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IMPACT OF STIMULATION INTERVENTION ON MENTAL DEVELOPMENT OF SLUM INFANTS

BY

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DISSERTATION

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COLLEGE OF HOME SCIENCE
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CANDIDATE'S DECLARATION

I, hereby declare that the dissertation or
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DATE : 31st MAY 1993

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This is to certify that the dissertation entitled "IMPACT OF STIMULATION INTERVENTION ON MENTAL DEVELOPMENT OF SLUM INFANTS (9 - 15 MONTHS)" , submitted in partial fulfilment of the requirement for the award of the degree of MASTER OF SCIENCE (HOME SCIENCE) in CHILD DEVELOPMENT AND FAMILY RELATIONSHIPS is a piece of the result of bonafide research carried out by Jayshree V. Nagure under my guidance and supervision. I also certify that the dissertation or part thereof has not been previously submitted by her for a degree of any University.


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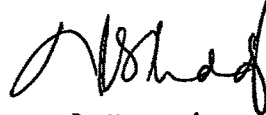
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submitted by Miss. Jayshree V. Nagure to the
Marathwada Agricultural University, in partial
fulfilment of the requirement for the degree of
MASTER OF SCIENCE (Home Science) in the subject of
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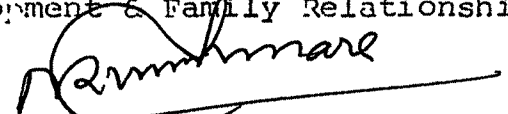
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Introduction

CHAPTER - I

INTRODUCTION

The first few years of human life span are crucial for the cognitive development. Cognition means knowing. It is the process of learning and understanding. It encompasses all mental life and includes imaginary, perception, thought, reasoning, reflection and problem solving. Cognitive development, therefore, refers to the development of intellectual skills (Muralidharan, 1991).

Cognitive development of infant takes place as a result of the interaction between neurological maturation and environmental learning. During the first two years, the infants cognitive growth is based on sensory and motor actions. The infant gets information about the surroundings through the five senses and his or her inborn reflexes. Ribble (1965) regarded three types of sensory experiences as essential for the proper development of the infant. This includes tactile and kinesthetic stimulation, visual stimulation and auditory stimulation. Hence, they should be exposed to a variety of stimulation that will arouse their curiosity.

Playfulness is another vital component of infant stimulation. Play is the most natural and spontaneous form of stimulation for the infant. Through play infant interacts with his or her family and environment. The instinct of play draws the infant's attention to all brightly coloured objects and those that produce interesting sounds. So mobiles, rattles, bells, paper, tins, containers and spoons become her objects for play. Toys that can be manipulated, chewed, reached out to, pulled or pushed enhance infants cognitive development and manipulatory skills as well as visual-motor co-ordination.

The infants who do not have adequate opportunity to play due to physical, mental, social or emotional handicaps are likely to demonstrate deficits in thoughts, feelings and action. Therefore caregiver must create an environment which gives the infant freedom, opportunities and motor experiences and hence they should be exposed to a variety of stimulation that will arouse their curiosity. Since infants vary greatly in their rate of neurological maturation, each infant must be observed and

accordingly activities must be planned for, on individual basis. Optimum stimulation is that which is appropriate, non-restricting, responsive and effective.

Babies are social beings from birth and responsive to changes in the environment. Social interaction is an even more important factor in inducing play in infants. Toys that are attractive as well as contingently responsive promote exploration and learning. Infant must have a setting that provides an emotionally safe and pressure free atmosphere and a physical environment with a variety of objects within reach which can be manipulated in number of ways. But stimulation of the infant by talking, cooing, singing, and pointing out things in the environment assumes special significance to mitigate the effects of lack of materials.

Stimulation at the early childhood stages means efforts to activate the child's early development. It is more than a series of exercises and it is a continuous dialogue between the child and those who care for her. For stimulation the experiences must be in accordance with the child's maturational level and should involve such

activities that demand a close interaction between the child and the caregiver. An essential ingredient in these activities is a warm and loving relationship between the child and the adult without which the activities would be meaningless (Muralidharan, 1991).

The young child spends maximum time with its family and much of the social interaction between baby and caring adult is a prerequisite to learning. Infants learn very early from their mother's caregiving, by interacting with mother, and also gradually extending their reciprocity to other members of the family and to other adults (Brazelton, 1969). Therefore a supportive family network for parents may be a crucial variable in an intervention programme to optimize an infants functioning.

Now a days millions of young children live in poverty in the developing country like India. Certain home conditions predispose the child to be at risk of inadequate stimulation and care. Such conditions are low per capita income, lack of literacy, migration, single

parenthood, broken home and employment of both parents outside the home without adequate substitute mothering support. These conditions cluster more frequently in lower socio-economic status families and in urban slums. It was found that children from disadvantaged homes were not equipped well in cognitive, verbal and attentional skills as compared with their relatively well-off counterparts, at the point of school entrance, and thus they started school with a handicap. Children exposed to pre-school activities are at an advantage in language and intellectual development and learning readiness in comparison to their counterparts without the exposure.

In low income families mothers provide a less supportive linguistic environment for the child than the middle income mothers (Streissgirth and Bee, 1972; Feshback, 1972). They allow their children to play alone more often, decrease their level of interaction as the child grows older, use more physical punishments and provide little positive reinforcement, issue more commands and ask fewer questions using authoritarian speech. Unfortunately, the development of cognitive competence often is threatened in children of poor families and may not improve without specific intervention (Zeskind and Ramey, 1978, 1981). Therefore, providing appropriate environment in such low income families may lead to give rich experiences and to enhance child's learning.

Over the years due to socio-cultural changes, Indian mothers are fast losing their ancient moorings.

The break-up of joint family system, migration from rural to urban areas and the need to seek employment outside have all contributed to resulting changes in child rearing practices. The age-old games, songs and stories, the home-made indigenous toys, which parents and grand parents used with their children are no longer in use. Many parents see no relevance of such practices in the modern push and pull mode of living which is generally considered necessary for survival in the present days.

In India the urban population has grown steadily and it has furthered its momentum in the recent decades. In Maharashtra 304.96 lakh people live in urban areas (Yojana, 1993) and Maharashtra has the highest percentage (35) of urban population in the country. Urbanization may bring in its wake problems of environmental degradation, pollution of air and water, proliferation of slums, housing problems, unhygienic atmosphere, etc. (Tripathy, 1988).

High quality early childhood programmes and good preschools can help children prepare for school. But preschools have to help 3 and 4 year olds overcome delayed

development and alter self-defeating attitudes already deeply ingrained. Therefore, early stimulation intervention programme at home level for effective development of children is a felt need. Hence in light of the above it is felt necessary to conduct this study with the following objectives.

1. To assess the mental development of selected slum infants.
2. To design the infant stimulation intervention programme corresponding to observed mental development of selected slum infants.
3. To execute the developed design of the infant stimulation programme on the selected infants through primary caregiver.
4. To assess the impact of infant stimulation intervention programme on mental development of slum infants.

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REVIEW OF LITERATURE

Slum infants due to poor environment may be delayed and deficit in learning process. But by providing appropriate environment i.e. extra stimulation they may overcome. On this basis an investigation on impact of stimulation intervention on slum infants was carried out for 2 months. The relevant studies cited in the literature are reviewed here under different heads.

1. Stimulation intervention programme on infants mental development.
2. Home environment in mental development of infants.
3. Caregiver/ other family members and infant interaction on mental development.
4. Play and play material in mental development of infants.

2.1 Stimulation Intervention Programme On Infants
Mental Development:

In infant stimulation intervention programme, Schaefer (1968) utilized home tutors one hour a day for

five days a weeks. Twenty eight (15 months old) black male infants were given stimulation until they become 36 months of age and mothers were also encouraged to participate but not to do themselves. Periodic testing of these experimental infants compared with a group of control infants showed that the experimental group infants IQ scores were significantly higher than the control group infants.

Painter (1969) in similar way utilized home tutors in the study of infant intervention programme. The subjects were younger siblings of both black and white four-year-old children already attending a preschool for "culturally disadvantaged ". Twenty infants (8 to 24 months old) were randomly assigned to either the experimental or the control group. After an initial IQ pre-test for all the infants (Experimental group mean=98.8, control group mean= 98.4), experimental group infants were engaged in activities thought to be relevant to cognitive and language development. They were also visited by a female tutor for a whole year. At the end of the year, however,

the experimental group mean was 108, while the control group mean was 98.8.

Yarrow, et al. (1972) evaluated the environments of the infants. It was found that personal environment was correlated positively with developmental scores and with goal directed behaviours of babies.

Herber and Garber (1973) by conducting infant intervention studies suggested that while infants were in programmes cognitive gains were achieved.

The quality of attachment and the quality of intelligence stimulation in the first three years affected competence. Carew, et al. (1976); and (1978) reported that intelligence grew mightily when cultivated well in the early years.

Lazar (1977) by observing children from many longitudinal intervention projects concluded that experimental children showed advances compared to controls.

Palmer's (1978) infant study, two-and three-year old boys were given two hours of tutoring weekly for eight months. The results showed that by fifth grade, experimental children were reading three months ahead of the control group. It appeared that infant intervention had shown effects of enrichment during elementary school years.

Anandlakshmy (1982) conducted a study on cognitive competence in infancy into three phases on 6-24 months old infants. In the first phase it was found that infants from upper socio-economic class had scored high on MDI scores than lower and lower middle class. This difference appeared to be due to a genuine lack of awareness about importance of play on the part of the lower socio-economic level mothers. In the second phase infants from lower and lower middle economic level were followed up. On the basis of these findings of the first phase play strategy were developed for stimulation which was practiced for one month. Anandlakshmy (1985) concluded that perhaps an intervention programme of one month's duration was not

sufficient to result in any appreciable increase as the trend was towards an increase in scores rather than being constant.

Ramey and Bryant (1982) conducted a study in which sixty-four high-risk families were randomly assigned to one of three conditions: day care and family education, family education, family education or untreated control group. The results showed that at 36 months, children in day care and family education group had higher IQs than children in the family education group and control group.

Zigler et al. (1982) examined "Is a intervention programme necessary in order to improve economically disadvantaged children's IQ scores?" Head start and non-Head start groups were tested on IQ and motivational measures 3 times before and during the Head start year (Pretest, retest, posttest). Both groups showed comparable IQ gains on retesting, but only the Head start group showed continued gain from retest to posttest.

