

THE UNIVERSITY OF CALGARY

DESCRIPTIVE ANALYSIS OF ECOLOGICAL AND PERFORMANCE
VARIABLES IN A GROUP OF MULTIPLY AND PROFOUNDLY
HANDICAPPED CHILDREN IN CONGREGATE AND HOME CARE

by

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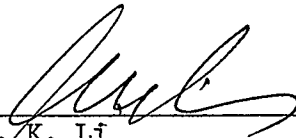
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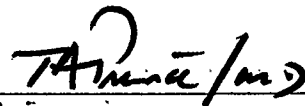
The undersigned certify that they have read and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled, "Descriptive Analysis of Ecological and Performance Variables in a Group of Multiply and Profoundly Handicapped Children in Congregate and Home Care" submitted by Irene Estay in partial fulfillment of the requirements for the degree of Master of Science.



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ABSTRACT

Thirty two profoundly and multiply handicapped children were observed as part of an exploratory study of developmental, ecological and social variables.

The main objective of the study was to examine developmental differences in two groups of severely and multiply handicapped children living in different environmental conditions.

The results obtained in this study support the contention that:

- (1) The ecological environment of children raised at home is richer than that of children raised in congregate care.
- (2) Children reared at home receive more social contact (verbal, physical and visual) compared with similar children in congregate care.
- (3) Children reared at home initiate contact with persons rather than objects whereas children in congregate care prefer contact with objects over contact with persons.
- (4) Children reared at home exhibit a more active awareness compared to similar children in congregate care.
- (5) Development of profoundly and multiply handicapped children appears to be affected by environmental

conditions. Children reared at home exhibit a higher level of cognitive, language and social development compared with similar children raised in congregate care facilities.

- (6) Children living in congregate care settings receive more medications and more medical care than similar children living in home care environments.

Implications resulting from this research:

- (1) While the natural home setting appears to be superior to congregate care, alternative living environments should be investigated to accommodate children in congregate care who do not have access to a natural home environment.
- (2) More precise studies should inquire into rehabilitation programs designed to increase cognitive, language and social development in congregate care settings.

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TABLE OF CONTENTS

	Page
Abstract	iii
Acknowledgements	v
List of Tables	ix
List of Figures	xii
 Chapter	
1. INTRODUCTION	1
Stimulation	3
Social Interaction	3
Ecological Determinants	5
2. LITERATURE REVIEW	7
Introduction	7
Environmental Influences	9
Developmental Studies	14
Cognitive Development	14
Language Development	21
Social Development	25
3. PILOT STUDY	31
Objective One	33
Objective Two	34
Objective Three	35

Chapter	Page
4. METHODOLOGY	38
Design	38
Subjects	38
Procedure	47
Instruments	49
Observation Checklist	50
Overall Functioning	51
Cognitive Development	52
Language Development	53
Social Development	54
5. RESULTS	57
Section A	
Ecological Environment	58
Location	59
Positioning	61
Caregiver/Family	63
Child Awareness	67
Child Activity	72
Level of Assistance	76
Summary	78
Section B	
Developmental Differences	79
Cognitive Development	79
Language Development	81

Chapter	Page
Social Development	87
Smiling	88
Contact Seeking	90
Response to Separation	91
Differentiation of self from others	92
Isolated Play	93
Summary	94
Section C	
General Functioning	95
Nursing Care	95
Medications	96
Medical Care	98
Physical Development	100
Awareness	100
Self Help	102
Dressing	102
Toileting	105
Feeding	107
Summary	108
6. DISCUSSION	110
BIBLIOGRAPHY	125
APPENDIX A: OBSERVATION CHECKLIST	136

LIST OF TABLES

Table	Page
1. Characteristics of the Subjects studied in the Pilot Project	32
2. Summary of Correlations for the Assessment Tools used in the Study	37
3. Age of the Subjects in Months	43
4. Level of Handicapping Condition for the Home Care 3-5 Years Old Group	44
5. Level of Handicapping Condition for the Home Care 6-8 Years Old Group	45
6. Level of Handicapping Condition for the Congregate Care 3-5 Years Old Group	45
7. Level of Handicapping Condition for the Congregate Care 6-8 Years Old Group	45
8. Distribution of Subjects by Location	45
9. Actual percentage represented in Figure 1 in the comparison of the groups in Location	60
10. Actual percentage represented in Figure 2 in the comparison of the groups in Position	62
11. Actual percentage represented in Figure 3 in the comparison of the groups in Social Contact	65
12. Actual percentage represented in Figure 5 in the comparison of the groups in Passive Awareness	69
13. Percentages represented in Figure 6 in the comparison of the groups in Active Awareness ...	70
14. Percentages represented in Figure 8 in the comparison of the groups in Response Observed	73

Table	Page
15. Percentages represented in Figure 9 in the comparison of the groups in Goal Directed Behaviours	76
16. Percentages represented in Figure 10 in the comparison of the groups in Level of Assistance..	77
17. Analysis of variance for the comparison of the groups in Cognitive Development	80
18. Analysis of variance in the Contrast of Environment (contrast 1 and Age (contrast 2) in Cognitive Development	80
19. Analysis of variance in the comparison of the groups in Receptive Language Development	82
20. Analysis of variance in the Contrast of Environment (contrast 1) and Age (contrast 2) in Receptive Language	83
21. Analysis of variance in the comparison of the groups in Expressive Language	85
22. Analysis of variance for the Contrast of Environment (contrast 1) and Age (contrast 2) in Expressive Language	86
23. Analysis of variance for the comparison of the groups in the Medications sub scale of Nursing Care	97
24. Analysis of variance for the comparison of the groups in the Medical Care sub scale of Nursing Care	99
25. Analysis of variance for the comparison of the younger group (contrast 1) and the older group (contrast 2) in the Contact with Things sub scale of Awareness	101
26. Analysis of variance for the comparison of the groups in the Dressing sub scale of the Self Help Scale	103
27. Analysis of variance for the contrast of Environment (contrast 1) and Age (contrast 2) in the Dressing sub scale of the Self Help Scale	104

Table	Page
28. Analysis of variance for the contrast of Environment (contrast 1) and Age (contrast 2) in Toileting Skills of the Self Help Scale	106
29. Analysis of variance for the contrast of Environment (contrast 1) and Age (contrast 2) for the Feeding sub scale of the Self Help Scale	108

LIST OF FIGURES

Figure		Page
1.	Histogram in percentage of the comparison of the 3-5 years old group and the 6-8 years old group in the category of Location	59
2.	Histogram in percentage of the comparison of the groups in the category of Position	62
3.	Histogram in percentage of Person Present and Type of Contact established in the comparison of the groups	65
4.	Cumulative Percentage of Social Contact and Person Present in the comparison of the groups ..	66
5.	Histogram in percentage of Passive Awareness in the comparison of the groups	68
6.	Histogram in percentage of Active Awareness in the comparison of the groups	70
7.	Relationship between Passive and Active Awareness in the comparison of the groups	71
8.	Histogram in percentage of Response Observed in the comparison of the groups	73
9.	Histogram in percentage of Goal Directed Behaviours in the comparison of the groups	75
10.	Histogram in percentage of Level of Assistance in the comparison of the groups	77
11.	Means, Standard Deviations and Ranges of the raw scores of the Bayley Mental Scale	79
12.	Means, standard deviations and ranges of the Receptive Language scores	82
13.	Means, standard deviations and ranges of Expressive Language scores	85
14.	Means, standard deviations and ranges of Smiling Responses in Social Development	89
15.	Means, standard deviations and ranges of Contact Seeking Responses in Social Development .	90

Figure	Page
16. Means, standard deviations and ranges of Response to Separation in Social Development ...	91
17. Means, standard deviations and ranges in Differentiation of Self from Others Responses in Social Development	92
18. Means, standard deviations and ranges of Isolated Play Behaviour in Social Development ..	93
19. Means, standard deviations and ranges for the Nursing Care scores	96
20. Means, standard deviations and ranges for the Medications sub scale of Nursing Care	97
21. Means, standard deviations and ranges of the Medical Care sub scale of the Nursing Care Scale	99
22. Means, standard deviations and ranges of the Contact with Things sub scale of Awareness	101
23. Means, standard deviations and ranges of the Dressing sub scale of the Self Help Scale	103
24. Means, standard deviations and ranges of Toileting Skills of the Self Help Scale	105
25. Means, standard deviations and ranges of the Feeding sub scale of the Self Help Scale	107

CHAPTER I: INTRODUCTION

Psychological development, for all individuals consists of progressive changes in behaviour which are brought about by the interaction of an individual as a total biological unit with his social and physical environment. Atypical conditions of development may arise from anomalies in anatomical structure and/or physiological functioning; a history of inadequate reinforcement and discrimination; the consequences of contingent aversive stimulation; and the reinforcement of aversive behaviour (Bijou, 1966).

Thus, an individual with gross organic damage or deviation, dating from birth or early infancy will be expected to exhibit retarded behaviour because of deviant biological conditions which will limit his capability to take advantage of, and respond to environmental stimulation. Variations in environmental and social conditions associated with development could be expected to either exacerbate or mitigate the degree of behavioural retardation.

Dramatic documentation of the effects of early experiences on human infants comes from studies in which children from impoverished environments have been placed in special enrichment programs. Studies of early environmental impact focus on children who have been subjected to deprived environmental conditions in infancy and early childhood. Still other data has come from enrichment studies, which have attempted to "undo" the effects of early deprivation or to prevent these effects (Skeels and Dye, 1939; White and Held, 1966; Murphy and Zahm, 1975, 1978; Rowe, 1974). Finally, there are findings from carefully controlled experimental studies of animals which

have been deprived of a variety of sensory and social stimulation (Bronfenbrenner, 1968).

From findings about early experiences from animals and humans, some general principles emerge.

- (1) The potential to behave in certain ways can be modified by early experiences.
- (2) The impact of experiences may extend not only to early childhood, but also to adulthood.
- (3) The timing of stimulation is important; deprivations during the first period of life may prove more damaging than equivalent later experiences.
- (4) The areas affected by deprivation may also vary. Variables such as intensity, previous experiences, constitutional vulnerability, experiences following deprivation, etc., also affect the impact of deprivation.

Deprivation has been conceptualized in terms of inadequate or distorted maternal care and social stimuli or inadequate or inappropriate stimulation from the inanimate environment (Caldwell, 1970).

Deprivation results from many different environmental circumstances. These can be organized in terms of concepts related to stimulation, and the conditions under which stimulation is provided.

Stimulation

The importance of adequate sensory stimulation for the development of cognitive abilities has been well documented. The findings of developmental retardation in children exposed to institutional environments are paralleled by findings of sensory impairment in animals deprived of stimulation (Bronfenbrenner, 1968). The importance of variety in stimulation has been increasingly emphasized in recent years, both from a neurological orientation and from a psychological perspective (Yarrow, 1970).

Using the concept of "Differentiation of Schema" from Piaget, Yarrow (1970) points out that stimuli that vary in a number of dimensions enable the child to develop and consolidate concepts through the processes of assimilation and accommodation. It is therefore probable that monotonous, unvaried stimulation leads to habituation so that a given level of stimulation or a degree of complexity loses its evocative power.

Social Interaction

How much does the nature of early attachment affect the child's subsequent development? This is a controversial issue. Kohlberg (1969) questions whether early relationships have any important effect on an individual's capacity for forming relationships in later life. He raises this question because he believes that the quality of relationships is so greatly transformed during cognitive growth, that it

is difficult to imagine how there could be any continuities between an infant's attachments and the affectional ties formed at later stages by the more mature individual.

Others (Erikson, 1950; Bowlby, 1969) strongly believe that the nature of the mother/infant bond is important for later development. The question is, does the quality of the mother/infant bond really affect the social and other related competencies of later life, when activities extend beyond the narrow confines of the home? Lack of opportunity for attachment (maternal deprivation) has been studied primarily in animals (Meyer et al., 1975; Novak, 1979; Spencer-Booth and Hinde, 1971) where animal infants can be experimentally isolated. The major findings in animal studies have shown:

- (1) Isolating monkeys in infancy produces serious deficiencies in their later social behaviour.
- (2) The effects of even a short period of mother/animal separation in infancy can still be seen years later in the social behaviour of the animal.

Even though the relevance of applying animal studies to man has been questioned (Clarke and Clarke, 1976), this does not mean animal research cannot generate useful hypotheses for testing in human social development.

Ecological Determinants

Social behaviour and learning are affected by the physical and social ecology of a setting and can be facilitated or limited by the manipulation of ecological factors. The term ecology refers to the gross conditions of an environment which determine which events and behaviours can occur in a setting. Specifically, the ecology of an environment determines whether or not a child can receive a stimulus or emit a response. The amount of floor space available, the position of walls, the furniture, the number of persons in the room, all represent physical conditions that can affect behaviour systems. Similarly, the type of interactions in a setting represent social facilitators or constraints on behaviour systems.

The role of environment is exemplified in studies where home reared retarded children perform better than similar institutionalized children in a variety of skills (Shipe and Shotwell, 1965; Clarke and Clarke 1953).

The recent trends toward deinstitutionalization have resulted in the transfer of individuals from large residential facilities (congregate care) to smaller living units (group homes). There are very few empirical studies on the effects of environment on multiply handicapped children. Predictions of the potential adverse effects of congregate care on the development of these children have been offered (Butterfield, 1967; Clarke and Clarke, 1953; Dentler and Mackler, 1964) but not confirmed.

The profoundly and multiply handicapped have been excluded from the process of deinstitutionalization until recently, when several demonstration projects in Alberta (Resources for the Dependent Handicapped, Southern Alberta Community Living Association, Edmonton Group Homes for the Multiple Handicapped) have suggested that these children benefit from more individualized environments.

The aims of the present study will be to:

- (1) Examine the differences in developmental status in cognitive, language and social skills,
- (2) Compare the ecological and social interaction variables, and
- (3) Compare general functioning variables such as nursing care, physical development, awareness and self help

of thirty-two profoundly and multiply handicapped children between three and eight years, living in different environments (home, congregate care). Ecological and social interaction variables on the nursing care, physical development, awareness and self help status of the children will also be collected.

CHAPTER II: LITERATURE REVIEW

Introduction

The review of the literature will involve:

- (1) a general description of studies which have investigated environmental variables and their impact on the development of the mentally handicapped;
- (2) specific environmental impact on areas of development such as cognitive, language and social development.

The early literature on stimulation and maternal relationship during early development in men and animals has led to interest in determining the effects of a child's early placement outside the home (institutional placement or temporary separation from his parents).

Research designed to assess the effect of placement of mentally handicapped children has most often emerged from the comparison of the behaviour and development of:

- (1) institutionalized and non-institutionalized mentally handicapped children, or
- (2) the comparison of two groups of institutionalized children, where one group has been involved in a program which is not part of the regular institutional routine.

In the few studies using Down's Syndrome children as subjects (Centerwall and Centerwall, 1960; Kugel and Reque, 1961; Stedman and Eichorn, 1964), it was found that home reared Down's Syndrome children performed better than institution reared children in speech behaviour, walking and manipulative skills. The superiority of home reared children in manipulating crayons and small objects was attributed to their greater access to, and opportunity to practise with these items. Their superiority in walking and speech was attributed to more active coaching in these skills, plus the possibility that the home reared children may have had the example of normal children to follow (Stedman and Eichorn, 1964).

Shotwell and Shipe (1964) compared the intellectual and social development of children who had been reared at home for two years, and then placed in a private institution from birth. While both groups showed an I.Q. decrease after three years in the institution, the children who had initially been reared at home maintained a better rate of social and intellectual growth.

Studies comparing the behaviour and development of institutionalized mentally retarded children in routine care and experimental conditions have, in most cases, dealt with special teaching programs organized along nursery school lines. The goals of the programs have been to improve the daily living skills of the children in areas such as self help, socialization and communication (Murphy and Zahn, 1978; Horner, 1980).

Environmental Influences

Previous to the review of environmental influences, it is necessary to specify the meaning of the word environment involved in this study.

The present research will relate to the subtle and much more controversial effects of social and physical environment, rather than the impact of pre-natal consequences.

Research into the effects of change due to environmental influences in the mentally retarded can be divided into those studies in which the macro environment was changed (adult/child ratio, physical environment, day to day routine), and those studies where only certain aspects of the environment were changed (toys, special activities). The central premise in this type of research is that day programs which espouse training orientations can be successful only if the physical and social environment in which the children live support these orientations.

Recently, researchers have demonstrated substantial differences among traditional residential institutions (Balla, Butterfield and Zigler, 1974; Butterfield, Barnett and Bernsberg, 1968) and among community facilities (Bjaanes and Butler, 1974).

Stephen and Robertson (1966, 1970) compared the progress of twenty severely and profoundly retarded children who lived in a family group in their ward and attended a special nursery program with similar children in the same hospital under routine care. After

one year, seven of the twenty experimental children showed more improvement in daily living skills and language than the controls. The children with IQs "around twenty" made only slightly greater improvement than the controls, while no changes were noted in the children with IQs below twenty. The authors felt that the low-functioning children had not benefitted from the family group and special nursery programs.

Mitchell and Smeriglio (1970) reported that with the exception of children with Social Quotients below thirty, direct teaching of social competence and pre-academic skills in a program organized along nursery school lines was instrumental in maintaining social skills at the pre-admission rate after three years of institutionalization (Mean pre-admission SQ = 36.76, SD 10.91; Mean post-admission SQ = 36.80, SD 19.81). Children not receiving the special teaching showed a much slower rate of mental growth (Mean pre-admission SQ = 36.92, SD 12.00; Mean post-admission SQ = 25.28, SD 13.96). The children in the experimental program were superior to the controls in categories of the Vineland Scale assessing socialization, self-help, eating, occupation, and some items in the communication category. By analyzing the results of both groups of institutionalized children and comparing them with the pattern of development shown for normal children, the authors found that both groups of institutionalized children obtained the lowest scores in those items which measured language development, and had the highest scores in those items which tested locomotion and general self-help skills. Those children in both groups who were initially low in social competence (SQs below 30) showed a marked tendency to decline still further (cf. Stephen and Robertson, 1970).

Jungjohann and Kaufman (1966) studied sixty severely retarded children, divided into small groups (three to five children), under the care of one aide, who cared for them exclusively throughout the day. Sixteen of the children were matched with sixteen similar children in another institution under routine care. After sixteen months, the "milieu therapy" children were significantly superior to the routine care group in manipulative skills and social behaviour.

Balla, Butterfield, and Zigler (1974), in a longitudinal cross-institutional investigation, tested one hundred and three children on their admission to four institutions for the mentally retarded. The children were mildly to moderately retarded (mean IQs ranging from 74 to 50 on the PPVT) and were divided into groups by aetiology: 63 familially retarded and 40 organically retarded. After two and one half years of institutionalization, the children were tested again - on MA, IQ, responsiveness to social reinforcement, verbal dependency, awareness of adults, imitation and behaviour variability. At the same time, objective characteristics of the four institutions were compared: population, employee turnover, residents per living unit, cost per person per day, numbers of attendants, physicians, nurses, social workers, recreation workers, educators, and volunteer hours per year. The authors reported that: "The effects associated with residing in one institution rather than in another... were surprisingly few in number." (p. 547). The only factor which seemed to be affected by institutional placement was the children's motivation for social reinforcement. In view of the connection which has been established between motivation for social reinforcement and social deprivation (Butterfield and Zigler, 1965;

Stevenson and Fahel, 1961; Zigler, Hodgen and Stevenson, 1958), this finding was interpreted by the authors to mean that significant differences existed between the institutions in the amount and type of staff/child interaction. In fact, Balla, Butterfield and Zigler (1974) recommended that:

Direct observational studies of the quality of the social interactions between the child caretakers of an institution and its residents (Balla, 1976) and/or attitude surveys of an institution's caretakers (Raynes and King, 1972) would appear to be promising procedures for categorizing institutions in future investigations of cross-institutional effects.

(p. 547)

Studies related to the impact of operant conditioning can also be considered ecological in nature since it involved manipulation of the environment such as: changing staff ratio; using punishment, reinforcement, etc. The behaviour is changed by manipulating the antecedents or consequences of the behaviour.

These operant conditioning programs, usually carried out on a one-to-one basis, have proven particularly effective in changing the behaviour of severely retarded and profoundly retarded children and adults and have led to improvements in self feeding (Bernsberg, Colwell and Cassel, 1965; Pursely and Hamilton, 1965; Spradlin, 1964), dressing (Bernsberg, et.al., 1965) and toilet training (Dayan, Azrin, and Fox, 1971).

Despite their diversity in design, a feature common to all the foregoing studies was an increase

in the adult/child ratio, which would provide more opportunities for adult/child interaction. Even in the behaviour modification studies, there is a question as to whether the improvements in behaviour were due solely to the techniques employed, or whether the increased attention received by the subjects made a significant contribution (Bernsberg, Colwell and Cassel, 1965).

Studies which involve modifications to the physical environment have also been considered to affect development.

Haywood and Tapp (1966) pointed out that characteristics of the physical environment will influence the type of behaviour that will occur. Research involving modification of the physical environment in congregate care settings, and the subsequent effects on the mentally handicapped residents is limited.

Kimbrell, Kidwell, and Hallum (1967) reported that substantial improvement in neuromuscular coordination, toileting and eating behaviours of severely and profoundly retarded girls occurred when the physical nature of the ward and playground were modified by introducing toys and dividing the play area.

The presence or absence of manipulatable objects is another important aspect of the physical environment. Davenport and Berkson (1963) presented four manipulatable objects to severely retarded individuals without training intervention. They proved that this change in the environment significantly decreased stereotypic behaviours.

Thus, it would seem that environmental factors such as - staff ratio, objects available in the environment, physical nature of the environment - are important variables to consider in the study of developmental status in mentally handicapped individuals.

Developmental Studies

Developmental studies have shown that there are basically three areas of development that are highly influenced by environmental conditions: communication and speech skills (Stephen and Robertson, 1966; Tizard, 1974), cognitive and adaptive skills (Webb and Koler, 1979), emotional adjustment and social responsiveness (Balla, Butterfield and Zigler, 1964; Klaber, 1969; Tizard, 1964).

Cognitive Development

Cognitive development, as viewed by Piaget, comprises four stages and evolves from the child's interaction with his environment. The theory starts from the central postulation that motor activity is the source from which mental operations emerge (Flavell, 1963). From this interaction, there occurs a gradual awareness of self, which begins mainly with actions, movements, perceptions and language until the child can think abstractly, formulate hypotheses, engage in deductive reasoning and check solutions.

Inhelder (1962) defines Piaget's stages using the following criteria:

- (1) A stage is comprised of a period of formation and initiation, and a period of attainment or organization of mental operations.
- (2) The attainment of one stage serves as the starting point for the next. Thus, mental development is ongoing and evolutionary.
- (3) The order of stages is constant, i.e. attainment of stage one consistently precedes the formation of stage two.
- (4) A transition is made from an earlier to a later stage; the preceding thought structures are integrated into, or become part of the later structure.

The controversy over cognitive development in the mentally retarded has involved two basic approaches:

- (1) cognitive development is similar in normal and mentally handicapped children, and
- (2) cognitive development is different.

