# The Relationship Between Participation in Integrated Structured Play Activities and the Levels of Social Interaction of Moderately to Severely Developmentally Delayed Children in an Integrated Preschool Setting

by

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A thesis
presented to the University of Manitoba
in partial fulfillment of the
requirements for the degree of
Master of Education

Winnipeg, Manitoba, 1983

# THE RELATIONSHIP BETWEEN PARTICIPATION IN INTEGRATED STRUCTURED PLAY ACTIVITIES AND THE LEVELS OF SOCIAL INTERACTION OF MODERATELY TO SEVERELY DEVELOPMENTALLY DELAYED CHILDREN IN AN INTEGRATED PRESCHOOL SETTING

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# ABSTRACT

A multiple baseline experimental design across subjects was used to study the relationship between participation in integrated structured play activities and general levels of social interaction in an integrated preschool. Data was collected on the levels of interaction and the levels of social behaviour that were exhibited by two female subjects who were both functioning in the moderate to severe range of mental retardation. Target behaviours were observed and recorded during periods of free play, and the collected data was then analyzed for trends over time. A slight trend toward improved social functioning was observable in the data for one of the subjects, but no such trend appeared in the data for the other subject. As a result, it was not possible to confirm the relationship between participation in structured play activities and increased social interaction, for either subject. Recommendations were made for modifying the intervention strategy, so as to make it more effective in promoting integration.

## Acknowledgements

A number of people have contributed to the successful completion of this project. In particular, the author would like to thank:

Dr. M. J. Hughes, Department of Educational Psychology, for his assistance in the organization of the study and in the preparation of the manuscript;

Dr. I. McIntyre, Department of Educational Psychology, for her guidance through the world of the preschool child, and for her willingness to sit as a member of the examining committee;

Dr. J. H. Whiteley, Department of Psychology, for his willingness to sit as a member of the examining committee;

Heather Kay, Bonnie Thiessen, and Ira Udow for their assistance in collecting the data for the study;

Margaret Maughan and Zlatica Stauder for permission to include their children in the research project, and for much valuable advice during the course of the study;

and, of course,

Sheila and Zuzanna.

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# CHAPTER 1 INTRODUCTION

## Context of the Problem

The movement to include the mentally handicapped in the mainstream of society has been gaining momentum in recent years, and this process has become particularly apparent in the schools. Many people, including Bricker (1978), Brown, Branston, Hamre-Nietupski, Johnson, Wilcox, and Gruenewald (1979), and Wolfensberger (1972), have been recommending that the educational segregation of the developmentally delayed be stopped and that a policy of integration be implemented as soon as possible. The efforts of these people have contributed significantly to the introduction of increasing numbers of developmentally delayed children into the educational mainstream, at increasingly younger ages, but the complete social integration of these children has been a difficult goal to realize.

At the preschool level, certain researchers (e.g. Dunlop, Stoneman, & Cantrell, 1980; Peterson & Haralick, 1977) have suggested that physical integration leads inevitably to social interaction and, therefore, to social integration. Recent research, however, has produced considerable evidence to the contrary. In most cases, it appears that developmentally delayed children, who have been introduced into regular preschool classrooms, have tended to develop poor social relationships, to experience problems interacting spontaneously and/or appropriately, and to become socially isolated (Cav-

allaro & Porter, 1980; Hughes, 1982; Fredericks, Baldwin, Grove, Moore, Riggs, & Lyons, 1978). Findings such as these have led to the conclusion that, for a policy of integration to work satisfactorily, some strategy which goes beyond mere physical integration has to be employed (Guralnick, 1978).

One such strategy involves the use of structured play, in which developmentally delayed children are required to function as part of a closely supervised, integrated play-group. Current research has left little doubt that this approach can be used to improve the social functioning of mildly developmentally delayed preschool children (Guralnick, 1976), and the strategy is now being recommended for use with the more-severely handicapped (Salend, 1981; Stainback, Stainback, & Jaben, 1981). With greater numbers of moderately to severely developmentally delayed children being placed in integrated educational settings, researchers and educators have been hoping that structured play activities will provide the means for improving the frequency and the quality of the interactions between more-severely handicapped preschool children and their nonhandicapped peers.

## Statement of the Problem

It is possible that structured play activities will eventually prove effective in facilitating the social integration of many more mentally handicapped preschool children, regardless of their level of developmental delay. However, because structured play has not been widely investigated as

a technique for fostering social interaction between moderately to severely developmentally delayed children and their nonhandicapped peers, it is still not possible to assess its value as an intervention strategy for more-severely handicapped individuals. It was this problem that formed the basis for the present study.

## Statement of the Purpose

The purpose of the present study was to investigate the general hypothesis that moderately to severely developmentally delayed preschool children, who participated in integrated structured play sessions, would show improvement in their level of interaction and in the quality of their social behaviour, during free play.

## Statement of the Hypotheses

For the purpose of this study, it was specifically hypothesized that participation in integrated structured play sessions, on the part of moderately to severely developmentally delayed preschool children, would lead to:

1. an increase in the frequency of prosocial behaviours;
2. a decrease in the frequency of antisocial behaviours;
3. an increase in the frequency of gestures and speech to peers;

4. a decrease in the frequency of speech and gestures to adults;

5. an increase in the frequency of parallel play behaviours;

6. a decrease in the frequency of onlooker behaviours;

7. a decrease in the frequency of solitary play behaviours; and

8. a decrease in the frequency of unoccupied behaviours,

during periods of free play.

## Rationale for the Hypotheses

During the course of the structured play sessions, it was expected: (a) that peer modelling would provide the developmentally delayed children with a variety of appropriate behaviours which they could learn to imitate, and (b) that peer and adult reinforcement would provide them with a reason for wanting to imitate those behaviours. By means of this strategy, it was anticipated that the developmentally delayed children would learn both appropriate new behaviours, as well as appropriate substitutes for most inappropriate behaviours. This led to the expectation that the delayed children would exhibit an increase in prosocial behaviours and a corresponding decrease in antisocial behaviours.

Improvement in the quality of social behaviour implies improved ability to initiate and to respond to social over-

tures in more appropriate ways. As a result, it was anticipated that there would be improved social interaction between the developmentally delayed children and their nonhandicapped peers. This expectation was reinforced by two assumptions: (a) that, through the process of habituation, nonhandicapped children would become accustomed to any residual inappropriate behaviours being displayed by the developmentally delayed children; and (b) that the social acceptability of the delayed children would be enhanced as they were observed performing appropriately in social situations. Taken together, these three factors led to the formulation of the general hypothesis that the intervention strategy would lead to more frequent positive contact between the two groups, and that there would be fewer instances of onlooker, solitary play, and unoccupied behaviours exhibited by the developmentally delayed children.

During intervention sessions, emphasis was placed on interpersonal communication, including: looking at, imitating, asking, telling, giving, taking. For this reason, it was assumed that increased social interaction would likely take the form of increased speech and gestures to peers. As the frequency of gestures and speech to peers increased, it was further assumed that the proportion of speech and gestures to adults would decrease.

## Operational Definitions of the Variables

### Structured Play

The structured play activities used in the study had four characteristics in common: (a) an emphasis on social play, (b) simplicity, (c) purposefulness, and (d) small numbers of participants. All activities emphasized social play, and only materials and activities that encouraged social interaction were used. The term simplicity indicates that the play behaviour in question had to exist already in the behaviour repertoire of the developmentally delayed child. The term purposefulness means that the pattern to be followed or the goal to be attained had to be explicitly defined, and that its occurrance could not be left to chance. In addition, the procedures that were followed involved small sequential steps, so as to avoid confusion on the part of the developmentally delayed participant. Finally, the attempt was made to limit the ratio of nonhandicapped to developmentally delayed children to two or three to one (i.e. 2 or 3: 1).

Three forms of structured play were employed, the definitions of which are all based on Parten's (1932) definitions.

1. Co-operative play involved play with other children, with roles assigned. There was a single goal for each activity, and each child was necessary to the success of the activity.

2. Associative play involved play with other children, but without role assignment and with less emphasis on formal group organization.

3. Parallel play with peer modelling or tutoring involved playing with toys similar to those being used by children in the subject's vicinity. Nonhandicapped peers were used to provide demonstrations of appropriate play behaviour.

Level of Interaction

Level of interaction refers to the kinds of behaviour that were exhibited by the developmentally delayed subjects in the course of free play. During each observation period, behaviours were classified, according to Schedule A of the Integrated Preschool Interaction Schedules[1] (Hughes, 1980), as: unoccupied, solitary play, onlooker, parallel play, nonverbal to adults, nonverbal to peers, speech to adults, or speech to peers. This procedure allowed the highest-level interaction that occurred in each ten second observation interval to be identified and recorded. At the end of each observation period, the individual recorded interactions which belonged to the same behavioural category were then tallied and calculated as a proportion of the total recorded interactions. (N.B. Unless otherwise indicated, the percentages of total interactions that are included in subsequent sections of this document always refer to the percentages of total recorded interactions that were calculated following each observation period.)

Improvement in the level of social interaction refers to: (a) an increase in the proportion of higher-level in-

[1]See Appendix A

teractions with nonhandicapped peers, as defined in the Integrated Preschool Interaction Schedules (e.g. parallel play, nonverbal and verbal attempts);

(b) a corresponding decrease in the proportion of lower-level interactions with nonhandicapped peers, as defined in the Integrated Preschool Interaction Schedules (e.g. unoccupied behaviours, solitary play, and onlooker behaviours);

(c) a decrease in the proportion of adult-centred behaviours, as defined in the Integrated Preschool Interaction Schedules (e.g. nonverbal and verbal attempts).

Level of Social Behaviour

The level of social behaviour is an indication of the quality of the subject's interactions. For the purposes of this study, it referred to those aspects of behaviour which are designated, in Schedule B of the Integrated Preschool Interaction Schedules (Hughes, 1980), as prosocial, antisocial, or neutral. During observations, these aspects of behaviour were classified on the basis of how they were likely perceived by the nonhandicapped peer or peers involved in the interaction.

# CHAPTER 2 REVIEW OF THE LITERATURE

## Introduction

In recent years, considerable attention has been directed toward the subject of learning and the mentally retarded. Experimental results from a variety of areas, such as attentional deficit (Das, 1978) and memory deficit (Lawson, 1978), have enabled educational and psychological researchers to reach two important conclusions. One of these is that deficit models of mental retardation do not completely explain the learning problems that are experienced by mentally retarded individuals, and that an important complement to these deficit theories is to be found in the theory of developmental delay. The second conclusion is that performance in most areas of intellectual functioning can be greatly improved with appropriate instruction and practice. This latter conclusion is especially important because of its implication that improvement in developmental status can depend on factors which are under the direct control of researchers and educators, factors such as motivation of the learner and effectiveness of the teaching technique. Therefore, in a very real sense, developments in mental retardation research have led to greater responsibility for the welfare of the mentally handicapped being placed with those professionals who are specifically concerned with their education.

The search for more effective approaches to the education of the developmentally delayed has led to the evolution

of a number of important instructional strategies. These have included: (a) the creation of more powerful activities to facilitate skill development, (b) the provision of more suitable learning environments within public school systems, (c)the provision of educational services for more severely handicapped children and young adults, and (d) the movement of mentally handicapped children into instructional programs at increasingly younger ages. The culmination of these developments has been the provision of formal schooling for mildly, moderately, and even severely mentally handicapped children, beginning in kindergarten, with some programs available even at the preschool level.

## A Rationale for Integration

In the opinion of many professionals working in the area of mental retardation, a major problem with the delivery of educational services to developmentally delayed children lies in the fact that most of these services are still being delivered in segregated settings. In response to this situation, Bricker (1978) has provided a rationale for the integration of handicapped children into the educational mainstream. Her arguments fall into three main categories: social-ethical, legal-legislative, and psychological-educational.

### Social-Ethical Arguments

Apolloni and Cooke (1974) have pointed out the lack of wisdom inherent in a policy which physically isolates a pop-

ulation already isolated by one or more handicapping conditions. In her social-ethical arguments in support of integration, Bricker (1978) has extended this argument by attacking the premises underlying the concept of segregation as being fundamentally untenable. In Bricker's opinion, a policy of segregation is unjustifiable because the mentally handicapped population is not discrete, and its learning problems are not unique. As an alternative, Bricker has suggested that developmentally delayed children ought to be allowed to use and expand the normal aspects of their behaviour repertoires. Like Auerbach (1970), she feels that this is most likely to be accomplished in integrated settings.

The section of the rationale dealing with the social-ethical arguments also emphasizes the importance of integration on attitude change. Several authors, including Bricker (1978), Guralnick (1978), Kaplan-Sanoff (1979), and Voeltz (1980), are convinced that exposure to and contact with developmentally delayed children contribute to the formation of positive attitudes toward the handicapped among the non-handicapped population. Furthermore, Bricker has suggested that, where attitudes are concerned, nonhandicapped children are not the only ones to benefit from integrated settings. She has indicated that there is some evidence that the attitudes of developmentally delayed children, the attitudes of parents of delayed children, and the attitudes of parents of nonhandicapped children all show positive changes following personal experience with integration.