Moxley-Haegert and Serbin (1983) compared the effectiveness of developmental education for parents with parent education in child management and with a no-education control condition in motivating parents to participate in home treatment programs for developmentally delayed infants. Thirty nine delayed infants, matched for age and severity of delay, and their families were randomly assigned to the three treatment groups. Results indicated that the children in the developmental, education group gained a greater number of skills, and their parents participated more in the assigned home treatment programs than did parents in the other two groups.

Early intervention and its effects on maternal and child development was studied by Slaughter (1983) for 2 years with lower-income black mothers and their 18-44 months age children. Intervention group was involved in toy demonstration and mother discussion groups compared with control group. The results revealed that the children from the two programme groups scored a higher average IQ scores on the McCarthy scale compared to the control group children.

Patri (1986) reported the results of an intervention programme of early stimulation in a group of disadvantaged children. He studied 75 disadvantaged children (8-36 months) belonging to unskilled workers in Haryana. Most of the children were lacking in material for stimulation. But after the implementation of intervention programme of infant stimulation, it was found that those children were more alert, more confident and had greater initiative than the children who had not participated in intervention programme.

White et al. (1989) investigated the effectiveness of parents involvement in identified 43 home-based intervention studies. The results showed that as the degree of parent involvement was more, the effect on IQ was greater comparatively to lesser parental involvement.

Powell and McGreger (1989) conducted two studies of home visiting and psychological stimulation to deprived children. In the first study children of 6 to 30 months were assigned to groups that visited biweekly, monthly. It was found that the biweekly group showed small but significant

increases in scores on the Griffiths mental development scales compared with the monthly and control group.

Where as no benefit was shown in the Griffiths scores of the monthly group. In the second study, children aged 16 to 36 months were randomly assigned to weekly visiting groups. The groups visited weekly showed marked improvements. The results showed that as the frequency of visiting increased from none to weekly, the benefits increased as well.

Muralidharn and Kaur (1989) conducted a study on the impact of an intervention programme on the language and cognitive development of tribal preschool children. Seventy two boys and 72 girls were included from the age 3-4½ and 4 ½ to 6 years. Out of 144 children 72 were formed the experimental group and remaining 72 were control group. Experimental group children were given activities developed in children's Media Laboratory. The findings showed that the experimental group gained better language and cognitive skills than control group.

Muralidharan and Kaur (1990) conducted a study on the impact of an intervention programme on the language and cognitive development of preschool children from the urban Anganwadies. The sample of 144 children was studied from the age 3 to 4 1/2 years and 4 1/2 to 6 years. Out of 144 children 72 formed the experimental group and remaining 72 children formed control group. Activities developed by children's Media Laboratory were given to experimental group. At the end of the study it was found that experimental group gained better language and cognitive skills as a result of the intervention.

Gupta and Patel (1991) screened a sample of six hundred and nineteen babies aged six weeks to two years from the slums of Jabalpur city. All children tested belonged to the deprived sections of society. In spite of this 74 percent of children scored above and at par on the Gesells developmental schedule.

Markowitz et al. (1991) examined the short-term effects of early intervention on 489 children who began

special education services under the age of 5 years.

Results indicated that children made developmental gain in their first programme year beyond that predicted by maturation alone.

Jayakameswari and Ratnakumari (1992) conducted a study to see the effect of a home stimulation intervention programme on mental development of toddlers (12-18 months) of slums in Hyderabad city. Results revealed that though the performance of both the groups (experimental and control group) was same at the time of pretesting, but due to exposure of stimulation programme experimental children's rate of improvement in mental age was higher than that of control group.

Desetty et al. (1992) conducted a study on underprivileged slum infants of parbhani town. Results indicated that the intervention programme which was designed to promote motor development found to be very effective, on the other hand the intervention programme designed to promote mental development need to be strengthened/ enriched to make infants to grow mentally to their maximum potential. It was

inferred that due to poor ~~environment~~ and ineffective and nonresourceful primary caregivers (mother/grandmother/elder siblings) the slum infants found to under grow to their potential.

Brooks-Gunn, et al. (1992) conducted a study on effects of early intervention on cognitive function of low birth weight pre-term infants. The infant health and development programme was randomized clinical trial to test the efficiency of educational and family support services and pediatric follow-up, offered during the first 3 years of life. It was hypothesized that larger intervention effects would be found for the domains in which birth weight pre-term infants are known to have problems, specifically visual-motor and spatial skills and receptive language skills.

Agarwal, et al. (1992) one hundred and ninety six children were assessed for physical growth, development, intelligence and concept development between 1 and 3 years of age, Home environment was also assessed using Caldwell Home Inventory. It was found that maternal involvement

and stimulation was strongly associated with better behavior development and intelligence. The results also showed that the effect of home environment on development and intelligence was of a higher magnitude as compared to status and family variables and nutritional status during 1-3 years.

2.2 Home Environment In Mental Development Of Infant Development:

Jones (1954) documented the correlational evidence on environment and mental development. Scores on intelligence tests were found to be related to social, economic and educational classification of the families of the children tested.

Elardo, et al. (1975) examined correlation of Home to children's cognitive development. It was found that maternal involvement with child and provision of appropriate play materials aspects of the home environment at both 12 months and 24 months correlated significantly with 36 months Stanford- Binet IQ scores.

Bradly and Caldwell (1976) In a follow-up study on the correlation of Home to children's cognitive development, one hundred and twenty-six children were reexamined at 24 months. The results indicated that the home environment variables such as provision of appropriate play materials ($r = 0.56$). 'Maternal involvement with child' ($r = 0.55$) and 'emotional and verbal responsivity of mother' ($r = 0.50$) were highly correlated with stanford Binet IQ scores.

Wach's (1978) research established a strong association between children's mental development and the quality of stimulation available in the home environment during the first three years of life.

Gottfried and Gottfried (1979) studied longitudinally sample of 130 infants to see the relationship between home environment and cognitive development in young children of middle socio-economic status families. The infants were tested on the Bayley scales of Infant development at 12, 18 and 24 months. The results of the study showed the positive Significant correlations between the home scales and the cognitive measures across all of the ages.

Bradly and Caldwell (1981) had reported that the home environment scores of children were less strongly related to race, gender, and even SES than they were to family structure, variables such as birth order, the amount of crowding, and family intactness.

Based on reproductive and demographic factors, development was tested with 51 full-term and 53 pre-term infants by Siegel (1982). Socio-economic status, birth order, and for the preterm group, severity of illness in the perinatal period were the most significant predictors of developmental outcome. The home observation for measurement of the environment scores were significantly correlated, independantly of SES and developmental level, with the 3 year Reynell and Standford-Binet scores for the preterm.

Bradly and caldwell (1984) examined the relation between the home observation for measurement of environment (HOME) inventory and several child status and family structure variables. The results showed consistent relations

with Home scores of the six home scales, organization of the environment, provision of appropriate play materials and maternal involvement showed the strongest relation to the status and structural measures.

Bradly et al. (1989) attempted to examine the generalizability of environment on development relationship among three years of life. Results indicated a fairly consistent relationship between home scores and children's developmental status. Measures of specific aspects of the child's home environment, such as parental responsibility and availability of stimulating play materials, were more strongly related to child's developmental status.

2.3. Caregiver/other Family Member And Infant Interaction On Mental Development of Infant:

BeckWith (1971) examined interactions between biological variables and environmental variables of ten months old infants. The results indicated that cattell developmental quotients of infants correlated positively

with both the extent to which a mother talked to and touched the baby and the extent to which the infant was given an opportunity to explore the home.

Stayton et al. (1971) studied compliance in the first year of life through in home naturalistic observation of 25 middle class mothers and their babies. It was found that insensitive mothers were geared almost exclusively to their own wishes, moods, and activities.

Clarke-Stewart (1973) in a study of relationship between optimal care and infant competence, found that the amount of maternal verbal stimulation as the best single predictor of the infants overall competence score. Specially, a mother who was affectionate, responsive and enriching from both visual and verbal perspectives appeared to produce intellectually competent and secured children.

Bakeman and Brown (1977) observed 'Behavioural Dialogues' An approach to the Assessment of mother-infant interaction. Applying this approach to the observation of 45 mothers infant dyads during feeding situation revealed that in early infancy, mothers rather than infants drew the

dyadic system. Mothers gave more attention to their male than to their female new born infants. Mothers of first born infants spent more time in feeding their infants than do mothers of later-born infants, because they lacked experience and could not satisfy their infants efficiently.

Misra (1977) conducted a study on the nutritional and socio-economic correlates of cognitive and motor development of 5-12 month old infants. The findings pointed to a positive relationship between amount and kind of maternal interaction with the infant and the performance of the infant on the Casati Lezine Scale and Bayley scales of Infant development.

Ainsworth and Bell (1973) examined six maternal variables in infants home environment. The results indicated that mothers who were sensitive to infants signals and permitted their babies floor freedom to explore the world tended to have babies with higher developmental scores.

Golden, et al. (1973) examined changes in cognitive development from 18 to 36 months. The results showed that intelligence scores of black males were strongly related to educational and economic conditions of the home by three years of age.

Belsky, et al. (1980) intervened in the interaction between eight mothers and their 12 month old infants comparing them to eight control mothers and their 12 month olds. The author was convinced that experimental mothers significantly exceeded their control group in the frequency of stimulating their infants. Two months later, the experimental infants were engaged in more competent play than the control infants.

Ninio (1980) investigated vocabulary acquisition in the context of joint reading of picture book, in mother infant dyads belonging to 2 social classes 20 lower class dyads were observed. The infants ranging in age between 17 and 22 months. In both groups interaction focused on eliciting or the labeling information. It was found that low-SES mothers talked less and high-SES infants had a

bigger productive vocabulary whereas low SES infants had a bigger imitative vocabulary. It was also shown further the rate of development was slower in the low SES group, as evidenced by lower correlations with the age of the infant.

Bee et al. (1982) illustrated that mother infant interaction and general environmental quality were among the best predictors of intellectual and language development during the first four years of life.

Olson, et al. (1984) in an analysis of 120 mother infant pairs observed at home, found that maternal verbal stimulation and responsivity, positive control, and affection best predicted toddler compliance.

Lutkenhaus, et al. (1985) explored the relation between the quality of infant-mother attachment at 12 months and the child's style of interaction with an unfamiliar visitor at age 3 years (20 girls and 26 boys). Findings indicated that children with a secure attachment relationship

at 12 months with their mothers: showed greater sociability in interactions with unfamiliar persons than children with an ~~insecure~~ attachment relationship.

Fiese (1990) examined the relation between 57 mother-toddler interaction and complexity of symbolic play under four conditions (1) child play alone (2) child play with mother (3) child modeling mother and (4) child play with mother following the modeling condition. Results showed that more cognitively complex play observed when the children were playing with their mothers than when playing by themselves and maternal intrusiveness was more likely preceded simple exploratory play.