Basically there are two approaches that have tried to answer this debate. On one side of the controversy is the developmental position based on Piaget's postulates and advanced by Zigler (1969).

This position states that cognitive development of retarded individuals, who are essentially normal genetically, is characterized by a slower progression through the same sequence of cognitive stages and a more limited upper stage of cognition than is characteristic of the individual of average intellect.

Inhelder (1968, French edition 1943) relates Piaget's theory to the area of mental retardation. She found that severely retarded subjects remained at the sensory-motor stage; trainable mentally retarded children functioned at the pre-operational level, whereas the educatable retarded children developed up to the stage of concrete operations. Piaget and Inhelder (1947) suggested that retardation may result from a partial or total cessation in mental functions at a certain level of normal development.

Early evidence bearing on the similar sequence hypothesis was provided by the research of Woodward (1959, 1961, 1962, 1963). The first of her studies was done with severely mentally retarded children. This study investigated a method of classifying the severely subnormal in terms of the six stages of sensory-motor development described by Piaget. She found that the performance in the group was hierarchical; that is, children who performed at the most advanced substages had successful performances at all preceding substages. This data gave strong support to the similar sequence hypothesis.

In a subsequent study, Woodward and Stern (1963) carried out an investigation related to the developmental patterns of severely subnormal children. They found that severely retarded children who functioned at sub-stage six (the highest stage of sensory-motor development) differed significantly from those at sub-stage five and below on a measure of verbal comprehension. Their results supported Piaget's contention that the achievements at the sixth substage of the sensory-motor period, a stage which deals with concepts of object permanency, were a necessary prerequisite for the acquisition of meaningful speech.

The other theoretical approach to cognitive development in mentally handicapped subjects is the "Difference Position" which states that at every cognitive level, the child with a low I.Q. will behave differently in tasks demanding learning or information processing, than the child with a high I.Q. at the same mental age.

Studies done within the "Difference Position" have found differential performance between mentally retarded and non-retarded subjects matched in M.A. (O'Connor and Hermelin, 1959; Milgram and Furth, 1963; Rohwer and Lynch, 1968). Most of these studies have been criticized from the developmental position for using, in the samples, organic mentally retarded subjects instead of genetically normal handicapped subjects.

Very few studies have dealt with cognitive development in multiply handicapped children, except for some references in Lyle's studies (1959, 1960) in language development in which language development is synonymous with cognitive development.

The studies done with severely and profoundly handicapped individuals have encountered formidable problems of experimental control. However, the assumption that profoundly retarded individuals are incapable of engaging in adaptive interaction with a novel environment has not been proved at the present time. Profoundly retarded individuals, unless severely restricted by visual and/or ambulation deficit, may be able to learn a variety of adaptive interactions, provided such interactions are systematically prompted and reinforced.

The role of the environment in cognitive development has been demonstrated by the consistent findings of higher I.Q.s for home reared than for institutionalized mentally handicapped children (Carr, 1970; Centerwall and Centerwall, 1960; Shipe and Shotwell, 1965).

Stedman and Eichorn (1964) compared a group of Down's Syndrome infants, aged 17 to 37 months, reared at home, with similar infants in an "enriched" institutional setting, using standardized measurements of mental, motor, social and physical development. The home reared group was significantly superior in mental test scores and social maturity scale. No statistically significant differences in motor performance were found.

Spradlin and Girardeau (1966) suggested that the adaptive behaviour of moderately and severely retarded individuals might be increased by structuring the environment to provide reinforcement for behaviours incompatible with maladaptive behaviours.

Horner (1980) studied the effect of an environmental "enrichment" program on the behaviour of institutionalized profoundly retarded children. He observed five profoundly retarded ambulatory females, placed in a dayroom where toys and objects were selected according to some criteria:

- (1) capable of being manipulated in some manner
- (2) resistant to being poked into body orifices
- (3) difficult to use as a weapon
- (4) low probability of producing injury if used as a weapon, and
- (5) could be cleaned or discarded when soiled.

A systematic observation of the group was undertaken, categorizing each response into four types of behaviours:

- (1) adult directed behaviour
- (2) child directed behaviour
- (3) self directed behaviour, and

(4) object directed behaviour.

The experimental design consisted of an ABAB design, where "enriched" environmental conditions were compared with "austere" environmental conditions. The outcome of the study demonstrated that under experimental conditions:

- (1) A slight increase in both adaptive and maladaptive adult directed behaviour was observed.
- (2) Child directed behaviour and self directed behaviour increased when object directed behaviour also increased.
- (3) The overall level of maladaptive behaviour was lower when objects were present in the environment.
- (4) Differential reinforcement, plus an adequate supply of toys appeared to maintain high interaction with the toys.

Enriching the environment by providing manipulatable toys and objects only was not sufficient to maintain interaction with the environment at a rate high enough to compete effectively with maladaptive behaviour.

Lyle (1960) investigated the relationship between environment and verbal intelligence. The study showed that when a group of severely handicapped, institutionalized children (I.Q. under 40) were placed in a residential family unit, they developed verbally at a

greater rate than matched controls who remained in the institution.

Although predictions of possible effects that the type of residential environment could have on the cognitive development of severely and profoundly retarded children have been offered (Butterfield, 1967; Clarke and Clarke, 1953; Dentler and Mackler, 1964), empirical evidence in support of these predictions is meager.

Language Development

Language and intelligence are so intimately related that some people have practically defined mental retardation in terms of language deficits (Bereiter and Engelmann, 1966; Stamm, 1974).

According to Piaget (1954), language may be conceptualized as a symbolic skill that evolves from general sensory-motor functioning. Studies which look at the relationship between sensory-motor development and language development among developmentally delayed children, have indicated similar relationships that have been reported for non retarded children.

The steps that children go through in acquiring language are remarkably similar regardless of what language the child is learning and how much or how little teaching and correction the child receives.

A debatable issue in language development is whether the mentally retarded child presents a unique kind of language deficiency, or his language deficiencies

are simply manifestations of his slower rate of development. As in cognitive development, the developmental position is widely accepted in language development.

- (1) Retarded children acquire language skills in essentially the same fashion as do normal children.
- (2) The rate at which they acquire language skills is slower than that of normal children. As a result, when retarded children are compared to normal children of similar chronological age, the retarded children show a distinct deficit.
- (3) The variance in language skills is greater among the retarded than in the normal population at a given developmental level.

Lyle (1959) investigated the effects of home and institutional environments on verbal intelligence in a group of mentally handicapped children. The comparison involved mentally handicapped children living in an institution (I.Q. between 20-50 range, and chronological age between 6.6-13.6 years old), and a group of handicapped children living at home with similar characteristics. The results demonstrated that:

- (1) there were no significant differences in non-verbal test scores, indicating that in terms of non-verbal mental age, the groups were comparable, and

- (2) there were highly significant differences between the scores on the verbal subtest of the Minnesota preschool scale (mean difference around 12 months) between home reared and institutionally reared mentally handicapped children. The results of the study seem to show that residence in institutions affects verbal intelligence more than non-verbal intelligence.

Lyle (1960) continued his research, trying to discover whether this verbal retardation could be offset by a differently organized social environment with a smaller number of children and a different pattern of care. A group of 18 mentally handicapped children between five and ten years of age were transferred from a large institution to a house away from the institution. Two principles followed in the unit were relevant for Lyle's study.

- (1) More attention was paid to personal relationships; the group of children were divided into two "families" of eight, each with two house mothers concerned primarily with the same group of children.
- (2) There was no formal instruction in play activities or free time; the children had access to a variety of toys and they could play with them at their own pace and interest. No formal verbal instruction was given and the children had the opportunity to communicate with the staff or with the other children as desired.

Verbal development was assessed by "before and after" measurements on the verbal subtest of Minnesota. Results on the comparison showed an increase in speech and language development of the "home based" group compared with the "institution based" group. The group of children placed in residential family units developed verbally at a greater rate than the matched controls who remained in the institution. The result of this study stresses again the importance of environmental conditions in language development. While environmental factors in the institution delayed language development, alternate care patterns which enriched the social environment offset these retarding effects to some extent.

More recently, Phillips and Balthazar (1979) studied changes in language in severely and profoundly long term institutionalized mentally handicapped residents. The sample consisted of twenty-five female and thirty-four male severely and profoundly handicapped residents observed twice, and eleven female and nine male residents observed three times at five year intervals. Individuals were tested for presence or absence of each of four language components:

- (1) social vocalization (an audible vocal "comment" that does not employ verbal language, such as "uuh" in response to a communication),
- (2) gestural and expressive communication,
- (3) inarticulate verbalization, and

- (4) meaningful articulate verbalization.

The results of the study supported the contention that communication declines during prolonged institutionalization when measured longitudinally.

For the studies described above, it is important to realize that neither the children of Lyle's studies, nor those in Phillips' and Balthazar's, were fully representative of all the population of severely and profoundly mentally handicapped subjects. In both studies, residents with marked physical handicaps or known sensory defects, residents who needed special nursing care or medical attention, and those whose behaviour made them untestable, were not considered for selection in the research.

Social Development

The first social responses in a newborn are looking, smiling and crying. In the early weeks, crying and smiling serve as signals in the sense that other people will be impelled to react to them. They are not yet signals in the sense that the infant uses them purposely in order to get some help or attention; they tend to be triggered by specific needs of the child, with no foresight involved on the part of the infant as to the consequences of his actions.

The realization that these responses have predictable effects on others, comes only with time, and will depend on the learning opportunities that an infant encounters in his particular social environment.

Adult/child relationship is an important component of social development in infants; children living in orphanages are slower to develop social smiling and purposeful crying than are children reared either in their own families or a family-like environment (Gewirtz, 1965). This work suggests that the rate of development of the child's social responsiveness as shown by smiling and crying depends on the responsiveness of the child's caretakers.

Although inadequate social behaviour is often cited as a major behavioural deficit of institutionalized retarded persons (Klaber, Butterfield and Gould, 1969; Spradlin, Girardeau and Corte, 1967), nevertheless little information is available on how retarded persons respond to others. Some investigators have addressed themselves to the training of social behaviours (Morris and Dolker, 1974; Harris and Col, 1974; Samaras and Col, 1975). All the approaches suggest that social behaviour of mentally handicapped individuals can be increased through manipulation of environmental contingencies, and that it is directly related to environmental conditions and social relationships.

However, research has been somewhat limited, and the basic training strategies utilized can usually be conceptualized in one of three ways:

- (1) overall enrichment of the living environment,
- (2) direct training of specific cooperative tasks,
and

- (3) direct training of specific response components of social behaviour.

Enrichment programs for institutionalized retarded persons are aimed at improving, or at least maintaining the existing levels of social skills. Residents participating in such programs generally engage in a higher frequency of informal and formal training situations compared with regular ward routines (Gray and Kasteler, 1969; Mitchell and Smeriglio, 1970). These programs often fail to provide objective data describing the various components of the programs, or details of changes in residents' social behaviour. These drawbacks make it difficult to ascribe reported gains to any one variable or groups of variables. In addition, some data suggests that certain activities reported as "enriching", such as improvement of physical conditions and more favourable aide-to-resident ratios, have only minimal beneficial impact (Harris, Veit, Allen and Chinsky, 1974; Murphy and Zahn, 1975).

The second approach to the development of social responses in severely and profoundly retarded persons is based on the direct training of specific cooperative behaviours, such as ball rolling, block passing, or some other experimental task involving cooperation among a small number of children (Morris and Dolker, 1974; Paloutzian, Hasazi, Streifel and Edgar, 1971, Samaras and Ball, 1975; Whitman, Mercurio and Caponigri, 1970).

The third approach to the training of social responses involves directly training specific response components of social behaviour, such as hand waving

and playing with others (Knapczyk and Yoppi, 1975; Stokes, Baer and Jackson, 1974). Again, generalization of the explicitly trained social behaviour to extraexperimental settings is stressed.

All three approaches suggest that social behaviour of institutionalized retarded persons can be increased through manipulation of various environmental contingencies. It may well be that reported deficits in social behaviour of institutionalized retarded persons are due, in part, to the failure of those with whom they have contact to attend to and reinforce the social behaviour that is exhibited.

Mayhew, Enyart and Anderson (1978) studied staff responsiveness and its influences in residents' behaviours. They systematically observed attending and ignoring behaviours from the staff to the residents, and changes in clients' behaviours. The study was conducted in a ward of eighteen severely and profoundly mentally handicapped institutionalized females, ranging in chronological age from 12.3 to 20.5 years old. Experimental sessions were conducted for fifteen minutes daily, where the experiment attempted to reinforce any resident emitting a specified social behaviour (i.e. proximity, physical contact, or vocalizations).

Results of the study indicated that social behaviour of the severely and profoundly mentally handicapped females appeared to increase and decrease systematically as social reinforcement procedures were presented and withdrawn. In the study, no specific training in social behaviour was involved. Social

reinforcement procedures alone were sufficient to increase and maintain these kinds of behaviour, without the use of more tangible consequences.

This data suggests that social responses may undergo extinction if they are not reinforced. Thus, it would appear that the deficits seen in social behaviour of mentally handicapped persons may be due, in part, to the failure of their environment to maintain and increase existing social behaviours.

This conclusion supports previous research suggesting that institutionalized retarded persons are on an inadvertant extinction program for most of their behaviour (Dailey, Allen, Chisky and Veit, 1974).

The information available on the social environment of profoundly mentally handicapped children is minimal. Of all groups, these children are the most dependent on their attendants, since they can neither take care of their own physical needs nor communicate their needs through language. Their limited movements, coupled in many cases with sensory impairments, render them minimally able to gain the experience which is essential for intellectual, social and language development. Without active physical and social contact with others, they are isolated from ordinary human experience.

Since the developmental studies done with profoundly mentally handicapped children are limited,

this study was undertaken to answer the following major research questions:

- (1) Are there any differences in the ecological environments (location, position, social contact, child awareness, child response) between the children living at home and those living in congregate care?
- (2) Are there any differences in the cognitive, language and social development of children reared at home and children reared in congregate care?
- (3) Are there any differences in general functioning (nursing care, physical development, awareness and self help) between children reared at home and children reared in congregate care.

CHAPTER III: PILOT STUDY

A pilot study was carried out at Baker Centre, an institution located in Calgary, Alberta. Six severely and profoundly mentally handicapped children (level three and four of handicapping condition) were:

- (1) observed for four hours, divided into two periods of two hours each in a weekday and a weekend day,
- (2) assessed with the Adaptive Functioning for the Dependent Handicapped Scale (Marlett, 1974),
- (3) assessed for their cognitive development with the Bayley Mental Scale (Bayley, 1969),
- (4) assessed with the Vulpe Language Development Scale (Vulpe, 1969), and
- (5) assessed with the Social Development Scale of Cohen and Gross (Cohen and Gross, 1979).

Characteristics of the subjects studied in the pilot project are summarized in Table 1.

The main objective of the pilot project was to get acquainted with the assessment tools to be used in the main research. The specific objectives for the pilot project were:

Table 1: Characteristics of the Subjects
Studied in the Pilot Project

Level of Handicap Condition

Sub- ject	Age in Mos.	Sup. & Care	Motor Con- trol	Socia- liza- tion	Dev. Skills	Beha- viour	Vi- sion	Hear- ing	Epi- lepsy
1	108	3	4	3	3	0	0	0	1
2	97	3	4	3	4	0	1	0	0
3	102	3	3	4	4	0	0	0	0
4	95	3	3	4	3	0	0	0	0
5	102	4	4	4	3	0	0	0	0
6	99	4	3	3	3	0	0	0	0
\bar{X}	100.5	3.3	3.5	3.5	3.5	0	0.16	0	0.16

- (1) to observe the relevance of the items categorized in the observation checklist;
- (2) to establish the interrater reliability for the observations;
- (3) to create a recording system for the Cohen and Gross Social Development Scale and to establish the interrater reliability for the scale.

Objective 1

The areas in the observation checklist were organized to obtain information about the child's interaction with the physical and social environment, and also the type of activities he engaged in within his environment.

The checklist was reviewed several times before the final checklist was completed. The most common problems with the checklist were:

- (1) behaviours ambiguously defined that led to confusions within observers. Items with low estimated reliability were reworded to reduce ambiguous categories.
- (2) missing information
- (3) irrelevant observations, and
- (4) items over inclusive.

The final checklist was divided into five general categories:

- (1) Location. The information covered in this category relates to the child's ecology and physical environment.
- (2) Position. The information in this area relates to the different positions the child is placed in within the environment (e.g. wheelchair, normal chair, floor, special device).
- (3) Type of contact the family/caregiver gives to the child.
- (4) Child awareness. Child's awareness of his environment.
- (5) Child activity. How the child responded to the interaction and the physical environment.

Objective 2

The interrater reliability of the observation checklist was carried out with the Rehabilitation Practitioner in charge of the unit. The calculations were based on intervals in which at least one observer recorded a response. An agreement was defined as an interval in which both observers recorded the occurrence of a response within the same category. A disagreement was defined as an interval in which one observer recorded the occurrence of a response and the other did not, or

recorded the occurrence of a different response. The number of intervals with interobserver agreements was divided by the sum of the agreements and disagreements, the quotient multiplied by 100 and the result reported as percentage of agreement between observers.

Percentage of agreements figures for the observation checklist ranged from a high of 97.5% in the Location Items, to a low of 87.2% in the Child Awareness Items and averaged 91.5% overall.

The items with the lowest reliability were: eye contact, gaze not directed and actively attending. The items with the highest reliability were: location, care being given, level of assistance and physical contact.

Objective 3

Since the Developmental Scale of Cohen and Gross did not have a scoring system, it was necessary to create a system that would be able to evaluate the differences in the child's social developmental level.

The Performance Analysis Scale created by Vulpe (1969) was adapted for the Social Developmental Scale and also the Language Developmental Scale. The Performance Analysis Scale is used either to teach a task or to enhance a child's performance. It identifies the child's achievement in the sequence of learning a task. Scoring by the Performance Analysis System is uniform and reproducible. It is a well

defined coding system for scoring which eliminates ambiguity and variability between observers.

The interrater reliability for the seven points system was done with the same procedure used for the calculation of interrater reliability in the observation checklist.

Percentage of agreement for the total performance analysis scoring system used in the social development scale ranged from 84.6% to 70.8% and averaged 80.7% overall.

For the purposes of the final study, the original scoring system of seven points was condensed to a four point system. The assistance levels (physical, social/emotional assistance and verbal assistance) were condensed into one level of assistance. The final scoring system was as follows:

- (0) No. No apparent interest or evidence of motivation for participation in task; inappropriate state; unable to be alert or attend.
- (1) Attention. Any definable indication of attention to any part of the activity, but not active participation due to insufficient attention or physical incapacity.
- (2) Assistance. Child actively participates in the activity when he gets assistance (physical, verbal or emotional).

- (3) Independent. Succeeds or performs with no assistance with familiar surroundings or with familiar media.
- (4) Transfer. Ability to perform task demanding equal skills in different forms and contexts.

Interrater reliability for the Social Developmental Scale was calculated with the four points system. Percentage of agreement ranged from a high of 94% to a low of 89.9% and averaged 92.0% overall.

The four points system was also used in the Language Developmental Scale (Vulpe, 1969). Interrater reliability ranged from a high of 97.3% to a low of 92.3% and averaged 94.8% overall.

The pilot study provided the assurance of the reliability of the basic tools used in the main research, and outlined the most effective procedure to be followed in the main research. Table 2 summarizes the correlations for the assessment tools used in the study.

Table 2. Summary of Correlations for the Assessment Tools

Tests	% of Agreement Within Observers		
	High	\bar{X}	Low
Observ. Checklist	95.7%	91.5%	87.2%
Social Developmental Scale	94.0%	92.0%	89.9%
Language Scale	97.2%	94.8%	92.3%

CHAPTER IV: METHODOLOGY

Design

The study was a descriptive comparison of the performance and environmental differences in two groups of profoundly mentally retarded children at home and in congregate care.

Environment	Age		Total
	3 - 5	6 - 8	
Home	8	8	16
Congregate Care	8	8	16
Total	16	16	32

Subjects

The subjects were thirty-two profoundly and multiply handicapped children between three and eight years of age from home and congregate care.

The sample was selected using several standards:

1. Level of Handicap

The selection was done using the classification prepared for Services for the Handicapped (Marlett, 1975). The criterion was level 3 and 4 from the grid. Specifically these children exhibited the following characteristics.

1.1 Supervision and Care

Level 3: Regular nursing care with some medical assistance, frequent convulsions, physical care in all daily routines.

Level 4: Extensive medical, physical and nursing care (e.g. large hydrocephalus, immobile child requiring positioning for congestion or bed sores, heart defects, aspirates when fed, tube fed).

1.2 Motor Control

Level 3: Head and trunk control limited, purposeful movements in limbs (e.g. creeping, batting toys, snuggles, squirms, creeps).

Level 4: Motor control severely affected due to spasms or limpness, no head control, no spontaneous motor movements.

1.3 Socialization/Communication

Level 3: Beginning awareness, responds to familiar persons, notices changes in environment, babbles, uses gestures.

Level 4: Impossible or extremely difficult to understand, no spontaneous vocalization apart from fear, hunger or pain; very little awareness

apart from response to cuddling and sharp environmental changes; shows some awareness of surroundings, eyes follow motion in general way.

1.4 Developmental Skills

Level 3: Shows interest in self care, attempts to hold the spoon or eat some finger foods, cooperates when being dressed, plays in bath.

Level 4: May assist when being fed (sucks food, takes food from spoon, opens mouth), may enjoy bath.

The interreliability for the classification of handicapping conditions scale (Marlett, 1975) is .87.

As additional information for the subjects selected for the study, an extra four categories were used only as descriptors of the sample.

1.5 Behaviour

Level 1: No specific behaviour problems, although some inappropriate behaviour is evident.

Level 2: Undesirable behaviour in special program.

Level 3: Unacceptable or disruptive behaviour requiring one to one intervention.

Level 4: Dangerous toward self, others or property, and as a result, cannot be handled in existing programs.

1.6 Vision

Level 1: Some correction needed, may wear glasses, not handicapped in seeing.

Level 2: Low vision, uses residual vision in most tasks, or uses special visual, auditory or tactile aids.

Level 3: Almost blind, totally blind. Relies on tactile and auditory modalities for learning.

1.7 Hearing

Level 1: Some difficulty in hearing, may wear hearing aids satisfactorily.

Level 2: Quite handicapped in hearing, has difficulty when wearing hearing aids.

Level 3: Almost deaf, totally deaf.

1.8 Epilepsy

Level 1: Controlled by medication

Level 2: Controlled apart from two to four seizures per month.

Level 3: Brittle epileptic

Tables 3, 4, 5, and 6 describe the characteristics of the sample in levels of handicapping condition.

2. Age Range

Children between 3-5 and 6-8 years old were selected (Table 7 shows the age of the subjects in months) in order to describe early impact (3-5 years old), and later impact (6-8 years old) in the developmental areas under study -- cognitive, language and social development. In the screening process it was determined that the possible subjects who could be categorized as level three and four in level of handicapping condition included close to the total population of the severely and profoundly mentally handicapped children of the City of Calgary. The City of Edmonton was chosen as a second possibility to collect the sample.

