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UNIVERSITY OF ALBERTA

THE COMMUNICATIVE PATTERNS OF A PRESCHOOL SPECIAL CHILD IN A MAINSTREAMED VERSUS A REVERSE INTEGRATED SETTING

BY

ELSIE TAN

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

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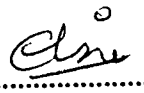

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled "The communicative patterns of a preschool special child in a mainstreamed versus a reverse integrated setting" submitted by Elsie Tan in partial fulfillment of the requirements for the degree of Master of Education in Special Education.

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Date: July 19, 1991

ABSTRACT

The influence of two models of integration on the communicative patterns of one child was examined. Video recordings were made as the four-and-a-half-year-old boy with Down syndrome engaged in free play in a mainstreamed day care center and a reverse integrated preschool. The data was subsequently coded and analyzed in terms of general interaction patterns, interactions with peers, and interactions with adults.

In terms of his total communication, the child behaved in a similar manner in the two settings. The number of interactions, their durations, and the patterns of communicative intents all showed little difference. In both settings, the child's primary modes of communication were gestures and a combination of gesture and vocalization. Speech was rare but was slightly more evident in the mainstreamed setting. There were more initiations in the reverse integrated setting, although the difference was not statistically significant.

Significant differences were found when the child's interactions with peers in the two settings were compared. Peer interactions in the mainstreamed setting were more sustained as measured by number of turns. The child engaged in more communicative acts with his peers in the mainstreamed setting and a larger proportion of these were positive. However, a contrasting pattern was observed in the communicative acts directed by peers in the two settings towards the child. While peers in the mainstreamed setting directed significantly more communicative acts towards the child, more than 60% of these acts consisted of "Protests" and "Demands." Proportionately more positive acts were displayed by peers in the reverse integrated setting. When patterns of initiations were studied, it was found that the child's initiations in the reverse integrated setting (73.9% negative; 26.1% positive) was almost an exact copy of the initiations of peers in the mainstreamed

setting (75% negative; 25% positive). It is believed that the initiation patterns reflect the child's relative social status in the two settings.

Interactions with adults made up about half of all the child's interactions in each of the two settings. The nature of the interactions were highly similar and almost half of all adult communications consisted of questions and other requests which reflect the instructional approach in the interactions of adults with the child.

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I. INTRODUCTION

A. Background of the problem

Preschool integration or the education of young disabled children with their normally developing peers has become an ideal much sought after by parents and professionals who believe in the principle of normalization. This principle can be defined as the "utilization of means which are as culturally normative as possible, in order to establish and/or maintain personal behaviors and characteristics which are as culturally normative as possible" (Wolfensberger, 1972, p. 28). In terms of early childhood education, this means that disabled children should, as far as possible, be educated with normally developing peers and engage in activities similar to those practiced by all normal children.

Apart from its philosophical appeal, there appears to be many advantages to integration:

1. Normally developing peers provide models of age-appropriate behaviors for disabled children.

2. The presence of normally developing peers creates a more "demanding" environment which, according to theories of development, fosters the cognitive, social, and communicative development of children (Bricker,1978; Meisels,1978).

3. More advanced peers can act as resources in peer-mediated intervention (Goldstein & Wickstrom,1986; Guralnick,1976).

4. The opportunity to observe disabled and nondisabled children together may help parents and teachers to set more realistic developmental goals (Chen, Hanline, & Friedman, 1989).

5. Exposure to disabled children may help nondisabled children and their parents develop a more positive attitude towards the disabled (Bricker & Bricker, 1976).

On the other hand, it must be recognized that there are practical problems involved in integrating disabled and nondisabled children. Regular teachers have complained that disabled children take an inordinate amount of their time (Dunn, 1968). Some disabled children, especially those with severe and multiple disabilities, may require intensive intervention which is not available in regular settings (Tawney, 1981). And there is concern that an integrated programme may not provide for the optimal development of disabled children because regular teachers are not trained to teach disabled children and the classroom environment may not be structured appropriately (Chen et al., 1989).

Much research has been conducted to determine the effectiveness of early childhood integration. In a review of 10 studies, Odom and McEvoy (1988) found that young disabled children in integrated programs generally made significant developmental progress. A consistent finding among social interaction studies is that nondisabled children prefer their nondisabled peers especially for more complex play (Cavallaro & Porter, 1980; Faught, Balleweg, Crow, & van den Pol, 1983; Ispa, 1981). There is little evidence of direct rejection, however, and disabled children were found to participate in a substantial proportion of interactions (Peterson and Haralick, 1977).