At the preschool level, the relationship between integration and children's attitudes has taken on added significance, for research on this topic is in general agreement that younger children are more accepting of developmentally delayed peers than are older children (Goodman, Gottlieb, & Harrison, 1971; Hartup, 1978). As a general rule, it can be said that the attitudes of nonhandicapped preschoolers are characterized by an ability and a willingness to adjust their speech and other forms of interaction to the needs and developmental levels of their mentally handicapped playmates (Guralnick,1978; Ispa & Matz, 1978; Kaplan-Sanoff, 1979). Clearly,the most important implication of these findings is that changing established attitudes among nonhandicapped preschoolers is less of an issue than encouraging the development of positive attitudes (and possibly discouraging the development of negative attitudes) toward the handicapped peer group. For these reasons, it seems most natural and most logical to begin implementation of the integration model at the preschool level.

Legal-Legislative Arguments

Abramson (1980) and Bricker (1978) have both provided excellent summaries of the court decisions and legislative enactments that have most strongly influenced the issue of mainstreaming in the United States of America. Although the same judicial and legislative mechanisms are not always available outside of that country, the general argument put forward by Bricker can easily be applied internationally. In

brief, this argument says that developmentally delayed children have a right to the least restrictive educational environment, which includes the right to be educated as much as possible among their nonhandicapped peers, and that all governments have an obligation to establish this right in law.

Psychological-Educational Arguments

In his review of the literature on mainstreaming, Abramsom (1980) concludes:

> As a principle, mainstreaming was not based on any empirical evidence that suggested that integrated programs for handicapped children would be beneficial, but on humanistic zeal and the desires of parents and special educators.

Although this conclusion may represent an extreme view, it seems to be true that early attempts to provide a rationale for integration relied heavily on theoretically based arguments and concerns for human rights. Even Bricker (1978) is forced to concede that many of the arguments put forward in the first two parts of her rationale have been "arrived at through value judgements rather than empirically based judgements". With the third group of arguments, however, empirical support takes on much greater significance, as most of these arguments are based on (or have been validated by) results obtained through social science research.

The arguments that fall into the psychological-educational category focus on three main areas: the relationship

between environmental demands and behaviour development, the importance of learning by imitation, and the effect of integrated settings on teacher/parent expectations. The principal arguments from each of these areas have been summarized in the paragraphs which follow.

Environmental demands and behaviour development. The development of simple action schemes into more complex kinds of behaviour depends upon increasing environmental demands. The activities, the nonhandicapped peers, and the adults present in integrated settings all contribute to the establishment of more demanding environments which generally elicit more mature forms of behaviour from the developmentally delayed participants (Auerbach,1970; Bricker, 1978; Plummer, 1977).

Learning by imitation. The ability of developmentally delayed children to learn to imitate more complex behaviours is strongly influenced by the nonhandicapped peer group. The importance of having nonhandicapped children available to model, to prompt, and/or to reinforce appropriate social and academic behaviours for their developmentally delayed peers has been documented both at the infant/toddler levels (Apolloni & Cooke, 1974, 1978) and at the preschool level (Bricker, 1978; Devoney, Guralnick, & Rubin, 1974; Guralnick, 1978; Kaplan-Sanoff, 1979; Nordquist, 1978).

Teacher/parent expectations. Finally, the behaviour of nonhandicapped children in integrated settings provides a more normal standard, against which the behaviour of devel-

opmentally delayed children can be measured (Bricker, 1978). This encourages both parents and educators to focus on the universalities of development and to avoid the tendency "to lump handicapped children together" and "to see them as a separate, uniformly disabled group" (Ispa & Matz, 1978).

## The Role of Developmental Level

Suggestions for the integration of mentally handicapped children into the educational mainstream generally imply placement with nonhandicapped peers of similar chronological age (Brown, Branston, Hamre-Nietupski, Johnson, Wilcox, & Gruenewald, 1979; Bruni, 1977). As this concept gains greater acceptance, and as the practice becomes more widespread, one question that has to be answered concerns the extent to which the process of integration is influenced by degree of impairment. Does the integration model apply equally across all levels of mental retardation, or are some forms of mental handicap too severe to benefit from its implementation? Evidence from the literature indicates that the integration model can, in fact, be applied to all levels of developmental delay, but results also suggest that age has considerable influence on the degree of success that is generated by specific approaches. Cognitive/developmental approaches to integration appear to work well with younger children (Ispa & Matz, 1978; Odom, 1981),but as they grow older, it seems that alternative strategies have to be employed (Odom, 1981).

Comparisons of developmentally delayed children with

nonhandicapped peers of similar mental age have demonstrated that the two groups show no significant differences in their learning behaviours (Das, 1978) or in their play behaviours (Mogford, 1977; Odom, 1981; Rosenblatt, 1977). It is obvious that these findings emphasize the similarity of the behaviours which are exhibited by both developmentally delayed and nonhandicapped children at any given developmental stage. However, they are also important because they support the contention that the patterns of behaviour development, followed by mentally handicapped and nonhandicapped individuals, are also very similar, with only the rates of development being different. This latter conclusion is especially important to people who are directly concerned with the process of integration because it permits the following two assumptions to be made. First, for all age levels, the behaviour development of nonhandicapped children can serve as an indicator of the behaviour development of their mentally handicapped peers. Secondly, for younger children in particular, activities which characterize the social interactions of the nonhandicapped (and which are also suitable to the developmental levels of the developmentally delayed) can form the basis for intervention strategies designed to foster meaningful interaction between the two groups.

Cognitive/developmental approaches to integration, in which intervention activities are based on the developmental levels of the handicapped children, appear to be particularly effective at the preschool level (Ispa & Matz, 1978; Odom,

1981). Odom has suggested that a major part of the explanation for this success is to be found in the small discrepancies that exist between the chronological and developmental ages of younger subjects. Odom (1981) has established that there is a strong relationship between developmental age and play level when CA/DA discrepancies are at a minimum, and that the relationship weakens considerably as the discrepancies become larger. It is for precisely this reason that play activities, which are based on developmental level, can be used so successfully with developmentally delayed preschoolers, but not with older mentally handicapped children. Of course, there is another way in which CA/DA discrepancies influence the quality of interaction in integrated preschools. Minimal CA/DA discrepancies more or less guarantee that developmentally delayed children will be able to spend at least part of their time in the company of younger nonhandicapped peers, whose developmental levels are not much different from their own. This gives mentally handicapped preschoolers the advantage of being able to practice appropriate social behaviours with a portion of the nonhandicapped peer group, not only during intervention sessions, where interactions are controlled, but also during periods of free play, where control is at a minimum.

With older children, developmental approaches to integration begin to lose their effectiveness, due to the increases in the discrepancies between the chronological and developmental ages of the handicapped individuals. Particu-

larly as handicapping conditions become more severe, activities which are directed toward the developmental levels of older handicapped children tend to become completely inappropriate for all concerned. Nonhandicapped peers are, understandably, not usually interested by such activities, and even developmentally delayed individuals begin to show preferences for more age-appropriate pursuits. In such cases, Odom (1981) has emphasized that integrated settings do not become irrelevant; rather, alternative approaches to fostering social interaction must be considered. At the high school level, for example, it might be more effective to teach appropriate social behaviours to severely handicapped adolescents by means of behaviour modification techniques.

Successful integration of the mentally handicapped does not, therefore, have to depend on factors such as developmental level. Research that has been conducted with mildly (Carlberg & Kavale, 1980), moderately/severely (Fredericks, Baldwin, Grove, Moore, Riggs, & Lyons, 1978; Peterson & Haralick, 1977; Plummer, 1977), and even profoundly (Galloway & Chandler, 1978) handicapped individuals has demonstrated that their levels of social interaction show considerable improvement in integrated settings. As long as the selected approach is appropriate to the specific age group, it appears that the integration model can be successfully applied to all levels of developmental delay.

## Physical Integration and Social Integration

At the preschool level, the attempt to bring about the social integration of the mentally handicapped population translates into the promotion of meaningful and frequent social interactions between developmentally delayed and nonhandicapped children in fully integrated educational settings. While the value of this goal no longer seems to be in question, some disagreement persists concerning the best way to move toward its realization.

### Physical Integration

One group of researchers has suggested that physical integration (i.e. the physical juxtaposition of developmentally delayed and nonhandicapped children in regular classrooms) is sufficient to bring about the social integration of mentally handicapped preschoolers. This group has included Dunlop, Stoneman, and Cantrell (1980), Kaplan-Sanoff (1979), Peterson and Haralick (1977), and Plummer (1977). The results that have been obtained by these researchers obviously point to an extraordinarily simple solution to the problems of integration, but it is a solution which now appears to be of questionable validity. Not only are their conclusions not supported by a large body of recent research, but closer examination of their methodology and findings also suggests that these conclusions regarding the value of physical integration may have been somewhat premature.

Kaplan-Sanoff's (1979) conclusions, regarding the relative superiority of integrated settings for generating appro-

priate social behaviours in handicapped children, are undermined somewhat by her use of heterogeneous groups of subjects. Because her sample contained children with Down's syndrome, cerebral palsy, spina bifida, language delay, emotional disturbance, and/or brain damage, it is difficult to be certain: (a) that the conclusions apply equally to all of the various subgroups which are represented in the study, or (b) that it is meaningful to generalize results to a population which contains so many diverse handicapping conditions. In other words, Kaplan-Sanoff's conclusions would be much more valuable if they could be tied more firmly to specific subgroups of handicapped children.

Plummer's (1977) study introduces a different problem, in that her independent variable does not seem to have been given a fair test. While observing Down's syndrome children in integrated settings, Plummer was able to document trends toward higher levels of social participation, as well as trends away from bizarre behaviours. However, the behaviours that she chose to observe included "response to structured activities" and "response to direction of adults". The presence of these two factors does not necessarily compromise the accuracy of her documentation, but they do appear to indicate that physical integration was not the only independent variable in operation.

The problems that are inherent in the studies of Dunlop et al. (1980) and Peterson and Haralick (1977) are of a more serious nature, because they appear to involve data that has

not been interpreted accurately. In the summary of their results, Dunlop et al. (1980) have emphasized how the groups of handicapped and nonhandicapped children in their preschool gradually became less distinguishable due to changes in their general levels of social interaction. This "increasing homogeneity of the two groups over time" is presented as evidence of the success of physical integration as an intervention technique. The decreased levels of solitary play and the increased levels of co-operative play that were exhibited by the handicapped children seem to support the conclusions put forward by the authors. The behaviour changes that were exhibited by the nonhandicapped children, however, simply cannot be interpreted as positively. The proportion of time spent by the nonhandicapped children in solitary play activities increased until their levels of solitary play were considerably above those exhibited by their handicapped peers. At the same time, the proportion of time spent by the nonhandicapped children in co-operative interactions showed an overall decrease. Based on the available data, it would seem to be more appropriate for Dunlop et al. (1980) to argue that the strategy of physical integration led to a deterioration in the social functioning of the nonhandicapped children rather than to improved levels of social interaction between them and their developmentally delayed peers.

Following rather complicated analysis of their data, Peterson and Haralick (1977) also come to the conclusion that a group of developmentally delayed children were not socially

isolated during free play activities in their integrated preschool classroom, and that social integration did, therefore, occur. It appears, though, that the authors have used very liberal interpretations of the terms social isolation and social integration. In the first place, they have emphasized the importance of parallel play as an indicator of meaningful social interaction. Secondly, they have acknowledged the existance of a trend toward preference by the nonhandicapped children for playmates of similar abilities, particularly for complex play. Both of these factors strongly suggest that physical integration did not really generate the levels of social interaction that are indicated in Peterson and Haralick's (1977) conclusions.

Social Integration

The alternative position regarding physical integration accepts it as a necessary first step, but maintains that it is plainly inadequate for bringing about the social integration of developmentally delayed preschool children. In recent years, it has become increasingly evident that simple observation of, and even contact with, nonhandicapped peers are not enough to influence the levels of interaction or the levels of social behaviour that are exhibited by mentally handicapped preschoolers (Devoney et al., 1974; Guralnick, 1976; Hartup, 1978; Nordquist, 1978). Developmentally delayed and nonhandicapped children who are placed in integrated preschool settings tend not to interact on their own (Hughes, 1982). The handicapped children display tendencies toward

unoccupied, solitary, and onlooker behaviours, while their nonhandicapped peers spend most of their time participating in parallel, associative, and co-operative play activities Fredericks et al., 1978).

Cavallaro and Porter (1980) have provided an excellent summary of the problems that often evolve in integrated settings. Following an analysis of gaze interactions, play behaviour, selection of seat partners, and selection of game partners in an integrated preschool, they concluded: (a) that handicapped and nonhandicapped children "do not interact indiscriminately", (b) that they tend to choose "playmates whose level of cognitive functioning approximates their own", and (c) that developmentally delayed children "suffer inferior social status relative to their normally developing classmates".