3. Institutionalization

The children in congregate care were to have been institutionalized as early as two years of age

to be considered in the sample; this limitation also caused difficulties and further limited the possible subjects available for the study.

4. Type of Programs

Since the comparison was basically considering living conditions as the only independent variable, the children involved in the study were enrolled either in day care (3-5 years old), or school programs (6-8 years old).

Table 3: Age of the Subjects
in Months

Subjects	Congregate Care		Home	
	3-5	6-8	3-5	6-8
1	44	92	36	96
2	37	95	56	79
3	55	90	50	89
4	46	82	52	88
5	59	91	39	96
6	43	95	57	86
7	46	93	50	92
8	43	83	50	96
Range	43-59	82-95	36-57	86-96
\bar{X}	46.62	90.12	48.75	90.25

Table 4: Level of Handicapping Condition for
-- the Home Care 3-5 Years Old Group

Sub- ject	Sup. & Care	Motor Con- trol	Social- ization	Dev. Skills	Beha- viour	Vi- sion	Hear- ing	Epi- lep- sy
1	3	3	3	3	0	0	0	0
2	3	3	3	3	0	0	0	0
3	4	4	3	3	0	0	0	0
4	4	4	3	4	0	3	0	1
5	4	4	3	3	0	2	0	3
6	4	4	3	4	0	2	0	1
7	4	3	3	3	0	0	0	2
8	3	3	3	3	1	0	0	0

Table 5: Level of Handicapping Condition for
the Home Care 6-8 Years Old Group

Sub- ject	Sup. & Care	Motor Con- trol	Social- ization	Dev. Skills	Beha- viour	Vi- sion	Hear- ing	Epi- lep- sy
1	4	3	4	3	0	2	0	0
2	3	3	3	3	1	0	0	0
3	3	3	3	3	1	0	0	0
4	3	4	3	3	0	0	0	0
5	3	3	3	3	1	0	0	0
6	4	4	4	4	0	2	0	1
7	4	4	3	4	0	0	0	1
8	3	3	3	3	2	0	0	0

Table 6: Level of Handicapping Condition for Congregate Care 3-5 Years Old Group

Sub- ject	Sup. & Care	Motor Control	Social- ization	Dev. Skills	Beha- viour	Vi- sion*	Hear- ing	Epi- lep- sy
1	3	3	3	0	0	2	0	0
2	4	4	4	4	0	3	0	2
3	3	4	4	3	0	3	0	0
4	3	3	3	4	0	3	0	0
5	3	3	3	4	0	3	0	0
6	3	3	3	4	0	2	0	3
7	4	3	3	3	0	3	0	0
8	3	3	3	3	0	0	2	0

* The majority of the younger group in congregate care were classified as "cortically blind" but in fact, only 2 children were unable to respond to visual stimuli in the Bayley Mental Scale

Table 7: Level of Handicapping Condition for Congregate Care 6-8 Years Old Group

Sub- ject	Sup. &	Motor Control	Social- ization	Dev. Skills	Beha- viour	Vi- sion	Hear- ing	Epi- lep- sy
1	4	3	3	3	0	0	0	3
2	4	3	4	3	0	0	0	0
3	4	3	3	3	4	0	0	3
4	3	3	4	3	3	0	0	0
5	4	3	3	3	0	3	0	0
6	4	4	4	4	0	0	0	2
7	3	3	3	3	0	0	0	3
8	4	3	3	4	0	3	0	1

Children from the congregate care category were chosen from two institutions: Baker Centre (Calgary) and Rosecrest Home (Edmonton).

Baker Centre is an institution for severely mentally handicapped children and adults. The children's residence is organized in independent wards of 12 and 15 clients, the majority classified as severely and profoundly mentally handicapped. In most of the wards, the residents are enrolled in school programs or day training programs, depending on their chronological age.

Rosecrest Home is an institution for the severely and profoundly mentally handicapped child. The residence is organized in independent wards of 12 and 15 residents. The children under five years of age attend different day training programs, and children six years of age and above are integrated into the school system.

Parents of children living at home were secured from three sources: Quest Children Society, Providence Child Development Center (P.C.D.C.), and from Separate and Public special education programs.

Quest Children Society is a specialized E.C.S. program for children under five years of age. The program is individualized to meet the needs of each child depending on his capacity and potential.

P.C.D.C. is a day training centre for normal and handicapped children; it serves children from birth to five years; the program is individualized and one

of the main objectives is to assist the handicapped child to integrate into the regular school system.

The Special Educational Program at public and Separate Schools is concerned with providing special facilities, curricula and specialized instruction for exceptional children who are unable to make adequate progress in the regular classroom. Table 8 shows the distribution of subjects by location.

Table 8: Distribution of Subjects
by Location

Location	3 - 5	6 - 8
Baker Centre	---	3
Rosecrest	8	5
P.C.D.C.	5	---
Quest	3	---
Public	---	5
Separate	---	3
Total	16	16

Procedure

The sequence of the study was determined by the pilot project. The procedure used was similar for both groups -- congregate and home care.

Step 1

The children were observed in their natural environment (home or congregate care) for a period of approximately four hours. The observation occurred during children's social activities and free time. The observation was divided into two sessions -- a week day (two hours), and a weekend day (two hours). The observation was carried out before the testing of the children to avoid bias information and interferences with child response to a new situation.

Step 2

A general functioning evaluation in nursing care, physical development, awareness and self help skills was done using the Adaptive Functioning Index for the Dependent Handicapped (Marlett, 1974).

Step 3

A cognitive development assessment was done using the Bayley Mental Scale (Bayley, Scales of Infant Development, 1963).

Step 4

A language development assessment was done using the Vulpe Assessment for Language Development (Vulpe, 1973).

Step 5

A social development assessment was done using the Cohen and Gross Social Development Scale (Cohen and Gross, 1979). Steps three to five were alternated depending on the assistance required from the caregiver or mother, and the time available for the interview in some of the items that were difficult to observe.

Instruments

The instruments used were:

- (1) Observation checklist: designed to obtain information about the child's daily activities and his contact with the environment.
- (2) Adaptive Functioning of the Dependent Handicapped: Overall assessment in nursing care, self help, physical development and awareness (A.F.D.H., Marlett, 2nd ed., 1974).
- (3) Cognitive assessment: Bayley Scales of Infant Development (Bayley, 1963).
- (4) Language assessment: Vulpe Assessment Battery (Vulpe, 1969)
- (5) Social development: Development of Social Skills, Cohen and Gross, 1979.

Observation Checklist

The observation checklist was based on a naturalistic observation of the client's behaviour in their living setting. Observations were conducted when the client was free to socialize (during breaks and leisure periods in the residence, or at home). The checklist was divided into different sections to identify variables with high probability of differentiating home from congregate care, and vice versa. The sections were:

- (1) Location. The information in this area covered information about the inanimate environment to which the child was exposed and how much of his time he spent in a variety of environments.
- (2) Position. When the child is placed in an environment, how his physical and motor needs are met by using special devices, wheelchair, or the child is placed in a normal chair or on the floor.
- (3) Caregiver/family. The interaction of the caregiver/family with the child. Information related to:
 - (a) general care (bathing, dressing, feeding, etc.), and
 - (b) socialization: type of contact - visual, verbal and physical contact in socialization time.

- (4) Child Awareness. Information in this section dealt with the child's interaction or response to the environmental stimulation (passive or active).
- (5) Child Activity. Kind of stimulation the child was seeking when he interacted with his environment (vestibular, visual, tactile or auditory) and type of assistance he required for his interaction with the environment. Interrater reliability for the observation checklist was 87.2% and 95.7% with an average of 91.5%.

Overall Functioning

Adaptive Functioning of the Dependent Handicapped (A.F.D.H.) (Marlett, Long, Hooper, Douglas and Cameron, 1974).

The A.F.D.H. assesses four major areas of concern with the profoundly handicapped. Interrater reliability for the scale was .83 for the full scale when calculated for a hospital population of profoundly retarded residents. The scale measures 75 skills or targets in three areas: physical development, awareness and self help. Using a three point scale for each skill measured, the maximum score in each area is 50. The fourth area measured is nursing care, which covers medications required, tonicity of the body, medical care necessary, observation for injury, and feeding difficulties arising from physical disability. Unlike the three other areas where a high score is indicative of a higher level of development, a high score in nursing care denotes a greater medical disability.

Cognitive Development

Bayley Scales of Infant Development (Bayley, 1963). The Bayley Scales are designed to provide a tripartite basis for the evaluation of a child's developmental status in the first two and one half years of life. For the purpose of this study, only the mental scale was used, since the severely mentally handicapped children have severe physical problems that vary depending on the type of damage they have sustained. The comparison in psychomotor development was irrelevant for the purposes of this study.

The Bayley Mental Scale has 163 items. The total scale has been standardized on a sample of 1,262 children, distributed in approximately equal numbers among fourteen age groups ranging from zero through thirty months.

The mental scale is designed to assess sensory-perceptual acuities, discriminations, and the ability to respond to these; the early acquisition of "object constancy" and memory, learning and problem solving abilities; vocalizations and the beginnings of verbal communication; and early evidence of the ability to form generalizations and classifications, which is the basis of abstract thinking (Bayley, p.3).

Results of the administration of the mental scale are expressed as a standard score; the M.D.I. or Mental Development Index. The reliability coefficient for the mental scale ranges from .81 to .93 with a medium value of .88. The standard score range of the mental scale is from 50 through 150 and covers

more than three standard deviations on either side of the average M.D.I. for each age. These standard scores permit comparison of the performance of an infant with the performance of his age peers.

Language Development

Vulpe Assessment Battery. (Vulpe, 1969).
Language Scale.

The Vulpe is a developmental assessment procedure for atypically developing children from birth through six years. The assessment is designed to provide a test of competencies in various developmental areas.

For the purposes of the study, the Vulpe Language Scale was used since it provides the most comprehensive coverage of language development from zero to thirty-six months in receptive language and zero to five years old in expressive language. The scoring system has seven ordinal steps. Each step in the scoring is specifically defined. They are sequenced to indicate progressive degrees of independence. The steps are:

- (1) No attention
- (2) Attention
- (3) Physical assistance
- (4) Social emotional assistance
- (5) Verbal assistance
- (6) Independent
- (7) Transfer

For the purposes of this study, the scoring system was reduced to four ordinal steps, since the assistance levels only gave qualitative differences that were not relevant for the study. Also, with this group it was difficult to separate physical assistance, social/emotional assistance and/or verbal assistance.

The scoring system was:

- | | |
|---|--------------|
| 0 | no attention |
| 1 | attention |
| 2 | assistance |
| 3 | independent |
| 4 | transfer |

The interrater reliability of the four step scoring system was .97 for different children and .88 for different tasks.

Social Development

Development of Social Skills (Cohen and Gross, 1979). This scale examines the development of social relationships as they originate in the parent/infant bond; it examines also the process of individuation and development of attachment or friendship outside the family.

The sequences presented in the scale have been organized to illustrate behavioural trends generally characteristic of the phases of attachment and relationship formation. The sequence of social development is

organized in four phases.

Phase 1

Indiscriminate social responsiveness. This phase includes initial signalling responses; smiling (36 items), crying (17 items), and vocalizing (14 items).

Phase 2

Differential social responsiveness. This phase includes: response to face (33 items), active contact seeking (28 items), reaction to strangers (12 items), response to separation (6 items).

Phase 3

Active initiative, seeking proximity and contact. This phase included differentiation of self from others (17 items), establishment of independent activities (11 items). Phase 3 serves to bridge the early attachment characteristics with a goal directed contact and relationships outside the primary family unit.

Phase 4

Goal directed partnership. This phase includes: isolated play (13 items), parallel play (5 items), co-operative play (35 items), sharing objects and activities (18 items), awareness of emotions (15 items).

The scoring system used was similar to the system used for the Vulpe Scale. A pilot study was carried out in order to establish the interrater reliability for the seven step scoring system and for the four step scoring system. The interrater reliability for the seven step scoring system was between 70.8 and 84.6, with a medium of 80.7%. The interrater reliability for the four step scoring system was between 89.9% and 94%, with an average of 92.4%.

CHAPTER V: RESULTS

Results

Each results section has been organized in the following way: statement of the hypothesis, presentation of graph and ANOVA tables, followed by description of results.

Section A: covers the ecological variables from the observation.

Section B: presents the developmental test information.

Section C: presents the data related to general functioning and nursing care.

One Way Analysis of Variance (ANOVA) was used to identify general effects for all normally distributed variables. Contrast focussing on age (3-5; 6-8 years old) and environment (home; congregate care) was also performed.

A non parametric one way ANOVA (Kruskal-Wallis) was used for variables which were not normally distributed. The observation checklist results are described as percentage of observation with no formal statistical analysis performed because of the nature of the data. The descriptive analysis is related to the number of observations in each group:

(1)	Home:	3 - 5	204 observations
		6 - 8	232 observations
(2)	Congregate care	3 - 5	181 observations
		6 - 8	172 observations

SECTION A

1. ECOLOGICAL ENVIRONMENT

Are there any differences in the ecological environments (location, position, contact, child response) between the children living at home and those living in congregate care?

Are there any differences in the type of contact (visual, verbal, physical) the caregiver/family establishes with the home and congregate care children?

Are there any differences in the children's awareness (passive, active) in the two environmental categories?

Are there any differences in the children's activity level in the two environmental categories?

1.1 Location

Location refers to the number of locations in which the child is placed with the assumption that "number of locations" provides more variation in stimulation. The categories were: dayroom/livingroom; lunchroom/diningroom; hallway, bathroom, bedroom.

Figure 1 shows the histogram in percentage of the comparison of the 3-5 years old group and the 6-8 years old group in the category of Location. Table 9 shows the actual percentage represented in Figure 1.

Figure 1

Histogram in % of Location in the comparison of the 3-5 and 6-8 years old

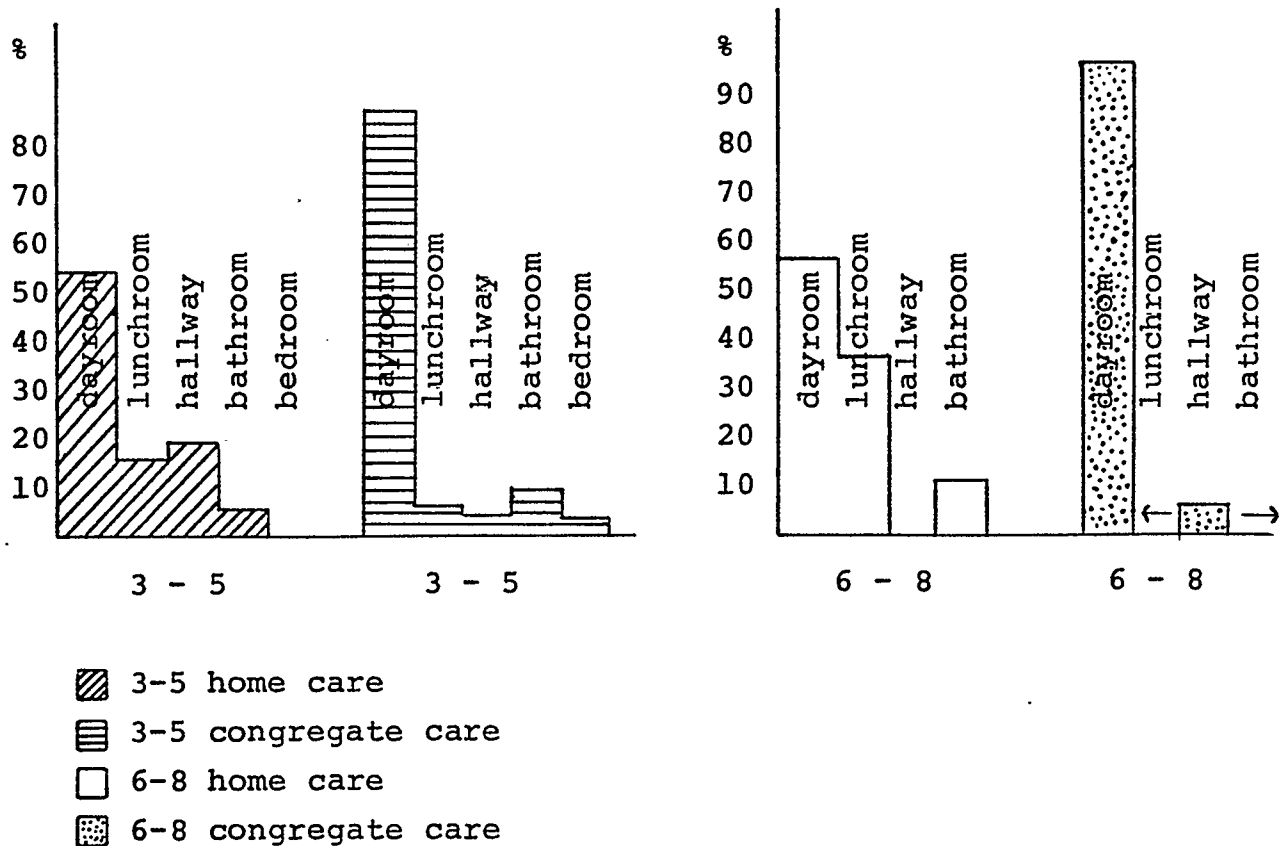


Table 9

Percentage represented in Figure 1 in
the comparison of the groups in Location

LOCATION	3 - 5		6 - 8	
	Home	Cong. Care	Home	Cong. Care
Dayroom	52.2 (108)	83.4 (150)	53.3 (124)	94.3 (162)
Lunchroom	14.5 (48)	3.8 (7)	35.7 (83)	↓
Hallway	19.5 (38)	3.3 (7)	-- (0)	5.0 (10)
Bathroom	3.5 (7)	7.7 (14)	10.2 (25)	↑
Bedroom	-- (0)	1.6 (3)	-- (0)	
Total % (N)	100.0 (204)	100.0 (181)	100.0 (232)	100.0 (172)

The younger children tend to have more variation in environment compared with the older children.

The younger children in home care spend their free time in different environments: living room 52.2%; dining room 24.5%; hallway 19.5%; bathroom 3.5%; whereas younger children in congregate care spend the majority of their time in the dayroom (83.4%) with only 16.4% of their time spent in other settings. The home care older group of children spend the majority of their free time in a variety of environments: living room 53.3%; lunch room 35.7%; bathroom 10.2%; whereas the older children in congregate care spend the majority of their free time in one place: dayroom 94.3%; other 5.0%.

An important observation in the congregate care groups was the more limited environment for the older group. As the children grow older they become more difficult to handle and therefore tend to remain in one place.

1.2 Positioning

Positioning refers to the different positions in which a child is placed: floor/mat - when the child is placed with no intention of corrective posture or recommended position; normal chair - the child is seated in a normal chair with no special devices; wheel-chair - the child has his own chair specially designed for corrective contractures; in arms - the child is being held; special devices - includes side liers, standing frames, wedges, etc. Figure 2 shows the histogram in percentage of the comparison of the groups in the category of Position. Table 10 shows the actual percentage represented in Figure 2.

Figure 2

Histogram in % of Position in
the comparison of the groups

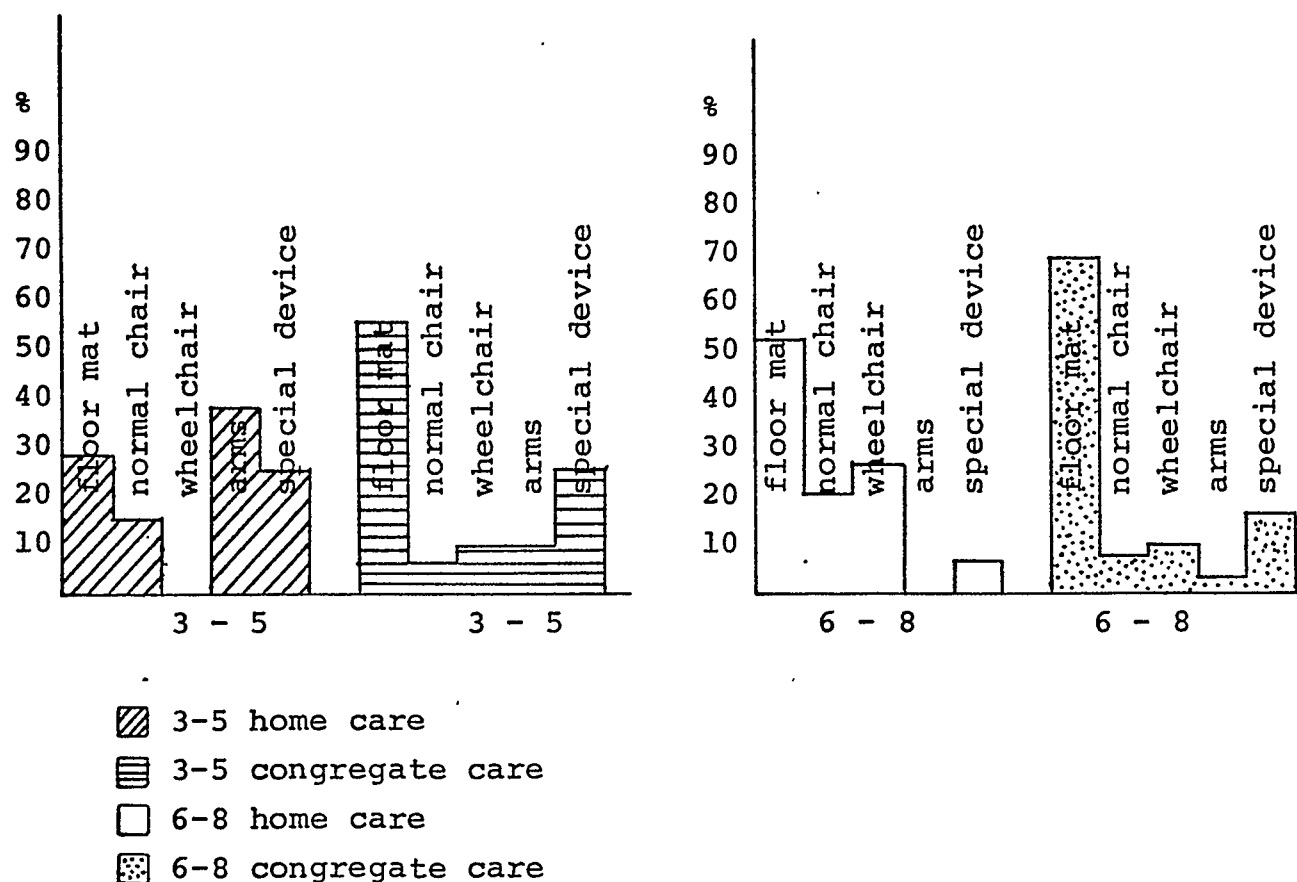


Table 10

Percentages represented in Figure 2
in the comparison of the groups in Position

POSITIONING	3 - 5		6 - 8	
	Home	Cong. Care	Home	Cong. Care
Floor mat	28.7 (59)	54.6 (99)	50.5 (119)	68.2 (114)
Normal Chair	13.7 (28)	4.8 (9)	19.75 (47)	7.1 (12)
Wheelchair	-- (0)	8.7 (15)	24.20 (57)	8.0 (13)
Arms	35.0 (71)	8.7 (15)	-- (0)	0.7 (12)
Special device	23.6 (48)	23.2 (42)	5.1 (12)	16.0 (26)
TOTAL % (N)	100.0 (204)	100.0 (181)	100.0 (232)	100.0 (172)

The most frequent position for all the children is on the floor or a mat. The younger group tends to have more variation in positioning than the older group and also tends to utilize more special devices (home 23.6%; congregate care 23.2%) in comparison with the older group (home 5.1%; congregate care 16.0%).