More importantly, perhaps, is the finding that disabled children do not perform any better in segregated settings compared to integrated settings. Comparisons of play and social interactions in integrated and segregated settings generally found no differences or a slight advantage for the integrated setting (Field, Roseman, De Stefano, & Koewler, 1981; Guralnick, 1981a). Jenkins, Speltz, and Odom (1985) found no differences between integrated and segregated settings in the development of

disabled preschoolers on measures of cognitive, preacademic, language, and fine motor ability.

In view of this lack of evidence for superior performance in segregated settings and the many possible benefits that can accrue through integration, it would appear that integration is a viable option for many disabled children. The more important question might be to determine the optimal integration models for children with various handicapping conditions. While integration tends to be referred to as if it is a unitary model, variations in integration programs have become extremely complex (Odom & Speltz, 1983). Guralnick (1981b) has identified 13 programmatic factors that may affect child-child interactions in integrated settings. These include, for example, teacher-child ratio; ratio of disabled to nondisabled children; types of handicapping conditions; level of teacher training; and the developmental model of the program.

The importance of these program variables in the success of integration efforts is highlighted in a study by Guralnick and Groom (1988). In contrast to the minimal differences found in previous research, this study found that the rate of positive social interactions among mildly delayed children in mainstreamed playgroups was more than twice that which occurred in segregated classrooms. One explanation offered for the dramatic difference found was the proportion of nondisabled peers in the mainstreamed playgroups (80%). The researchers argue that previous research tended to compare segregated settings with integrated settings that contained relatively few nondisabled children. In such integrated programs, it is possible that the forms of interaction were determined by the larger number of disabled children thus minimizing the influence of nondisabled peers.

It is important to determine if similar effects will be found in relation to communicative and language development. The ability to communicate effectively is

perhaps one of the most vital skills that has to be acquired in childhood but few studies have looked at communicative development in the context of integration. Of these, Guralnick (1981a) found no differences in the frequency and nature of the communication of disabled children in integrated as opposed to segregated groups. Similarly, Harris, Handleman, Kristoff, Bass, and Gordon (1990) found no differences in the language development of autistic children in integrated and segregated classrooms.

The findings are surprising considering the many advantages that are apparently present in integrated settings. Normally developing children provide a richer linguistic environment and function as competent language models who provide opportunities for observational learning not present in a segregated setting. Furthermore, Guralnick and Paul-Brown (1980) found that normally developing children were able to appropriately adjust their communications so that messages to disabled peers were more likely to be understood and responded to.

One possible reason for the no difference findings in the research cited is the high ratio of disabled children in the integrated settings studied. Another reason could be that general measures of frequency of positive and negative interactions used by Guralnick (1981a) and the standardized Preschool Language Scale used by Harris et al. (1990) lacked the sensitivity to detect subtle but important differences. It is also possible that the disabled children studied were unable to profit from observational learning.

B. Statement of the problem

The present study sought to determine the effects of two models of integration - mainstreaming and reverse integration - on the communicative functioning of one child with Down syndrome. The four-and-a-half-year-old boy spends his mornings in a

regular day care center which enrols some disabled children (mainstreamed) and his afternoons in an early intervention program designed for disabled preschoolers but includes a small number of normally developing children (reverse integration).

The child's interactions in the two settings were videotaped and subsequently coded for various aspects of communication including frequency and duration of interactions, nature of communicative initiations, and pattern of communicative intents. It was decided that communicative intent, for example "Request" and "Comment," would be an appropriate area to study as the child communicates largely through gestures and non-speech vocalizations. Also, it is believed that pragmatic competence, of which the ability to use a range of intents forms a part, lays the foundation for later language development (Sugarman, 1984).

Data were collected during free-play sessions in the two settings when children were free to choose from various available activities with little direction from teachers. This afforded the opportunity to observe the child's unrestricted communicative functioning and to determine the influence of salient features in the two settings including teacher-child ratio and the ratio of disabled to nondisabled children.

The primary question the study sought to answer was:

Is the communicative profile of the child in the mainstreamed day care setting different from his performance in the reverse integrated preschool program?

This was determined by answering the following more specific questions:

1. Are there more interactions in one setting compared to the other?
2. Is there more interaction with peers as opposed to adults in one setting?
3. Is there more initiation compared to responding in one setting?
4. Are there more failed initiations (initiations that result in no

response or negative responses) in one setting?