## Alternative Strategies

Simply introducing nonhandicapped children into a play setting had virtually no effect on the quality of play of a heterogeneous group of handicapped children. However, when a teacher structured the setting so as to promote interactions (by arranging equipment and other prompts), a substantial increase in the proportion of associative and co-operative play was noted for virtually all of the handicapped children (Guralnick, 1978).

It is now widely recognized that physical integration

is only a preliminary stage in the overall process of integration, and that other strategies are necessary to generate and to maintain meaningful social interaction between developmentally delayed and nonhandicapped children in integrated educational settings (Apolloni & Cooke, 1974; Devoney et al., 1974). The literature is full of references to such strategies, many of which have been used successfully with preschoolers or with other very young children. Some of the more relevant techniques include:

(a) providing play materials which foster social interaction (Haralick & Peterson, 1979; Quilitch & Risley, 1973);

(b) prompting developmentally delayed children to imitate peer models in free play (Apolloni & Cooke, 1978; Ispa & Matz, 1978; Peck et al., 1978);

(c) the use of social reinforcement by adults (Fredericks et al., 1978; Ispa & Matz, 1978; Nordquist, 1978; Ross, 1970);

(d) the use of social reinforcement by nonhandicapped peers (Guralnick, 1976; Hartup, 1978; Nordquist, 1978; Sherbenou & McGuigan, 1979);

(e) the use of a nonhandicapped constant companion to "tag along", to initiate interactions, and to respond to overtures (Guralnick, 1978);

(f) the use of simple group projects and recreational activities that encourage co-operation (Apolloni & Cooke, 1974; Devoney et al., 1974; Hartup, 1978; Stainback, Stainback, & Jaben, 1980);

(g) restructuring competitive games to emphasize co-operation and to accommodate varying ability levels (Marlowe, 1979; Salend, 1980);

(h) the use of socio-dramatic play (Smith, 1977; Strain, 1975); and

(i) the use of play therapy (Bentovim, 1977; Li, 1981). While all of these techniques have been used with some success, their significance does not lie in the fact that they can be readily applied so as to guarantee maximum social interaction, in any given integrated setting. Rather, they are important for the clues they provide regarding those elements which might be common to successful intervention strategies, and which could be adapted, singly or in combination, to specific preschool settings.

## The Importance of Play

### Nonhandicapped Children's Play

Children's play begins as repetitious, undifferentiated activity during infancy, and gradually evolves into very complex forms of behaviour during middle and later childhood (Rosenblatt, 1977). Piaget's (1962) view of this progression is that it occurs in three separate, definable stages: (a) sensorimotor play, (b) symbolic play, and (c) games with rules. Sensorimotor play dominates the interval from birth to approximately two years of age, when cognitive development appears to be based primarily in physical action (Garwood, 1982). It consists, for the most part, of simple (i.e. rel-

ative to the child's developmental status) actions which are performed repeatedly for the pleasure that they provide. Symbolic play occurs from approximately two to seven years of age, and is dependent upon the ability to use mental symbols to represent experience (Garwood, 1982). With this ability comes the capacity to play games of make-believe, to base present activities on experiences from the past, and eventually to take on the roles of others. The final stage emerges around seven years of age, as children become able to accept pre-arranged rules and to control their behaviour within the imposed limits (Frost & Klein, 1979).

Piaget's analysis of children's play emphasizes the relationship that exists between play development and cognitive development. According to Piaget, children's progress through the hierarchy of play stages is predicated upon improved cognitive functioning, a conclusion that is supported by Heffernan (1980), Rosenblatt (1977), and Smilansky (1969). However, Piaget's analysis also underscores the significance of the relationship between play development and social development. As children move into and through the symbolic play stage, social interactions become progressively more important, a phenomenon that was also documented by Parten (1932). Furthermore, the trend toward more sophisticated social functioning continues into the final play stage, games with rules. Therefore, on the basis of Piaget's conclusions, it can be argued that children's play development is determined by their levels of cognitive and social functioning. More

importantly, though, it appears that play development is actually accelerated by the two factors working in combination.

As children experience greater social involvement through play, it appears that they build and refine repertoires of appropriate play behaviours by means of exploration, mutual imitation, and repeated practice (Apolloni & Cooke, 1974; Guralnick, 1978). In other words, it seems that the development of play behaviour is a function not only of maturation but also of learning. (i.e. As children play, they learn to play more effectively.) The interpretation of play behaviour as learned behaviour has been discussed with reference to both representational play (Feitelson, 1977) and social play (Hartup, 1978), and has produced important implications for cognitive-developmental approaches to education. The influence of learning on play development, particularly learning that occurs at the hands of the peer group, has contributed significantly to the conclusion that healthy group play is essential for normal human development (Apolloni & Cooke, 1974; Hartup, 1978).

Developmentally Delayed Children's Play

It has been suggested that the play behaviours of developmentally delayed and nonhandicapped preschool children show marked differences, in that the play of the handicapped group is characterized to a much greater degree by: (a) the persistance of narrow inflexible methods of exploration, (b) brief toy contacts with much undiscernable manipulation and pounding, (c) the absence of combinational use of toys,

and (d) the use of play materials in rather structured unimaginative ways (Li, 1969). More recently, however, researchers have been unable to uncover any significant differences in the play behaviour of developmentally delayed and nonhandicapped children of comparable developmental status (Odom, 1981; Rosenblatt, 1977), and these findings have led to alternative interpretations of mentally handicapped children's play. It is now widely accepted that what distinguishes developmentally delayed from nonhandicapped children is that, due to their handicap, they progress more slowly through a normal sequence of play development, but that the pattern of development is essentially the same (Mogford, 1977). Viewed in these terms, Li's (1969) catalogue of play characteristics does not support her contention that the play development of mentally handicapped and nonhandicapped children is markedly different; rather it suggests that the two groups occupy different positions on the same developmental continuum. To use Piaget's terminology, Li's assessment of developmentally delayed children's play seems to be little more than a description of children exhibiting behaviours from the sensorimotor play stage.

It has already been established that social interaction, in general, and social play, in particular, become increasingly important as children progress through the symbolic play stage and move on to games with rules. It is also true that, for those children who are unable to interact successfully, the social consequences can be very serious. For

social play to succeed, appropriate responses are necessary to continue the sequence of interaction between children (Hartup, 1978; Smith, 1977). It follows that failure to respond, or the tendency to respond inappropriately, will threaten social interaction by causing play episodes to end prematurely. Because they operate at levels of play development that are frequently below those of their nonhandicapped peers, and because, by definition, they are not able to learn appropriate responses as efficiently as their nonhandicapped peers, developmentally delayed children tend to exhibit unusually large numbers of inappropriate behaviours. This tendency to respond inappropriately, particularly when involved with nonhandicapped peers who are developmentally more advanced, is one of the main reasons why handicapped children often become the agents of their own exclusion from integrated play groups (Cavallaro & Porter, 1980).

At the preschool level, some of the problems that developmentally delayed children experience during social play can be avoided by encouraging them to interact with developmental age-mates. When children are of equivalent developmental status, it is reasonable to expect that their frequencies of response, both appropriate and inappropriate, will be very similar (Mogford, 1977; Odom, 1981; Rosenblatt,1977). However, this strategy introduces an additional problem in that it does not guarantee exposure to play behaviours that are age appropriate. Furthermore, the strategy has very limited application for older children. As the discrepancy

between developmental age and chronological age increases, play behaviours that are appropriate to the developmental age of the handicapped child become more and more inappropriate for the nonhandicapped peer group (Odom, 1981). Therefore, even at the preschool level, it appears to be most desirable to use strategies that foster interaction between mentally handicapped children and their nonhandicapped chronological age-mates.

When given the opportunity to interact with nonhandicapped peers in a controlled setting, developmentally delayed children can learn to imitate more appropriate play behaviours, including behaviours that are necessary prerequisites to more sophisticated social play (Apolloni & Cooke, 1978, Guralnick, 1976; Kaplan-Sanoff,1979; Peck et al., 1978; Plummer, 1977). Moreover, it has been established that these behaviours will persist under nontreatment conditions (Fredericks et al., 1978), and even in the absence of the nonhandicapped models (Devoney et al., 1974). For people who are concerned with the social integration of mentally handicapped children, the implications are clear. Acting either directly or through the nonhandicapped peer group, they must:

(a) maintain adequate levels of social interaction, so as to maximize the opportunities for developmentally delayed children to learn and to practice appropriate social behaviours; and

(b) teach developmentally delayed children how to keep interactions going on their own.

## Structured Play Activities

The analysis of intervention strategies, that have proven successful in stimulating social interaction between developmentally delayed and nonhandicapped children, leads to the identification of those elements that were likely responsible for the success. Once these elements have been identified, it then becomes possible to construct a model on which future intervention strategies can be based. If the process of analysis, identification, and synthesis has been carried out with care, the resulting intervention strategies ought to be that much more effective in bringing about the social integration of developmentally delayed preschool children. The model for intervention which is currently being considered has a total of six essential components, each of which is presented and discussed in the paragraphs which follow.

### Social Play

At the preschool level especially, social play must remain central to any intervention strategies that are designed to foster interaction between developmentally delayed and nonhandicapped children. Both Piaget (1962) and Parten (1932) have emphasized the importance that social development assumes as children enter their preschool years (i.e. the first part of Piaget's symbolic play stage). During this time, developing cognitive and social skills require outlets for expression and refinement, and this seems to occur most readily during periods of social play (Guralnick, 1978; Hartup,

1978). In addition, social play provides a forum for learning, allowing children to observe successful strategies that have been developed by their peers, and to incorporate those strategies into their own behaviour repertoires (Apolloni & Cooke, 1974; Guralnick, 1978; Hartup, 1978).

The fact that a great deal of social behaviour is, in fact, learned behaviour (Feitelson, 1977; Hartup, 1978) becomes particularly important when discussing the social development of the mentally handicapped. Due to their handicap, developmentally delayed children do not easily learn cognitive and social behaviours on their own. Under the right conditions, however, they can learn even complicated social behaviours very successfully, and it appears that one of the simplest and most effective means of working toward this end is through the use of social play (Apolloni & Cooke, 1978; Devoney et al., 1974; Fredericks et al., 1978; Guralnick, 1976; Kaplan-Sanoff, 1979; Peck et al., 1978; Plummer, 1977).

Behaviour Repertoire

When selecting intervention activities for use with a developmentally delayed child, Auerbach (1970) and Guralnick (1978) have both emphasized the importance of concentrating on behaviours (i.e. other than social behaviours) that are already part of the child's behaviour repertoire. This is necessary if play skill development is to be prevented from taking precedence over social development.

Purposefulness and Organization

Guralnick (1978) has also emphasized the need for inter-

vention strategies to have a well defined goal or outcome, and for them to proceed toward this goal by means of small sequential steps. Great care must be taken to keep the activities meaningful, particularly for the developmentally delayed participant.

Suitable Activities

Quilitch and Risley (1973) confirmed their hypothesis that certain play materials and toys foster social interaction, while others discourage it. With preschool children, particularly, it is necessary to guard against attempting to induce social interaction with materials that are not appropriate to the task. Of course, the same caution has to be exercised in the selection of suitable play activities. When attempting to bring about the social integration of developmentally delayed children, obviously games and activities that promote social interaction ought to be used (Salend, 1980; Stainback et al., 1980), while activities that encourage solitary play or competitiveness ought to be avoided (Marlowe, 1979).

Reinforcement

Once intervention activities are selected and put into use in preschool settings, a certain amount of reinforcement is necessary to encourage and to maintain appropriate social behaviours, on the part of developmentally delayed children. Supervising adults ought to make liberal use of social reinforcement (Ross, 1970). More importantly, though, nonhandicapped children ought to be encouraged to reinforce appropri-

ate social behaviours that are displayed by their handicapped peers (Guralnick, 1976).

Small Numbers of Participants

Implicit in many of the articles cited previously is the need to restrict participation, in any one intervention session, to a small number of children. Following his observations of preschool play groups, Smith (1977) concluded that, among three and four year olds, groups of "two children are the most common; groups of three and four children are relatively frequent"; but "groups of five are rare". It follows from Smith's conclusions that play groups of four could represent an upper limit, but that groups of two or three are probably preferable. When activities have been carefully chosen to provide adequate stimulation and to maintain a suitable level of social interaction, care must be taken to prevent developmentally delayed children from being overwhelmed by too many playmates.

## Summary

The delivery of educational services to the developmentally delayed population has shown considerable improvement in recent years, but one problem that has remained involves the continued use of segregated educational settings. As an alternative, people like Bricker (1978) have been calling for greater emphasis to be placed on the integration of the handicapped and nonhandicapped populations, and their arguments in support of this position have contributed signifi-

cantly to the introduction of many more developmentally delayed children into the educational mainstream. It has become apparent that the integration model can, in fact, be applied across virtually all levels of developmental delay; however, the success that is generated by specific intervention strategies seems to be heavily influenced by the age of the target population.