In the contrast of environment more variation of positioning was observed in the home care groups. Normal chairs were used more frequently for the home care groups (younger 13.7%; older 19.75%) than for the congregate care group.

An important observation was the number of times that the younger home care children were picked up in arms (35.0%) whereas the older home care children, since they are more difficult to handle, were not picked up at all in the home environment and were only picked up infrequently in congregate care settings (0.7%).

1.3 Caregiver/Family

Caregiver/Family refers to the relationship the caregiver/family members have with the child. The categories were: care being given (bathing, dressing, feeding, toileting, nursing care, transportation); person absent/person present in the child's environment; social contact - refers to the type of interaction the caregiver establishes with the child and includes visual contact, verbal contact task related, verbal contact non task related, physical contact.

1.3.1 Care being given

Care being given was similar in the comparison of the four groups. Since this category includes different activities related to the well being of the child, the observations were combined in one area defined as "General Care". It was observed that the congregate care group used "free time" to accomplish general care (younger 16.8%; older 10.4%) whereas the home care groups have less general care in their free time period (younger 7.9%; older 2.6%).

1.3.2 Person present/absent

This category compares the number of persons present in the child's environment and the actual contact with the child.

Figure 3 shows the Histogram in percentage of the number of times a person was present in the child's near environment and the type of contact that was established with the child. Table 11 shows the actual percentage represented in Figure 3.

Figure 3

Histogram in % of person present and type of contact established in the comparison of the groups

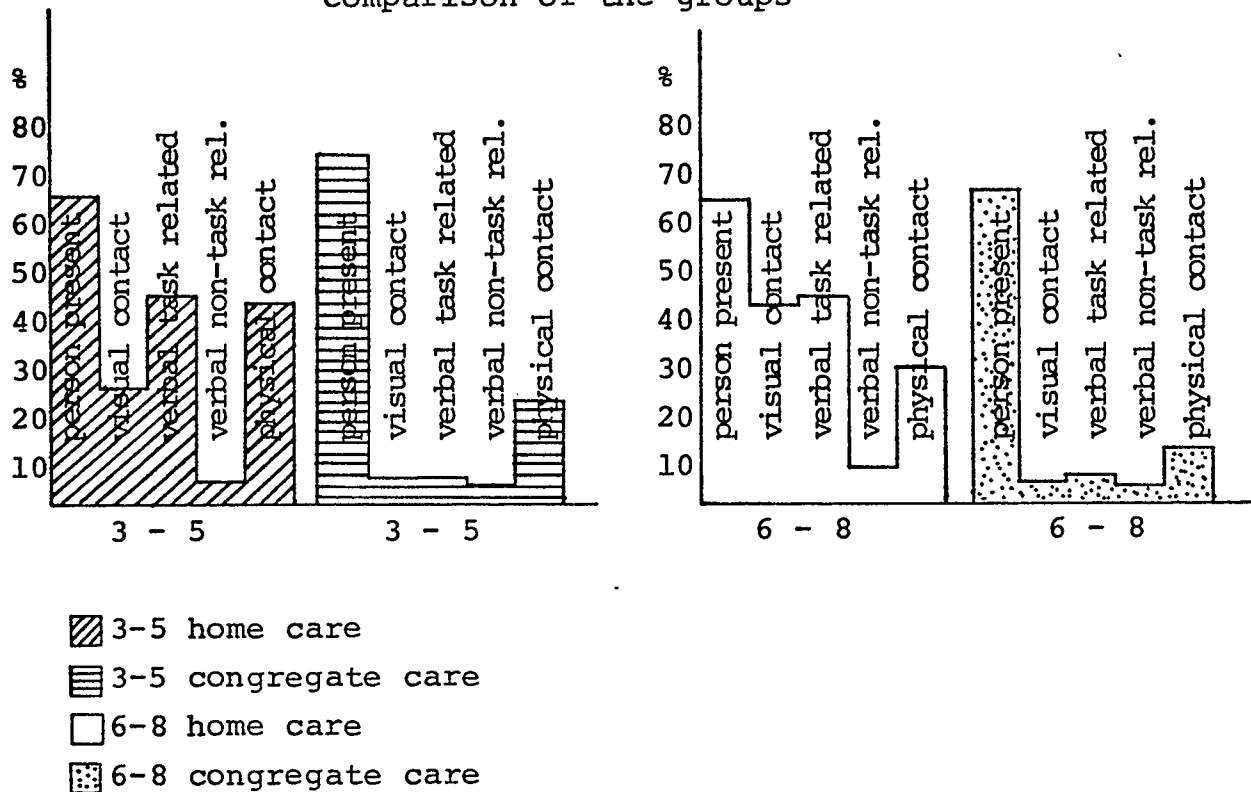


Table 11

Percentages represented in Figure 3 in the comparison of the groups in social contact

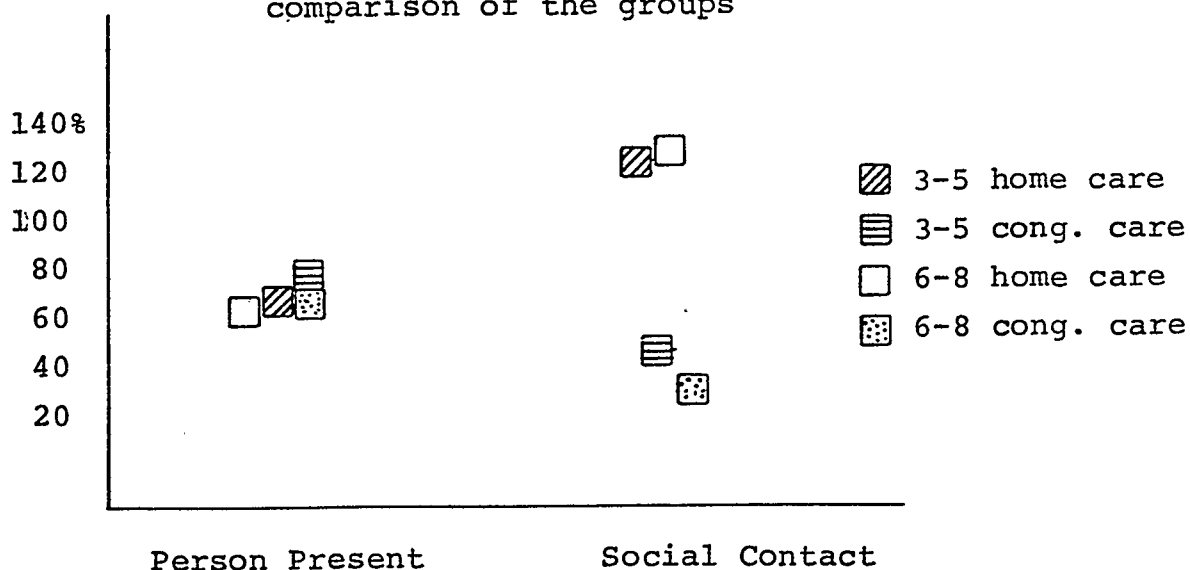
SOCIAL CONTACT	3 - 5		6 - 8	
	Home	Cong. Care	Home	Cong. Care
Person present	66.6 (135)	74.0 (133)	64.16 (151)	66.7 (114)
Visual contact	27.5 (56)	9.3 (17)	41.6 (98)	6.3 (10)
Verbal task rel.	44.5 (90)	9.3 (17)	42.9 (99)	7.1 (13)
Verbal non task r.	7.0 (14)	7.7 (14)	10.8 (24)	5.8 (9)
Physical contact	42.9 (87)	22.0 (87)	30.0 (72)	13.9 (23)
CUMULATIVE % (N)	121.9 (204)	48.3 (181)	125.3 (232)	33.1 (172)

There is no important difference in the number of persons present in the child's environment in the comparison of the groups. The difference appears to be in the amount and type of contact the children receive.

The congregate care groups receive less social contact than the home care groups (cong. care 3-5, 48.39%; 6-8, 33.1%; home care 3-5, 48.3%; 6-8, 125%). The most prevalent type of contact received by the congregate care group is "physical contact" which is probably related to general care rather than social contact. Figure 4 represents the cumulative percentage of "social contact" and the category "person present" in the comparison of the groups.

Figure 4

Cumulative % of social contact
and person present in the
comparison of the groups



1.4 Child Awareness

Child awareness refers to the child's responsiveness to his environment. This category involves passive and active awareness.

1.4.1 Passive Awareness

- (a) Asleep - which is no contact at all.
- (b) Gaze not directed - which implies a visual response without an object to focus upon, and
- (c) Self stimulation - when the child is providing self amusement by displaying a repetitive behaviour which interferes with his active relationship with the environment.

1.4.2 Active Awareness

This category refers to a motion on the child's part to participate in some way with his environment and includes:

- (a) Other person - the child is establishing contact with other person.
- (b) A toy - the child is establishing contact with an object.
- (c) Actively attending - the child is occupied attending to an activity or to another interaction which is occurring in his near environment.

- (d) Orienting - the child is trying to locate a noise, visual stimuli or activity that is not quite close to his near environment.

Figure 5 shows the Histogram in percentage of "Passive Awareness' in the comparison of the four groups. Table 12 shows the actual percentage represented in Figure 5.

Figure 5

Histogram in % of passive awareness in the comparison of the groups

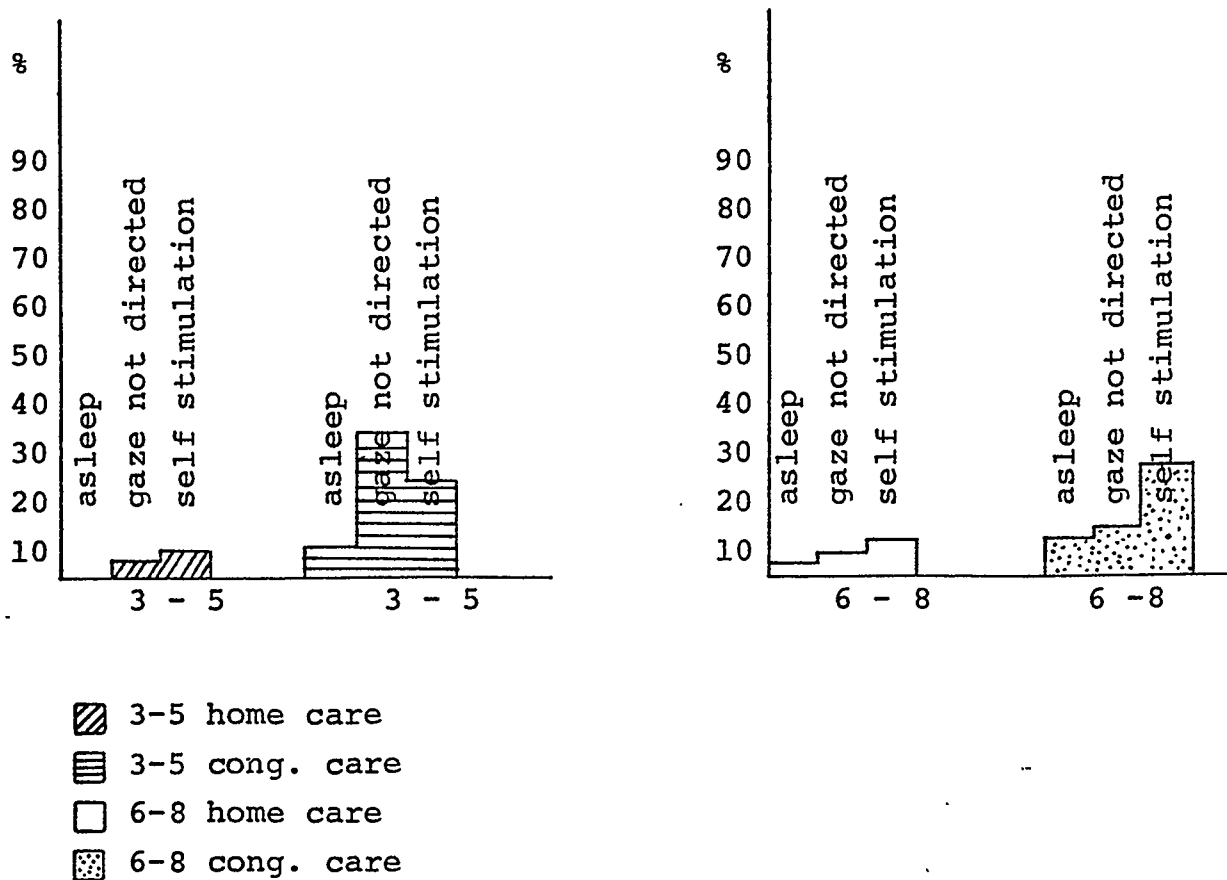


Table 12

Percentages represented in Figure 5
in the comparison of the groups in
passive awareness

Passive Awareness	Home	Cong. Care	Home	Cong. Care
Asleep	0 (0)	6.6 (11)	2.0 (4)	5.8 (10)
Gaze not directed	3.3 (7)	32.5 (58)	3.3 (6)	9.3 (16)
Self stimulation	4.5 (9)	23.8 (43)	5.0 (14)	26.1 (44)
CUMULATIVE % (N)	7.8 (16)	62.9 (113)	10.3 (14)	41.2 (70)

The results show a higher passive awareness in the congregate care groups (104.1) in comparison with the home care groups (21.0%). An important finding is the great amount of self stimulating behaviour in the congregate care groups (3-5, 23.8%; 6-8, 26.1%) in comparison with the home care groups (3-5, 4.5%; 6-8, 5.0%).

Active awareness was determined by the child's responsiveness to his environment. It involved: attention to other persons; (b) attention to an object or toy; (c) actively attending; (d) orienting.

Figure 6 shows the histogram in percentage of active awareness in the comparison of the groups. Table 13 shows the actual percentage represented in Figure 6.

Figure 6

Histogram in percentage of active awareness in the comparison of the groups

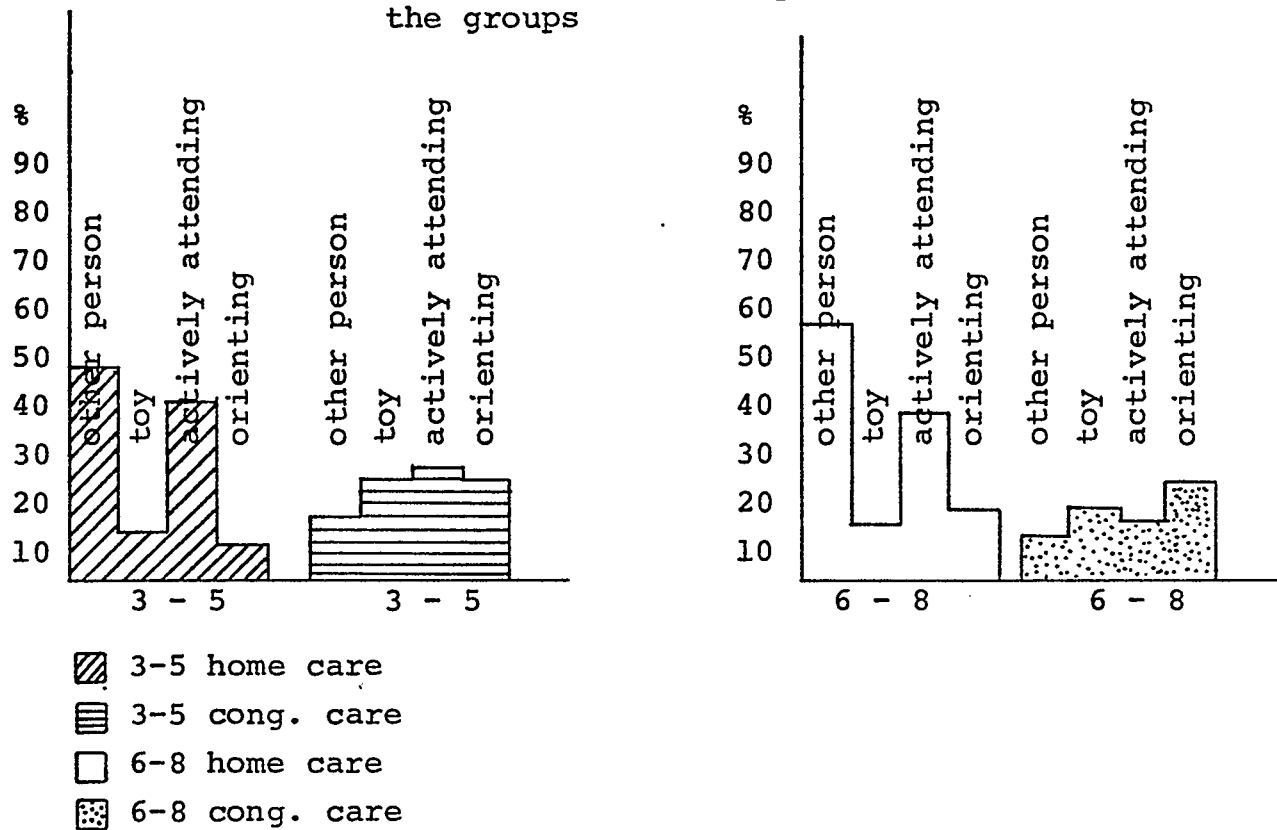


Table 13

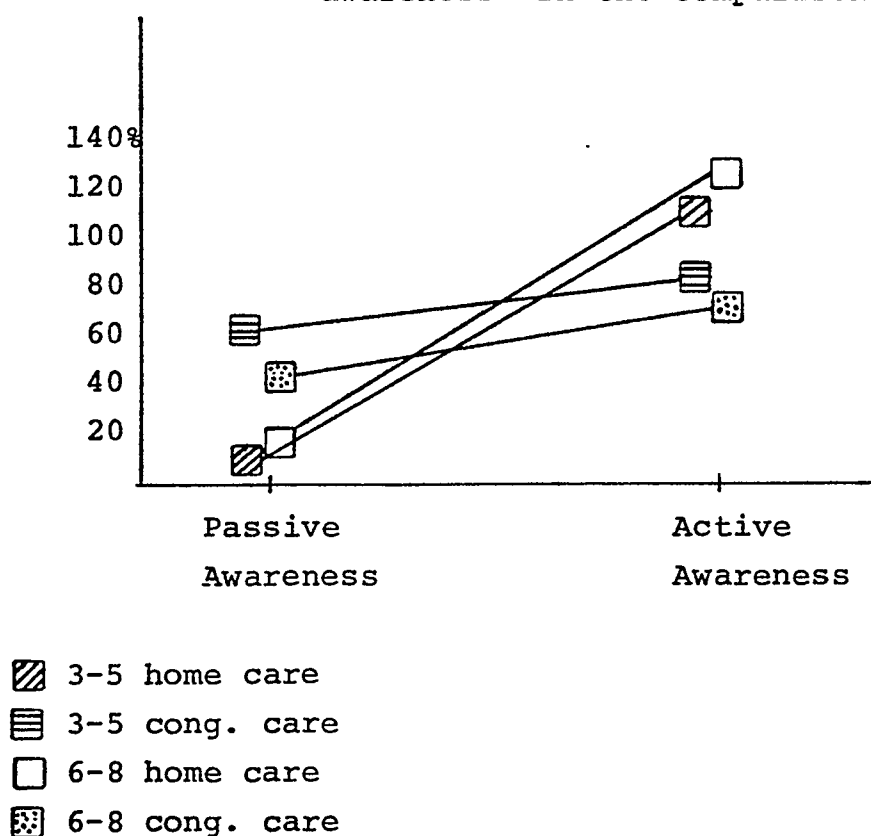
Percentages represented in Figure 6 in the comparison of the four groups in active awareness

ACTIVE AWARENESS	3 - 5		6 - 8	
	Home	Cong. Care	Home	Cong. Care
Other person	47.9 (91)	17.1 (30)	55.0 (127)	12.7 (21)
Toy	12.0 (24)	22.0 (37)	15.8 (36)	19.7 (37)
Actively attend.	40.0 (81)	23.2 (38)	37.5 (87)	16.2 (27)
Orienting	10.4 (20)	22.0 (37)	16.6 (38)	22.2 (38)
CUMULATIVE % (N)	110.3 (204)	84.3 (181)	124.9 (232)	70.8 (172)

In all four groups, active awareness is higher than passive awareness. In the comparison between home care and congregate care groups, the results show more active awareness directed to "other persons" in the home care groups and more to "objects" (e.g. toys) in the congregate care groups. Figure 7 shows the relationship between active and passive awareness in the comparison of the two groups.

Figure 7

Relationship between active and passive awareness in the comparison of the groups



1.5 Child Activity

Child activity refers to the type of activity in which the child engages in his free time. The categories include:

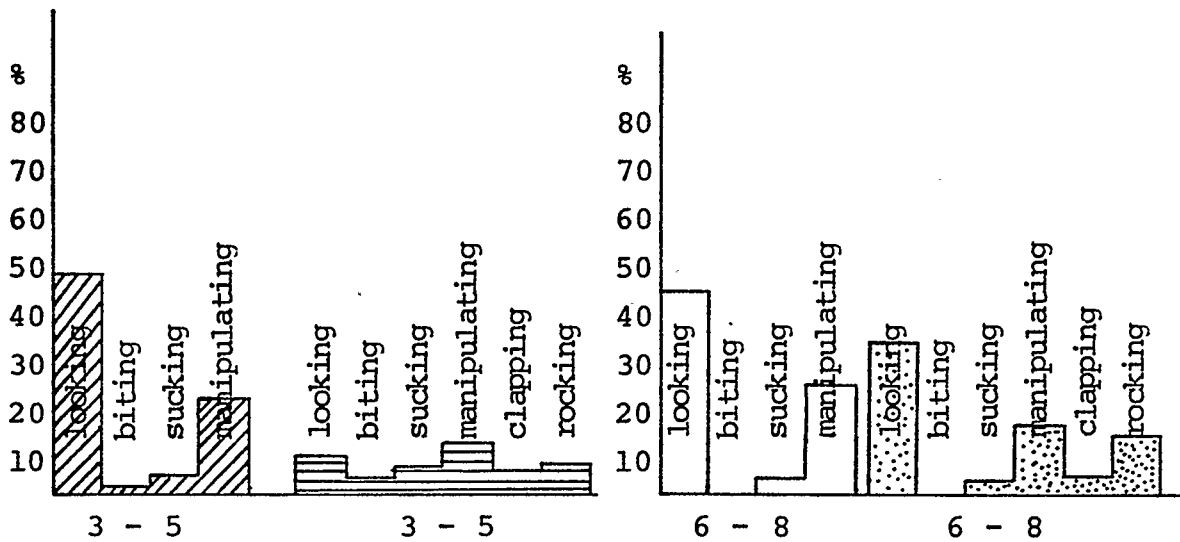
- (a) Response observed: - looking, banging, biting hitting, sucking, manipulating, clapping and rocking.
- (b) Stimuli seeking: - the type of stimulation the child is seeking with his behaviour: vestibular, visual, tactile or auditory.
- (c) Goal directed behaviours: - smiling (produce or exhibit a smile), crying (showing distress).
- (d) Random movements: - no goal directed behaviour.
- (e) No movement: - the child is quiet.
- (f) Communciation: - the child is vocalizing, pointing, using symbols or sign language.
- (g) Noises: - screaming, a repetitive and unintentional noise, etc.