In a study " Early maternal and environmental correlates of quality of infant and 18 month Bayley performance" Ricciuti and Thomas (1990) found that maternal and family environmental characteristics showed significantly influence on quality of infant care as well as subsequent behavioural development within low income " high-risk" populations. The substantial correlates were found in predicting 18 month Bayley score.

Singer and Singer (1992) conducted a study on "The House of make-Believe: play and the developing imagination". They emphasized the blending of three facets of the child's development constitutional factors, the influence of the caregiver's personality traits and style, and the combined effect of these components on the baby's emerging cognitive skills. They noted the importance to young children of a person who plays and encourages play, places, space and time for play, and props and pets.

2.4 Play And Play Material In Mental Development Of Infants:

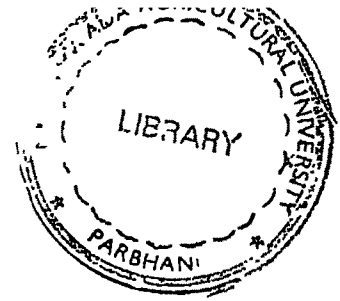
The predictability of cognitive differences at 12 months from infant and maternal behaviours at 4 months was investigated by Ruddy and Bornstein (1982). The results indicated that frequent maternal stimulation at 4 months specially, by encouraging babies attention to objects, correlated with the size of speaking vocabulary at 12 months, and the maternal stimulation positively influenced infants cognitive development.

Parpal and Maccoby (1985) examined the effects of 3 models of mother-child interaction on children's subsequent compliance with maternal directives. Thirty-nine lower, middle class families with children ranging in age from 3-2 to 4-6, were included in the study. Prior to the compliance test, mothers and children were in one of the following conditions; Responsive play (mother-trained), free play (mother - untrained), or noninteractive. The results showed that both the responsive play and non-interactive conditions produced higher levels of child compliance than the untrained free play condition.

Mothers and Fathers of 4 boys and 4 girls at each of 3 ages (7, 10 and 13 months) were videotaped during toy play interactions with their infants by Power (1985). It was found that parents of older infants used more verbal techniques alone and less physically perform behaviours for their children. It is also noticed that mothers were more responsive than fathers to infant cues of interest and attention specially at 13 months and were more successful in influencing infants behaviour. With increasing infant age, mothers of girls were more directive of their infants play, whereas mothers of boys were less directive.

Sing and Gill (1986) investigated maternal judgement of appropriateness of play materials for infants, toddlers and preschoolers. Mothers were selected for the study. The results revealed that a majority of mothers rated different types of squeeze toys (87.7%) rattles (75.4%) and air filled toys (78.5%) to be most appropriate for infants, followed by balls, string pulled toys and mechanical toys. Small blocks (75.3%) were judged most appropriate toys for toddlers. All types of squeeze, stuffed and air filled toys still remained suitable for toddlers.

Symons and Moran (1987) examined "The Behavioural dynamics of mutual responsiveness in early face-to-face mother- infant interaction. In this study 20 mothers were instructed to play with, imitate and hold the attention of their 13-16- week- old infants in 33 minute. Correlation analysis revealed that the infants of mothers who were most responsive during play and attention getting episodes also displayed relatively high levels of responsiveness.



A comparative study of the intervention and non-intervention group was done by Mokashi (1990) on the high risk babies. In intervention group, parents were instructed to provide simple stimulation with ordinary cheap objects available in the home, and also especially mothers were asked to play with the infants and cooperate in infant's play activities. The results showed that out of 64 babies who followed therapy advised to them at 6 months, 70.3 percent normalized at 12 months. It is further informed that regular stimulation and early intervention had a significant role to play in the improvement of high-risk newborns.

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**Materials
Connections**

CHAPTER-III

MATERIALS AND METHODS

~~This~~ This study was planned to investigate the impact of stimulation intervention on mental development of slum infants (9-15 months). Materials and methods used in this investigation are discussed under the following sections.

1. Location of the study.
2. Selection of the sample.
3. Selection of the tools.
4. Selection of the play materials for stimulation intervention programme.
5. Implementation of the stimulation intervention programme.
6. Statistical analysis.

3.1 Location Of The Study:

For this investigation four slums i.e. Jai Ambabhavaninager, sant Gadgebabnanger, Bhaiyasaheb Ambedkarnager and Ramaji Subhedar Ambedkarnager were randomly selected from Parbhani town, because of their

near by distance and hence ease of approach to the investigator. Experimental sample for the study was selected from Jai Ambabhavaninager and Sant Gadgebaba-nager. While for control group infants were chosen from remaining two slums.

3.2 Selection of the sample:

Prior to the experiment all the infants from the selected four slums were tested to estimate ^{their} mental development. From this, a sample of 60 healthy infants of both sexes, each of 30 in the age group of 9-13 months with similar level of mental age (9-11) and belonging to low socioeconomic status and nuclear families were selected randomly. Out of these 60 infants, boys and girls each 15 were picked up to form the experimental group who had access for stimulatory activities which were specially designed for the study. The remaining 30 infants i.e. boys and girls each 15 comprised of control group who had only routine activities.

3.3 Selection Of The Tools:

For the stimulation intervention programme following tools were used.

1. Interview schedule.
2. Bayley scale of Infant Development (BSID).
3. Home Inventory.
4. Socio-economic status scale.

3.3.1 Interview Schedule:

All the sample infants mothers and other caregivers were personally interviewed with the help of pretested questionnaire. They were also observed in their various interactions with the selected infants. The information was collected on various aspects, such as family background, play materials and other materials available in the home, caregiver's involvement in infants activities, interaction between caregivers and infants, personality traits of primary caregivers, etc. (Appendix-I.)

3.3.2 Bayley Scale Of Infant Development: (BSID):

To estimate the mental development of 9-15 months old infants, items were taken from Bayley scale of infant

development (BSID). Mental scale of BSID consists of 163 items which cover mental development from birth to 30 months. For this study items from 5 months onwards were selected for pre and post-testing (Appendix-II). Items were administered to the infants depending on chronological age of the infant. The procedure of presenting each item and the nature of performance of the infant for credit were also referred from BSID manual as per Baroda studies and Baroda Norms (1961).

3.3.2.1 Training Of The Investigator:

Before the commencement of this research work, the investigator was given training in using BSID scale. The investigator was then given experience of testing a few cases to ensure her thoroughness of handling and implementing the given instructions.

3.3.2.2 Testing Procedure:

All the sample infants were tested in their own home surroundings like court-yards and inside doorways twice during the period of the study. The

testing done initially while selecting the sample was treated as pre-testing. The 2nd post-testing was done two months after the implementation of the stimulation intervention programme. Infant testing was done in the presence of their primary caregivers while the remaining mob was controlled by the helper of the investigator. Pre and post-testing was done under the supervision of trained personnel to avoid discrepancy and to ensure validity and accuracy of the results.

3.3.2.3 Calculation Of Mental Development:

To calculate the mental quotients the BSID manual was adopted as per Baroda studies and Baroda Norms (Research Form, 1961). Total mental performance score was counted for each infant, it was converted into mental age (MeA) by referring to the age placement norms (Table-2) as per the BSID manual (Research Form, 1961). The age, placements of the total score, item number were noted seperately. Then the mental scores were converted into mental quotients by referring Table 4 as per the BSID mannual.

3.3.3 Home Inventory:

The home observations for measurement of the environment inventory (Home: caldwell and Bradly, 1984) was administered on participating family considering the cultural practices. Home inventory scoring was done on the basis of responses of the mothers of selected infants obtained through their interview as well as observations in the situation. The Home Inventory for families of infants and toddlers version containing 45 binary choice items was used. These were classified into 6 subgroups and total scores as shown in Appendix-III.

3.3.4 Socio-economic Status Scale:

In selecting the infants from lower socio-economic status group socio-economic status scale for urban population (Kuppaswamy, 1989) was used. Accordingly education, occupation and income of the parents of the selected infants were indicated on seven point scale. The maximum score for these three variables were 7, 10, 12 respectively. The total obtained score was classified into three groups as follows.

<u>SES class</u>	<u>Total score</u>
Low SES	0-9
Middle SES	10-21
High SES	above 21

3.4 Selection Of Play Materials For Stimulation Programme: -

1. Sources used for developing play materials.
2. Development of play materials.
3. Package of activities used.

3.4.1 Sources Used For Developing Play Materials:

For planning stimulation intervention programme, for infants activities developed by Swaminathan (1989), Muralidharan and Asthana (1991) and Patnam, Desettey and Vasekar (1991) were used as basic sources for developing suitable materials for infant stimulation activities.

3.4.2 Development Of Play Materials:

Mostly cheap and indigenous materials were provided for the designed activities by the department of child development and family relationships, in addition to the materials available in the infants homes.

The provided materials were as follows.

a) Readymade Materials:

1. Plastic doll.
2. Small plastic boxes with lids.
3. Rattles.
4. Balloons.
5. Balls.
6. Sponge pieces.
7. Crayons and white papers.
8. Sand paper, glaze paper and velvate papers were used for differentiating between different textures.

b) Developed materials:

1. Wooden blocks.
2. Cardboard puzzles.
3. Story books.

c) Materials available in the home:

Cup and spoon, pots, plates, steel catories, containers, clothes, foods, coloured picture books of elder siblings, posters, mirror, baskets of different materials (iron and cane), rolling board etc. in addition certain materials such as taperecorder and used pianotype switches were also used for intervention programme.

3.4.3 package of Activities:

The series of infant stimulation activities planned and executed to the infants of experimental group were as follows.

Looking for, identifying body parts, imitating, pointing out, opening and closing lids, putting in and taking out, scooping, following instructions, feeling air, pulling, pushing, hiding and finding object, squeezing, placing, scribbling, splashing, naming, paper tearing, banging, patting, filling, making and listening different sounds, hide and seek game, knowing different textures and colour, shape and size concept, listening songs, singing songs, dancing, building blocks and collection, turning pages, pointing out, naming pictures.

3.5 Implementation of Stimulation Intervention programme:

The intervention programme was executed through the primary caregivers continuously for two months (approximately 3-4 hrs. per day) in the homes of selected infants (experimental group), primary caregiver is the person who is relatively more involved in infant care activities and who interacts more with infant. The



Play materials introduced in Infant stimulation intervention



Educating primary caregivers on the activity of identification of body parts of a doll.



Making efforts to build a tower of 5 blocks after instruction.



Encouraging infant to match the basic shapes



Encouraging infant to feel and enjoy various textures.



Encouraging infant to paint out body parts of a doll.



