (1984) was used. Its 45 items were scored in binary (yes-no) fashion and divided into six subscales namely: (i) Emotional and Verbal Responsivity of Mothers; (ii) Acceptance of Child's Behavior (previously titled "Avoidance of Restriction and Punishment"); (iii) Organization of the Physical and Temporal Environment; (iv) Provision of Appropriate Play Materials; (v) Maternal Involvement with Child; and (vi) Opportunities for Variety in Daily Stimulation. It is an observation/interview technique that assesses the quality of the social and emotional stimulation available to a child in the home environment. Most of the items are based on direct observation, while some informations are obtained through interviews from the mother or caregiver of the children.

Demographic data sheet

The demographic data sheet obtained informations about sex, age, birth order of the child, number of male/female siblings, fathers' and mothers' education, occupation, *SES*, current child caregiver, family type, family size, and language used in the family.

Procedure

Families selected at random were contacted in advance by telephone or letter explaining the purpose of the visit of the researcher. The mothers' of the infants were advised that the child should be awake when the female researcher came, since she would be interested in observing the usual daily routine of the child. Once the mothers agreed to participate in the study, subsequent observation/ interview took place in their homes.

RESULTS

In order to determine internal consistency of the HOME Inventory for the sample of the study, Kuder Richardson (KR-20) was calculated (see Table 1).

Table 1

Internal consistency (KR-20) of the total and subscales of HOME inventory (N= 50)

	Subscales	*KR-20*
I.	Responsivity	.1893
II.	Acceptance	.1972
III.	Organization	.4170
IV.	Play materials	.7254
V.	Involvement	.7002
VI.	Variety	.1451
	Total	.8293

Table 1 indicates that the total and two subscales i.e., *Play materials* and *Involvement* of HOME Inventory have high internal consistency.

The *t*-tests were applied in comparing mean scores of the total HOME Inventory and its six subscales in relation to differences in-between *SES*, gender, and family type. These are given in Table 2.

Table 2

The mean, standard deviation, and t-values of HOME Inventory (subscales and total) of lower-middle and upper-middle SES groups

		Lower-Middle *SES*		Upper-Middle *SES*			
Subscales	No. of items	*Mean*	*S.D*	*Mean*	*S.D*	*t*	*p*
Responsivity	11	7.04	1.51	9.12	1.05	5.64	.000***
Acceptance	8	5.08	1.47	6.64	.91	4.52	.000***
Organization	6	3.00	1.04	4.56	1.19	4.93	.000***
Play materials	9	3.16	1.57	5.52	1.74	5.04	.000***
Involvement	6	2.12	.97	3.96	1.46	5.25	.000***
Variety	5	2.44	.87	3.40	.58	4.60	.000***
Total	45	22.84	4.44	33.20	4.05	8.62	.000***

$df = 48$ $^{***}p < .001$

Table 2 shows significant differences between lower-middle and upper-middle *SES* on the total and all subscales of HOME Inventory. The mean scores indicate that the families from upper-middle *SES* scored higher on HOME Inventory (total and subscales) as compared to the families from lower-middle *SES* thereby suggesting a better environment in the homes of the children belonging to upper-middle *SES*.

Table 3
The mean, standard deviation, and t-values of HOME Inventory (subscales and total) comparing gender

		Boys		Girls			
Subscales	No. of items	*Mean*	*S.D*	*Mean*	*S.D*	*t*	*p*
Responsivity	11	7.76	1.69	8.40	1.61	1.37	.176
Acceptance	8	5.88	1.13	5.84	1.72	.10	.923
Organization	6	3.68	1.31	3.88	1.42	.52	.608
Play materials	9	4.64	2.02	4.04	2.03	1.05	.300
Involvement	6	2.88	1.56	3.20	1.52	.73	.468
Variety	5	2.88	.88	2.96	.89	.32	.751
Total	45	27.72	6.26	28.32	7.26	.31	.758

df= 48

Table 3 shows no significant differences in the scores of boys and girls on HOME Inventory (total and subscales).

Table 4
The mean, standard deviation, and t-values of HOME Inventory (subscales and total) comparing family type (nuclear and joint)

		Nuclear Family		Joint Family			
Subscales	No. of items	*Mean*	*S.D*	*Mean*	*S.D*	*t*	*p*
Responsivity	11	7.85	1.44	8.53	2.00	1.25	.225
Acceptance	8	5.73	1.44	6.12	1.45	.90	.374
Organization	6	3.45	1.28	4.42	1.33	2.45	.020*
Play materials	9	4.06	2.02	4.88	1.99	1.37	.179
Involvement	6	2.79	1.52	3.53	1.51	1.65	.109
Variety	5	2.82	.95	3.12	.69	1.27	.212
Total	45	26.70	6.32	30.60	6.90	1.94	.061

df= 48 *$p < .05$

Table 4 shows significant difference only in the subscale *Organization*. The scores indicate that joint families are more organized than the nuclear families. The other differences were not significant.