At the preschool level, it has been suggested that physical integration leads inevitably to social interaction and, therefore, to social integration, but recent research has revealed that, in most instances, this is simply not the case. Unless special strategies are employed to foster social integration, the amount of meaningful interaction that occurs between developmentally delayed and nonhandicapped children tends to remain at an absolute minimum. Like their nonhandicapped peers, developmentally delayed children have to build and refine repertoires of appropriate social behaviours through exploration, mutual imitation, and practice; unlike their nonhandicapped peers, though, developmentally delayed children appear to be unable to accomplish this, on their own, during the course of social play. Because they progress more slowly through the process of play development, and because they do not learn appropriate social behaviours as efficiently as their nonhandicapped counterparts, mentally handicapped children tend not to be able to function effectively in integrated play groups. It is for this reason that special intervention strategies become necessary.

One way to improve the social functioning of developmentally delayed preschoolers might be through the use of structured play activities. For reasons which have already been indicated, social play remains central to this particular intervention technique, but certain other factors are almost as important. For structured play activities to be effective, they must also: (a) focus on behaviours that are within the behaviour repertoires of the developmentally delayed subjects; (b) emphasize purposefulness and organization; (c) employ materials and activities that foster cooperation and other forms of positive social interaction; (d) make adequate provision for reinforcement of appropriate social behaviours; and (e) be directed toward small numbers of participants.

# CHAPTER 3 METHOD

## Subjects

Two girls, aged four years, served as subjects for the study. They were enrolled in the integrated preschool located in the Faculty of Education at the University of Manitoba. Both girls had been diagnosed as moderately to severely retarded (see Appendix C for definition). They were at a beginning language stage of development, with attempts at communication consisting of gestures combined with vocalizations. The vocalizations were, most often, beginning consonant or consonant-vowel sounds rather than complete words.

### S-1

When the present study began, S-1 was exactly four years two months of age, and quite large compared to the other children. Her delay was apparently related to an undefined neurological condition, the cause of which was not fully understood by her doctors. This condition had also affected her co-ordination, causing her movements to be somewhat "jerky". She had started to walk unassisted four weeks prior to the commencement of the study, but preferred to move around in the preschool on all fours, or by assuming a kneeling position and bouncing forward. She was still experiencing some seizuring at irregular intervals. She was enrolled in the preschool four afternoons per week.

### S-2

S-2 was exactly four years six months of age, and was

also larger than most of her peers. Her delay was apparently the result of physical trauma at birth. She had experienced some seizuring during the previous summer, and had been diagnosed as 60 to 70 per cent hearing impaired during the fall term of the year in question.

At the time of the study, both subjects lived at home with their parents in middle-class areas of the city of Winnipeg. They had neither brothers nor sisters, and they attended, each morning, an alternate preschool program for the mentally handicapped.

## Setting

The integrated preschool was under the direction of two professors from the Faculty of Education. It was staffed by three students from the Early Childhood Education program, who were responsible for providing the curriculum for the children enrolled in the preschool. It was the intention of the Early Childhood staff to provide a variety of activities, designed to contribute to the cognitive, language, motor, and social development of the preschool children. Activities varied from semi-directed during instructional sessions to self-directed (with supervision) during free play.

With respect to the delayed children, the intention was to integrate them as fully as possible into the regular preschool program, and to provide experiences (1:1 with an

instructor) which would increase their proficiency in the areas of language, cognitive functioning, social skills, and motor skills. This part of the program was the special responsibility of graduate students from the Mental Retardation program.

The total number of children in attendance on any given day varied from 16 to 24, and the average ratio of nonhandicapped to developmentally delayed children was calculated at 16:4.

## Independent Variables

### Moderator Variable: Developmental Level

The subjects' suitability for study was determined by means of a three part assessment. First, the diagnosis of the Child Development Clinic in the Health Sciences Centre indicated that, based on the Yale Developmental Schedules, both subjects were functioning in the moderate to severe range of mental retardation. Secondly, an informal language assessment indicated that the subjects were at a beginning language stage of development, communicating by means of gestures and one or two syllable vocalizations. Finally, Scale 1 of Assessment in Infancy (Uzgiris and Hunt, 1975) revealed that visual pursuit and a sense of the permanence of objects were well developed in both subjects.

Wachs and DeRemer (1978) have recently demonstrated that there is a strong relationship between the cognitive parameter of Object Permanence and social behaviour in

developmentally delayed preschoolers. Therefore, the results of Assessment in Infancy:Scale 1 (Uzgiris and Hunt, 1975) were interpreted as an indication that both subjects would probably be able to benefit from activities involving social play.

Treatment Variable: Structured Play Activities

The structured play activities employed during the study were selected to conform to the criteria described in the Operational Definitions section of the Introduction. To summarize, the activities took the form of co-operative play, associative play, or parallel play with peer modelling/tutoring; and they were characterized by simplicity, purposefulness, and small numbers of participants.

Specific activities differed for each of the subjects. Factors influencing the selection of activities included: (a) interests demonstrated by each subject during the preceding school term, (b) specific recommendations by the parents of the subjects, and (c) special considerations such as gross-motor impairment. Activities which proved to be too difficult, uninteresting, or otherwise unsuitable were immediately modified or discarded in favour of more suitable alternatives. Those activities which were eventually selected for use with each subject are listed and briefly described below. More detailed descriptions are provided in Appendix D.

S-1: Transporting and building

Activity 1. Cleaning up a mess

Activity 2. Going for water

Activity 3. Making a tent

Activity table

Activity 1. Bubble machine

Activity 2. Hide-it-find-it

Role play

Activity 1. Blanket monsters

S-2: Singing games

Activity 1. Ring Around the Rosie

Activity 2. Here We Go Round the Mulberry Bush

Throw and catch

Activity 1. Log rolling

Activity 2. Balloon game

Snack preparation

Activity table

Activity 1. Bubble machine

Activity 2. Play dough figures

Finally, in accordance with certain procedural requirements which were laid down beforehand:

(a)intervention sessions occurred approximately twice per week (i.e. For S-1, actual frequency averaged to 1.9 times per week. For S-2, actual frequency averaged to 2.5 times per week.);

(b) sessions did not occur on successive days;

(c) individual sessions lasted for a maximum of 15 minutes; and

(d) all sessions incorporated as much gestural and verbal interaction as possible.

## Dependent Variables

The overall level of social interaction was measured by means of the Integrated Preschool Interaction Schedules (Hughes, 1980), which have been included as Appendix A. Emphasis was placed on Schedule A (Level of Interaction) and Schedule B (Level of Social Behaviour). For each ten second observation interval, all observed behaviours were classified according to Schedule A as: unoccupied, solitary play, onlooker, parallel play, nonverbal to adults, nonverbal to peers, verbal to adults , or verbal to peers. The highest level of interaction that occurred during the interval was recorded. Where appropriate (i.e. for Interaction Levels 1 through 4) this behaviour was also classified according to Schedule B as either prosocial, antisocial, or neutral. At the end of each observation period, totals were calculated for each level of interaction (i.e. levels 1 through 8) and for each level of social behaviour. Each of these totals was then converted to a percentage of the total recorded interactions. Data on direction of interaction (i.e. initiating or responding) and level of communication (i.e. vocalization, one word, more than one word) were also collected. In addition, the measure included the identification of peers during verbal and nonverbal interactions.

Procedural requirements that were observed during data

collection were as follows:

(a) Observations began on January 11, 1982 and continued to March 25, 1982 for S-1, and to April 8, 1982 for S-2.

(b) All observations were conducted during free play periods.

(c) Each observation interval was of 15 seconds duration, with the final five seconds used for recording.

(d) Each observation period was of ten minutes duration.

(e) Except for the baseline phase when subjects were observed daily, each subject was observed once per day, two days per week.

(f) Observations did not occur on successive days.

(g) At least one of the observations occurred on a day during which there was no intervention session.

Single observers were employed for data collection, but observation teams of two were used at regular intervals to establish and to maintain reliability. Once particular types of interactions were counted and translated into percentages of total interactions, interobserver reliabilities were calculated using the formula:

$$\text{Interobserver Reliability} = \frac{\text{agreements}}{\text{agreements} + \text{disagreements}}$$

Reliability values which were obtained for each type of interaction were then used to calculate average values for each observation session and for the study as a whole. For S-1, interobserver reliability averaged 80 per cent for

Level of Interaction and 83 per cent for Level of Social Behaviour. For S-2, reliability averaged 86 per cent for Level of Interaction and 93 per cent for Level of Social Behaviour.

## Procedures

### Research Schedule

| | |
|---|---|
| January 4-7 | Reliability established |
| January 11 | Baseline data collection begun |
| January 25 | Intervention 1 begun |
| February 22 | Intervention 2 begun |
| March 25 | Intervention 1 terminated |
| April 8 | Intervention 2 terminated |

### Selection of Nonhandicapped Playmates

The nonhandicapped children in the preschool were defined as the "pool" of potential participants. A number of playmates were randomly selected from the class list the day before the intervention session was to take place. Immediately prior to the beginning of the intervention, target children were approached and asked to participate, until the required number of playmates was reached.

### Anecdotal Record

During the course of the intervention program, any information that was potentially useful to the study, but which was not recorded by means of the Integrated Preschool Interaction Schedules (Hughes, 1980), was entered into an anecdotal record. It was anticipated that much of this

information would be useful when intervention strategies needed to be modified and when the accumulated data was to be interpreted. Examples of such information included:

(a) attendance records;

(b) accounts of developmentally delayed children's experiences with illness, both at home and at school;

(c) responses to specific intervention activities on the part of: (i) the developmentally delayed children, (ii) the nonhandicapped peers, and (iii) the supervising adults; and

(d) descriptions of any unusual behaviours that were exhibited by the developmentally delayed children or their nonhandicapped peers during free play sessions.

## Data Analysis

The use of a multiple baseline design across subjects (Hersen and Barlow, 1976) allowed the experimental data to be analyzed for trends over time. Upward trends were defined as overall increases (i.e. relative to baseline values) in the frequencies of exhibited behaviours during the intervention phase, while downward trends were defined as overall decreases in those frequencies. Upward trends were expected in the areas of prosocial behaviour, speech and gestures to peers, and parallel play. Downward trends were expected in the areas of antisocial behaviour, speech and gestures to adults, onlooker behaviour, solitary play, and unoccupied behaviour. Of course, the attempt was made to identify and to report all relevant trends, regardless of direction or strength.

# CHAPTER 4 RESULTS

## Introduction

The data that were collected by means of the Pupil Observation Form (i.e. See Appendix B)have been presented in Table 1 (for Subject 1) and in Table 2 (for Subject 2). Weekly means were calculated for each observational category, in order to minimize the variability that was observed in the accumulated data. These mean values are based on observations which varied in number from one to four per week. (N.B. A more precise breakdown of the number of observations per subject per week is presented in Appendix E.

From Table 1, it is obvious that there were no instances of unoccupied behaviour recorded while S-1 was being observed. From Table 2, it is obvious that very few instances of unoccupied behaviour were recorded while S-2 was being observed. (Unoccupied behaviours were recorded for only two of the five weeks that made up S-2's baseline phase. During each of these two weeks, unoccupied behaviours accounted for just slightly more than one per cent of the total interactions.) Because these values were non-existant for S-1, and extremely small and localized for S-2, they were judged to be of little importance. Interaction level 8 was, therefore, dropped from further consideration.