Encouraging infant to identifying pictures from picture-book



Investigator discussing with primary caregiver about Infant progress.



Experimenting to bounce the balloon tied to
a thread.

programme was supervised by the investigator twice in a week. Before and during the stimulation intervention programme primary caregivers in the group of 4-5 were given demonstrations regarding how to use play materials for different activities and trials were also taken to ensure that the instructions given were followed fully.

The infants were given readymade, developed and homemade materials alternately through the primary caregivers as per their convenience. Every time in the first visit the readymade or developed material was given. While in the second visit addition of materials available in the home was suggested for continuing the activities with change in the situations. For example- If ball was given in the first visit to stimulate activities of throwing, catching on the floor. In the second visit the addition of home materials such as container, was suggested to place the ball in the water to continue the activity. Similarly the pictures, photographs, etc. were related to items in the real life.

Instructions regarding handling and proper storing of provided materials were given to the primary caregivers. Besides this, they were also asked to praise, encourage, clap, kiss and hug the infant immediately after the successful completion of each activity or after quick correct response. Primary caregivers were encouraged to play with infants whenever they had free time and were also requested to take infants for out to expose them to their surroundings and allow their infants to play with their siblings and other children around.

3.6 - Statistical Analysis- To analyse the data, paired 't' test was used to find out the significant difference in mental quotients on pre and post test and unpaired 't' test was used to compare the mental ages of control and experimental groups at the time of pretesting at varying chronological ages. The standard procedures given by Panse, and Sukhatme, (1985), and Singh, and Chaudhary, was used for statistical analysis.

The absolute and relative gains were calculated as follows.

$$\text{Absolute gain} = \text{Post-test MQ} - \text{Pre-test MQ}$$

$$\text{Relative gain} = \frac{\text{Post-test MQ} - \text{Pre-test MQ}}{\text{Pre-test MQ}}$$

Results

Discussion

CHAPTER-IV

RESULTS AND DISCUSSION

This study was carried out to investigate the impact of stimulation intervention programme on mental development of slum infants. For this purpose play materials and activities were specially designed. They were used in intervention programme on experimental group infants for 2 months to make them grow mentally to their optimum potential. The data obtained was tabulated, analysed statistically and presented under the following heads.

1. Background information of the sample.
2. Assessment of the mental development of selected slum infants prior to stimulation intervention programme.
3. Assessment of the impact of infant stimulation intervention programme on mental development of slum infants after implementation.
4. Factors affecting infant stimulation intervention programme.

4.1 Background Information Of The Sample:

Table 1 reveals, the background information of the sample in terms of birth order of the infant,

size of the family, income of the family and education of parents.

Table 1: Background information of the sample.

Characteristics	Percentages of families			
	Control group		Experimental group	
	(30)		(30)	
A. Birth order:				
First born	20.00		20.00	
Later born	80.00		80.00	
B. Size of the family:				
Small	36.66		26.66	
Middle	56.66		73.33	
Large	6.00		--	
C. Income of the family (Rs. per month)				
Below 600	10.00		3.33	
600-800	50.00		53.33	
Above 800	40.00		43.33	
D. Education of parents:				
	Mother	Father	Mother	Father
Illiterate	93.33	56.66	83.33	53.33
Primary	3.33	26.66	10.00	16.66
Higher secondary	3.33	16.66	6.66	30.00

It is observed from Table 1, that majority of the infants (80 per cent) were later borns in both control and experimental groups and remaining 20 per cent were first borns.

As seen from the Table 1, 56 to 73 per cent families were middle sized families. Twenty six to 36 per cent families belonged to small sized families in both control and experimental groups.

Information regarding the income of the family is given in Table 1, near about 50 per cent families from both the control and experimental groups had monthly income in the range of Rs. 600-800. Above Rs. 800 monthly income was seen in 40 per cent to 43 per cent families of both groups.

Regarding the education of the parents of infants, a large percentage of infants mothers (above 83 per cent) and above 53 per cent fathers were illiterates in both the control and experimental groups. Three to ten percent mothers in both the groups had education upto primary school.

Sixteen to thirty per cent fathers of infants in control and experimental groups had education upto higher secondary school and remaining sixteen to twenty-six fathers were educated upto primary school in both the groups.

4.2 Assessment of The Mental Development Of Selected Slum Infants Prior To Stimulation Intervention Programme:

The pretest findings of the mental development of selected infants are given in Table-2 and 3.

4.2.1 Mean Mental Age Of Selected Slum Infants Prior To The Stimulation Intervention Programme:

Mental ages of the selected slum infants are presented in Table-2.

Table 2. Mean Mental age of selected slum infants prior to the intervention programme

Age of infants (months) mean \pm SD	Mental age of infants				't' value
	Control group No.of infant	Mean \pm SD	Experimental group No.of infants	Mean \pm SD	
11.35 \pm 0.21	6	10.31 \pm 0.34	8	10.17 \pm 0.38	0.69 NS
12.26 \pm 0.26	19	10.57 \pm 0.33	20	10.56 \pm 0.38	0.38 NS
13.00	5	10.74 \pm 0.16	2	10.80 \pm 0.14	--

NS- Non-significant.

3.3-- As seen from the Table the mean mental age of infants of 11.35 \pm months in the control and experimental group was 10.31 and 10.17, respectively. For infants of 13 \pm months age the mental age was 10.74 in the control group and 10.80 in the experimental group. In the mental ages of infants 12 \pm months of control and experimental groups were 10.57 and 10.56 respectively.

It is clear from the Table 2 that the mental ages of the infants of both the study groups were almost similar at the time of implementation of stimulation intervention programme though the selected infants varied in their chronological ages. Further it is also noted that the mental ages of all the selected infants were below their chronological ages. The low mental quotients of the infants may be attributed to the unstimulatory environment in which the slum infants are being reared.

There was no significant difference in the mental ages of control and experimental group infants of 11.35 and 12.26 months ages.

It can be concluded that the mental ages of infants were almost similar which were below their chronological ages at the time of pretesting.

4.2.2 Mean Mental Quotients Of Selected Slum Infants

Prior To The Stimulation Intervention Programme:

Mental quotients of selected infants are given in Table-3.

Table 3. Mean Mental Quotients Of Selected Slum Infants

Prior To The Stimulation Intervention Programme:

Groups	Mean age of infants (months)	Mean mental quotients of infants mean \pm SD	't' value
Control group (30)	12.21 \pm 0.52	70.32 \pm 8.72	0.43 NS
Experimental group (30)	12.06 \pm 0.56	70.56 \pm 9.76	

NS- Non-significant.

As noted in Table 3, the mean mental quotients of control group and experimental group were 70.32 and 70.56, respectively. The obtained scores were low when compared

with the normal. It is evident from the table that the mental quotients of selected infants of control and experimental groups did not differ. The low scores of mental quotients may be due to inadequate stimulation, improper care of infants, and due to lack of awareness on part of the primary caregiver about proper rearing methods. It may be also due to passive interaction with the infants by the caregivers and lack of resourcefulness. These results indicating, infants from low income families have low mental quotients. These results are similar with that of findings of Anandlakshmy (1985), Patri (1986) and Desetty et al. (1992).

Statistically there was no significant difference in mean mental quotients between control and experimental groups at the time of pre-test.

4.3 Assessment Of The Impact of Infant Stimulation Intervention Programme On Mental Development of Slum Infants After Implementation:

The findings of the impact of stimulation intervention programme on mental development of selected

slum infants are given under following sections.

1. Mental quotients of the selected infants before and after stimulation intervention programme and absolute and relative gains.
2. Mental quotients of selected male and female infants before and after the stimulation intervention programme.
3. Mental quotients of selected infants of varying ages.

4.3.1 Mental Quotients of The Selected Infants Before And After Stimulation Intervention Programme and Absolute And Relative Gains:

As evident from Table 4, that the mean mental quotients of the infants of control group were 70.32 and 74.32 at pre and post-testing respectively. The corresponding values of the experimental group infants were 70.56 and 97.48. The absolute gain from the stimulation intervention programme was 4.00 and 26.92 in control and experimental groups respectively. The relative gain of both the group infants was 0.06 and 0.38 respectively.

The mean quotients of experimental group was higher than that of control group. The absolute gain mental quotients of experimental group was seven times more than that of control

Table 4. Mental quotients of the selected infants before and after stimulation intervention programme and absolute and relative gains.

Groups	Mean age of infants	Mental quotients		Absolute gain	Relative gain	't' value
		Mean + SD				
		Pre-testing	Post-testing			
Control group : (30)	12.21 ±	70.32 ±	74.32 ±	4.00	0.06	9.18*
	0.52	8.72	9.03			
Experimental group (30)	12.06 ±	70.56 ±	97.48 ±	26.92	0.38	16.62*
	0.56	9.76	8.94			

* = p < 0.05
NS - non-significant

group infants. The relative gain of infants of experimental group was 6 times more than that of control group. The slight increase in mental quotients of control group infants might be due to maturity and acquaintance of suitable activities in their routine life. While in experimental group the stimulation intervention programme was mainly responsible for higher gain of mental quotients.

On the whole it can be concluded that though the mean mental quotients were similar on pre-test, after 2 months stimulation intervention programme, there was an increase in mental quotients of control and experimental group infants. The findings are in line with the findings of Painter (1969), Zigler et al. (1982) and Jayakameswari (1992). The findings of this study are also in line with the findings of Powell and McGregor (1989) where play material had played an important role in raising mental quotients of the experimental group infants of low socio-economic group.

The calculated 't' value also indicated a significant difference in the mental quotients of control and experimental group infants.

4.3.2 Mental Quotients Of Selected Male And Female Infant Before and After the Stimulation Intervention Programme and Absolute and Relative Gains:

The mental quotients of selected male and female infants of control and experimental group infants before and after stimulation intervention programme is shown in Table 5.

Table 5 indicates that in control group the male infants mean mental quotients at pre-test and post-test were 69.38 and 73.38 respectively. The corresponding values for the female infants were 71.25 and 75.25 in the control group. Among the experimental group, male infants had mean mental quotients of 72.03 and 95.83 at pre and post-test. The corresponding values for female infants were 69.76 and 99.06 respectively. The absolute and relative gain of male infants of control group were 4.00 and 0.05 respectively. The corresponding values of female infants were 3.99 and 0.09. Among the infants of the experimental group the absolute and relative gain of male infants were 23.80 and 0.33 respectively. The corresponding values for female infants were 29.29 and 0.42.

Table 5. Mental quotients of selected male and female infants before and after the intervention programme and absolute and relative gains.