An analysis of variance (ANOVA) was done to determine the effects of differences in fathers' and mothers' education, fathers' and mothers' occupation, age, birth order, number of male and female siblings, language used in the family, current child caregiver, and family size on HOME Inventory scores.

ANOVA revealed that fathers' education has significant effect on the total score of HOME Inventory [$F(5, 44) = 5.338$, $p < .0006$] and three subscales i.e., *Responsivity* [$F(5, 44) = 6.318$, $p < .0002$], *Acceptance* [$F(5, 44) = 7.197$ $p < .0001$], and *Play materials* [$F(5, 44) = 3.433$, $p < .0105$]. Mean scores for different educational groups indicate that the fathers with professional degree (i.e., MBBS/Engin./LLB/CSS) provide better social and emotional stimulation to a child in the home environment than the fathers with other educational qualifications. For the other three subscales, i.e., *Organization*, *Involvement*, and *Variety*, no significant differences were found in relation to fathers' education.

The mothers' education on the contrary, appears to have a significant effect on the total [$F(8, 41) = 4.884$, $p < .0003$], and subscales, i.e., *Responsivity* [$F(8, 41) = 3.036$, $p < .0090$], *Play materials* [$F(8, 41) = 2.912$, $p < .0114$] and *Involvement* [$F(8, 41) = 2.650$, $p < .0193$]. Mean scores indicate that the mothers having master's degree provide an environment which fosters maximum development to their children as compared to the mothers of other educational groups. For the subscale *Organization* the results were also significant [$F(8, 41) = 2.604$, $p < .0212$]. The mean scores indicate that the mothers' having professional degree organize the environment (physical and temporal) in a way which provides their children with more cognitive, emotional, and social development as compared with the mothers in other educational groups. No significant difference was found in the subscales of *Acceptance* and *Variety* in mothers' educational groups.

The results also reveal significant effect of fathers' occupation on the total [$F(4, 45) = 7.098$, $p < .0002$] and all the subscales as *Responsivity* [$F(4, 45) = 3.540$, $p < .0135$], *Acceptance* [$F(4, 45) = 2.602$, $p < .0484$], *Organization* [$F(4, 45) = 3.490$, $p < .0145$], *Play*

materials [F (4, 45)= 4.675, $p<.0031$], *Involvement* [$F(4, 45)= 4.090$, $p<.0065$], and *Variety* [$F(4, 45)= 2.992$, $p<.0284$]. Mean scores indicate that the fathers holding executive jobs provide better environment to their children as compared to those in other occupations such as professionals, armed forces, business and office jobs (supporting staff).

For the mothers' occupation the results were significant only on one subscale i.e., *Involvement* [$F(3, 46)= 2.901$, $p<.0449$]. Mean scores indicate that the professional mothers (e.g., doctors, etc.) have more involvement with their children as compared to those in other occupations.

Finally, the birth order of the child had significant effect on the total [$F(3, 46)= 3.958$, $p<.0136$] and two subscales, that is *Organization* [$F(3, 46)= 4.220$, $p<.0102$], and *Play materials* [$F(3, 46)= 7.313$, $p<.0004$]. The mean scores indicate that the eldest children in the family are provided with more stimulation in the home as compared with the middle and younger child.

The other variables i.e., age, number of male and female siblings, language used in the family, current child caregiver and family size did not reveal statistically significant results.

DISCUSSION

According to the results of this study, the HOME Inventory appears to have validity for use in Pakistan. The results indicating the differences in upper-middle and lower-middle *SES* suggests that the parents of the upper-middle *SES* are more responsive (verbally, physically, and emotionally) to their child; they imposes a minimum of social restrictions on exploratory and motor behavior; have more involvement; provide better environment (physical and temporal); more play materials/toys; and variety in daily stimulation for their children as compared to the parents of lower-middle *SES*. It can be further interpreted that the caregivers (mostly mothers in this sample) from the upper-middle *SES* encourage their children to spend more time in intellectual tasks, i.e., with books, blocks and different types of toys or play materials which facilitate the coordination of sensory-motor processes and are provided a play environment permitting their utilization. The findings of this study are similar to those of studies

done in the West which show a positive association between *SES* and home environment (e.g.. Barnard, Bee, & Hammond, 1984; Beckwith & Cohen, 1984; Bradley & Caldwell, 1984; Gottfried, 1984; Gottfried & Gottfried, 1984; Johnson, Breckenridge, & McGowan, 1984; Siegel, 1984).