From Table 1 and Table 2, it is also obvious that S-1 and S-2 exhibited very few social behaviours that could be classified as neutral. As a result, this category was also

Table 1

S-1: Percentage of Total Recorded Interactions in All Categories: Mean Values By Week

| | Baseline | | Intervention | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Week / Level | B-1 | B-2 | I-1 | I-2 | I-3 | I-4 | I-5 | I-6 | I-7 | I-8 |
| 1 | 8.00 | 8.75 | 10.00 | 10.00 | 6.25 | 7.50 | 11.25 | 10.00 | 16.25 | 2.50 |
| 2 | 7.00 | 9.38 | 0.00 | 2.50 | 0.00 | 2.50 | 6.25 | 1.25 | 2.50 | 2.50 |
| 3 | 14.50 | 7.50 | 27.50 | 7.50 | 12.50 | 25.00 | 27.50 | 16.25 | 6.25 | 8.75 |
| 4 | 6.35 | 9.38 | 10.00 | 5.00 | 1.25 | 13.75 | 13.75 | 3.75 | 3.75 | 8.75 |
| 5 | 15.13 | 15.63 | 5.00 | 30.00 | 36.25 | 3.75 | 15.00 | 5.00 | 0.00 | 7.50 |
| 6 | 40.63 | 38.75 | 37.50 | 30.00 | 30.00 | 37.50 | 23.75 | 55.00 | 51.25 | 65.00 |
| 7 | 8.13 | 10.63 | 10.00 | 15.00 | 13.75 | 10.00 | 2.50 | 8.75 | 20.00 | 5.00 |
| 8 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pro-social | 31.88 | 32.50 | 47.50 | 25.00 | 20.00 | 27.50 | 46.25 | 25.00 | 25.00 | 21.25 |
| Anti-social | 4.25 | 2.50 | 0.00 | 0.00 | 0.00 | 21.25 | 8.75 | 5.00 | 2.50 | 1.25 |
| Neutral | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.75 | 1.25 | 1.25 | 0.00 |

Table 2

S-2: Percentage of Total Recorded Interactions in All Categories: Mean Values by Week

| | Baseline | | | | | Intervention | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Week / Level | B-1 | B-2 | B-3 | B-4 | B-5 | I-1 | I-2 | I-3 | I-4 | I-5 | I-6 |
| 1 | 8.13 | 6.88 | 2.50 | 15.00 | 16.25 | 13.75 | 1.80 | 3.75 | 3.75 | 3.75 | 0.00 |
| 2 | 11.50 | 11.88 | 17.50 | 0.00 | 8.75 | 5.00 | 9.80 | 13.75 | 35.00 | 8.75 | 3.75 |
| 3 | 4.25 | 4.38 | 10.00 | 5.00 | 7.50 | 8.75 | 0.00 | 6.25 | 11.25 | 16.25 | 6.25 |
| 4 | 4.88 | 3.13 | 6.25 | 10.00 | 1.25 | 1.25 | 5.35 | 1.25 | 6.25 | 1.25 | 1.25 |
| 5 | 19.38 | 21.88 | 1.25 | 25.00 | 10.00 | 7.50 | 14.50 | 2.50 | 3.75 | 21.25 | 1.25 |
| 6 | 14.50 | 16.88 | 18.75 | 10.00 | 33.75 | 38.75 | 16.25 | 23.75 | 23.75 | 40.00 | 30.00 |
| 7 | 36.25 | 35.00 | 43.75 | 35.00 | 21.25 | 25.00 | 52.30 | 48.75 | 16.25 | 8.75 | 57.50 |
| 8 | 1.13 | 0.00 | 0.00 | 0.00 | 1.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pro-social | 26.38 | 26.25 | 35.00 | 25.00 | 32.50 | 21.25 | 17.00 | 18.75 | 40.00 | 16.25 | 5.00 |
| Anti-social | 2.38 | 0.00 | 1.25 | 5.00 | 0.00 | 6.25 | 0.00 | 5.00 | 13.75 | 13.75 | 6.25 |
| Neutral | 0.00 | 0.00 | 0.00 | 0.00 | 1.25 | 1.25 | 0.00 | 1.25 | 2.50 | 0.00 | 0.00 |

judged to be of little importance, and was similarly discarded.

The presentation of the data was modified in another way. For each subject, weekly means for Interaction Level 1 (i.e. speech to peers) and Interaction Level 3 (i.e. nonverbal attempts to peers) were combined to yield a single total (i.e. speech and gestures to peers). A similar procedure was followed for Interaction Level 2 (i.e. speech to adults) and Interaction Level 4 (i.e. nonverbal attempts to adults). There were two reasons for this operation. First, with both subjects functioning at a beginning language stage of development, communication attempts usually took the form of vocalizations in combination with gestures. This situation suggested the appropriateness of the combined categories. Secondly, the study was not concerned with increasing the frequency of verbal interactions, relative to nonverbal interactions. Rather, it was concerned with increasing the frequency of positive interactions, whether verbal or nonverbal, between the developmentally delayed children and their nonhandicapped peers.

Tables 3 and 4 show the weekly mean values, from the baseline phase of the study, for S-1 and S-2 respectively. In both cases, Interaction Level 8 and the category for neutral behaviours have been excluded, Interaction Levels 1 and 3 have been combined, and Interaction Levels 2 and 4 have been combined. Extreme values can be observed in the data, but for the most part, the weekly mean values in any

Table 3

S-1: Percentage of Total Recorded Interactions in Selected Categories: Mean Values by Week (Baseline Phase)

| Level \ Week | B-1 | B-2 |
|---|---|---|
| 1-3 | 22.50 | 16.25 |
| 2-4 | 13.35 | 18.76 |
| 5 | 15.13 | 15.63 |
| 6 | 40.63 | 38.75 |
| 7 | 8.13 | 10.63 |
| Pro-social | 31.88 | 32.50 |
| Anti-social | 4.25 | 2.50 |

Table 4

S-2: Percentage of Total Recorded Interactions in Selected Categories: Mean Values by Week (Baseline Phase)

| Level \ Week | B-1 | B-2 | B-3 | B-4 | B-5 |
|---|---|---|---|---|---|
| 1-3 | 12.38 | 11.26 | 12.50 | 20.00 | 23.75 |
| 2-4 | 16.38 | 15.01 | 23.75 | 10.00 | 10.00 |
| 5 | 19.38 | 21.88 | 1.25 | 25.00 | 10.00 |
| 6 | 14.50 | 16.88 | 18.75 | 10.00 | 33.75 |
| 7 | 36.25 | 35.00 | 43.75 | 35.00 | 21.25 |
| Pro-social | 26.38 | 26.25 | 35.00 | 25.00 | 32.50 |
| Anti-social | 2.38 | 0.00 | 1.25 | 5.00 | 0.00 |

given observational category are quite similar. As a result of the relative stability of this data, one other modification was made to the data presentation prior to complete analysis of the experimental results. For each category in the baseline phase, an overall mean was calculated. This strategy was used to simplify data analysis by providing one baseline mean per category, for comparison with the relevant weekly mean values from the intervention phase.

As a final step, overall means for the intervention phase were also calculated and tabulated. In this instance, though, the overall means were not intended to replace the weekly mean values; rather they were intended only to provide a supplementary source of information.

All of these modifications have been incorporated into Tables 5 and 6, which show the relevant experimental data for S-1 and S-2 respectively. To summarize:

(a) For both the baseline phase and the intervention phase: (i) data from Interaction Level 8 and the category for neutral behaviours have been excluded, (ii) data from Interaction Levels 1 and 3 have been combined, and (iii) data from Interaction Levels 2 and 4 have been combined.

(b) For the baseline phase, the overall means (i.e. one for each observational category) have been calculated and tabulated.

(c) For the intervention phase: (i) the weekly mean values in each observational category have been tabulated, and (ii) the overall means (i.e. one for each observational

Table 5

S-1: Percentage of Total Recorded Interactions in Selected Categories: Overall Means for Baseline Versus Mean Values by Week for Intervention

| | Baseline | Intervention | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Week / Level | Overall | I-1 | I-2 | I-3 | I-4 | I-5 | I-6 | I-7 | I-8 | Over-all |
| 1-3 | 19.38 | 37.50 | 17.50 | 18.75 | 32.50 | 38.75 | 26.25 | 22.50 | 11.25 | 25.63 |
| 2-4 | 16.06 | 10.00 | 7.50 | 1.25 | 16.25 | 20.00 | 5.00 | 6.25 | 11.25 | 9.69 |
| 5 | 15.38 | 5.00 | 30.00 | 36.25 | 3.75 | 15.00 | 5.00 | 0.00 | 7.50 | 12.81 |
| 6 | 39.69 | 37.50 | 30.00 | 30.00 | 37.50 | 23.75 | 55.00 | 51.25 | 65.00 | 41.25 |
| 7 | 9.38 | 10.00 | 15.00 | 13.75 | 10.00 | 2.50 | 8.75 | 20.00 | 5.00 | 10.63 |
| Pro-social | 32.19 | 47.50 | 25.00 | 20.00 | 27.50 | 46.25 | 25.00 | 25.00 | 21.25 | 29.69 |
| Anti-social | 3.38 | 0.00 | 0.00 | 0.00 | 21.25 | 8.75 | 5.00 | 2.50 | 1.25 | 4.84 |

Table 6

S-2: Percentage of Total Recorded Interactions in Selected Categories: Overall Means for Baseline Versus Mean Values by Week for Intervention

| Week / Level | Baseline | Intervention | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Overall | I-1 | I-2 | I-3 | I-4 | I-5 | I-6 | Overall |
| 1-3 | 15.98 | 22.50 | 1.80 | 10.00 | 15.00 | 20.00 | 6.25 | 12.59 |
| 2-4 | 15.03 | 6.25 | 15.15 | 15.00 | 41.25 | 10.00 | 5.00 | 15.44 |
| 5 | 15.50 | 7.50 | 14.50 | 2.50 | 3.75 | 21.25 | 1.25 | 8.46 |
| 6 | 18.78 | 38.75 | 16.25 | 23.75 | 23.75 | 40.00 | 30.00 | 28.75 |
| 7 | 34.25 | 25.00 | 52.30 | 48.75 | 16.25 | 8.75 | 57.50 | 34.76 |
| Pro-social | 29.03 | 21.25 | 17.00 | 18.75 | 40.00 | 16.25 | 5.00 | 19.71 |
| Anti-social | 1.73 | 6.25 | 0.00 | 5.00 | 13.75 | 13.75 | 6.25 | 7.50 |

category) have been calculated and tabulated.

Finally, these same data have been presented graphically in Figure 1 (for S-1) and in Figure 2 (for S-2).

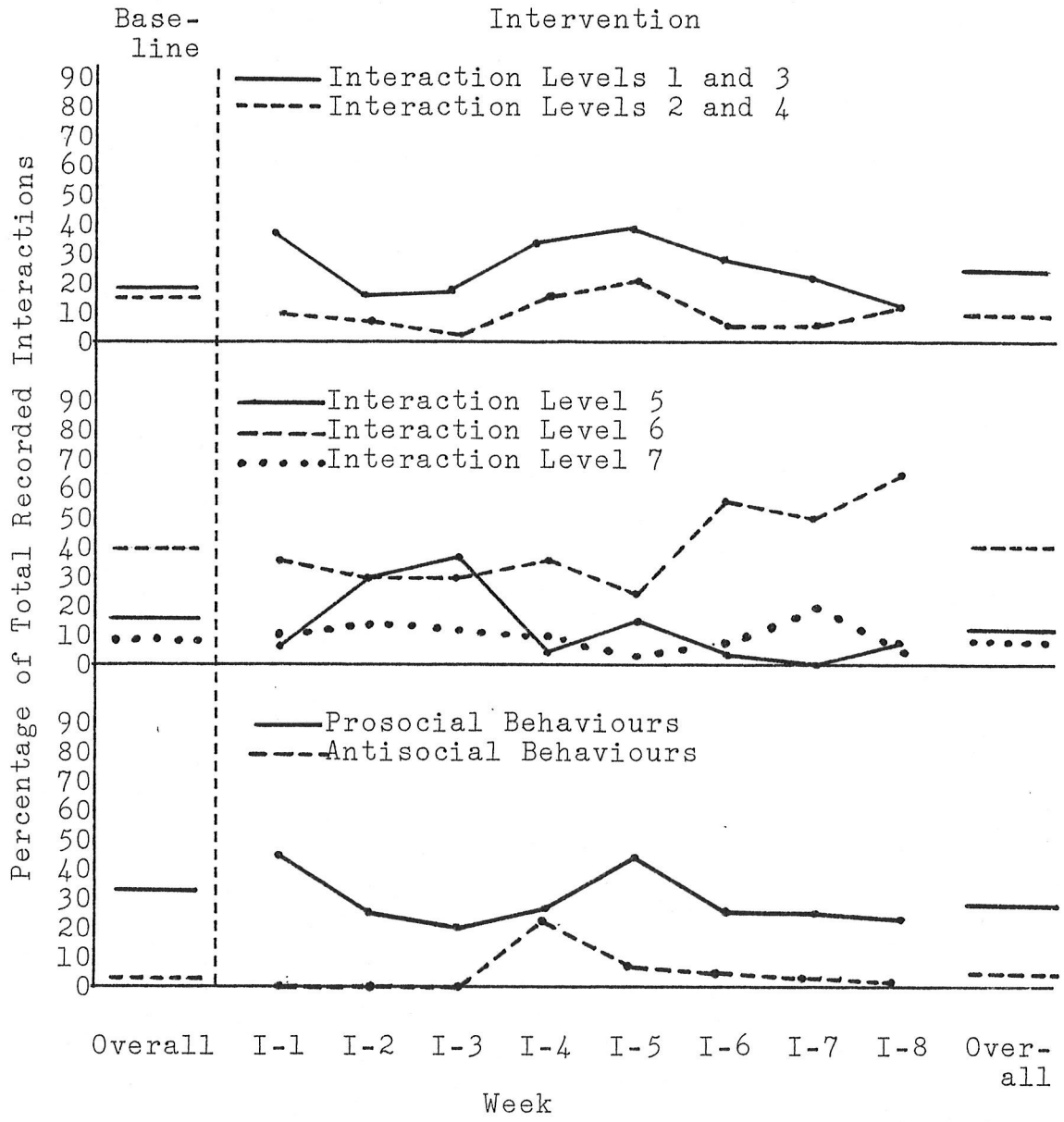


Figure 1. S-1: percentage of total recorded interactions in selected categories: overall means for baseline versus mean values by week for intervention.