Groups	Mean age of infants (months)	Mean mental quotients		G. in		't' Value
		Mean \pm SD		Absolute	Relative	
		Pre testing post testing				
Control group :						
Male	12.30 \pm	69.38 \pm	73.38 \pm	4.00	0.06	06.04*
	0.59	8.18	NS 8.22			
			0.5 / 0.49			
Female	12.13 \pm	71.25 \pm	75.25 \pm	3.99	0.09	0.676*
	0.45	9.40	9.90			
Experimental group:						
Male	11.88 \pm	72.03 \pm	95.83 \pm	23.80	0.33	12.16*
	0.49	9.73	NS 11.18			
			0.54 1.17			
Female	12.25 \pm	69.76 \pm	99.06 \pm	29.29	0.42	11.70*
	0.60	9.29	5.87			

* P < 0.05
NS - non-significant

There was a wide variation in relative and absolute gain between male and female infants of control and experimental groups. A similar trend was also observed in the case of mental quotients of the infants of both the groups. Improvement in mental quotients of experimental male and female group infants was due to intervention programme. The absolute gain and relative gain in mental quotients of female infants of experimental group was more than that of male experimental group infants. These findings are in line with the findings of power (1985) that increasing age of female infants mothers were particular about accomplishment of the activity of their infants play, where as mothers of boys were casual. Statistically there was no significant difference in the mental quotients of male and female infants of both the groups.

4.3.3 Mental Quotients Of Selected Infants At Varying Ages:

The mental quotients of selected infants at varying ages of control and experimental group is presented in Table-6. From the Table,6, it is obvious that the infants of control group, 'Group-I' had mental quotients 70.10 and 80.77 at pre and post-test respectively. The corresponding values of the infants of the experimental group were 76.19 and 99.05

Table 6. Mental quotients of selected infants at varying ages

Groups (Infants' age in months)	Mental quotients		Gain	
	Mean + SD		Absolute	
	Post-testing		Relative	
	Pre-testing	Post-testing	CG	EG
	Control group (30)	Experimental group (30)	CG	EG
Group-I 11-12	77.10 ± 7.41 (6)	76.19 ± 8.85 (8)	3.67	22.86
			99.05 ± 7.67	0.05 0.30
Group-II 12-13	70.89 ± 7.56 (19)	69.76 ± 9.10 (20)	4.26	26.43
			96.19 ± 9.64	0.06 0.38
Group-III 13-14	59.98 ± 4.64 (5)	61.05 ± 2.47 (2)	3.34	42.55
			103.60 ± 2.54	0.04 0.69

Figure in parentheses indicate the number of infants.

CG - control group.

EG - experimental group.

Note: The mental quotients of control group and experimental group infants of each three groups were compared by using ANOVA, 't' values were as follows.

	t' values	
	CG	EG
Group-I Vs Group-II	1.523 ^{Ns}	0.392 ^{Ns}
Group-I Vs Group-III	1.572 ^{Ns}	0.518 ^{Ns}
Group-II Vs Group-III	0.102 ^{Ns}	0.103 ^{Ns}

Ns- non-significant

P < 0.05

Among the infants of Group-II the mental quotients of control group at pre and post-test were 70.89 and 75.15 respectively. The corresponding values of experimental group were 69.76 and 96.19.

The absolute and relative gain of Group-I of control group infants were 3.67 and 0.05 respectively. The corresponding values of experimental group infants were 22.86 and 0.30 respectively. Absolute and relative gains among the control group infants of Group-II were 4.26 and 0.06 respectively. The corresponding values of experimental group infants were 26.43 and 0.38.

Among two groups Group-I and Group-II of infants, the absolute gain of experimental group was very high compared to control group. The same trend was also observed in the relative gain, this may be due to the stimulation intervention programme. But there was no significant difference in mental quotients among the three groups of each control and experimental group.

On the whole it can be said that there was variation in mental quotients of infants of varying ages between control and experimental groups.

4.4 Factors Affecting Stimulation Intervention Programme:

1. Primary-Caregiver
2. Home-environment.
3. Play materials and family possessions.

4.4.1 Primary Caregivers:

The details of the primary caregiver, personality traits of the primary caregiver and influence of primary caregiver on mental development of slum infants are given in table 7,8 and 9 are presented under the following heads.

1. Details of the primary caregivers of selected slum infants .
2. The personality traits of the primary caregivers of the selected infants.
3. Primary caregivers influence on mental development of selected infants.

4.4.1.1 Details of Primary Caregivers of The Selected Slum Infants:

It is evident from the Table7, that 47 mothers 2 grand mothers and 11 elderly siblings in both the groups were found as primary caregivers of selected slum infants. Majority (95 to 100 per cent) of the mother caregivers of infants in both the groups were in the age range of 20 to 29 years. All the sample infants grandmothers were illiterates and their

Table 7. Details of the primary caregivers of selected slum infants.

Details of primary caregivers.	<u>Percentage of primary caregivers</u>					
	<u>Mother</u>		<u>Grand mother</u>		<u>Elder siblings</u>	
	CG (27)	EG (20)	CG (0)	EG (2)	CG (3)	EG (8)
Age (yrs):						
07-09					33.33	25.00
10-19					66.66	75.00
20-29	95.00	100.00				
30-39	5.00					
>39				100.00		
Education:						
Illiterate	92.59	75.00		100.00	100.00	75.00
Primary	3.70	15.00				25.00
Secondary		5.00				
Middle	3.70	5.00				

CG- Control group

EG- Experimental group

ages were above 39 years in experimental group. Majority (66 to 75 per cent) of elder sibling caregivers in both the groups were in the age range of 10-19 years and remaining (25 to 33 per cent) were in the age range of 7-9 years.

Majority of the mother caregivers (72-92 percent) were illiterates and 3-15 per cent and only 3 to 5 per cent mother caregivers in both the groups were primary and middle schools educated respectively. In control group all the sample infants elder sibling caregivers were illiterates, while in experimental group their percentage was 75.

On the whole it can be inferred that mostly the mothers were the primary caregivers of the studied infants.

4.4.1.2 The Personality Traits of The Primary Caregivers of The selected Infants:

Table 8 explains the personality traits of the primary caregivers of the selected slum infants. It is observed from the table that large percentage (93 to 96) of primary caregivers in both the groups were warm and affectionate towards their infants. Understanding the signals and behaviours of infants by reading and observing them was noted among 83-86 per cent.

Table 8. Personality traits of primary caregivers of the selected slum infants

Personality traits	Percentage of primary caregiver		't' value
	Control group (30)	Experimental group (30)	
Resourceful	30.00	40.00	0.66 NS
Responds quickly and appropriately	53.33	73.33	0.91 NS
Warm and affectionate	93.33	96.66	0.13 NS
Understand infants signals and behaviour.	83.33	86.66	1.14 NS
Good in verbal interaction	50.00	70.00	1.00 NS
Active involvement	36.66	60.00	1.31 NS
Passive involvement	63.33	40.00	1.26 NS
Motivates and appreciates infants	30.00	50.00	1.24 NS

NS- Non-significant.

Majority (70 per cent) of the primary caregivers in experimental group and 50 per cent in control group were good in verbal interaction and were involved actively in infants' play and other care activities and responded quickly and appropriately to infant's behaviour by reading and observing them.

The percentage of primary caregivers personality traits such as resourcefulness, motivation and appreciation of the infants was noted among each 30 and above 40 per cent caregivers in control and experimental groups respectively. Sixty per cent experimental primary caregivers while the passive involvement was found in 63 per cent primary caregivers of the control group. These findings are in accordance with that of Ainsworth and Bell (1973), Stressing that mothers were sensitive to infants' signals. It is explained that the personality traits of the primary caregivers may be attributed to the improvement in mental quotients of control and experimental group as illustrated earlier in Table 3.

Difference in the personality traits of the primary caregivers of infants between experimental and control groups was non-significant.

4.4.1.3 Primary Caregivers Influence on Mental Quotients of Selected Infants:

The mental quotients of the infants cared by different primary caregivers are given in Table 9. It is evident from the Table 9, that the control group infants cared by mother had mental quotients of 70.97 and 75.11 respectively at pre and post-test. The corresponding values of experimental group infants were 68.55 and 96.38 respectively. The difference in the mental quotients between pre and post-test of both the groups of infants cared by mothers was quite obvious. The mean of the mental quotients of both groups infants was increased after stimulation intervention. The absolute and relative gains of mother cared infants in control group were 4.13 and 0.06 respectively. The corresponding values of experimental group infants were 27.83 and 0.40.

The number of grandmothers and elder siblings in the selected caregiver sample was inadequate for statistical

Table 9. Impact of primary caregiver on the mental quotients and absolute and relative gains of selected infants.

Primary caregivers.	Age range (yrs)	Mean mental quotients						Absolute gain		Relative gain	
		Mean \pm SD		Experimental group		CG	EG	CG	EG	CG	EG
		Control group Initial	After 2 months	Initial	After 2 months						
Mother	20-34	70.97 \pm 8.88 (27)	75.11 \pm 9.10	68.55 \pm 9.59 (20)	96.38 \pm 9.72	4.13	27.83	0.06	0.40		
Grand mother	50-55	--	--	74.32 \pm 7.30 (2)	102.82 \pm 1.16	--	28.50	--	0.38		
Elder siblings	7-14	64.29 \pm 4.34 (3)	67.22 \pm 4.62	75.90 \pm 7.90 (8)	98.76 \pm 7.75	2.92	22.86	0.04	0.30		

Figures in parenthesis indicates the number of infants.

analysis. Therefore, the data was statistically analysed only for mother-caregivers.

From the Table 9, it is implied that there was improvement in mental quotients of control and experimental group infants cared by mother caregivers after the stimulation intervention programme. Among the infants of mother caregivers the experimental group infants had gained more mental quotients than that of control groups. The same trend was found in absolute and relative gains of experimental group. This may be due to the more involvement of mother caregivers in stimulation intervention. The findings are in the line with Beckwith (1971), Carew et al. (1976) and Moxely-Haegert and Serbin (1983).

4.4.2.1 Level of Home Environment in the Mental Quotients of Selected Infants:

The impact of level of home environment on the mental quotients of selected infants is given in table 10 and illustrated in Fig.2.

It is evident from the table that the mean quotients of control group infants from lowest middle home scores at pre and post-test were 70.02 and 73.52 respectively. The

Table 10. Impact of level of home environment on the mental quotients of selected infants.