The results indicate no gender differences which may mean that parents provide the same type of home environment to both boys and girls. This finding is similar to some Western studies (e.g., Barnard, Bee, & Hammonds, 1984; Bradley & Caldwell, 1984; Gottfried & Gottfried, 1984; Johnson, Breckenridge, & McGowan, 1984; Siegal, 1984).

On the variable of family type the only significant difference is found in the subscale of *Organization* indicating that joint families have a better organization of physical and temporal environment as compared to the nuclear families.

The results indicate that the educated fathers and mothers are more responsive; provide an environment containing a minimum of social restriction on exploratory and motor behavior; and more play materials which help in the cognitive and intellectual development of their children than less educated fathers and mothers. Educated fathers and mothers also have more involvement and contact with their children as compared to the less educated fathers and mothers. Johnson, Breckenridge, and McGowan (1984) in their study also found the same results.

The parents' occupation also show significant effect on home environment. This is an important variable for the healthy development of children. Fathers with better jobs (such as executives) provide more stimulating environment to their children possibly because of more income than fathers with lesser income. This is also supported by the findings for *SES* indicating that family from upper-middle *SES* lived in an environment that was physically and verbally richer than the lower-middle. For the mothers' occupation the only significant difference appeared on the *Involvement* subscale. It showed that the professional mothers have more involvement with their children as compared with the mothers of other occupational groups. Although the findings here are not statistically significant, they show that the occupational status of the mothers positively affects scores on the HOME Inventory.

The results showed significant differences ($p < .05$) for the total

scales of HOME as well as in the two subscale viz *Organization* and *Play materials* when considering the birth order of children. The eldest (first born) child in the family is provided with better home environment. The findings are consistent with the findings of Bradley and Caldwell (1984), Gottfried and Gottfried (1984), and Wachs (1984). The major difference appears to be in contingent responsiveness. The first borns are responded to more quickly than later borns (Beckwith & Cohen, 1984). They also receive more verbal, social and object stimulation from the caregiver (Sigman, Cohen, Beckwith, & Parmalee, 1981) than the other group. They are also expected to have higher levels of achievement (Marjoribanks, 1981).

To conclude, the HOME Inventory (Infant version) appears to be a useful instrument for the future research in Pakistan. Although the sample of this study was quite small, it revealed quite significant results.

REFERENCES

Bakeman, R., & Brown, J. V. (1980). Early interaction: Consequences for social and mental development at three years. *Child Development, 51,* 437-447.

Barnard, K. E., Bee, H. L., & Hammond, M. A. (1984). Home environment and cognitive development in a healthy, low-risk sample: The Seattle study. In A.W. Gottfried (Ed.), *Home environment and early cognitive development: Longitudinal research* (pp. 117-149). Orlando: Academic Press.

Beckwith, L., & Cohen, S. E. (1984). Home environment and cognitive competence in preterm children during the first 5 years. In A. W. Gottfried (Ed.), *Home environment and early cognitive development: Longitudinal research* (pp.235-271). Orlando: Academic Press.

Bee, H. L., Barnard, K., Eyres, S. J., Gray. C. A., Hammond, M. A., Spietz, A. L., Snyder, C., & Clark, B. (1982). Prediction of IQ and language skill from perinatal status, child performance, family characteristics, and mother-infant interaction. *Child Development, 53,* 1134-1156.

Bloom, B. S. (1964). *Stability and change in human characteristics.* New York: Wiley.

Bradley, R. H., & Caldwell, B. M. (1976). Early home environment and changes in mental test performance in children from six to thirty-six months. *Developmental Psychology, 12,* 93-97.

Bradley, R. H., & Caldwell, B. M. (1984). 174 children: A study of the relationship between home environment and cognitive development during the first 5 years. In A. W. Gottfried (Ed.), *Home environment and early cognitive development: Longitudinal research* (pp. 5-56). Orlando: Academic Press.

Bradley, R. H., Caldwell, B. M., & Elardo, R. (1979). Home environment and cognitive development in the first two years: A cross-lagged panel analysis. *Developmental Psychology, 15,* 246-250.

Bradley, R. H., Caldwell, B. M., Rock, S. L., Barnard, K. E., Gray, C., Hammond, M. A., Mitchell, S., Siegel, L., Ramey, C. T., Gottfried, A. W., & Johnson, D. L. (1989). Home environment and cognitive development in the first three years of life: A collaborative study involving six sites and three ethnic groups in North America. *Development Psychology, 25* (2), 217-235.