1.5.1 Response observed

Figure 8 shows the percentage of response observed in the comparison of the groups. Table 14 shows the actual percentage represented in Figure 8.

Figure 8

Histogram in % of responses observed
in the comparison of the groups

Table 14

Percentages represented in Figure 8
in the comparison of the groups in
response observed

RESPONSE OBSERVED	3 - 5		6 - 8	
	Home	Cong. Care	Home	Cong. Care
Looking	49.1 (100)	10.9 (37)	46.9 (110)	33.7 (58)
Biting	0.8 (1)	4.9 (5)	-- (0)	-- (0)
Sucking	4.1 (8)	7.1 (12)	4.1 (10)	2.9 (5)
Manipulating	22.9 (47)	13.2 (24)	26.8 (63)	19.8 (34)
Clapping	-- (0)	5.5 (9)	-- (0)	6.3 (10)
Rocking	-- (0)	8.2 (14)	-- (0)	15.1 (26)
TOTAL % (N)	76.9 (156)	59.8 (108)	77.8 (103)	77.8 (133)

The most frequent activities observed in all the groups were "looking" and manipulating". These activities were used more frequently by the home care groups (looking: 3-5, 59.1%; 6-8, 46.9%; manipulating: 3-5, 22.9%; 6-8, 26.8%) compared with the congregate care groups (looking: 3-5, 20.9%; 6-8, 33.7%; manipulating: 3-5, 13.2%; 6-8, 19.8%).

An important difference between home care and congregate care groups is the percentage of clapping and rocking activities in the congregate care groups (clapping: 305, 5.5%; 6-8, 6.3%; rocking: 3-5, 8.2%; 6-8, 15.1%).

These activities were observed predominantly in self stimulating behaviours; children stimulated more than one sense, using them in combination. Clapping and rocking together covered auditory, vestibular, tactile and visual senses.

Children at home showed less self stimulating behaviours and they generally used activities such as sucking and manipulating which are activities that are normally used to explore and learn about the environment.

1.5.1 Goal Directed Behaviours

Goal directed behaviours refer to the child's activities in relation to pleasant (smiling) and unpleasant response (crying), physical activities (movements versus no activities, no movements) and the verbal approach the child tries to establish with

his environment (noises, communication). Figure 9 shows the histogram in percentages of goal directed behaviours in the comparison of the groups. Table 15 shows the actual percentage of goal directed behaviours.

Figure 9

Histogram in % of goal directed behaviours in the comparison of the groups.

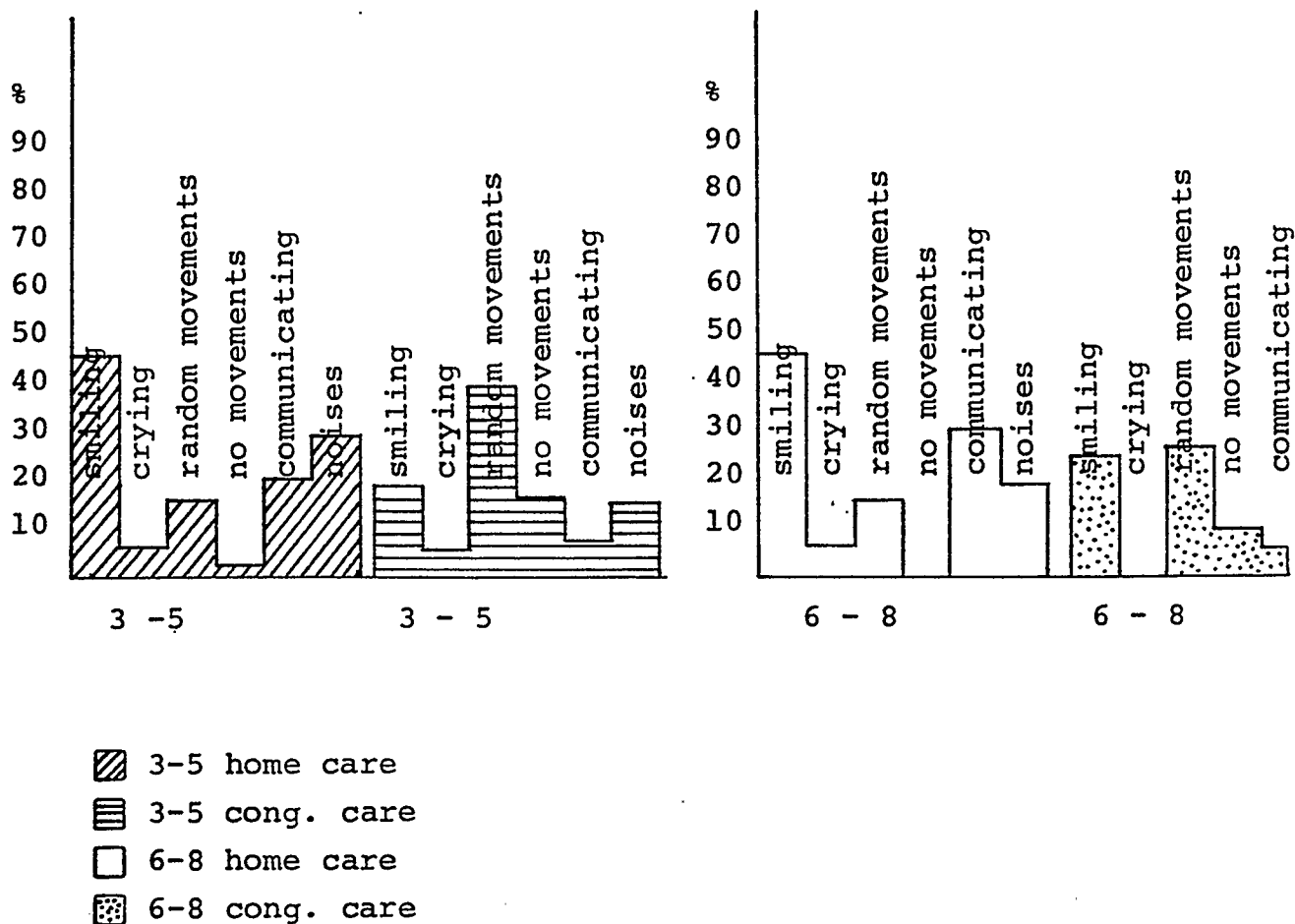


Table 15

Percentages represented in Figure 9
in the comparison of the groups in
goal directed behaviour

GOAL DIRECTED	3 - 5		6 - 8	
BEHAVIOUR	Home	Cong. Care	Home	Cong. Care
Smiling	45.0 (91)	17.6 (31)	43.7 (101)	22.0 (37)
Crying	5.41 (11)	4.9 (8)	5.4 (12)	0.0 (0)
Random movements	14.1 (28)	37.5 (67)	12. (27)	23.8 (40)
No movements	1.25 (3)	14.3 (25)	-- (0)	7.5 (12)
Communicating	18.75 (37)	5.5 (9)	28.75 (66)	4.6 (79)
Noises	27.5 (56)	11.0 (19)	16.25 (37)	19.1 (32)

The most frequent responses observed for the home care groups were: smiling, 3-5, 45.0%; 6-8, 43.7%; communicating: 3-5, 18.7%; 6-8, 28.7%; and noises, 3-5, 37.5%; 6-8, 23.8%, and noises, 3-5, 11.0%, 6-8, 19.1% were observed more frequently.

An important observation was the lack of crying response for the older congregate care groups. Crying as an attention seeking behaviour does not appear to be as effective in a congregate care setting. Instead, making noises is more frequently observed in the congregate care groups as a means of soliciting attention from the staff.

1.6 Level of assistance

Level of assistance refers to the amount of assistance the child received from the caregiver or family when engaging in some activities. Figure 10 shows the histogram in percentages of level of assistance in the comparison of the groups. Table 16 shows the actual percentage represented in Figure 10.

Figure 10

Histogram in % of level of assistance
in the comparison of the groups

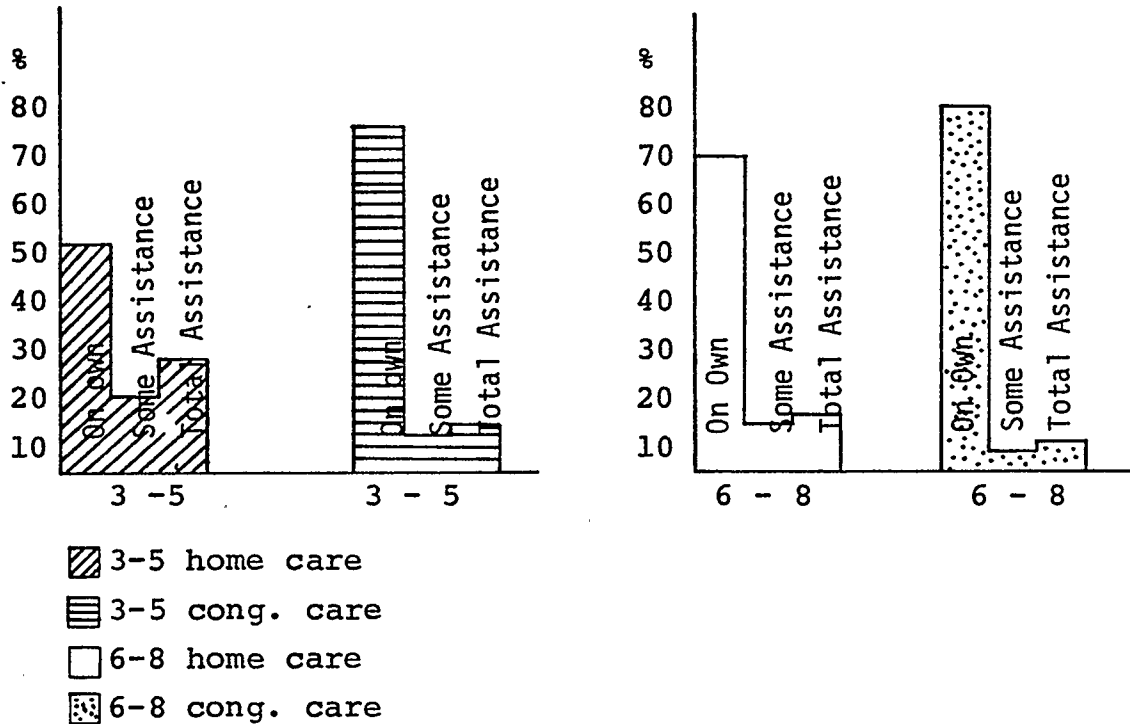


Table 16

Percentages represented in Figure 10
in level of assistance in the
comparison of the groups

LEVEL OF ASSISTANCE	3 - 5		6 - 8	
	Home	Cong. Care	Home	Cong. Care
On own	50.4 (102)	76.2 (137)	70.0 (162)	80.2 (137)
Some Assistance	20.0 (40)	11.0 (19)	12.9 (30)	9.0 (16)
Total Assistance	29.5 (60)	12.7 (22)	15.0 (34)	10.7 (18)
CUMULATIVE % (N)	100 (204)	100 (181)	100 (232)	100 (172)

In all four groups the children spend the majority of their time on their own - more so in congregate care than in home care settings. The younger groups tend to receive more assistance than the older groups and the home care groups receive more assistance in comparison with the congregate care groups.

The caregiver involvement is observed more often in the home care children compared with the congregate care children.

1.7 Summary

The observation of these children in their natural settings has outlined important differences in their relationship with the physical and social environment.

- (1) Children reared at home are exposed to a more complex and a richer environment compared with children reared in congregate care.
- (2) Children reared at home have developed a more positive relationship with their caregivers which involves more social contact, a greater responsiveness and more appropriate behaviours in their contact with the environment.
- (3) Children in congregate care tend to be more passive in their contact with the environment and they also tend to develop inappropriate behaviours such as self stimulating behaviours in their relationship with the environment.
- (4) In all four groups, the level of assistance received for the children to interact with their environment is minimal.

2. DEVELOPMENTAL DIFFERENCES

2.1 Cognitive Development

Are there any differences in the cognitive development of children reared at home and children reared in congregate care?

Cognitive development was assessed by the Bayley Developmental Scale. The comparison of the four groups in cognitive development shows a significant difference between the groups. Figure 11 shows means, standard deviations and ranges of the raw scores on the Bayley Mental Scale. Table 17 shows the analysis of variance in the comparison of the four groups and Table 18 shows the contrast of environment and age.

Figure 11

Means, standard deviations and ranges of the raw scores on the Bayley Mental Scale

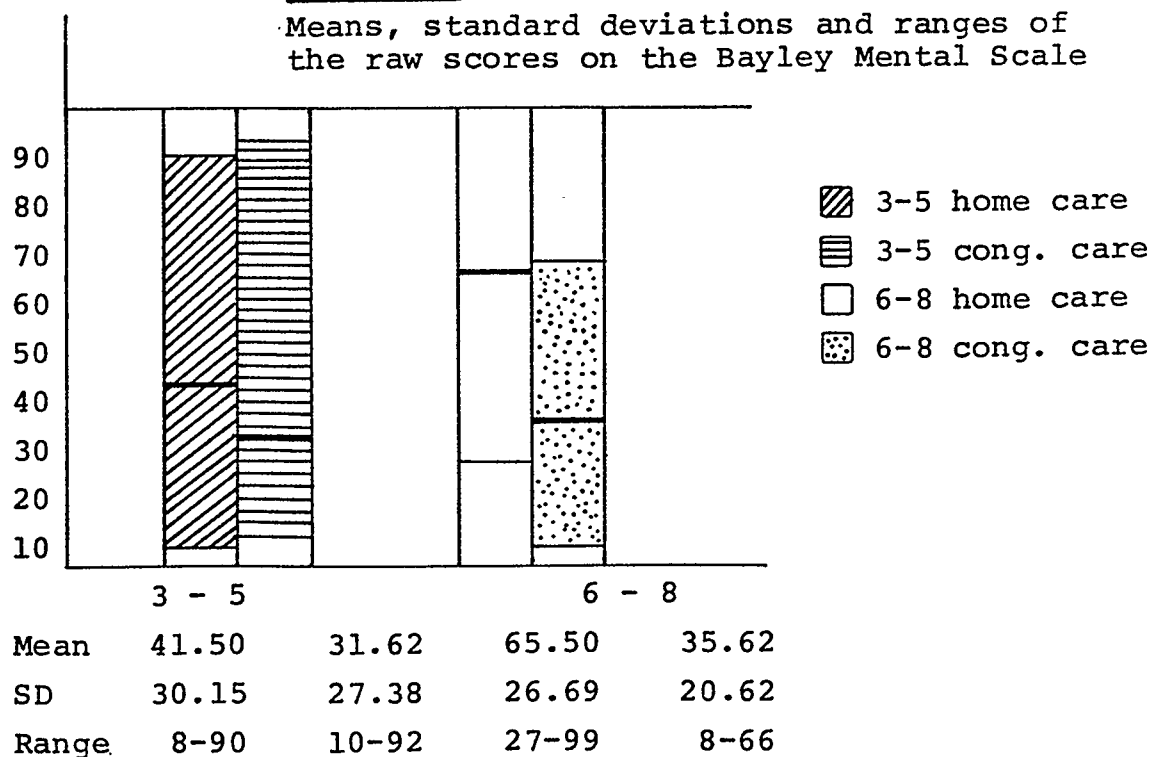


Table 17

Analysis of variance for the
comparison of the four groups
in cognitive development

Source	D.F.	Sum of Squares	Mean Squares	F.Ratio	F.Prob.
Between Groups	3	5528.1250	1842.7083	2.634	0.0694*
Within Groups	28	19587.7500	699.5625		

Table 18

Analysis of variance in the contrast
of environment (contrast 1) and
age (contrast 2) in cognitive development

Pooled Variance Estimate

	Value	S. Error	T. Value	D.F.	T. Prob
Contrast 1	39.7500	18.7024	2.125	28.0	0.043
Contrast 2	-28.0000	18.7024	-1.497	28.0	0.146

Separate Variance Estimate

	S. Error	T. Value	D.F.	T. Prob
Contrast 1	18.7024	2.125	26.4	0.043*
Contrast 2	18.7024	-1.497	26.4	0.146

The overall group differences were significant at $p < .069$ with the significance determined mainly by the home care group ($p < .04$). The results show higher cognitive development for the home care groups ($\bar{X}_1 = 41.50\%$; $\bar{X}_3 = 65.50\%$) compared with the congregate care groups ($\bar{X}_2 = 31.62\%$; $\bar{X}_4 = 35.62\%$).

2.2 Language Development

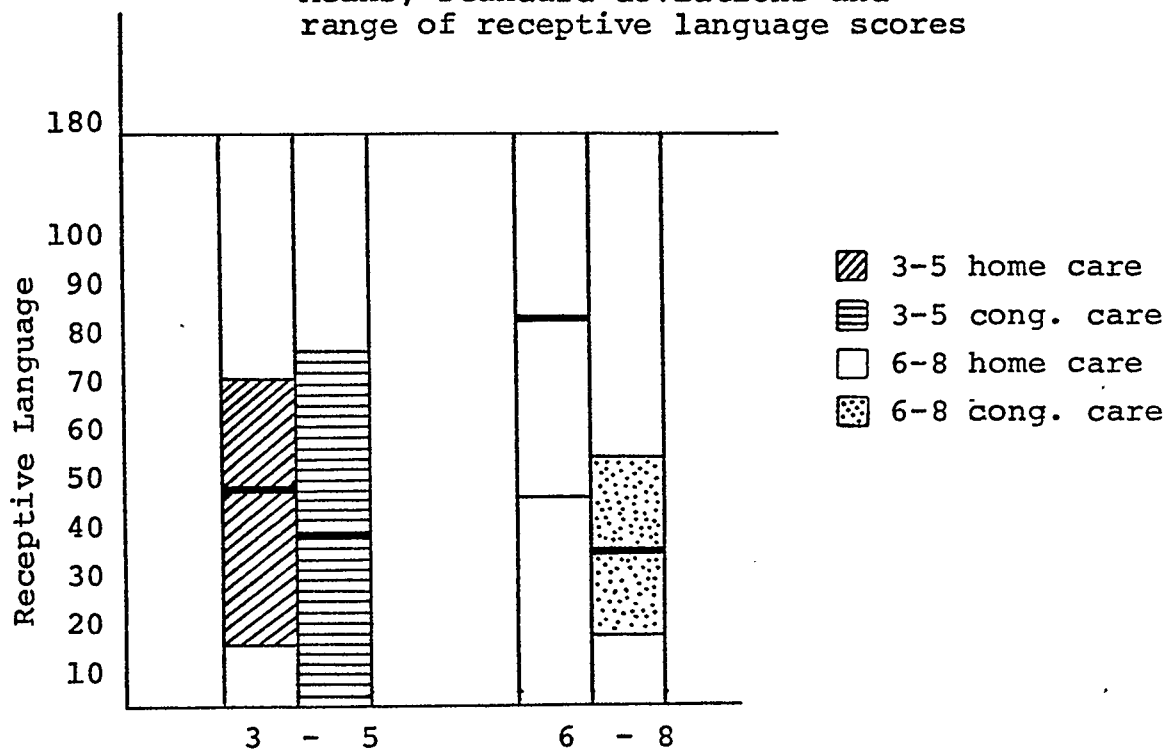
Are there any differences in Receptive and Expressive language between the children at home and those in congregate care?

Language was assessed by the Vulpé scale using the two major dimensions - receptive and expressive language. The assessment in receptive language included areas such as: response to sounds, listening when spoken to, discrimination of adults' voices, location of speaker when spoken to, anticipation of feeding, source location for a variety of sounds, etc. Expressive language includes items such as: vocalizing other than crying, differential crying, vowels and back of throat consonants, vocal response to sound, speech or smile, vocal expression of pleasure etc.

Both expressive and receptive language were highly significant in the comparison of the four groups. Figure 12 shows means, standard deviations and ranges of the receptive language scores. Table 19 shows the analysis of variance in the comparison of the four groups. Table 20 shows the analysis of variance in the contrast of environment (home vs. congregate care) and age (3-5 vs. 6-8) in receptive language scores.