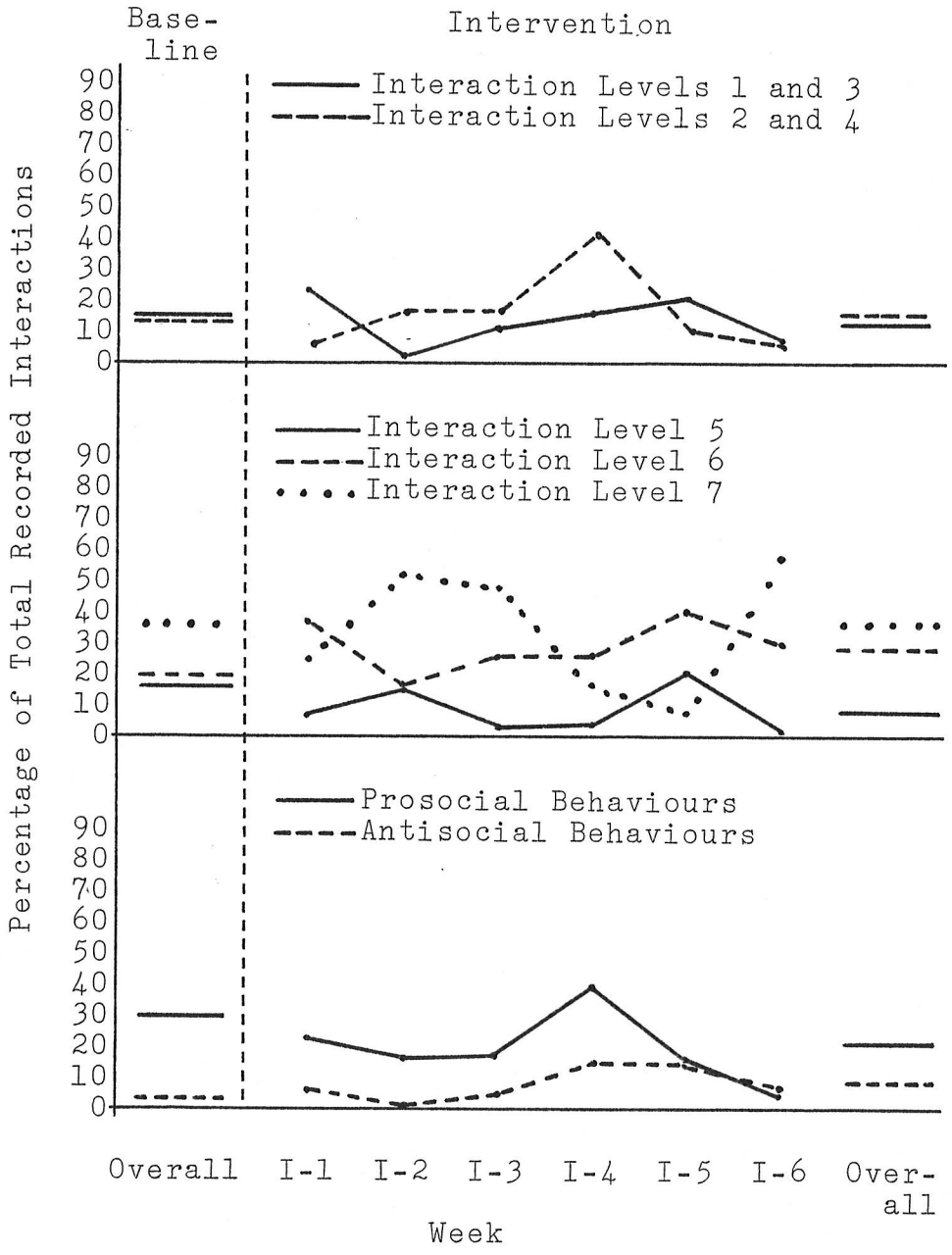


Figure 2. S-2: Percentage of total recorded interactions in selected categories: overall means for baseline versus mean values by week for intervention.

## Preliminary Consideration of the Data

For both subjects, one outstanding feature of the intervention data, presented in Tables 5 and 6, is its variability. In most observational categories, the rate of change in the mean values often varies considerably from week to week. More importantly, for most categories, the direction of change is not constant over the course of the intervention. The significance of these two factors is that, generally, the weekly mean values do not show an obvious overall increase (or decrease) during the intervention phase. Rather, increases and decreases of varying size appear to follow each other unsystematically. However, while these fluctuations in the mean values complicate the analysis of the data by masking possible trends, closer scrutiny reveals some interesting patterns, for both subjects.

### S-1

For S-1, some of the most interesting data were obtained for Interaction Level 6 (i.e. onlooker behaviour). From Week 1 to Week 5, it is possible to see a gradual overall decrease in the frequency of onlooker behaviours. This is followed by a sudden substantial increase during the final three weeks of the intervention. Two factors indicate that

this result deserves special attention: (a) the size of the initial increase, from 23.75 per cent of total interactions during Week 5 to 55 per cent during Week 6; and (b) the fact that the increase was maintained at 51.25 per cent and 65 per cent of total interactions during Weeks 7 and 8 respectively.

A number of other potentially important patterns can be observed in the data that was obtained for S-1 during the intervention phase of the study. For example, weekly mean values for Interaction Level 1/3 (i.e. speech and gestures to peers) are very high. A total of five means exceed 20 per cent of total interactions, with three of these values being in excess of 30 per cent. At the same time, weekly mean values for Interaction Level 2/4 (i.e. speech and gestures to adults) are very low. Five of these means fall between 0 per cent and 10 per cent of total interactions. Considering the two levels together reveals a third pattern. From Week 3 to Week 7, increases and decreases in the weekly mean values of Interaction Level 1/3 are matched almost exactly by the increases and decreases in the corresponding mean values of Interaction Level 2/4. Furthermore, with only one or two exceptions in each observational category, very low weekly mean values were obtained for Interaction Level 5 (i.e. parallel play), Interaction Level 7(i.e. solitary play), and Antisocial Behaviour. Finally, although six of the weekly means in the category Prosocial Behaviour fell below the baseline mean, intervention means in this

category remained quite high. Throughout the intervention phase of the study, not one of the weekly means fell below 20 per cent of total interactions.

S-2

For S-2, some of the most interesting data were obtained for the two categories included under the heading Level of Social Behaviour. The weekly mean values for the category Antisocial Behaviour are quite low from Week 1 to Week 3. However, they increase substantially (i.e. from 5 per cent to 13.75 per cent of total interactions) during Week 4, and this increase is maintained during Week 5. At the same time, the weekly mean values for Prosocial Behaviour show a marked overall decline from Week 1 to Week 6 (i.e. 21.25 per cent to 5 per cent of total interactions). In other words, over the course of the intervention, antisocial behaviours appear to increase as prosocial behaviours show a corresponding decrease.

The variability in S-2's data tends to conceal any other possible trends, but there are a few patterns that are worthy of further consideration. For example, results for Interaction Levels 1/3 (i.e. speech and gestures to peers) and 2/4 (i.e. speech and gestures to adults) show considerable overall similarity. Except for one result, weekly mean values in both categories are comparatively low, with the majority of means falling between 5 and 20 percent of total interactions. In addition, with only one exception, very low mean values were obtained for Interaction Level 5 (i.e. parallel play).

Four of the six mean values for this category fall below 10 per cent of total interactions. Finally, results for Interaction Level 6 (i.e. onlooker behaviour) show considerable variability. However, the mean values also appear to show a marked overall increase over the course of the intervention.

## Evaluation of the Hypotheses

### Hypothesis 1

> Participation in integrated structured play sessions, on the part of moderately to severely developmentally delayed preschool children, will lead to an increase in the frequency of prosocial behaviours.

S-1. For the category Prosocial Behaviour, the overall mean obtained during the baseline phase of the study is 32.19 per cent of total interactions. Except for the means from Weeks 1 and 5, all mean values from the intervention phase fall below the baseline value. In addition, the overall mean obtained during the intervention phase (i.e. 29.69 per cent) falls below the baseline value. Therefore a mild downward trend is observable in the data. For S-1, the data do not appear to support the hypothesis.

S-2. For the category Prosocial Behaviour, the overall mean obtained during tha baseline phase of the study is 29.03 per cent of total interactions. Except for the mean from Week 4,all mean values from the intervention phase fall well below the baseline value. The overall mean obtained during

the intervention phase (i.e. 19.71 per cent) also falls well below the baseline value. Therefore, a downward trend is clearly observable in the data. For S-2, the data do not appear to support the hypothesis.

Hypothesis 2

> Participation in integrated structured play sessions, on the part of moderately to severely developmentally delayed preschool children, will lead to a decrease in the frequency of antisocial behaviours.

S-1. For the category Antisocial Behaviour, the overall mean obtained during the baseline phase of the study is 3.38 per cent of total interactions. Of the eight weekly mean values that were obtained during the intervention phase, five of these means fall below the baseline value, suggesting a mild downward trend in the data. This trend is not reflected in the overall mean from the intervention phase (i.e. 4.84 per cent of total interactions), principally because the mean from Week 4 exceeds the baseline value by almost 18 percentage points, and has the effect of raising the overall intervention mean above the baseline level. Therefore, it is possible that the data might lend some support to the hypothesis.

S-2. For the category Antisocial Behaviour, the overall mean obtained during the baseline phase is 1.73 per cent of total interactions. This value is exceeded by five of the six weekly mean values from the intervention phase. In two cases (i.e. Weeks 4 and 5), the baseline value is ex-

ceeded by a considerable margin (i.e. 12.02 percentage points). In addition, the baseline value is also exceeded by the overall mean obtained during the intervention phase (i.e. 7.50 per cent). Therefore, there is evidence of an upward trend in the data. For S-2, the data do not appear to support the hypothesis.

Hypothesis 3

> Participation in integrated structured play sessions, on the part of moderately to severely developmentally delayed preschool children, will lead to an increase in the frequency of gestures and speech to peers.

S-1. For Interaction Level 1/3 (i.e. speech and gestures to peers), the overall mean obtained during the baseline phase of the study is 19.38 percent of total interactions. This value is exceeded by five of the eight weekly mean values from the intervention phase. In the case of Week 1, Week 4, and Week 5, the baseline value is exceeded by 18.12, 13.12, and 19.37 percentage points respectively. The baseline value is also exceeded by the overall mean obtained during the intervention phase (i.e. 25.63 per cent). Therefore, there is evidence of an upward trend in the data. For S-1, the data might lend some support to the hypothesis.

S-2. For Interaction Level 1/3 (i.e. speech and gestures to peers), the overall mean obtained during the baseline phase of the study is 15.98 per cent of total interactions. Except for the means from Weeks 1 and 5, all mean values from the intervention phase fall below the baseline value. The overall mean obtained during the intervention

phase (i.e. 12.59 per cent) also falls below the baseline value. Therefore, there is evidence of a mild downward trend in the data. For S-2, the data do not appear to support the hypothesis.

Hypothesis 4

> Participation in integrated structured play sessions, on the part of moderately to severely developmentally delayed preschool children, will lead to a decrease in the frequency of gestures and speech to adults.

S-1. For Interaction Level 2/4 (i.e. speech and gestures to adults), the overall mean obtained during the baseline phase of the study is 16.06 per cent of total interactions. Except for the means for Weeks 4 and 5, all mean values from the intervention phase fall well below the baseline value. The overall mean obtained during the intervention phase (i.e. 9.69 per cent) also falls well below the baseline value. Therefore, a downward trend is clearly observable in the data. For S-1, the data might lend some support to the hypothesis.

S-2. For Interaction Level 2/4 (i.e. speech and gestures to adults), the overall mean obtained during the baseline phase of the study is 15.03 per cent of total interactions. Of the six weekly mean values that were obtained during the intervention phase, three of these means are considerably lower than the baseline value, while two of the means equal it almost exactly. On the basis of these results, it seems reasonable to suggest that a downward trend is ob-

servable in the data. This trend is not reflected in the overall mean from the intervention phase, largely because the mean from Week 4 exceeds the baseline value by more than 26 percentage points, and has the effect of raising the overall intervention mean to the baseline level. For S-2, therefore, it is possible that the data might lend some support to the hypothesis.

Hypothesis 5

> Participation in integrated structured play sessions, on the part of moderately to severely developmentally delayed preschool children, will lead to an increase in the frequency of parallel play behaviours.

S-1. For Interaction Level 5 (i.e. parallel play), the overall mean obtained during the baseline phase of the study is 15.38 per cent of total interactions. Except for the means from Weeks 2 and 3, all mean values from the intervention phase fall below the baseline value. The overall mean obtained during the intervention phase (i.e. 12.81 per cent) also falls below the baseline value. Therefore, a mild downward trend is observable in the data. For S-1, the data do not appear to support the hypothesis.

S-2. For Interaction Level 5 (i.e. parallel play), the overall mean obtained during the baseline phase of the study is 15.50 per cent of total interactions. Except for the mean from Week 5, all mean values from the intervention phase fall below the baseline value. Because of especially low values for Weeks 1, 3, 4, and 6, the overall mean obtained

during the intervention phase (i.e. 8.46 per cent) falls well below the baseline value. Therefore, a downward trend is clearly observable in the data. For S-2, the data do not appear to support the hypothesis.