Level of home environment.	Mean mental quotients		Absolute gain		Relative gain		t-value			
	Mean \pm SD									
	Initial	After 2 months								
	Control group	Experimental group	CG	EG	CG	EG				
Lowest middle	70.02 \pm	70.33 \pm	73.52 \pm	94.29 \pm	3.50	23.96	0.05	0.34	5.19*	11.13*
	9.00 (21)	9.64 (17)	9.11	9.92						
Middle half	70.90 \pm	71.64 \pm	76.15 \pm	101.59 \pm	5.25	29.95	0.07	0.41	5.43*	13.07*
	8.63 (9)	9.45 (13)	9.11	7.37						

Figures in parenthesis indicate the number of infants.

* $P < 0.05$

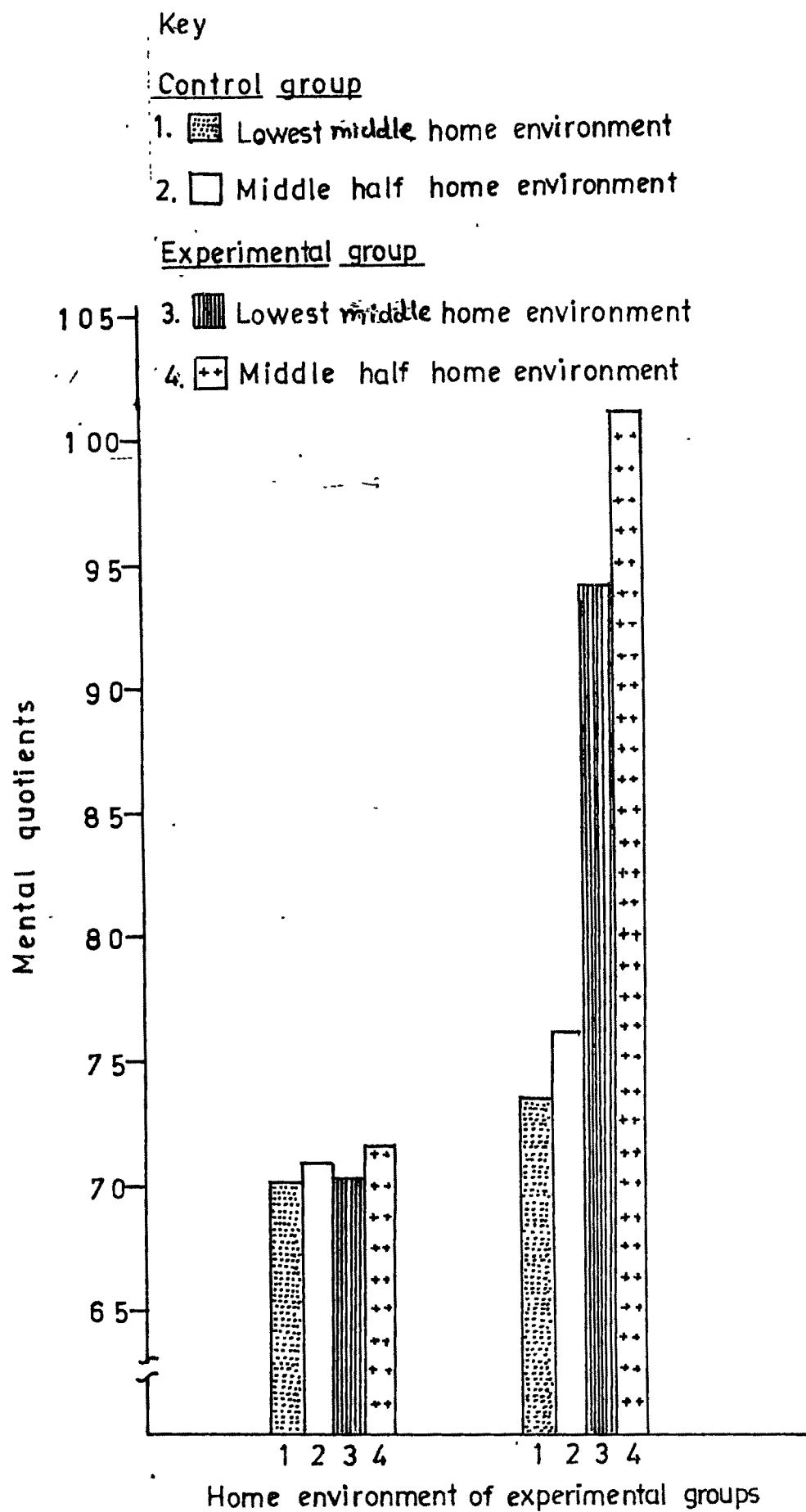


Fig 2. Impact of level of home environment on the mental quotients of experimental groups

corresponding values for the experimental group infants were 70.33 and 94.29. Among the infants of middle half level home scores of control group infants had mental quotients of 70.90 and 76.15 on pre-test and post-test respectively. The respective values for experimental group infants were 71.64 and 101.59.

Among the infants of the control group the absolute and relative gains of lowest middle level scores of home environment infants were 3.50 and 0.05 respectively. The corresponding values for experimental group infants were 23.96 and 0.34. The absolute and relative gains of control group infants from middle level home environment were 5.25 and 0.07. The respective values of experimental group infants were 29.95 and 0.41. There was a wide variation in the relative and absolute gain between control and experimental group infants of low and middle level home environment families.

The difference in mental quotients on pre and post-test was significant for low and middle level home scores of infants of control and experimental group.

In light of above discussion it can be concluded that mental quotients were not significantly differing between control and experimental groups of lowest middle and middle half level home environment. Though there was difference in the mental quotients between control and experimental groups.

The slight increase in mental quotients scores of control group infants from lowest middle and middle half home environment may be due to level of maturation and acquaintance of suitable activities in their routine life. The stimulation intervention programme is solely responsible for high score in mental quotients of experimental group infants from lowest middle and middle-half-home-environment.

The experimental group infants gained more mental quotients than the lowest middle home environment group infant. This may be due to the home environment of the infants and also due to the stimulation intervention programme. The findings are in the line of Bradly and Caldwell (1976), Gottfried and Gottfried (1976), Bradly and Caldwell (1981).

4.4.3.1 Play Materials and Family Possessions Available at Infants Homes Contributing To Their Stimulation:

Play materials and family possessions available at infants' homes contribution to their stimulation are indicated in table 11.

It is observed from the Table 11. A, that majority (60 per cent) of infants in both the groups were not provided any play materials by their families. In remaining families (36 to 40 per cent) either homemade or readymade toys, were available for infants but they were not in good condition.

The information regarding indigenous materials used for play purpose of infants are indicated in table 11-B. Majority of the families from both the groups utilized kitchenware/ Dining ware like catories, cups, spoons, plates, vessels and laddles as toy substitutes for their infants' play. Thirty six to ~~forty~~ three per cent families encouraged their infants play with wooden pieces and with water, mud, sand, etc. in home surroundings under the supervision of primary caregivers.

Table 11. Play materials and family possessions available at infants home contributing to their stimulation.

Play materials/ family possessions available in home.	Percentage of families		't' value
	CG (30)	EG (30)	
A. Toys:			
i. Available	40.00	36.66	0.21 NS
Home made	16.60	9.09	0.59 NS
Readymade	66.66	72.72	0.00 NS
Homemade and readymade	16.66	18.18	0.00 NS
ii. None	60.00	63.33	0.01 NS
B. Indigenous :			
Wooden pieces, sand, water, etc.	36.66	43.33	0.11 NS
Kitchen ware / dinning ^{dinning} ware	90.00	93.33	0.13 NS
C. Family possessions :			
Radio	40.00	43.33	1.11 NS
T.V.	6.66	6.66	0.00 NS
Clock	3.33	13.33	1.43 NS
Fan	6.66	16.66	1.18 NS
Wall hangings	26.66	23.33	1.03 NS
Coloured picture, books of elderly siblings	46.66	66.66	1.51 NS
Wall decorative pieces	20.00	30.00	0.79 NS

NS- Non-significant.

CG- control group.

EG- Experimental group.

As seen from Table 11 c, sixty six per cent infants in experimental group and 46 per cent in control group had coloured picture books of elder siblings. Near about forty per cent families of the infants possessed radio, folowed by wall hangings (23 to 26 per cent), and wall decorative articals hung on the walls (20 to 30 per cent), television and fan (6 per cent). It can be concluded that majority of the families had not possessed any play materials but utilized indigenous materials.

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CHAPTER-V

SUMMARY

This study titled " Impact of stimulation intervention on mental development of slum infants (9-15 months)" has been carried out with the following objectives.

1. To assess the mental development of selected slum infants.
2. To design the infant stimulation intervention programme corresponding to observed mental development of selected slum infants.
3. To execute the developed design of the infant stimulation programme on the selected infants through primary caregivers.
4. To assess the impact of infant stimulation intervention programme on mental development of slum infants.

For this study a sample of 60 healthy infants of both sexes of 9-13 months age, with similar level of mental ages from low socio-economic and nuclear families were selected randomly from 4 slums of Parbhani town i.e.

JaiAmbabhavaninager, Sant Gadgebabnager, Bhaiyasaheb Ambedker nager, Ramji S. Ambedkar Nager. Out of these 60 infants,

30 infants were picked up from Jai Ambabhavaninager and Santgadgebabanager to form the experimental group who had access for stimulatory activities which were specially designed for the study. The remaining 30 infants comprised of control group who had only routine activities. All the sample infants were tested twice during the period of the study. The testing done initially while selecting the sample was treated as pre-testing. The ~~post~~ testing was done two months after the implementation of the stimulation intervention programme.

For the stimulation intervention programme the tools such as interview schedule, Bayley scale of infant development, Home Inventory, Socio-economic status scale were used.

Stimulation intervention programme for infants activities developed by Swaminathan (1989), Muralidharn and Asthana (1991) and Patnam, Dessettey and Vasekar (1992) were used as basic sources for planning developing suitable materials for infant stimulation activities. Mostly cheap

and indigenous materials were provided for designed activities in addition to the materials available in the infants respective homes.

The stimulation intervention programme was executed through the primary caregivers. The stimulation intervention programme was conducted for 2 months in the homes of selected experimental group infants. It was periodically supervised by the investigator. The stimulatory activities were demonstrated with the play materials in series to the primary caregiver by the investigator. Primary caregivers and elder siblings were encouraged to play with infants.

The findings of the study are summarised under:

5.1 Mental Development of Selected Infants Prior to Stimulation Intervention Programme:

1. All the selected infants had almost similar mental ages ($10\pm$) and mental quotients ($70 \pm$).
2. The mental quotients and mental ages of the selected infants were below their chronological ages.
3. The mental ages of the selected infants ($11 \pm$ to 13 months) were in the age range of 10.31 to 10.80 months.

5.2 Impact o Stimulation Intervention Programme on Mental Development of Slum Infants:

1. There was significant difference in the mental quotients of control and experimental group infants after the implementation of stimulation intervention programme.