Figure 12

Means, standard deviations and
range of receptive language scores



Mean	48.3	38.0	82.1	34.6
SD	22.5	24.6	42.7	12.8
Range	14-69	1-75	45-172	15-52

Table 19

Analysis of variance for the
comparison of the groups in
receptive language

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	11300.8438	3766.9479	4.839	0.0077*
Within Groups	28	21794.6250	778.3795		
Total	31	33095.4688			

Table 20

Analysis of variance for the contrast
of environment (contrast 1) and age
(contrast 2) for receptive language

Pooled Variance Estimate

	Value	S. Error	T Value	D.F.	T Prob.
Contrast 1	57.8750	19.7279	2.934	28.0	0.007
Contrast 2	-30.3750	19.7279	-1.540	28.0	0.135

Separate Variance Estimate

	S. Error	T Value	D.F.	T Prob.
Contrast 1	19.7279	2.934	16.9	0.009*
Contrast 2	19.7279	-1.540	16.9	0.142

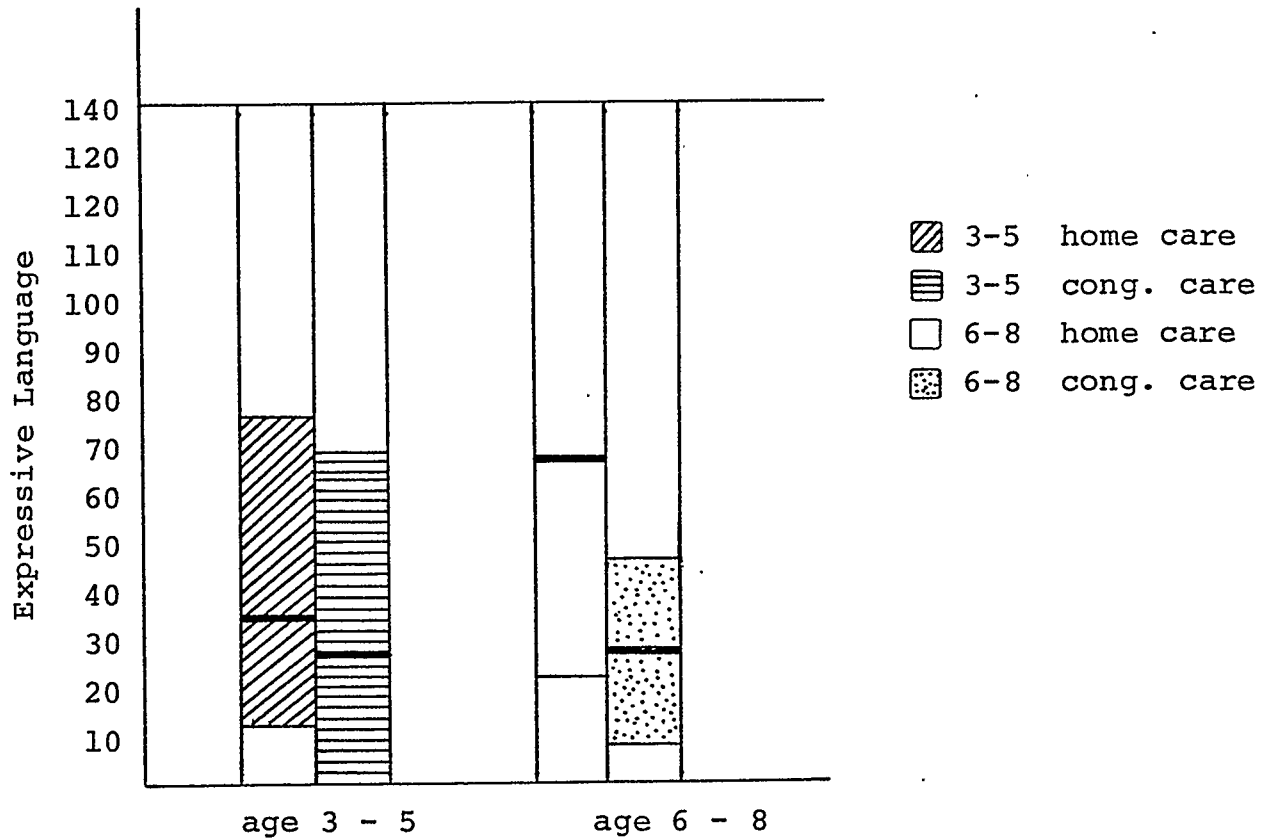
The overall group effect in receptive language was significant at $p < .007$. In the comparison of the 3-5 year old group, the difference in means is not significant ($\bar{X}_1 = 48.3$; $\bar{X}_2 = 38.0$). In the comparison of the 6-8 year old group, the difference is highly significant ($p < .017$), suggesting an increased receptive language development for the home care older group ($\bar{X}_3 = 82.1$; $SD = 42.7$) compared with the congregate care older group ($\bar{X}_4 = 34.6$; $SD = 12.8$)

In terms of developmental age, the differences between the groups are about 3-4 months; the mean of the older home care group ($\bar{X}_3 = 82.1$) corresponds to 7-8 months in language development and the mean of the older congregate care group ($\bar{X}_4 = 34.6$) corresponds to 304 months in language development. In the contrast of environment (home vs. congregate care), the difference between groups is highly significant ($p < .009$), suggesting greater receptive language development for the home care group ($\bar{X}_1 = 48.3$, $\bar{X}_3 = 82.1$) compared to the congregate care group ($\bar{X}_2 = 38.0$; $\bar{X}_4 = 34.6$). The contrast of age (3-5 vs. 6-8) was not significant for receptive language development.

Expressive language development was also significant in the comparison of the four groups. Figure 13 shows means, standard deviations and ranges of expressive language scores. Table 21 shows the analysis of variance in the comparison of the four groups in expressive language. Table 22 shows the analysis of variance in contrasts of environment (home vs. congregate care) and age (3-5 Vs. 6-8) in expressive language.

Figure 13

Means, standard deviations and ranges
of expressive language scores



Mean	35.5	27.5	67.2	27.8
SD	23.8	24.5	38.3	12.3
Range	11-76	0-69	21-140	8-45

Table 21

Analysis of variance for the
comparison of the groups in
expressive language

Source	D.F.	Sum of Squares	Mean Squares	E. Ratio	F. Prob.
Between Groups	3	8521.5938	2840.5313	4.008	0.0171*
Within Groups	28	19833.3750	708.7277		

Table 22

Analysis of variance for the contrast of environment (contrast 1) and age (contrast 2) in expressive language

Pooled Variance Estimate

	Value	S. Error	T Value	D.F.	T Prob.
Contrast 1	47.3750	18.8246	2.517	28.0	0.018
Contrast 2	-32.1250	18.8246	-1.707	28.0	0.099

Separate Variance Estimate

	S. Error	T Value	D.F.	T Prob.
Contrast 1	18.8246	2.587	18.8	0.021*
Contrast 2	18.8246	-1.707	18.8	0.194

In the comparison of the four groups in expressive language, the significance was $p < .017$. In the comparison of the 3-5 years old group ($\bar{X}_1 = 35.5$; $\bar{X}_2 = 27.5$), the difference in means is not significant. In the comparison of the older group, the difference is highly significant ($p < .026$). This suggests greater expressive language development for the older home care group ($\bar{X}_3 = 67.2$ SD = 38.8) compared to the older congregate care group ($\bar{X}_4 = 27.8$ SD = 12.3). In terms of developmental age, the difference between the groups is about 4-5 months. The mean of the older home care group ($\bar{X}_3 = 67.2$) corresponds to 6-7 months in language development and the mean of the older congregate care group ($\bar{X}_4 = 27.8$) corresponds to 2-3 months in language development. In the contrast of environment (contrast 1) the difference between groups is highly significant ($p < .021$). This suggests greater expressive language

development for the home care group ($\bar{X}_1 = 35.5$, $\bar{X}_3 = 67.2$) compared to the congregate care group ($\bar{X}_2 = 27.5$, $\bar{X}_4 = 27.8$). The contrast of age was not significant for expressive language but it is important to mention that the level of significance was close to ($p < .10$).

2.3 Social development.

Are there any differences in social development between the children reared at home and in congregate care?

Social development was assessed by the Cohen and Gross Social Development Scale. The scale is organized into different components of social development:

- (1) Indiscriminate social responses which include smiling, crying and vocalizing.
- (2) Differential social responses which include response to face, contact seeking, reaction to strangers and response to separation.
- (3) Active seeking proximity which includes differentiation of self from others, and
- (4) Goal directed partnership which includes isolated play, cooperative play and awareness of emotions.

The comparison of the four groups uses a non parametric analysis of variance (Kruskal-Wallis one way ANOVA) since the results were not normally distributed.

The results indicated significant differences only for the older group (6-8 years old) in the areas of:

- (1) Indiscriminate social responses (smiling)
- (2) Differential social responses (contact seeking, response to separation)
- (3) Active seeking proximity (differentiation of self from others)
- (4) Goal directed partnership (isolated play).

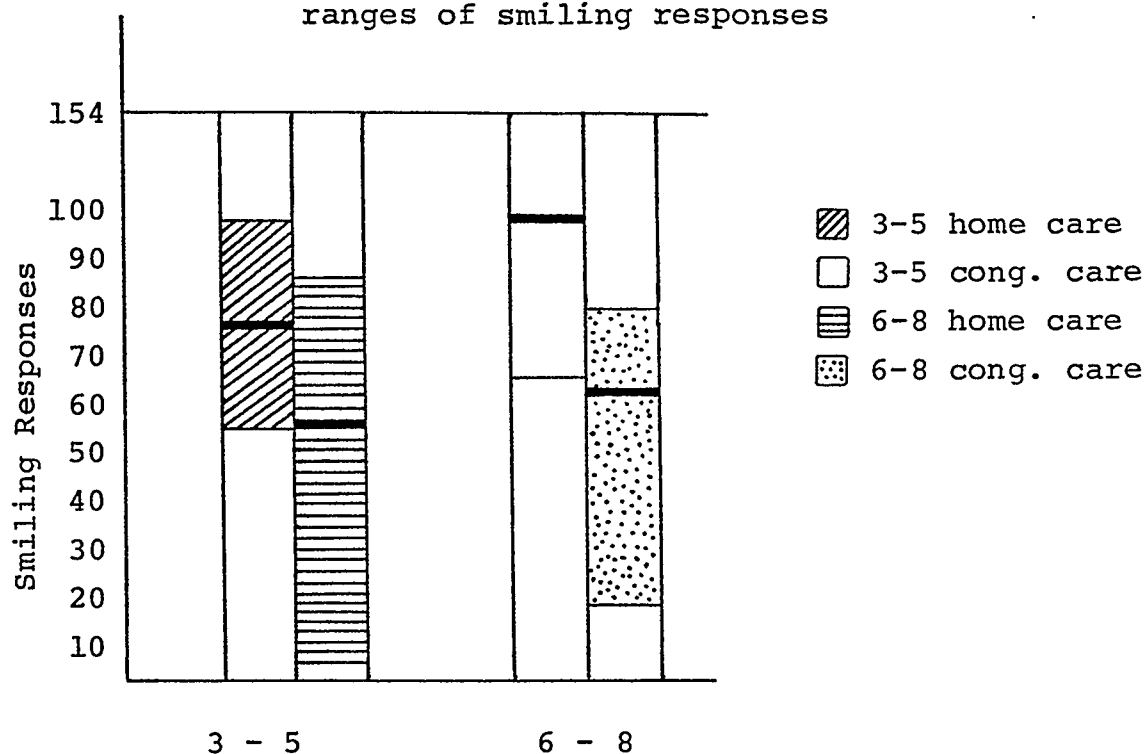
The rest of the components in the social development responses were not significant either in the comparison of the four groups or in the contrasts of environment and age.

1.1 Smiling

Smiling was significant at $p < .007$ in the comparison of the older group (6-8 years old) in a non-parametric ANOVA (Chi square value of 7.172 and 7.182 corrected for ties). Figure 14 shows means, standard deviations and ranges of smiling responses in social development.

Figure 14

Means, standard deviations and
ranges of smiling responses



Mean	76.75	50.50	97.75	61.50
SD	14.44	31.81	27.33	18.56
Range	54-96	3-85	64-154	19-78

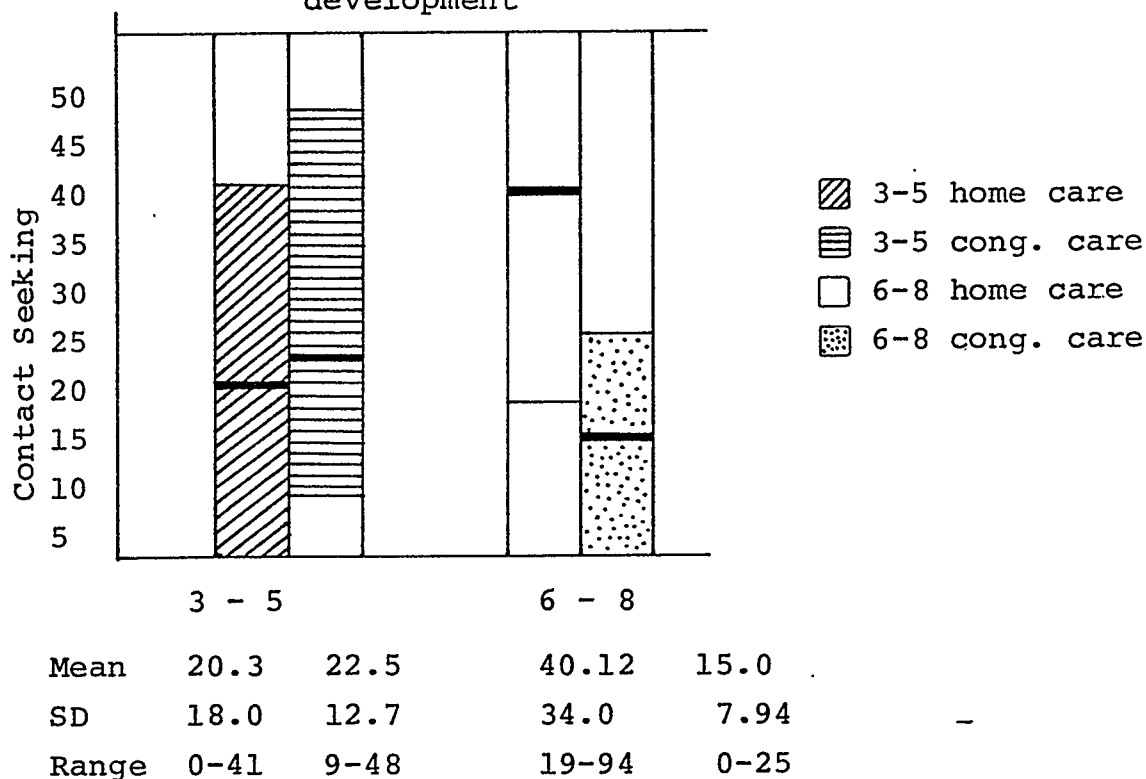
This suggests more smiling responses for the home care older group ($\bar{X}_3 = 97.75$ SD 27.33) compared to the congregate care older group ($\bar{X}_4 = 61.50$ SD 18.56). In the contrast of environments, the significance level was $p < .001$. The results showed more smiling responses for the home care groups ($\bar{X}_1 = 76.75$, $\bar{X}_3 = 97.75$) compared to the congregate care groups ($\bar{X}_2 = 50.50$, $\bar{X}_4 = 61.50$).

2.1 Contact seeking

Contact seeking was significant at $p < .007$ in the comparison of the older groups (6-8 years old) in a non-parametric ANOVA (Chi square value 7.172 and 7.225 corrected for ties). The results suggest greater contact seeking responses for the older home care group ($\bar{X}_3 = 40.12$, SD 34.0) compared to the older congregate care group ($\bar{X}_4 = 15.0$ SD = 7.94). Figure 15 shows means, standard deviations and ranges of contact seeking responses.

Figure 15

Means, standard deviations and ranges of contact seeking responses in social development

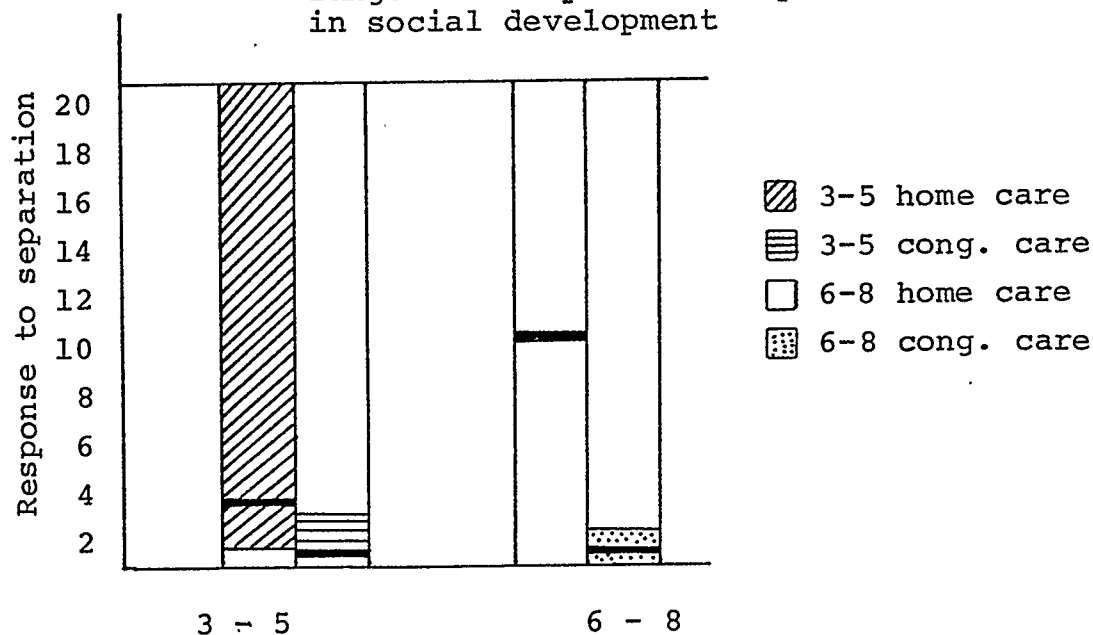


2.2 Response to separation

Response to separation was significant at $p < .021$ for the older group (6-8 years old) in a non-parametric ANOVA (Chi square value 4.864 and 5.318 corrected for ties). The results show that response to separation is more developed in the older home care group ($\bar{X}_3 = 10.37$ SD = 9.1) compared to the older congregate care group ($\bar{X}_4 = 0.50$ SD=0.75). Figure 16 shows means, standard deviations and ranges of the response to separation in social development.

Figure 16

Means, standard deviations and ranges of response to separation in social development



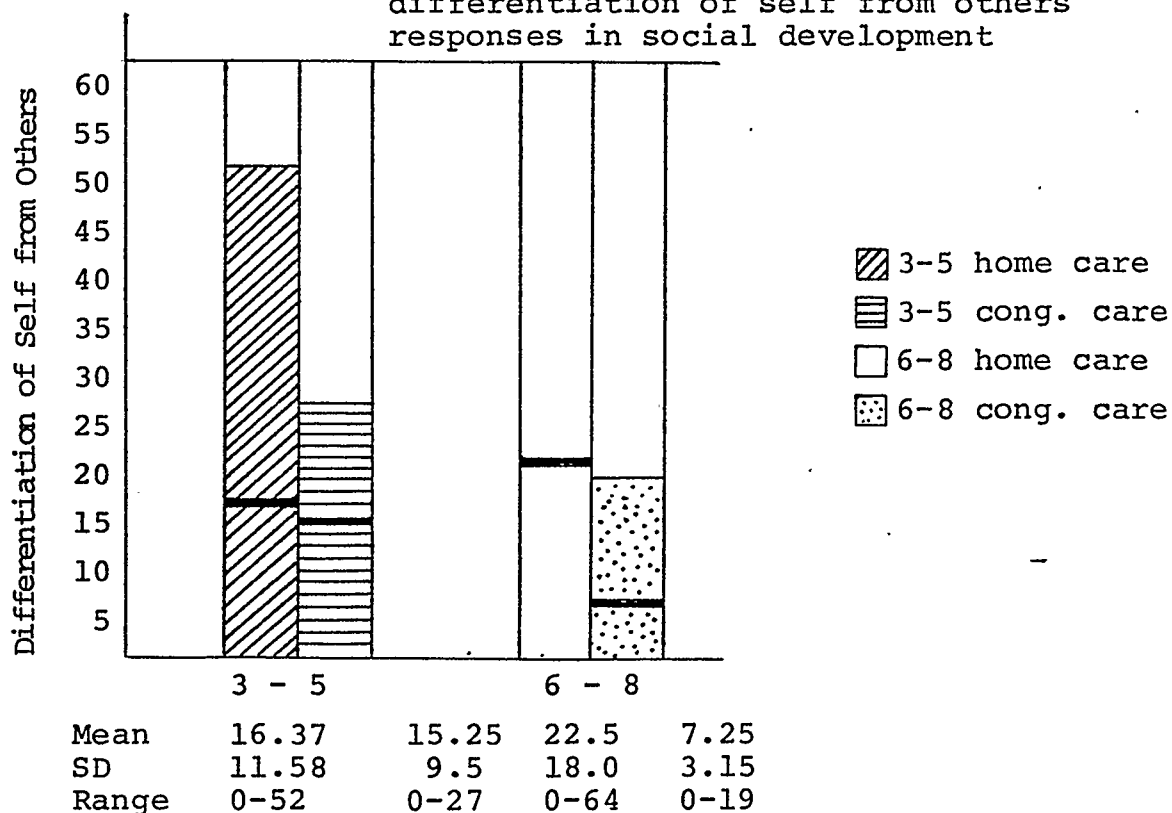
Mean	3.75	0.87	10.37	0.50
SD	6.54	1.12	9.1	0.75
Range	1-21	0-3	0-21	0-2

3.1 Differentiation of self from others

Differentiation of self from others in social development was significant in the comparison of the older group at $p = .013$ in a non-parametric ANOVA (Chi square value 5.584 and 6.134 corrected for ties). The results show differentiation of "self from other" responses are more developed in the home care older group ($\bar{X}_3 = 22.5$ SD = 18.0) compared to the congregate care older group ($\bar{X}_4 = 7.25$ SD = 3.15). In the contrast of environment there was a difference at $p = .025$ supporting greater differentiation of self from others for the home care group ($\bar{X}_1 = 16.37$ $\bar{X}_3 = 22.5$) in comparison with the congregate care group ($\bar{X}_2 = 15.25$ $\bar{X}_4 = 7.25$). Figure 17 shows means, standard deviations and ranges of differentiation of self from others.

Figure 17

Means, standard deviations and ranges in differentiation of self from others responses in social development

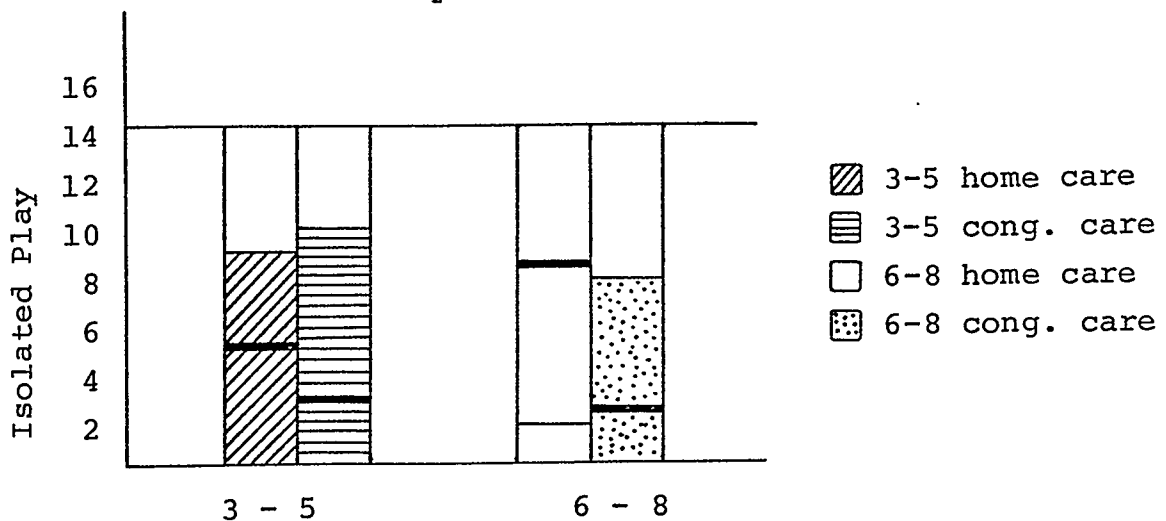


4.1 Isolated play

Isolated play was significant at $p < .049$ in the comparison of the older group in a non-parametric ANOVA (Chi square value 3.775 and 3.866 corrected for ties). The results show more isolated play behaviour for the home care older group ($\bar{X}_3 = 8.25$ SD = 5.20) compared to the congregate care older group ($\bar{X}_4 = 2.87$ SD = 2.41). In the contrast of environments there was a difference at $p < .071$. This indicates more isolated play behaviour for the home care group ($\bar{X}_1 = 5.12$, $\bar{X}_3 = 8.25$) compared to the congregate care group ($\bar{X}_2 = 3.37$, $\bar{X}_4 = 2.87$). Figure 18 shows means, standard deviations and ranges of isolated play behaviour in social development.