Hypothesis 6

> Participation in integrated structured play sessions, on the part of moderately to severely developmentally delayed preschool children, will lead to a decrease in the frequency of onlooker behaviours.

S-1. For Interaction Level 6 (i.e. onlooker behaviour), the overall mean obtained during the baseline phase of the study is 39.69 per cent of total interactions. The mean values for the first five weeks of the intervention phase all fall below the baseline value. However, the mean values for Weeks 6, 7, and 8 exceed the baseline value by 15.31, 11.56, and 25.31 percentage points respectively. Therefore, two distinct "trends" are observable in the data, an initial downward trend followed by a strong upward trend. A comparison of the mean for the final three weeks of the intervention phase (i.e. 57.08 per cent) with the mean for the initial five weeks of the intervention phase (i.e. 31.75 per cent) suggests that the upward trend is the stronger of the two. As a result, it seems reasonable to suggest that the data do not appear to support the hypothesis.

S-2. For Interaction Level 6 (i.e. onlooker behaviour), the overall mean obtained during the baseline phase of the study is 18.78 per cent of total interactions. This value

is exceeded by five of the six weekly mean values from the intervention phase. The baseline value is also exceeded by the overall mean obtained during the intervention phase (i.e. 28.75 per cent). Therefore, there is evidence of an upward trend in the data. For S-2, the data do not appear to support the hypothesis.

Hypothesis 7

> Participation in integrated structured play sessions, on the part of moderately to severely developmentally delayed preschool children, will lead to a decrease in the frequency of solitary play behaviours.

S-1. For Interaction Level 7 (i.e. solitary play), the overall mean obtained during the baseline phase of the study is 9.38 per cent of total interactions. Five of the mean values from the intervention phase fall within five percentage points of the baseline value. In addition, the overall mean obtained during the intervention phase (i.e. 10.63 per cent) exceeds the baseline value by only 1.25 percentage points. Therefore, there is no evidence of any trend in the data. For S-1, the data do not appear to support the hypothesis.

S-2. For Interaction Level 7 (i.e. solitary play), the overall mean obtained during the baseline phase of the study is 34.25 per cent of total interactions. The extreme variability of the data from the intervention phase (i.e. Range= 48.75 percentage points) makes any comparison of the weekly mean values with the baseline value very difficult. However,

the overall mean obtained during the intervention phase (i.e. 34.76 per cent) is almost exactly equal to the baseline value. Therefore, there is no evidence of any trend in the data. For S-2, the data do not appear to support the hypothesis.

# CHAPTER 5 DISCUSSION OF THE RESULTS

## S-1

### Introduction

Table 7 presents a portion of the experimental results that were obtained for S-1. It represents a summary of the hypothesis evaluation section from Chapter 4.

Table 7

Summary of Hypothesis Evaluation for S-1

| Hypothesis | Results |
|---|---|
| $H_1$ (i.e. prosocial) | - |
| $H_2$ (i.e. antisocial) | * |
| $H_3$ (i.e. speech and gestures to peers) | * |
| $H_4$ (i.e. speech and gestures to adults) | * |
| $H_5$ (i.e. parallel play) | - |
| $H_6$ (i.e. onlooker behaviour) | - |
| $H_7$ (i.e. solitary play) | - |

Note. *indicates that some support for the hypothesized relationship is observable in the data.

- indicates that no support for the hypothesized relationship is observable in the data.

From this table, it is obvious that three of the hypothesized relationships (i.e. $H_2$, $H_3$, and $H_4$) received some support from data that was obtained during the intervention phase of the study. It is also obvious that, in the remaining cases,

support for the hypotheses failed to materialize. This situation makes it very difficult to confirm the existance of a relationship between structured play activities and S-1's general level of social interaction; however, it is also not possible to deny the existance of such a relationship. An important consideration,in this regard, involves the presence of certain extraneous factors which may have contributed to the apparent lack of correspondence between the treatment variable and the dependent variables. These factors include: (a) the briefness of the intervention period, (b) seizuring, and (c) gross-motor impairment.

Duration of the intervention period. Systematic changes in the dependent variables under consideration would have to reflect changes in attitudes and related behaviours. This implies a gradual process, unlike the simpler stimulus-response relationships that frequently characterize single case studies. The intervention phase for S-1 spanned eight weeks. The possibility exists that this period of time was too brief. Perhaps a study lasting a full school year (i.e. 25 to 30 weeks or longer) would have been more effective. Over a longer term, it is possible, for example, that the fluctuations in the data might have become less pronounced, and that any relationship between the treatment variable and the dependent variables might have become more apparent.

Seizuring. Another factor emerged as result of S-1's medical condition. During the middle of the second week of intervention, she experienced severe seizuring. This was

characterized, in part, by extreme muscle rigidity. During the course of the following week, her condition slowly improved as her muscles relaxed, and she was able to return to the preschool at the end of this period. However, the effects of this experience were two-fold. First, the intervention phase was further shortened by a full week. Secondly, it took some time for S-1 to return to an optimal level of functioning. The after effects of her seizuring were strongly in evidence until the end of the fifth week of the intervention. This was most noticable in:

(a) S-1's reduced motor activity, characterized by a tendency to sit or lie in one place for prolonged periods;

(b) her tendency to slouch forward when sitting;

(c) her increased drooling; and

(d) her general slowness of response.

As a result of this unexpected turn of events, it seems reasonable to suggest that S-1 was not as sensitive to the treatment variable as she might have been, had seizuring not emerged as a problem.

Gross-motor impairment. The single most important factor affecting S-1's general level of social interaction was likely her gross-motor impairment. Because she moved about by crawling, by bouncing forward on her knees, or by walking while holding on to various supports, S-1 travelled much more slowly than the other children. In addition, she had great difficulty using those activity areas which required the ability to climb, either up and down (e.g. the climbing

frame) or in and out (e.g. the shape box). During intervention sessions, when the selection of activities and the movements of the co-operating peers could be controlled, S-1 was able to interact quite successfully. During free play, though, when the children's activities became more energetic, with frequent changes of location, S-1 was repeatedly "left behind". This situation occurred even more frequently following her seizuring, when S-1's gross-motor control was even more severely impaired. Once again, it seems reasonable to suggest that this problem with gross-motor control influenced the treatment-dependent variable relationship to at least some degree, and that this influence was likely negative.

Improved Social Functioning

The attempt to improve S-1's general level of social interaction, within the preschool setting, provided the focus for the present study. Although support for four out of seven of the minor hypotheses failed to materialize, there is evidence in the data that some improvement was beginning to take place. Those areas which provided the strongest evidence of improved social functioning have been indicated in Tables 5 and 7.

(a) The upward trend in the data for Interaction Level 1/3 indicates that S-1 experienced a greater degree of involvement with her peer group during the course of the intervention.

(b) The downward trend in the data for Interaction Level 2/4 indicates that she experienced decreased involve-

ment with adults.

(c) The analysis of trends in the data for antisocial behaviours has indicated the distinct possibility of improvement in this area.

In each of these cases, the trend in the data is not strong. However, when all three areas are taken together, they do seem to indicate a re-orientation toward the peer group, and some improvement in S-1's general level of social interaction.

For the remaining levels of interaction and social behaviour, there are features in the data which might be relevant to the question of improved social functioning, even though the overall trends in the data for these areas do not support the hypothesized relationships. For example:

(a) During the first five weeks of the intervention, there was a definite downward movement in the frequency of onlooker behaviours.

(b) Throughout the intervention, the frequency of solitary play behaviours remained very low.

(c) Throughout the intervention, the frequency of prosocial behaviours remained very high.

It is possible that the conclusion regarding improved social functioning might be reinforced, at least to some degree, by these three factors.

Parallel Play Behaviour

With S-1, it was hypothesized that exposure to integrated play groups would lead to an overall increase in the

frequency of parallel play behaviours. In fact, this did not occur. During the intervention phase of the study, parallel play behaviours decreased to levels which were considerably below baseline values. Observations included in the anecdotal record offer a possible explanation for this occurrance. With S-1, it was observed that proximity to a peer group invariably led to verbal and/or nonverbal overtures being directed toward the other children. In other words, in most instances, S-1 did not participate in parallel play activities. Given a group of children playing in her vicinity, S-1 appeared to prefer functioning at the level of speech and gestures. It seems very likely that this is one more indication of the extent to which S-1 was becoming peer oriented.

Onlooker Behaviour

One of the strongest trends in S-1's data was found in the area of onlooker behaviour. At the outset of the study, it was hypothesized that involvement with integrated play groups would lead to an overall decrease in the frequency of these behaviours. During the first five weeks of the intervention, this is exactly what happened. Weekly mean values for Interaction Level 6 declined from 37.50 per cent to 23.75 per cent of total interactions. However, with Week 6, the mean increased to 55 per cent of total interactions, and remained at 51.25 per cent and 65 per cent of total interactions for Weeks 7 and 8 respectively. A reasonable explanation for this development was not hard to find.

The extent to which S-1's ability to interact with her peers was influenced by her gross-motor impairment (and by her seizuring) has been described in some detail. Physically, she was unable to keep up with her more mobile playmates, who could move much more quickly and who could climb to reach preferred play areas. As a result, it seems reasonable to suggest that the combined influence of her gross-motor impairment and her seizuring might provide an explanation for the high levels of onlooker behaviour that were documented during the intervention phase. S-1 seems to have been strongly oriented to the activities of her peers, but because she was unable to move as skillfully as they were,it is quite possible that her level of interaction was unintentionally restricted, for a proportion of the time, to looking on. It is also possible that the tendency of the other children to leave S-1 to her own resources as the intervention phase proceeded, might have led to the dramatic increase in the amount of time that she was forced to spend watching them play.

## S-2

### Introduction

Table 8 presents a portion of the experimental results that were obtained for S-2. It represents a summary of the hypothesis evaluation section from Chapter 4.

Table 8

Summary of Hypothesis Evaluation for S-2

| Hypothesis | Results |
|---|---|
| $H_1$ (i.e. prosocial) | - |
| $H_2$ (i.e. antisocial) | - |
| $H_3$ (i.e. speech and gestures to peers) | - |
| $H_4$ (i.e. speech and gestures to adults) | * |
| $H_5$ (i.e. parallel play) | - |
| $H_6$ (i.e. onlooker behaviour) | - |
| $H_7$ (i.e. solitary play) | - |

Note. * indicates that some support for the hypothesized relationship is observable in the data.

- indicates that no support for the hypothesized relationship is observable in the data.

From this table, it is obvious that only one of the hypotheses received any support from the data that was obtained during the intervention phase of the study. As a result, it is not possible to confirm the existance of any relationship between structured play activities and S-2's general level of social interaction. However, before denying the existance

of such a relationship, it is necessary to consider the presence of two extraneous factors, which may have contributed to the apparent lack of correspondence between the treatment variable and the dependent variables. These two factors are: (a) the briefness of the intervention period, and (b) S-2's auditory impairment.

Duration of the intervention period. In the case of S-1, it was suggested that the duration of the intervention phase might have been too brief. Changes in attitudes and behaviours might not have had sufficient time to occur. In S-2's case, this must also be considered as a possibility, as her intervention phase was even shorter, spanning only six and one half weeks.

Auditory impairment. The other factor which possibly influenced the relationship between the treatment variable and the dependent variables was S-2's auditory handicap. The degree of hearing loss had been estimated at 70 per cent, but this did not include an assessment of what sounds, if any, S-2 was not able to detect. While the quality of the information that was being received by S-2 was not known, it seems reasonable to assume that it was not at a normal level. This situation could only have had a negative effect on S-2's general level of social interaction.

Of course, attempts were made to compensate for S-2's auditory handicap, but these attempts frequently generated additional problems. At one point, S-2 was fitted with double hearing aids, which worked satisfactorily most of the time,

but which also malfunctioned periodically. When one or other of the aids malfunctioned, it did so by emitting a high pitched squeal. S-2's response to this situation was to remove one or both of the hearing aids and to throw them away. Fitting S-2 with a Phonic Ear solved the problem of the squealing aids, but there was no question that the newer bulkier apparatus served as a distraction, at least for the first three or four sessions during which it was worn. Consequently, there is little doubt that, for S-2, the net result was a sizable decrease in the effective intervention time.

Social Behaviour

During the intervention phase of the study, S-2 experienced some problems in the area of general social functioning. An upward trend is clearly observable in the data for Antisocial Behaviour. During Weeks 4 and 5, the frequency of S-2's antisocial behaviours (i.e. principally pinching, hitting, and pushing) reached 13.75 per cent of total interactions, a value that is considerably above the one that was obtained for baseline. In point of fact, the data tend not to reflect the true seriousness of the situation, for two reasons. In the first place, they do not indicate the intensity of some of the behaviours. (Because of her larger size and superior strength, S-2 was able to cause a considerable number of upsets and tumbles.) Secondly, they do not indicate the number of times that antisocial behaviours were repeated during any given observation interval.