2. The experimental group infants gained more scores (on Bayley scales of Infant Development) than the control group infants.

3. There was variation in mental quotients at varying ages between control and experimental groups.

4. There was no significant difference in mental quotients of the male and female infants of both the groups.

5.3 Factors Affecting Stimulation Intervention Programme:

1. Mostly the mothers were primary caregivers and majority of them were illiterates.

2. Though the primary caregivers in experimental group had good personality traits than control group but there was no significant difference in the personality traits of the primary caregivers of both the groups.

3. Majority of the infants have lowest middle home environment and also majority of the families had not possessed any play materials but substituted indigenous materials. (wooden pieces, kitchen wares, dinning ware, water, etc).

Les sept ans

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LITERATURE CITED

- Agarwal, D.K., Awasthy, A., Upadhyay S.K., Singh P., Kumar J.
and Agarwal K.N. (1992). Growth, behaviour development
and intelligence in rural children. Indian pediatrics.
J. Indian Academy pediatrics, 28 (4) : 467-480.
- Ainsworth, M.D.S. and Bell S.M. (1973). Cited in Infants,
Weissbourd, B., Music J. (ed). National Association
for the education of young children, Washington, D.C.
- Anandlakshmy, S. Cited in Infant stimulation. Documentation of
research in Delhi, 1989. Lady Irwin college, New Delhi,
Funded by UNICEF.
- Bakeman, R. and Brown J.V. (1977). Behavioural dialogues : An
approach to the assessment of mother infant interaction.
Child Development, 48 : 195-203.
- Beckwith, L. Cited in infants, Weissbourd, B., Music, J. (ed).
National Association for the education of young
children, 1981, Washington, D.C.
- Bee, H.L., Barnard K.E., Gray S.T., Hommond M.A., Spietz, A.L.,
Snyder, C. and 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.
- Belsky, J., Goode, M.K. and Most, R.K. Cited by Parinello and
Ruff. The influence of adult intervention of infants
level of attention, 1988. 59 : 1125-1135.
- Bradley, R.H. and Caldwell B.M. Cited in infants, Weissbourd, B.,
Music, J. (ed). National Association for the education
of young children, 1981. Washington., D.C.
- Bradly, R.H. and Caldwell, B.M. (1981) Cited by Gottfried, A.W.
in Home Environment and early cognitive development
1984. Academic Press Inc.

- Bradly, R.H. and Caldwell, B.M. (1984). The home inventory and family demographics. *Developmental Psychology*, 20 (2) : 315-320.
- Bradly, R.H., Caldwell, B.M., Rock S.L., Barnard, K.E., Gray, C., Hammond, M.A., Mitchell, S., siegel, L., Ramey, C., Gottfried, A.W., Johnson, D.L. (1989). Home environment and cognitive development in first 3 years of life: A collaborative study involving six sites and three ethnic groups in North America. *Developmental psychology*, 25 (2) : 217-235.
- Brooks-Gunn, J., Liaw, F. and Klebanov, P.K. (1992). Effects of Early Intervention on cognitive function of Low-birth weight pre-term Infants. Cited in *Child Development Abstracts and Bibliography 1992*, 66 (2). P-7.
- Carew, J.V., Chan, I. and Halfer, C. Cited in *Infants*. Weissbourd, B. and Musik, J. (ed). National Association for Education of young children, Washington, D.C.
- Clarke-Stewart A.K. Cited in *Infant stimulation documentation of research in Delhi, 1989*. Lady Irwin College, New Delhi, Funded by UNICEF.
- Desett, R., Patnam, V., Vasekar, J. and Siddiqui, I. (1992). Impact of stimulation intervention programme on underprivileged slum infants. *Annual Research Report (1991-92)*, College of Home Science, MAU, Parbhani
- Elardo, R., Bradly, R. and Caldwell, B. (1975). The relation of infants home environment to mental test performance from six to thirty-six months: A longitudinal analysis, *Child Development*. 46 : 71-76.
- Fiese, B.H. (1990). Playful relationship : A contextual analysis of mother-toddler interaction and symbolic play. *Child development*, 61 : 1618-1656.

- Golden, M., Birhs, B. and Bridger, N. (1973). Cited in infants. Weissbourd, B. and Musick (ed.). National Association for the education of young children, 1981, Washington, D.C.
- Gottfried, A.W. and Gottfried, A.E. (1979). Cited in Home environment and early cognitive development, Gottfried, A.W. (ed.), 1984. Academic Press, Inc.
- Gupta, R. and Patel, N.V. (1991). Trial of a screening technique of the developmental assessment of infants and young children (6 weeks- 2 years). Indian Pediatrics, 29:1.
- Herber, R. and Garber, H. Cited in Infants. Weissbourd, B. and Musick, J. (ed.). National Association for the education of young children, 1981, Washington, D.C.
- Jayakameswari, S. and Ratnakumari, S. (1992). The effects of Home stimulation programme on mental development of Toddlers (12-18 months) of Hyderabad city. Indian Psychological Review, 36: 32-33.
- Jones, J.S. (1969). Cited by Caldwell, B.M. and Ricciuti, H.N. (1973). Review of Child Development Research, Vol. 3. United States of America.
- Lazar, I., Hubbelli, V.R., Murray, H. Rosche, M. and Royce, J. (1977). Cited in Infants. Weissbourd, B. and Musick, J. (ed). National Association for the education of young children. 1981. Washington, D.C.
- Lutkenhaus, P., Grossmann, K.J. and Grossmann, K. (1985). Infant mother attachment at twelve months and style of interaction with a stranger at the age of three years. Child Development, 56: 1538-1542.

Markowitz, J.B., Hebbeler, K., Larson, J.C., Cooper, J.A. and Edmister, P. Cited in child development abstract and Bibliography, 1992, 66 (2): 57.

Misra, N. Cited in Infant stimulation, documentation of research in Delhi, 1989. Lady Irwin College, New Delhi, Funded by UNICEF.

Mokashi, S. (1990). Stimulation therapy, developmental assessment, follow-up and intervention in high risk neonates, workshop held at K.E.M. Hospital, Pune.

Moxely-Haegert, L and Serbin, L.A. (1983). Developmental education for parents of delayed infants: Effect of parental motivation and children's development. Child development, 54 (3): 1324-1331.

Muralidharan, R. and Kaur, B. (1989). The impact of an intervention programme on the language and cognitive development of tribal preschool children, 1-26.

Muralidharan, R. and Kaur, B. (1990). The impact of an intervention programme on the language and cognitive development of preschool children from the urban Anganwadis (Preschool Centres), 1-15.

Muralidharan, R. and Asthana, S. (1991). Stimulation activities for young children, Department of Preschool and Elementary Education, New Delhi, 1-10.

Ninio, A. (1980). Picture-book reading in mother-infant dyads belonging to two subgroups in Israel. Child Development, 51: 587-590.

- Parpal, M. and Maccoby, E.E.(1985). Maternal responsiveness and subsequent child compliance. *Child Development*, 56: 1326-1334.
- Patnam, V., Desetty, R. and Vasekar, J. (1992). Child Development through stimulatory activities (Uttesanatamak Karyatun Balvikas). Home Science College, MAU, Parbhani.
- Patri, V. Cited in Infant stimulation. Documentation Research in Delhi, 1989. Lady Irwin College, New Delhi, Funded by UNICEF.
- Olson, Bates and Bayles, Cited by Honig, A.S. in young children. The Journal of the National Association for the Education of Young children (NAEYC), November, 1985, 41 (1) : 40-47.
- Painter, G. Cited in Review of child Development Research, Caldwell, B.M. and Ricciuti, H.N. (ed). The University of Chicago Press, 1973, PP 352-353.
- Palmer, F.H. Cited in Infants. Weissbourd, B. and Musick, J.(ed). National Education for the education of young children, 1981, Washington, D.C.
- Panse, V.G. and Sukhatme, P.V. (1985). Statistically methods for Agricultural Workers. Indian Council of Agricultural Research, New Delhi.
- Phatak, P. (1986). Mannual for using Bayley scales of Infant Development (Research Form, 1961), The Maharaji Sayajirao University of Baroda.
- Power, T.G. (1985). Mother and Father Infant Play: A developmental analysis. *Child Development* , 56 : 1514- 1524.

- Powell, C. and Grantham McGregor, S. (1989). Home visiting of varying frequency and child development. *Pediatrics*, 84(1): 157-164.
- Ramey, C. and Bryant, D. (1982). Cited by McCarthy, K. and Howley, E. in *Directors of Development 1991*, Okagaki, L. Sternberg, R.J. (ed). Lawrence-Erlbaum Associates, Publishers.
- Ribble (1965). Cited in *Infant stimulation, Documentation of Research in Delhi* (1989). Funded by UNICEF.
- Ricciuti, H.N. and Thomas, M. (1990). Early maternal and environmental correlates of quality of infant care and 18 month bayley performance. Poster paper: ICIS Meetings, Montreal.
- Ruddy, M.C. and Bornstein, M.H. (1982). Cognitive correlates of infant attention and maternal stimulation over the first year of life. *Child Development*, 53: 183-188.
- Schaefer, E.S. Cited in *Review of Child Development Research*. Feldwell, B.M. and Ricciuti. H.N. (ed.). The University of Chicago Press, 1973, p 352.
- Singh, M.B. and Gills, S. (1986). Maternal judgement of appropriateness of play materials for children. *The Indian Journal of Home Sci.* 16 (4): 212-214.
- Singh, R.K. and Chaudhary, B.D. (1986). Biometrical methods in quantitative analysis, Kalayani publishers, New Delhi.

- Siegel, S.L. (1982). Reproductive, perinatal and environmental factors as predictors of the cognitive and language development of preterm and full-term infants. *Child development*, 53: 963-973.
- Singer, G.D. and Singer, J.L. The house of make Believe play: play and the Developing Imagination (1990). Harvard University Press, 79.
- Slaughter, D.T. (1989). Cited in Infant Stimulation Documentation of Research in Delhi. Funded by UNICEF, pp 14-15.
- Stayton, Hogan and Ainsworth (1971). Cited by Honig, A.S. in Young Children. The Journal of the National Association for the education of young children (NAEYC), November, 1985, 41 (1): 40-47.
- Streissgirth and Bee and Feshback. Cited in Infant Stimulation Documentation Research in Delhi, 1989. Lady Irwin College, New Delhi, Funded by UNICEF.
- Symons, D.K. and Moran, G. (1987). The behavioural dynamics of mutual responsiveness in early face-to-face mother-infant interaction. *Child Development*, 58: 1488-1495.
- Wach, T. Cited by Bradly, R.L. and Caldwell, B.M. in Home Environment and Early Cognitive Development. Gottfried, A.W. (ed.). 1984. Academic Press Inc.
- White, K., Taylor, M. and Moss, V. Cited by McCartney, K. and Howley, E. in Directors of Development, 1991. Okagaki, L. Sternberg, R.J. (ed.). Lawrence Erlbaum Associates, Publishers.