Figure 18

Means, standard deviations and ranges in isolated play behaviour in social development



Mean	5.12	3.37	8.25	2.87
SD	3.22	3.80	5.20	2.41
Range	0-9	0-10	2-14	0-8

2.4 Summary

- (1) The testing of these children in cognitive, social and language development has confirmed previous research done in these areas.
- (2) Cognitive development tends to be higher in the home care group of severely and multiply handicapped children compared with similar children in congregate care.
- (3) Children reared at home exhibit a higher developmental age (three to four months) in the assessment of language development (expressive and receptive) than do those raised in congregate care settings.
- (4) Differences in social development are exhibited by the older group only. The older children reared in home care settings have more highly developed social skills than those reared in congregate care.

SECTION C

3. GENERAL FUNCTIONING

Are there any differences in the nursing care required for children at home compared with similar children in congregate care?

Are there any differences in physical development in children reared at home compared to children reared in congregate care?

Are there any differences in awareness in children reared at home compared to similar children in congregate care?

Are there any differences in self help in children at home compared to similar children in congregate care?

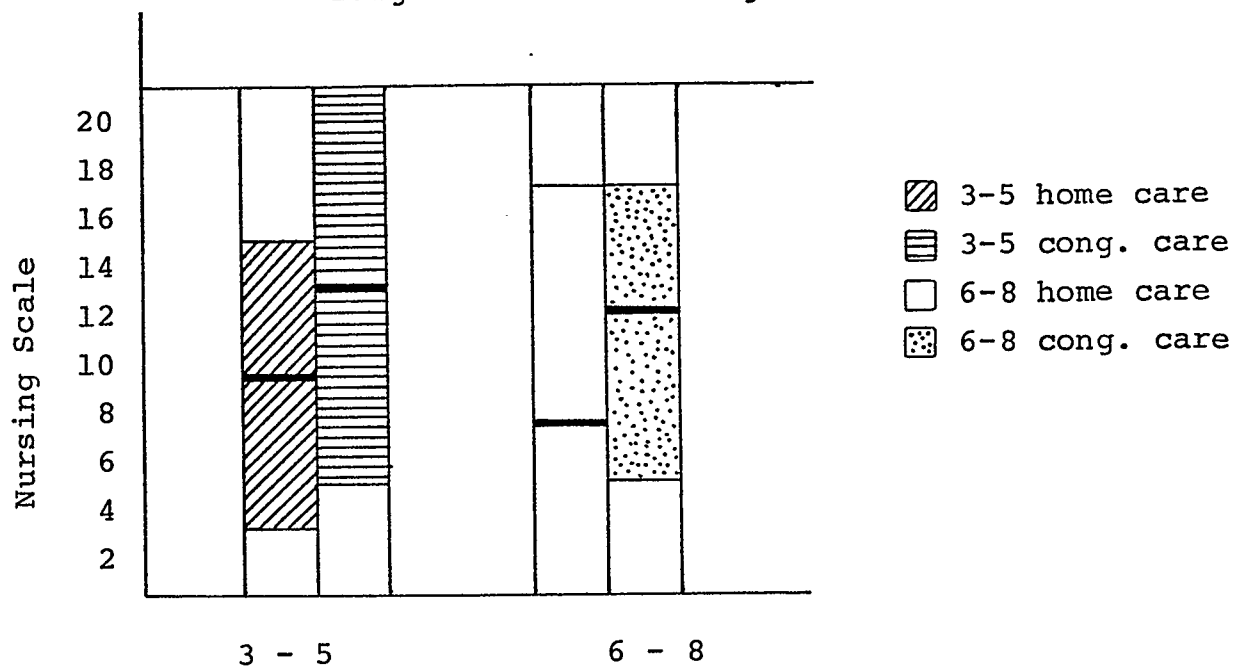
3.1 Nursing care

The A.F.D.H. Nursing Care Scale was used in the analysis of the nursing care required for these children. There were no overall group differences in total score of nursing care, body and feeding scales. The total score in nursing care became significant when the contrast of environment (home care vs. congregate care) was performed.

-

Figure 19

Means, standard deviations and
ranges for the Nursing Scales



Mean	9.5	13.25	7.5	12.0
SD	3.7	6.27	5.5	5.2
Range	3-15	5-21	0-17	5-17

Total nursing care is significant at $p < .03$ with the contrast of environment (home vs. congregational care). The results show more nursing care given to the congregational care group ($\bar{X}_2 = 13.25$, $\bar{X}_4 = 12.0$) compared with the home care group ($\bar{X}_1 = 9.5$, $\bar{X}_3 = 7.5$).

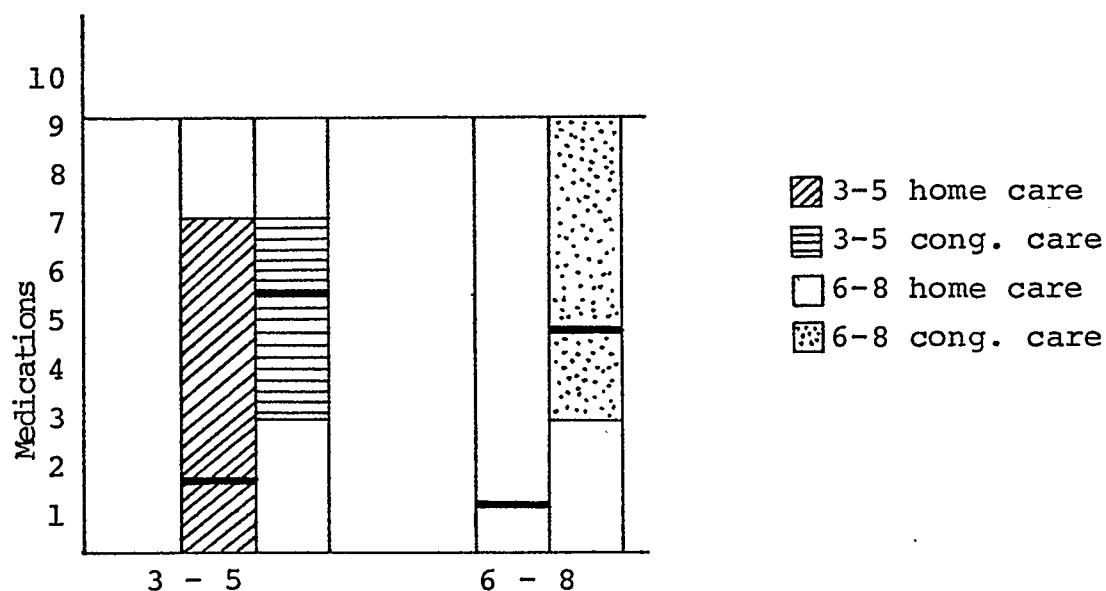
3.1.1 Medications

The medications sub-scale, including use of drugs, is significant in overall comparison of the four groups. Figure 20 shows the means, standard

deviations and ranges for the medication sub scale in the Nursing Care Scale in the comparison of the four groups. Table 23 shows the analysis of variance for the comparison of the four groups.

Figure 20

Means, standard deviations and ranges for the medications sub scale of the Nursing Scale



Mean	1.75	5.50	1.37	4.75
SD	0.88	1.69	0.96	2.37
Range	0-7	3-7	0-9	3-9

Table 23

Analysis of variance for the comparison of the four groups in the medications sub scale of Nursing Care

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob
Between Groups	3	104.3438	74.7813	13.741	0.0000*
Within Groups	28	70.8750	2.5313		
Total	31	175.2188			

Use of medication is significant at $p < .000$ in the comparison of the four groups. In the comparison of medications for the younger group (3-5 years old), the differences between home and congregate care are significant at $p < .000$, suggesting that the younger congregate care group ($\bar{X}_2 = 5.50$ SD = 1.69) uses more medication than the younger home care group ($\bar{X}_1 = 1.75$ SD = 0.88). In the comparison of the older group (6-8 years old), the differences between home and congregate care are also significant at $p < .005$, indicating greater use of medication for the older congregate care group ($\bar{X}_4 = 4.75$ SD = 2.37) compared to the older home care group ($\bar{X}_3 = 1.37$ SD = 0.96). In the contrast of environment, results indicate that medication is used more often for the congregate care group ($p < .000$) in comparison with the home care group.

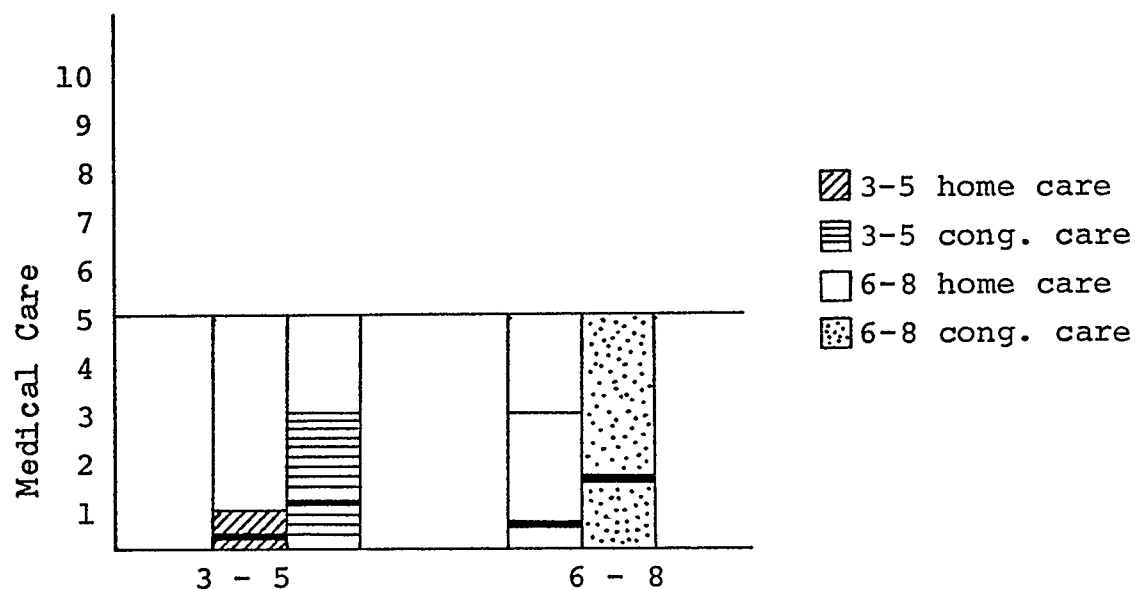
3.1.2 Medical care

The medical care sub scale involves specific care for ulcers, bed sores, colostomy, congestions, etc. Medical care is significant at $p < .099$ in the comparison of the four groups.

Figure 21 shows the means, standard deviations and ranges of the medical care sub scale of Nursing Care. Table 24 shows the analysis of variance in the comparison of the four groups.

Figure 21

Means, standard deviations and range of the Medical Care sub scale of the Nursing Care Scale



Mean	0.37	1.25	0.62	1.87
SD	0.51	1.38	1.18	1.64
Range	0-1	0-3	0-3	0-5

Table 24

Analysis of variance for the comparison of the four groups in the Medical Care sub scale of the Nursing Care Scale

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob
Between Groups	3	10.8438	3.6146	2.294	0.0997*
Within Groups	28	44.1250	1.5759		
Total	31	54.9688		-	

In the younger group (3-5 years old), more medical care is given to the congregate care group ($\bar{X}_2 = 1.25$ SD = 1.38) compared with the home care group ($\bar{X}_1 = 0.37$ SD = 0.51). In the comparison of the older group (6-8 years old), the results show more medical care for the congregate care group ($\bar{X}_4 = 1.87$ SD = 1.64) compared to the home care group ($\bar{X}_3 = 0.62$ SD = 1.18). These findings are corroborated by the environmental contrast (home vs. congregate care) which is highly significant ($p < .026$).

3.2 Physical development

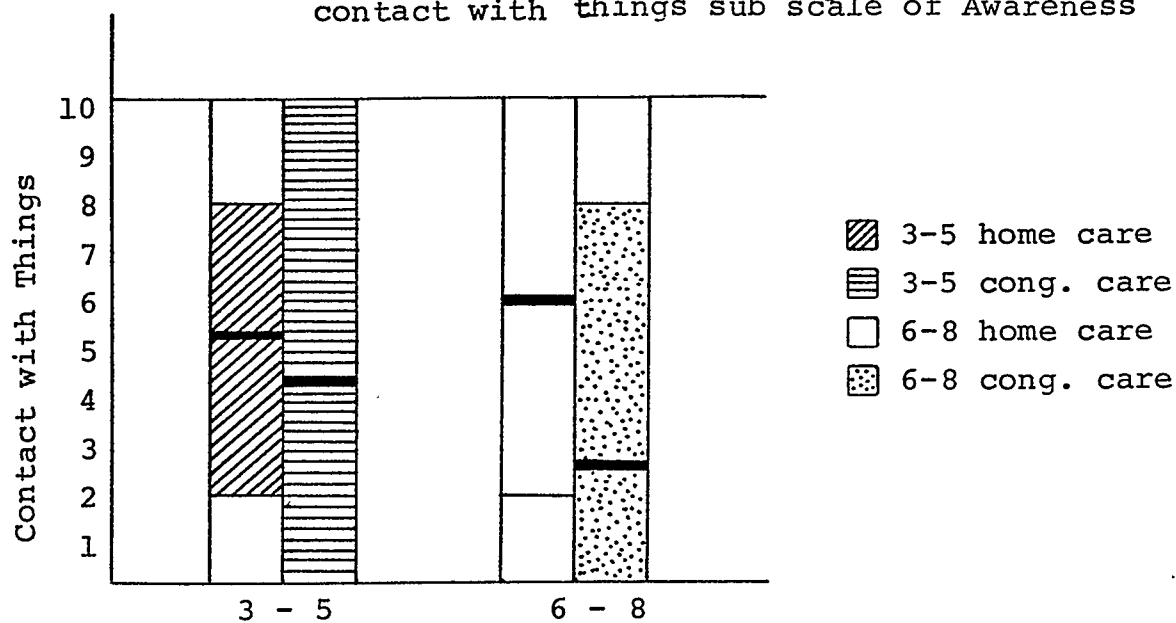
The physical development scale includes five areas: head control, legs, body, hands and movements. Physical development is not significant either in the comparison of the four groups or in the contrast of environments or age. The children selected for the study from home and congregate care are similar in terms of physical development status..

3.3 Awareness

The awareness scale in the A.F.D.H. consists of five areas: eye contact, contact with the world, contact with people, communication, and contact with things. The only significant finding was contact with things. This area includes items such as rattles or squeaks toys or furniture, tastes and feels objects, attached to specific toys/blankets, etc. Figure 22 shows the means, standard deviations and ranges of the contact with things sub scale in the Awareness Scale. Table 25 shows the analysis of variance in the comparison of the four groups.

Figure 22

Means, standard deviations and range of the contact with things sub scale of Awareness



Mean	5.12	4.25	6.00	2.87
SD	2.64	4.16	3.20	2.99
Range	2-8	0-10	2-10	0-8

Table 25

Analysis of variance for the comparison of the younger group (contrast 1) and the older group (contrast 2) in the contact with things sub scale of Awareness

Pooled Variance Estimate

	Value	S. Error	T Value	D.F.	T Prob.
Contrast 1	0.8750	1.6509	0.530	28.0	0.600
Contrast 2	3.1250	1.6509	1.893	28.0	0.069

Separate Variance Estimate

	S. Error	T Value	D.F.	T Prob.
Contrast 1	1.7443	0.502	11.8	0.625
Contrast 2	1.5519	2.014	13.9	0.064*

The overall comparison of the four groups shows no significant differences. However, there was a significant difference in the older group (6-8 years old) at $p < .064$, suggesting more contact with objects by the home care older group ($\bar{X}_3 = 6.00$ SD = 3.20) than by the congregate care older group ($\bar{X}_4 = 2.87$ SD = 2.99). In the contrast of environment (home vs. congregate care), there is a significance at $p < .099$. The results show more contact with things for the home care group ($\bar{X}_1 = 5.12$, $\bar{X}_3 = 6.00$) compared to the congregate care group ($\bar{X}_2 = 4.25$, $\bar{X}_4 = 2.87$).

3.4 Self help

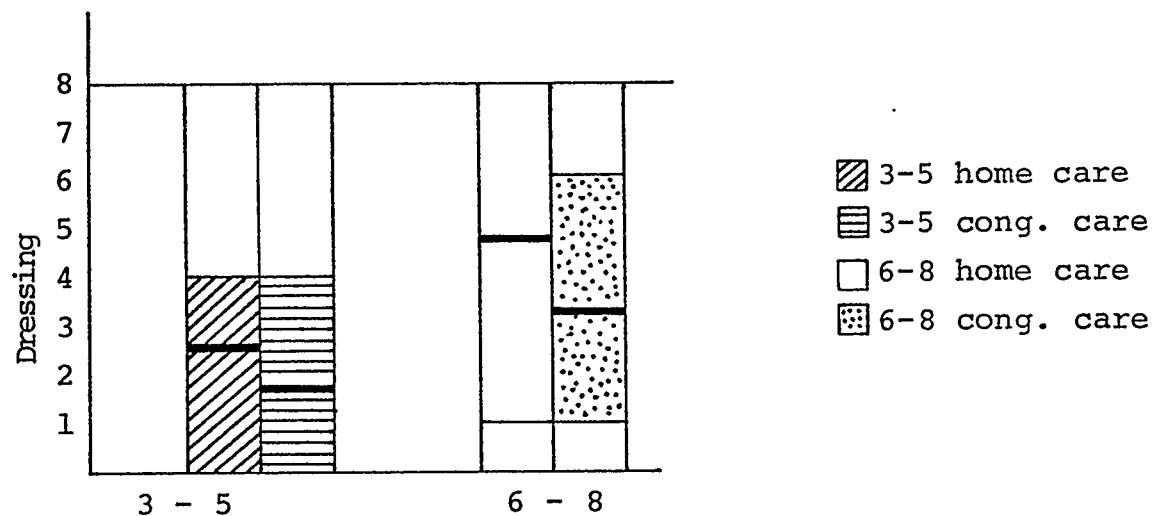
The Self Help Scale consists of five different areas: feeding, eating, washing, dressing and toileting. In the overall comparison of the four groups, only two areas showed significance: dressing and toileting. The feeding sub scale was significant only in the contrast of age (3-5 and 6-8 years old).

3.4.1 Dressing

Figure 23 shows the means, standard deviations and range of dressing in the Self Help Scale. Table 26 shows the analysis of variance in the comparison of the four groups in the dressing area in the Self Help Scale.

Figure 23

Means, standard deviations and range of the dressing sub scale of the Self Help Scale



Mean	2.62	1.75	4.87	3.12
SD	1.68	1.28	2.8	1.95
Range	0-4	0-4	1-8	1-6

Table 26

Analysis of variance for the comparison of the four groups in the dressing sub scale of the Self Help Scale

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	41.5938	13.8646	3.432	0.304*
Within Groups	28	113.1250	4.0402		
Total	31	154.7188			

There is a significant difference in dressing skills in the overall comparison of the four groups ($p < .030$). In the contrast of environment (home vs. congregate care) the difference ($p < .079$) shows more dressing skills for the home care group ($\bar{X}_1 = 2.62$, $\bar{X}_3 = 4.87$) compared to the congregate care group ($\bar{X}_2 = 1.75$, $\bar{X}_4 = 3.12$). In the contrast of age (3-5 vs. 6-8), there is also a significant difference ($p < .019$), suggesting more dressing skills for the older group ($\bar{X}_3 = 4.87$, $\bar{X}_4 = 3.12$) compared to the younger group ($\bar{X}_1 = 2.62$, $\bar{X}_2 = 1.75$). Table 27 shows the analysis of variance for the contrast of environment (contrast 1) and the contrast of age (contrast 2) in dressing skills.

Table 27

Analysis of variance for the contrast of environment (contrast 1) and the contrast of age (contrast 2) in the dressing sub scale of the Self Help Scale.

Pooled Variance Estimate

	Value	S. Error	T Value	D.F.	T. Prob
Contrast 1	2.6250	1.4213	1.347	28.0	0.075
Contrast 2	-3.6250	1.4213	-2.550	28.0	0.017

Separate Variance Estimate

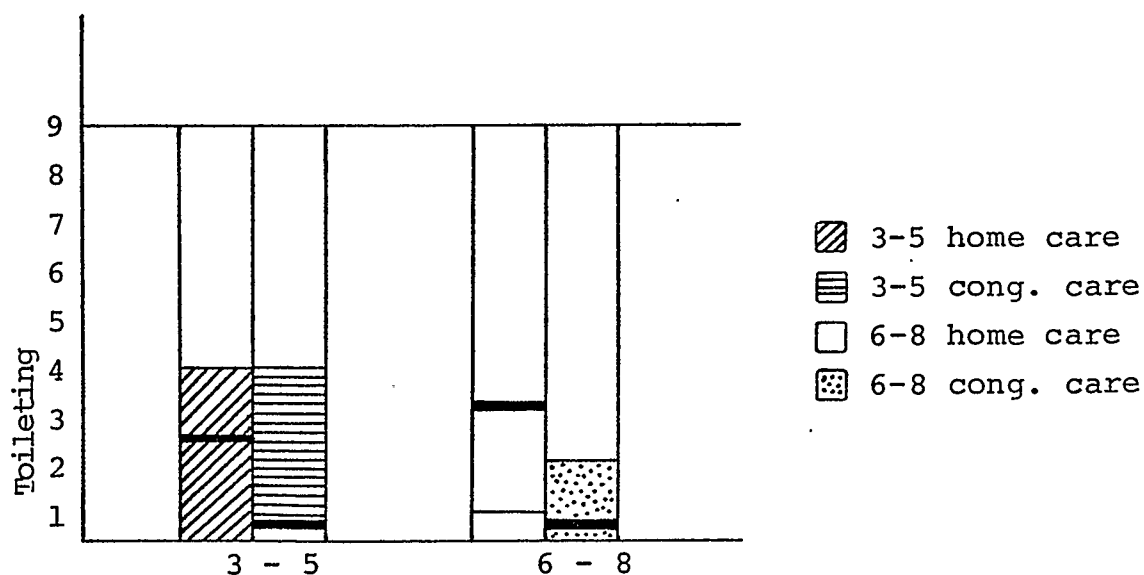
	S. Error	T Value	D.F.	T. Prob
Contrast 1	1.4213	1.847	21.0	0.079
Contrast 2	1.4213	-2.550	21.0	0.019

3.4.2. Toileting

Toileting skills in the Self Help Scale are significant in the overall comparison of the four groups as well as in the contrast of environment (home vs. congregate care) and age (3-5 and 6-8). Figure 24 shows means, standard deviations and ranges of toileting skills in the Self Help Scale. Table 28 shows the analysis of variance for the contrast of environment (contrast 1) and the contrast of age (contrast 2).