The appearance of these behaviours and their escalation had a very important effect on the other children and on the study as a whole. The reaction of the children quickly became one of avoidance, as evidenced by: (a) their leaving play areas when S-2 arrived, (b) their refusing to sit beside her at the activity or snack tables, and (c) their refusing to participate in the intervention sessions with her. Naturally, as these patterns of avoidance became more firmly established among the nonhandicapped children, any improvement in S-2's general level of social interaction became a virtual impossibility. Eventually the avoidance behaviours became so strong and so prevalent that the intervention phase had to be terminated prematurely.

Attempting to establish a reason for the appearance of S-2's negative behaviours is extremely difficult. It is possible that this method of interaction was one aspect of a completely normal stage of development. The behaviours were certainly inappropriate, but they did not seem to be malicious. They were frequently accompanied by intense scrutiny of the injured party, vocalizations, and occasional laughter. Ames and Ilg (1976a) refer to "experimental aggression" being used by children with "immature and unpractised social abilities". They suggest that this form of aggression represents an effort, on the part of these children, to investigate the extent of their influence on their environment. Ames and Ilg (1976b) also refer to the appearance of aggression as an extension of the young child's sense of humour. Both of these

explanations could easily apply to the behavioural pattern that was being exhibited by S-2 during the latter half of her intervention phase.

Parallel Play, Onlooker Behaviour, and Solitary Play

The avoidance behaviours that emerged, on the part of the nonhandicapped children in the preschool, might have influenced the sort of data that was collected for Interaction Level 5 (i.e. parallel play), Interaction Level 6 (i.e. onlooker behaviour), and Interaction Level 7 (i.e. solitary play). With S-2, there is no question that parallel play situations frequently generated antisocial gestures. When these behaviours appeared, the nonhandicapped children in S-2's vicinity usually responded by leaving the area. Repeated often enough, these occurrances should have resulted in decreased levels of parallel play on the part of S-2. In fact, the data for Interaction Level 5 (i.e. parallel play) conforms exactly to this pattern, as a downward trend is clearly observable. In addition, the fact that S-2 was being left alone more and more frequently, over the course of the intervention, might provide at least part of the explanation for: (a) the upward trend that is clearly observable in the data for Interaction Level 6 (i.e. onlooker behaviour), and (b) the extremely high values that can be seen in the data for Interaction Level 7 (i.e. solitary play).

Speech and Gestures to Peers and Adults

The downward trend in the data for Interaction Level 2/4 (i.e. speech and gestures to adults) appears to indicate

that S-2 experienced decreased involvement with adults during the course of the intervention. However, the mildness of the trend suggests that this might not be the most significant aspect of this particular group of data. The results that were obtained for Interaction Level 1/3 (i.e. speech and gestures to peers) and Interaction Level 2/4 (i.e. speech and gestures to adults): (a) contained values that were comparatively low (i.e. overall mean values of 12.5 to 16 per cent of total interactions), (b) showed very little change over the course of the intervention, and (c) showed considerable similarity over the two interaction levels (i.e. overtures to peers and overtures to adults). This could be interpreted as meaning: (a) that speech and gestures to peers and adults were less important to S-2 than other forms of interaction (i.e. solitary play and onlooker behaviour), and (b) that little distinction was made between peers and adults, as objects of social overtures. Under the circumstances, though, one has to wonder to what extent S-2's hearing impairment influenced the results for these particular levels of interaction.

## Summary

For S-2, the use of structured play activities does not appear to have been very effective in improving her level of interaction or her level of social behaviour. The main problem appears to have been the appearance of various antisocial behaviours, the frequency and intensity of which seem to have

given rise to significant avoidance behaviours, on the part of S-2's nonhandicapped peers. An obvious solution to this problem seems to be the substitution of prosocial behaviours for the antisocial ones. However, the possibility exists that the real problem was linked to S-2's auditory impairment. If this is the case, it would seem that a whole new instructional strategy is called for.

For S-1, the use of structured play activities appears to have been somewhat effective in improving her level of interaction and her level of social behaviour. However, problems related to her gross-motor impairment seem to have counteracted the influence of the intervention strategy. In order to compensate for her lack of mobility, supplementary strategies might have been useful. Examples of such strategies could have included:

(a) the creation of free play activities around S-1, which might have caused her nonhandicapped peers to gravitate to her; and

(b) the restructuring of the environment so as to have guaranteed S-1 ease of access to all play areas.

## Conclusions

The present study was designed to investigate the relationship between participation in selected structured play activities and the social functioning of two moderately to severely developmentally delayed children in an integrated preschool. For the existance of this relationship to have

been confirmed, two requirements were necessary: (a) the majority of minor hypotheses ought to have been supported by readily apparent trends in the data; and (b) the documented trends ought to have been apparent across both subjects. From the data that were accumulated during the course of the study, it is clear that these requirements were not met. For S-1, only three of the minor hypotheses were supported by trends in the data; while, for S-2, only one of the hypotheses gained any measure of support. Moreover, even in those instances where support can be demonstrated, the evidence is, at best, very weak.

Of course, it is possible that the attempt to document the relationship between structured play activities and the social functioning of S-1 and S-2 was confounded by those extraneous factors which have been described in some detail. The briefness of the intervention phase, the presence of secondary handicapping conditions in the form of gross-motor and auditory impairments, and the onset of seizuring may have influenced the experimental results. However, the possibility also exists that the general lack of success that was observed in the present study can be related to the severity of the handicapping conditions. In other words, the structured play activities that were used might have been inappropriate for children functioning in the moderate to severe range of developmental delay.

The specific reasons for the failure to document the hypothesized relationship will have to be made the focus of

future research. In the meantime, it must be emphasized that structured play activities, as they were described and used in the present study, were not very effective in improving the level of interaction or the level of social behaviour of the two developmentally delayed subjects. As a result, it is not yet possible to lend any support to the hypothesis that structured play activities can prove useful in fostering social interaction between moderately to severely developmentally delayed preschool children and their nonhandicapped peers. Furthermore, until this relationship can be more clearly identified by researchers, it is similarly not possible to suggest that structured play activities can be an effective means of bringing about the social integration of moderately to severely developmentally delayed preschool children.

## Recommendations

There is no question that the present study failed to document the hypothesized relationship between the treatment and the dependent variables which were under consideration. However, the successful use of similar strategies with other groups of developmentally delayed children, the presence of the extraneous factors which were mentioned previously, and the evidence of improved social functioning in some of the data from the present study, all suggest that structured play activities should not yet be dismissed as an intervention technique. With minor modifications, the structured play

activities that were employed in the present study might still prove useful in helping to bring about the social integration of moderately to severely developmentally delayed preschoolers. Modifications to the intervention strategy from the present study could include some or all of the following supplementary techniques:

(a) The substitution of appropriate behaviours for inappropriate ones could be carried out according to the following pattern: (i) practice with the subject in isolation,

(ii) development with one or two peer tutors,

(iii) further practice during structured play sessions, and

(iv) performance in the preschool under conditions of minimal control.

(b) Strategies such as Human Differences Training (Stainback et al., 1980) could be used to teach the nonhandicapped peer group understanding of various handicapping conditions, as well as acceptance of specific inappropriate behaviours.

(c) Most importantly, specific strategies could be devised and implemented so as to help compensate for any secondary handicapping conditions. This might be as simple as moving furniture, or it might be as complex as moving in a whole new technology, such as the one that is currently being used in the teaching of the hearing impaired.

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# Appendix A: Integrated Preschool Interaction Schedules

## Schedule A: Level of Interaction

| Behaviour | Code |
|---|---|
| Speech attempts to peers | 1 |
| Speech attempts to adults | 2 |
| Nonverbal attempts to peers (i.e. gestures, facial expressions) | 3 |
| Nonverbal attempts to adults | 4 |
| Interaction with others, toys (i.e. in parallel play) | 5 |
| Interaction with others, toys (i.e. as onlooker) | 6 |
| Interaction with self, toys (i.e. solitary play) | 7 |
| Unoccupied (i.e. includes crying, etc.) | 8 |

## Schedule B: Level of Social Behaviour

| Behaviour | Code |
|---|---|
| Prosocial interactions | P |
| Antisocial interactions (i.e. includes inappropriate) | A |
| Neutral interactions | N |

Schedule C: Direction of Interaction

| Behaviour | Code |
|---|---|
| Initiates the interaction | i |
| Responds to the interaction | r |

Schedule D: Level of Communication

| Behaviour | Code |
|---|---|
| Speech attempts of more than one word (i.e. sentences, phrases, etc.) | S |
| Speech attempts of one word | W |
| Speech attempts involving only vocalizations | V |

## Appendix B: Integrated Preschool

## Pupil Observation Form

Subject: _____ Recorder: _____

Project No.: _____ Time Ended: _____

Date: _____ Time Started: _____

Duration: _____

| Level of Interaction | Code | Tally | Percentage |
|---|---|---|---|
| Speech attempts to peers | 1 | | |
| Speech attempts to adults | 2 | | |
| Nonverbal attempts to peers | 3 | | |
| Nonverbal attempts to adults | 4 | | |
| Interaction with others, toys (in parallel play) | 5 | | |
| Interaction with others, toys (as onlooker) | 6 | | |
| Interaction with self, toys (solitary play) | 7 | | |
| Unoccupied (includes crying) | 8 | | |
| Total | | | |
| Interactions directed to D-D children | | | |
| Interactions directed to N-H children | | | |

| Social Behaviour | Code | Tally | Percentage |
|---|---|---|---|
| | P | | |
| | A | | |
| | N | | |

| Direction | | |
|---|---|---|
| | i | |
| | r | |

| Communication | | |
|---|---|---|
| | S | |
| | W | |
| | V | |

## Appendix C: Mental Retardation Defined

The definition of mental retardation that has been used during the course of the present study is the revised definition that was adopted by the American Association on Mental Deficiency (AAMD) in 1973. This definition states:

> Mental retardation refers to significantly subaverage general intellectual functioning existing concurrently with deficits in adaptive behaviour, and manifested during the developmental period (Grossman, 1973, p.11).

The phrase "adaptive behaviour" refers to skills which are age- and situation-specific, and which are, therefore, difficult to define in general terms. However, the phrase "significantly subaverage general intellectual functioning" refers specifically to performance on a standardized test of intelligence, which is at least two standard deviations below the mean.

## Appendix D: Structured Play Activities

S-1

Transporting and building.

Activity 1. Cleaning up a mess

S-1 and a playmate were required to push a wagon to scattered piles of toys. They had to pick the toys up and pass them to a third playmate who placed them in the wagon. They then returned the toys to the proper area in the preschool.

Activity 2. Going for water

S-1 and two playmates pushed a wagon to a nearby tap, filled a container with water, and returned the container to the preschool. They usually took turns being pushed to and from the room.

Activity 3. Making a tent

S-1 and her playmates helped an instructor to make a tent using a blanket, four chairs, and some oversize wooden blocks. They then played games (e.g. Peek-a-boo; Make-believe) using the tent as a locus.

Activity Table.

Activity 1. Bubble machine

S-1 and two playmates played with a commercial bubble mixture. They made bubbles by blowing into a wand, waving the wand, and holding the wand in front of an electric fan. During the second part of the activity, the two playmates tried catching the bubbles being made by S-1.

Activity 2. Hide-it-find-it

Presented with three identical boxes, S-1 and her playmates had to guess which one contained the hidden toy. Various strategies were employed to simplify the process of discovery.

Role play.

Activity 1. Blanket monsters

Placing their hands on the shoulders of the person in front, S-1 and her playmates formed a line. After being covered by a blanket, they walked around the preschool, making ferocious noises and causing their classmates to squeal with delight.

S-2

Singing games.

Activity 1. Ring Around the Rosie

S-2 and two playmates performed the activity using the traditional movements.

Activity 2. Here We Go Round the Mulberry Bush

For this activity, S-2 and her playmates substituted familiar, easily performed movements (e.g. hand clapping, head shaking, foot stamping) for the traditional movements.

Throw and catch.

Activity 1. Log rolling

S-2 and a playmate played "catch" by rolling a cylindrical object back and forth, from one to the other.

Activity 2. Balloon game

Seated in a circle, S-2 and two playmates played catch using a balloon instead of a ball.

Snack preparation.

At regular intervals, S-2 and her playmates were required to help with the preparation of the afternoon snack. They practiced mixing ingredients (e.g. Jello or pudding) and pouring liquids (e.g. juice, milk, or water).

Activity table.

Activity 1. Bubble machine

This activity was identical to that described for S-1.

Activity 2. Play dough figures

S-2 and two playmates made a variety of objects using the available supply of play dough.

## Appendix E

Table A

Number of Observation Periods Per Subject

Per Week Over the Course Of the Study

| Subject \ Week | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S-1 | 4 | 4 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | - |
| S-2 | 4 | 4 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

From the above table, it can be seen that, for each of the first two weeks of the study, each subject was observed four times. During the third week of the study, there was one observation period for S-1 and two observation periods for S-2. For the fourth week of the study, each subject was observed only once, but during the remaining weeks, there were two observation periods per subject per week. In addition, it can be seen that S-1's involvement in the study lasted for a total of ten weeks, while S-2's involvement lasted for a total of eleven weeks.