Caldwell, B. M., & Bradley, R. H. (1984). *Home observation for measurement of the environment.* Little Rock: University of Arkansas.

Caldwell, B. M., Heider, J., & Kaplan, B. (1966). *The inventory of home stimulation.* Paper presented at the annual convention of the American Psychological Association, Washington.

Clarke-Stewart, K. A. (1973). Interactions between mothers and their young children: Characteristics and consequences. *Monographs of the Society for Research in Child Development, 38* (6-7), No. 153.

Elardo, R., Bradley, R., & Caldwell, B. M. (1977). A longitudinal study of the relation of infants' home environments to language development at age three. *Child Development, 48,* 595-603.

Gottfried, A. W. (1984). Home environment and early cognitive development: Integration, meta-analysis, and conclusions, In A.W. Gottfried (Ed.), *Home environment and early cognitive development: Longitudinal research* (pp. 329-342). Orlando: Academic Press.

Gottfried, A. W., & Gottfried, A. E. (1984). Home environment and cognitive development in young children of middle socio-economic status families. In A. W. Gottfried (Ed.), *Home environment and early cognitive development: Longitudinal research* (pp. 57-115). Orlando: Academic Press.

Hess, R., & Shipman, V. (1965). Early experiences and the socialization of cognitive modes in children. *Child Development, 36,* 869-886.

Hunt, J. M. (1961). *Intelligence and experience.* New York: Ronald Press.

Johnson, D. J., Breckenridge, J. N., McGowan, R. J. (1984). Home environment and early cognitive development in Mexican-American children. In A. W. Gottfried (Ed.), *Home environment and early cognitive development: Longitudinal research* (pp. 151-195). Orlando: Academic Press.

Marjoribanks, K. (1981). Birth order and family learning environments. *Psychological Reports, 49,* 915-919.

Parks, P. L., & Bradley, R. H. (1991). The interaction of home environment features and their relation to infant competence. *Infant Mental Health Journal, 12* (1), 3-16.

Parks, P. L., & Smeriglio, V. L. (1986). Relationships among parenting knowledge, quality of stimulation in the home and infant development. *Family Relations: Journal of Applied Family and Child Studies, 35* (3), 411-416.

Pervez, S. (1992). *The role of play in the development of preschool children.* Doctoral dissertation. Islamabad: National Institute of Psychology, Quaid-i-Azam University.

Pervez, S., & Anila. (1991). *Validation of HOME Inventory for Pakistani preschooler.* Unpublished manuscript. National Institute of Psychology, Quaid-i-Azam University, Islamabad.

Reynold, A. J., & Lee, J. S. (1991). Factor Analyses of measures of HOME environment. *Educational and Psychological Measurement, 51,* 181-192.

Saegert, S. (1985). The role of housing in the experience of dwelling. In I. Altman and E. Werner (Eds.), *Home environment, human behavior and environment.* Vol. 8, (pp. 287-309). New York: Plenum Press.

Siegel, L. S. (1981). Infant tests as predictors of cognitive and language development at two years. *Child Development, 52,* 545-557.

Siegel, L. S. (1984). Home environmental influences on cognitive development in preterm and full-term children during the first 5 years. In A. W. Gottfried (Ed.), *Home environment and early cognitive development: Longitudinal research* (pp. 197-233). Orlando: Academic Press.

Sigman, M., Cohen, S. E., Beckwith, L., & Parmelee, A. H. (1981). Social and familial influences on the development of preterm infants. *Journal of Paediatric Psychology, 6,* 1-13.

Stott, H. L. (1974). *The psychology of human development.* New York: Holt, Rinehart and Winston.

Wachs, T. D. (1984). Proximal experience and cognitive-intellectual development: The social environment. In A. W. Gottfried (Ed.), *Home environment and early cognitive development: Longitudinal research* (pp. 273-328). Orlando: Academic Press.

Wachs, T. D., Uzgiris, I. C., & Hunt, J. M. (1971). Cognitive development in infants of different age levels and from different environmental backgrounds: An exploratory investigation. *Merrill-Palmer Quarterly, 17,* 283-317.

Wulbert, M., Inglis, S., Kriegsman, E., & Mills, B. (1975). Language delay and associated mother-child interactions. *Developmental Psychology, 11,* 61-70.

Yarrow, L. J., Rubenstein, J. L., & Pedersen, F. A. (1975). *Infant and environment.* New York: Wiley.