Figure 24

Means, standard deviations and ranges of toileting skills of the Self Help Scale



Mean	2.62	0.50	3.37	0.50
SD	1.68	1.41	2.56	0.92
Range	0-4	0-4	1-9	0-2

Table 28

Analysis of variance for the contrast of environment (contrast 1) and the contrast of age (contrast 2) in toileting skills of the Self Help Scale

Pooled Variance Estimate

	Value	S. Error	T Value	D.F.	T Prob.
Contrast 1	3.2500	1.2008	2.706	28.0	0.011
Contrast 2	-2.5000	1.2008	-2.082	28.0	0.047

Separate Variance Estimate

	S. Error	T Value	D.F.	T Prob
Contrast 1	1.2008	2.706	17.8	0.014*
Contrast 2	1.2008	-2.082	17.8	0.052*

There is a significant difference in toileting skills in the overall comparison of the four groups ($p < .004$). In the contrast of environments (home vs. congregate care) the significance level is $p < .014$. Results show more toileting skills for the home care group ($\bar{X}_1 = 2.62$, $\bar{X}_3 = 3.37$) compared to the congregate care group ($\bar{X}_2 = 0.50$, $\bar{X}_4 = 0.50$). In the contrast of age (3-5 and 6-8 years old), the older group shows more toileting skills ($\bar{X}_3 = 3.37$, $\bar{X}_4 = 0.50$) than the younger group ($\bar{X}_2 = 2.62$, $\bar{X}_1 = 0.50$). It is important to mention that the age difference is only determined by the 6-8 home care group ($\bar{X}_3 = 3.37$) since the mean of the 6-8 congregate care group ($\bar{X}_4 = 0.50$) is the same as that of the 3-5 congregate care group ($\bar{X}_2 = 0.50$).

3.4.3 Feeding

Feeding skills involve activities such as sucking the food or swallowing the food by the child on his own, taking pureed food from spoon, drinking from a glass, opening the mouth when the food is presented, chewing the food.

Feeding does not show significant differences in the overall comparison of the four groups.

Figure 25 shows means, standard deviations and ranges of the feeding area in the Self Help Scale. Table 29 shows the contrast of age and environment of the feeding sub scale.

Figure 25

Means, standard deviations and range of the feeding sub scale of the Self Help Scale

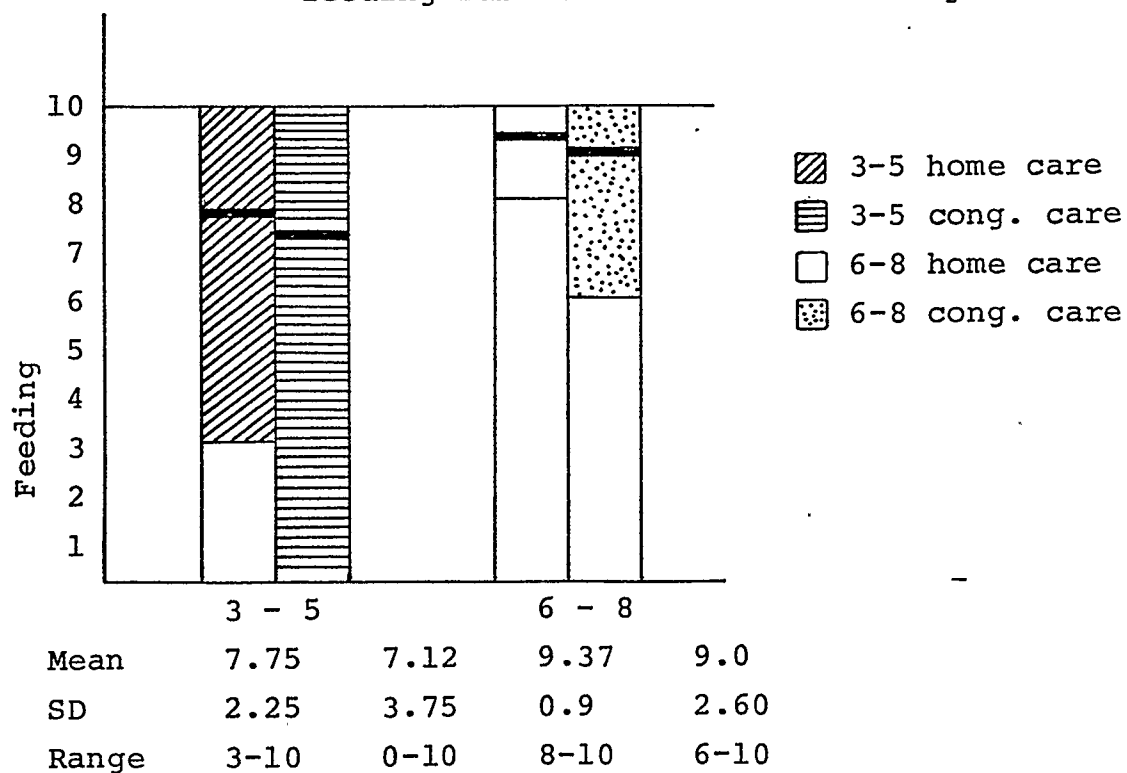


Table 29

Analysis of variance for the contrast of environment (contrast 1) and age (contrast 2) for the feeding sub scale of the Self Help Scale

Pooled Variance Estimate

	Value	S. Error	T Value	D.F.	T Prob.
Contrast 1	1.0000	1.6810	0.595	28.0	0.557
Contrast 2	-3.5000	1.6810	-2.082	28.0	0.047

Separate Variance Estimate

	S. Error	T Value	D.F.	T Prob.
Contrast 1	1.6810	0.595	15.4	0.561
Contrast 2	1.6810	-2.082	15.4	0.055*

Feeding shows a significant difference at $p < .055$ in the contrast of age (3-5 vs. 6-8), suggesting that feeding skills are more developed in the older group ($\bar{X}_3 = 9.73$, $\bar{X}_4 = 9.0$) compared to the younger group ($\bar{X}_1 = 7.75$, $\bar{X}_2 = 7.12$). Environment is not an important factor in feeding skills. Results in this area show that the older children have reached their maximal potential in feeding skills.

3.5 Summary

Results in general functioning indicate that:

- (1) children in congregate care use more medications and receive more medical care compared to children living at home.

- (2) Nursing care tends to diminish with the age factor - older children receive less nursing care ($\bar{X}_3 = 7.5$, $\bar{X}_4 = 12.0$) compared to younger children ($\bar{X}_1 = 9.5$, $\bar{X}_2 = 13.2$).
- (3) Physical development is similar for the home care and congregate care children tested in the study.
- (4) The Awareness Scale in the A.F.D.H. shows differences between the groups in "contact with objects" only. The home care older group shows more contact with objects compared with the children in congregate care.
- (5) Differences between the groups occur in the Self Help area (dressing and toileting). The older children reared in home care settings show higher development in these areas compared with similar children in congregate care.
- (6) Feeding is significant in the contrast of age (3-5 and 6-8 years old). The older children exhibit more feeding skills compared with the younger children.

CHAPTER VI: DISCUSSION

The children in the study were selected on the basis of disability, age range, institutionalization date and formal activities. The limitation on the characteristics of the sample implied a limited number of children available in the city of Calgary. The city of Edmonton was chosen to complete the sample as a result of these limitations. The decision to institutionalize was constrained by different admission policies in Edmonton and Calgary (i.e. families in Calgary did not have the option of institutionalizing their children at a younger age whereas families in Edmonton have institutions available).

The comparison of these children in home and congregate care demonstrated that:

- (1) there were no differences in the total scores in physical development, awareness and self help in the A.F.D.H., and
- (2) there were significant differences in total nursing care determined basically by the amount of medication and medical care received by the institutionalized group of children.

The major findings of the study supported the contention that environmental conditions appear to influence language, cognitive and social development of multiply handicapped children.

The results of the study showed that multiply handicapped children reared at home achieve a higher developmental level in cognitive, social and language

skills when compared to similar children reared in congregate care settings. These major findings are supported by similar findings in studies done by Farrel, 1956; Centerwall and Centerwall, 1960; Stedman and Eichorn, 1964; Piper and Ramsay, 1980; although these subjects were less handicapped.

Ecological Differences

To date, there have been no studies done which compared the ecological environments of multiply handicapped children. The findings in the present study are descriptive of the differences in living conditions for these children.

The social milieu of the two groups - home and congregate care - was described using a time sample observation of the children's free time. The main focus of the comparison was the social interaction behaviour of the children with parents and caregivers.

The major findings in this area demonstrated that home reared children are exposed to a richer environment, and also receive much more complex stimulation from their caregivers compared to children reared in congregate care.

At a basic level, children reared at home spend their time in a variety of environments (e.g. living room, bedroom, dining room, bathroom), with the potential of changing stimulation. Lack of variation in-stimulation has been shown to be an important factor in developmental retardation. The findings of developmental retardation in children exposed to a congregate care setting

are paralleled with findings of sensory impairment in animals deprived of stimulation (Bronfenbrenner, 1968). Thus children in congregate care are not stimulated enough to develop their potential for sensory development.

Home reared children receive a variety of stimulation that is not available for the congregate care children. Although there were no differences in the number of people present in the child's environment, there were major differences in the amount of social contact. (Note: the institutions utilized for the study were not large, impersonal institutions.) Children at home received more visual, verbal and physical contact compared to the children in congregate care (refer to Figure 4). The lack of social contact has been proved to be responsible for regression in social skills (Lawrence and Kartye, 1971), self help skills (Ball, Seric and Payne, 1971) and verbal development (Lyle, 1959). Studies in social development in the multiply handicapped have suggested that social behaviour can be increased through manipulation of environmental contingencies (Mayhew, Enyart and Anderson, 1978). If the staff available were encouraged to provide more social contact through talking with the clients when they were receiving care, playing with them in their social activities, relating to them in those activities in which they cannot participate, etc., the staff ratios might translate into a more conducive social environment. Staff often feel that these profoundly handicapped children are not aware, and therefore do not feel comfortable talking to the children. However, it was clearly evident that active awareness was more often observed in both groups than passive awareness (refer to Figure 7). This result seems to suggest that, even though congregate care children are

exposed to a poor stimulating environment, they tend to remain "active" in their environment. There is, however, a noticeable difference in the direction of awareness; the children at home are more interested in observing and attending actively and responding to persons, whereas children in congregate care are more interested in attending toys and objects.

The differences in response patterns may be due to the different amount of "social contact" the groups are receiving (i.e. visual contact, social and physical contact). The child at home is reinforced by his environment to maintain contact with the caregiver, thereby increasing the frequency of responses to persons. On the other hand, in congregate care, social contact is not reinforced by the environment. This could decrease the probability of "person" directed awareness, and could lead to extinction of social contact, as well as increasing the probability of responding to objects as an alternative.

It would seem important in the design of the rehabilitation programs in institutions, that social contact should be programmed, rather than left to the discretion of the workers in charge of these children; and that basic techniques for provoking awareness in these children should be taught.

The results tend to show that children in congregate care are exposed constantly to an inadvertant extinction program for most of their behaviours as postulated by Dailey, Allen, Chisky and Veit (1974). Since they are totally dependent on their caregivers and other persons are not around to interact with these children normally, the staff becomes the only source of social

contact available. The children in congregate care receive attention and physical contact only when care is provided (feeding, changing toileting, etc.). In most home settings children receive social stimulation, not only from their caregivers, but also from siblings, other family members, neighbours, etc.

Impact of Environment on Development.

The results of the study supported the contention that environment influences cognitive, language and social development in severely multiply handicapped children.

Throughout, the trend toward differences between the two settings with the young children became more noticeable with the older children.

The most dramatic environmental influence seems to be in language development which has been equated with cognitive development. According to Piaget (1954), the sensory-motor period of cognitive development is marked by the development of general representational skills. Since language is essentially a symbolic mode of communication, the development of symbolic representation, as indicated by the understanding of the permanence of objects, should be a general prerequisite for language development. The most noticeable findings in the language area were not only a greater receptive and expressive language development in the home reared children, but also a decrement in receptive and expressive language in the older congregate care group. The differences in environmental conditions were highly significant ($p < .009$).

This cross section analysis seems to support longitudinal studies done by Phillips and Balthazar (1979), which reported a decrement in language performance in severely and profoundly mentally handicapped residents during prolonged institutionalization.

In the observation of environment between home and congregate care, higher verbal responses (21.3%) and noises (21.8%) were noticed for the home care group, as compared with the congregate care group (verbal responses 5%, noises 10.0%).

Lyle's studies (1959, 1960) showed an increase in speech and language development when multiple handicapped children were placed in a home care situation, in comparison with similar children in congregate care.

In the present findings, it may not be unreasonable to assume that the effect of congregate care upon verbal development could be offset to an important extent by increasing the amount of social contact and human relationships within the institutional setting. Attendant/resident interactions are generally neutral. Social interaction occurs slightly more than 10% of the time, as compared with custodial care and housekeeping chores that occupy nearly 75% of the time, as reported by Mayhew, Enyart and Anderson (1978) in a study with profoundly retarded adolescents. The findings of this study showed considerable differences in social contact between children reared at home (verbal contact 52.6%, visual contact 34%, physical contact 36.4%), compared with children living in congregate care (verbal contact 14.9%, visual contact 7.8%, physical contact 18%). There is no reason to believe that these findings would be applicable only to the particular

institutions in which this investigation took place. On the contrary, they are similar to findings in a number of other investigations which have been concerned with institutionalized children (Bowlby, 1953; Skeels and Col, 1929; Goldfarb, 1945; Centerwall and Centerwall, 1960). It may be that long term residence in congregate care affects the verbal development of the severely and profoundly mentally handicapped children even more than normal children because of existing difficulties in verbal ability.

Cognitive development results showed significant differences in the comparison of all four groups. The children reared at home showed a greater development of cognitive skills compared with the children reared in congregate care. Similar findings have been reported in studies done by Centerwall and Centerwall (1960); Shipe and Shotwell, (1965), for less disabled children.

The possible explanations for the impact of environment on cognitive and language development found in this study might be due, in part, to the conformation of the physical and social environment that the children have been exposed to:

- (1) the child reared at home tends to receive more stimulation from his physical and social environment than the child reared in congregate care,
- (2) the ecological environment in the home care setting tends to have more variation than the environment in congregate care,

- (3) children at home spend their free time in a variety of environments, compared with the limited environment of the children in congregate care, and
- (4) children at home receive more social contact from their caregivers than do children in congregate care.

From these findings, several explanations may be advanced: children at home are exposed to a highly stimulating environment, which facilitates their cognitive and language development, or severely and profoundly mentally handicapped children who are kept at home retain their initial level of skills and, over time, this facilitates increased parental involvement.

The results of the present study cannot determine which of these hypotheses explains the differences in developmental status in these children. The relationship is suggestive; the direction remains to be determined.

Studies in social development suggest that deficits in social behaviour in retarded persons may be due to failure of the environment to stimulate such behaviours (Klaber, Butterfield and Gould, 1969; Spradlin, Girardeau and Corte, 1967). Lawrence and Col (1971), reported a significant decrement in social skills in a group of severely and profoundly mentally handicapped females after discontinuing a social skills training program.

In the present study, significant differences were found in the basic components of social skills (such as smiling, response to separation, contact seeking,

isolated play) with the older group, but not with the younger group.

Smiling, as one of the first social responses in children, was significantly more prevalent in children at home, rather than those in congregate care. Contact seeking and response to separation were more developed in the home care group than in the congregate care group. The older home care children showed more responsiveness to contact seeking and were better able to respond to separation from the caregiver. In the evaluation of "contact seeking" by the A.F.D.H. which is a scale of general functioning, there were not significant differences between the groups, but they became significant with the Cohen and Gross Social Development Scale - a more comprehensive scale to evaluate social development.

Differentiation of self from others, and isolated play (some of the more complex and advanced behaviours in social development) were significantly different in environmental contrast of the older groups.

Findings in this area are limited. The research available indicates that the acquisition of social behaviours and basic self help skills can be slowed as a result of admission to an institutional program for the mentally retarded (Kaufman, 1967; Eyman, Tarjan and Cassady, 1970).

General Functioning

Results in the nursing care area showed no significant differences in the total nursing care required for the 3-5 and 6-8 years old children reared

at home or in congregate care. However, in the contrast of environment (home vs. congregate care), nursing care tended to be greater for the congregate care group compared with the home care group. The difference was basically determined by the amount of medications and the medical care given to the congregate care group. The children in congregate care tend to receive more medications (laxatives, seizure medications, sedatives, etc.) and also the congregate care group tends to receive more medical care (congestion, positioning, ulcer care, colostomy, impacted feces etc.) in comparison with the home care group.

The findings in this area raise important questions:

- (1) Are the needs in nursing care a major cause for the parents to seek the institutionalization of the severely and profoundly mentally handicapped child?
- (2) Does the medical model determine the type of care given to these children?

The design of this study does not provide answers for these important questions, but has established the basic differences in nursing care for further investigations.

A particularly noteworthy finding was the similarity of the groups in physical development, which evaluates a range of motor skills from birth to approximately one year of age. There were no differences between age (3-5, 6-8 years old), or in the contrast of environment (home vs. congregate care). This particular finding

signifies a validation for the selection of the sample using the Level of Handicapping Condition Scale (Marlett, 1975). This also supports the contention that physical development in these groups of children is determined by non regenerative neurological damage, and the differences in language, cognitive and social development are determined basically by environmental influences.

In the general assessment of awareness, the sub scale "contact with things" became significant in the comparison of the older group (6-8 years old). The home care older group displayed more contact with objects and toys than the congregate care older group. In the contrast of environment (home versus congregate care), the significant differences was at $p < .09$. A recent descriptive study done by Levine, Elzey and Fisker (1979), found that approximately 73% of severely and profoundly mentally handicapped children enrolled at the California Center for the Mentally Handicapped were "low" in awareness, which meant they had minimal contact with the general environment, and only minimal differentiation of objects in the environment.

On the other hand, O'Sullivan's study (1977) with severely and profoundly mentally handicapped children showed significant improvements in awareness in a group of children living in congregate care after a sensory motor training program was carried out for the group.

In the self help area, dressing and toileting scales were shown to be influenced by environmental conditions, and also by the age factor. Dressing and toileting skills tend to be more developed in older children and in children living at home.

Kaufman (1967) and Eyman, Tarjan and Cassady (1970), found evidence that the acquisition of basic self help skills can be slowed as a result of admission to an institutional environment. Toileting, specifically, seems to be not only developmentally determined, but also highly influenced by training.

In general, self help skills respond to training (Azrin and Fox, 1971; O'Brien and Azrin, 1972), and also to improved physical, social and environmental conditions (Vogel, Kun, Meshorer, 1968; Murphy and Zahm, 1978) in mentally handicapped subjects.

It appears that the home environment offers more resources than the congregate care environment.

The main conclusion to be derived from the study is that home environments facilitate the development of severely and profoundly mentally handicapped children. For the profoundly retarded child, the ideal environment would be the one where the child can initiate behaviours that produce reinforcement; the one which provides a variety of stimulations and interactions, and; the one in which the child can engage in adaptative behaviours providing systematic prompting and reinforcement.

Limitations of the study

There are two major limitations of the study to be considered in future follow up studies.

- (1) The selection of the two groups of children (home vs. congregate care) may, in fact, have been a self selection due to the limited

population of severely and profoundly mentally handicapped children. The subjects used in the study were all the children available with the appropriate characteristics for the purposes of the study.

- (2) The observation checklist was validated only in the pilot project and during the research phase it was carried out by one observer. For future studies the observation checklist should be revalidated and retested by at least two observers.

Implications

The major findings of this research seem to suggest that the home environment tends to facilitate the child's potential for development. The characteristics of home environment are basically determined by:

- (1) variation in physical and social stimulations
- (2) individualization in social contact
- (3) contingency reinforcement
- (4) facilitation of the development of more independent skills, and
- (5) increased opportunities for social contact.

On the other hand, congregate care environments are generally determined by:

- (1) limited range of stimulation
- (2) group training
- (3) promotion of more dependent behaviours, and
- (4) lack of contingent reinforcement.

Children in congregate care, on the other hand, have more comprehensive medical resources. Nurses are available twenty-four hours a day and medical personnel visit on a regular basis.

From the present study, some general ideas can be developed to create a more positive environment for these children.

The ideal living condition for multiply handicapped children is a definite home or "home type" setting integrated into a community with a limited number of children where a one to one relationship can be developed with the residents. In the observation of home environment, it was noted that children at home were capable of developing some independence in terms of their mobility within the environment; skills that were not present in similar children in congregate care. For example, the home care child, in spite of his disability, can change positions on his own, which, in the long run, tends to avoid a series of medical problems such as skin problems, scoliosis, lordosis, etc.

Children in home care do not require 24 hour care. In the congregate care groups, however, a large

number of dependent behaviours have been created and this results in the need for full time care.

The accommodation of these children in a "home type" environment would require a medical support system which could be provided by community resources (hospitals, family doctors, community health clinics, etc.).

These children do attend and are able to benefit from a more complex environment. If they are integrated into a community, they could have the opportunity to relate and participate with other persons (neighbours, children, parents), who could serve as models for learning social behaviours and developing language skills. In a traditional institutional setting, these skills are taught in isolation and the children have limited opportunities to practice and generalize them.

Future research should:

- (1) inquire into other types of available living conditions (i.e. foster homes) which could benefit the development of these children's potential,
- (2) investigate suitable changes in traditional institutional settings to accommodate the children's needs,
- (3) develop training packages to be taught to staff involved with mentally handicapped children, and
- (4) evaluate present alternatives for mentally handicapped children and generate policies and procedures for future accommodations.

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APPENDIX A

OBSERVATION CHECKLIST

OBSERVATION NO.	PLACEMENT	NAME	DATE
L Position	Location		
	Floor/mat		
	Normal chair		
	Wheelchair		
	Special device		
Caregiver/Family	Care being given*		
	Person absent		
	Person in sight		
	Eye contact		
	Verbal contact/T		
	Verbal contact T.		
	Physical contact		
Child Awareness	Asleep		
	Gaze not directed		
	Self esteem		
	Type of Stimul. (#)		
	Other person		
	A toy		
	Actively Attend.		
Child Response	Orienting		
	Response observ. @		
	Stimul. seeking		
	Smiling		
	Crying no reason		
	Crying reason		
	On own		
Child Activity	Some assistance		
	Total assistance		
	Random movements		
	No movements		
	Communicating		
	Noises		

RECORDING SYSTEM

Code ⊛ Bathing (B)
Dressing (D)
Feeding (F)
Toileting (T)
Nursing Care (N.C.)
Transporting (T)

Code ⊕ Vestibular (VS)
Visual (VI)
Tactile (T)
Auditory (A)

Code @ Banging (BA)
Biting (BI)
Hitting (H)
Sucking (S)
Manipulating (M)