Yarrow, L.J., Rubenstein, J.L., Peder, Son, F.A. and Jankowski, J.J. (1972). Cited in Infants. Weissbourd, B., Musick, J.(ed.). National Association for the education of young children, Washington, D.C.

Zeskind, P. and Ramey, C. Cited by Hupp, S.C. Promoting cognitive competence in children at risk. American Behavioural Scientist, 1991. 34 (4): 454-455.

Zigler, E., Abelson, W.D. and Trickett, P.K. (1982). In an intervention programme necessary in order to improve economically disadvantaged children's IQ scores ? Child Development, 53: 340-348.

APPENDICES

APPENDIX - I

Interview Schedule

General Information

Name of the infant :

Age :

Date of birth :

Sex : Male / Female

Ordinal position :

Name of the respondent :

Name of the Mother :

Name of the Father :

Area : Slum / Rural :

Address of the family : _____

Type of family : Nuclear / Joint / Extended

Size of the family : Small / Middle / Large

(0-4) (5-10) (Above 10)

Total income by the family Rs. _____ / months.

Total family members :

Information about the family members :

S.No. Name Age Literacy Relation Occup- Income
level with infant ation

1.

2.

3.

4.

5.

Who spends most of the time with infant : Mother/

Grand mother / Elder sibling/anyother

How old primary caregiver is _____ years

Educational status of the primary caregivers :

Illiterate / literate / primary /

secondary middle / college.

Personality traits of primary caregiver

Is the primary caregiver.

1. Resourceful
2. Responds quickly and appropriately
3. Warm and affectionate
4. Understands infant signals and behaviour
5. Good in verbal interaction
6. Actively involvement
7. Motivates and appreciates infants
8. Passive involvement

Does the infant's family have :

1. Radio, 2. T.V. 3. Clock, 4. Fan
5. Wall hangings, 6. Wall decorative pieces
7. Coloured picture books of elder children

Play and play materials.

1. Does the infant have toys ? Yes/No
If yes, home made/readymade
2. If no, does the infant play with any toy substitutes like wood/stone/kitchenware/dinningware/other household materials/anything else.

APPENDIX - II

Mental scale

Name of the child : Date of birth I testing II testing
Address : Age :
Examiner :

Sr. No.	50% age placement in month	Item description	-----	
			1	2
59.	5.0	Sustained inspection of ring		
60.	4.9	Picks up cube		
61.	5.0	Turns head after fallen spoon		
62.	5.1	Recovers rattle in crib		
63.	5.2	Reaches persistently		
64.	5.3	Lifts cup		
65.	5.5	Reaches for second cube		
66.	5.5	Transfers object hand to hand		
67.	5.5	Exploitive string play		
68.	5.6	Smiles at mirror image		
69.	5.6	Hangs in play		
70.	5.6	Interest in sound production		
71.	5.7	Picks up cube defectly and directly		
72.	5.8	Lifts cup with handle		
73.	5.9	Pulls string securesring		
74.	5.99	Looks for fallen spoon		
75.	6.1	Retains two of three cubes offered		
76.	6.3	Playful response to mirror		

1	2	3
77.	6.5	Manipulates bell : interest in details
78.	6.5	Attends to scribbling
79.	6.9	Cooperates in games
80.	7.1	Vocalizes 4 different syllables.
81.	7.1	Pulls string adaptively and secures ring
82.	7.1	Listen s selectively to familiar words.
83.	7.4	Attempts to secure 3 cubes
84.	7.5	Uncovers toy
85.	7.7	Rings bell purposively
86.	8.3	Adjusts to words
87.	8.9	Fingers hole in pegboard
88.	8.9	Says "da-da" of equivalent
89.	9.0	Picks up cup : secured cube
90.	9.7	Inhibits on command
91.	9.9	Looks at pictures in book.
92.	9.97	Looks for contents of box
93.	10.2	Puts cube in cup on command
94.	10.2	Stirs with spoon in imitation
95.	10.5	Repeats performance laughed at
96.	10.6	Unwraps cube
97.	10.7	Uses expressive jargon
98.	10.9	Holds crayon adaptively
99.	10.9	Attempts to imitates scribble.
100.	10.98	Turns pages of books
101.	11.1	Dangles ring by string

1	2	3
102.	11.3	Pushes car long
103.	11.9	Immitates words
104.	11.9	puts 3 or more blocks in cup
105.	12.0	Pats whistle do-11
106.	12.1	Uncovers square box
107.	12.5	Puts beads in box (6043)
108.	13.1	Spontaneous scribble
109.	13.1	Removes pellet from bottle
110.	13.3	Closes round box
111.	13.4	Places one peg repeatedly.
112.	13.67	Uses gustures to make wants known
113.	13.71	Builds tower of 2 cubes
114.	14.1	Says two words
115.	14.1	Shows shoes, or other clothing or own toys
116.	14.9	One round block in Dayley board
117.	15.1	Adjusts round block in 3 holed board
118.	15.3	Attains toy with stick
119.	16.2	Builds tower of 3 cubes.
120.	16.4	imitiates strocke
121.	16.5	Pegs placed in 70 seconds
122.	16.8	Pink form board:Places round block
123.	17.1	Two round block in blue board
124.	17.5	Uses words to make wants known
125.	17.96	Follows directions call

1	2	3
126.	18.2	Pegs placed in 42 seconds.
127.	18.6	Blue board also 2 squares (Blue board two rounds, 2 squares)
128.	19.2	Points to partes of the doll.
129.	20.4	Names one object
130.	20.8	Blue board: places six blocks.
131.	20.8	Differentiates a scribble and a stroke.
132.	20.9	Pink form board: Completes.
133.	21.0	Selects box: containing kitty.
134.	21.2	Sentence of two words.
135.	21.3	Names one picture.
136.	21.4	Pegs placed in 30 seconds.
137.	22.33	Discriminates between cup and plate.
138.	22.6	Points to three pictures.
139.	22.8	Names two objects.
140.	22.9	Discriminates cup, plate and box.
141.	23.5	Mends broken doll marginally.
142.	23.8	^a T ins of cubes.
143.	23.8	Completes blue board in 150 second .
144.	24.1	Names 3 objects.
145.	24.3	Pink form board: 90 second.

APPENDIX - IV

Socio-economic status scale of Kuppuswamy

Date : SES
 Name :
 Age :
 Address :

Items	Weightage	Husband	Wife
<u>A. Education</u>			
1. Professional degree or above	7		
2. B.A. or B.Sc. degree	6		
3. Intermediate or post high school diploma	5		
4. High school certificate	4		
5. Middle school completion	3		
6. Primary school or literate	2		
7. Illiterate	1		
<u>B. Occupation</u>			
1. Profession	10		
2. Semi-profession	6		
3. Clerical/shop owners/farm owners, etc.	5		
4. Skilled worker	4		
5. Semi-skilled worker	3		
6. Unskilled worker	2		
7. Unemployed	1		
<u>C. Income</u>			
1. Above 3000/- per month	12		
2. Between 1500-2999	10		
3. Between 1000-1499	6		
4. Between 750-999	4		
5. Between 450-749	3		
6. Between 151-449	2		
7. Below 150	1		
Total score (Add A, B, C)			
Total score.		SES class	
0-9		Low SES	
10-21		Middle SES	
Above 21		High SES	

APPENDIX - VIMental ages of the slum infants of the study groups

Infants age (months)	Mental ages			
	Control group		Experimental group	
	Pre- testing	Post- testing	Pre- testing	Post- testing
11 \pm	9.90	11.9	10.5	13.67
	9.97	11.9	10.5	13.30
	10.20	11.9	10.7	13.67
	10.50	12.5	9.7	13.10
	10.60	12.5	10.2	13.10
	10.70	13.1	10.2	12.10
			9.7	13.10
			9.9	13.40
12 \pm	10.90	13.1	10.90	14.10
	10.70	13.1	10.9	13.67
	10.5	12.1	10.7	13.30
	10.98	13.1	10.2	13.40
	10.98	13.4	9.9	13.40
	10.90	12.5	9.9	12.00
	10.5	12.5	10.9	14.10
	9.97	12.1	10.6	13.67
	9.97	11.9	10.5	14.10
	10.2	12.00	9.9	13.30
	10.98	13.3	10.98	14.90
	10.2	12.0	10.90	14.90
	10.5	12.0	10.5	13.71
	10.6	13.1	10.2	14.10
	10.5	12.1	10.2	13.67
	10.6	13.1	10.60	13.40
	10.2	11.9	10.9	14.10
	10.9	13.1	10.98	14.10
	10.7	13.1	10.9	13.71
			10.6	13.67
13	10.9	12.5	10.7	14.9
	10.6	11.9	10.9	15.1
	10.6	12.0		
	10.9	12.1		
	10.7	12.0		

APPENDIX - VI

Mental quotients of slum infants of the study groups

Infants age (months)	Mental quotients			
	Control group		Experimental group	
	Pre- testing	Post- testing	Pre- testing	Post- testing
11 \pm	69.70	75.52	87.80	112.70
	69.50	74.15	80.00	97.15
	73.00	74.15	86.90	104.80
	80.00	85.65	69.10	102.00
	83.50	85.65	73.00	89.50
	86.90	89.50	80.60	91.30
			66.15	94.00
			66.00	101.00
12 \pm	72.55	76.65	72.55	103.65
	78.90	80.50	72.30	92.10
	67.17	70.60	69.10	84.35
	79.55	84.35	65.40	92.80
	84.32	90.50	51.60	92.80
	71.22	70.92	56.60	68.20
	72.20	76.40	70.62	94.50
	62.00	72.30	85.70	109.20
	65.40	68.20	58.60	88.70
	62.00	64.10	72.20	105.10
	79.55	84.35	79.55	107.55
	68.80	72.30	67.67	104.67
	62.15	68.90	62.15	95.95
	75.60	84.60	59.20	99.80
	67.17	70.60	59.20	92.10
	78.90	80.50	70.62	90.50
	75.60	80.50	82.30	105.10
	56.25	57.30	79.55	103.65
	67.67	74.72	85.70	101.00
			65.65	92.10
13 \pm	66.40	69.10	59.30	101.80
	55.70	58.20	62.80	105.40
	55.70	61.90		
	62.80	65.50		
	59.30	61.95		