5. Are certain communicative functions, for example "Answer" and "Protest," more prevalent in one setting?
6. Is there a difference in the length of interactions as measured by number of turns?
7. Is there a difference in the mode of communication (gesture, vocalization, speech, or a combination) used.

C. Definition of terms

Mainstreaming: In this study, mainstreaming refers to the practice of placing a minority of disabled children in settings primarily set up for normally developing children.

Reverse integration: This refers to the placing of a minority of normally developing children in programs set up primarily for disabled children.

Segregation: This refers to the practice of educating children in groups of individuals who are similar to each other. For example, segregated classes may have children who are all normally developing or all disabled.

Integration: Integration refers to all situations where normally developing and disabled children are educated together. It encompasses mainstreaming, reverse integration and all other models of service delivery that place disabled and nondisabled children together in varying ways and over varying lengths of time.

II. Literature Review

Rationale for early childhood integration

Integrating young disabled children with their normally developing peers holds a great deal of appeal. As Hobbs (1975) argued, the best chance of reducing the rejection of disabled people is to recognize that everyone is different and to bring together from the earliest years onward, children with different abilities to "learn from each other and to nurture respect for each other" (p. 15).

In addition, developmental theories suggest that being with normally developing peers will facilitate the development of disabled children. According to theories of cognitive and social development, a "demanding" environment fosters the cognitive, social, and communicative development of children. Piaget (1964) believed that cognitive development occurs when children are challenged by novel experiences to modify mental constructs (schemas) in order to "accommodate" the new experiences. In discussing moral development, Kohlberg (1969) also suggests that a child at a certain stage of development is most likely to move to a more complex level when he or she is exposed to the ideas of someone who is functioning at a slightly higher level.

The presence of normally developing children in the integrated setting makes it a naturally more demanding environment. In their daily interactions with their nondisabled peers, disabled children may be constantly challenged to adjust their intellectual schemas in order to accommodate to new experiences and information, thus stimulating their development (Bricker,1978; Meisels,1978).

Social learning theory provides another rationale for the benefits of educating disabled children with normally developing peers. Bandura (1977) states that much learning occurs vicariously by observing other people's behavior and the consequences

that follow. He adds that some complex behaviors can be produced only through the aid of modelling. It would be almost impossible to teach children all the linguistic rules of their language if they had no opportunity to hear the speech of models, for example.

This has important consequences for disabled children in segregated settings who are exposed only to deficit peer speech models. Children in integrated settings have the opportunity to hear more varied and complex speech. Normally developing children also appear to be highly adaptable and responsive in their communications with their disabled peers. Guralnick and Paul-Brown (1989) found that even three-year-old children can make subtle adjustments in their communications with disabled peers in order to make themselves understood. Nondisabled children have also been found to spontaneously teach and encourage their disabled peers (Ispa & Matz, 1978). This responsiveness could play an important role in facilitating the communicative development of disabled children.

In the integrated setting, disabled children are also exposed to age-appropriate social and play behaviors which provide the opportunity for learning through observation and imitation. Social learning research suggests that disabled children are likely to imitate their nondisabled peers. Noncompetent observers have been found to be more imitative than competent observers (Strichart, 1974) and models who have high status and are more competent, are more likely to be imitated (Bandura, 1977.) It can, therefore, be expected that less competent disabled children would imitate their high status, more competent normally developing peers.

Such opportunities for learning age-appropriate behaviors would be difficult to duplicate even in the most intensive special program especially if it focuses on adult teaching rather than learning through peer interaction. Additionally, skills learned in the integrated environment are likely to be maintained by naturally occurring

contingencies of reinforcement and the problem of generalizing what is learned in a special setting to the natural environment is avoided.

In summary, the presence of normally developing peers in integrated settings affords much opportunity for disabled children to learn age-appropriate behaviors and be challenged to reach higher levels of development.

Integration and developmental outcome

Studies on the developmental outcome of preschool integration have tended to be descriptions of model programs. Most of these did not include equivalent control groups making it difficult to determine if effects found can be attributed to integration. However, the results obtained are fairly consistent. In a review of 10 studies, Odom and McEvoy (1988) found that disabled children in integrated programs generally made significant developmental progress that could not be accounted for by maturation alone.

Ispa and Matz (1978) found that over the course of one school year, disabled children in an integrated program made gains on the McCarthy Scales of Children's Abilities equivalent to that made by nondisabled peers. Galloway and Chandler (1978) found that mildly retarded children showed median gains of one month's development for one month in an integrated early intervention program. Moderately retarded children made gains of two to five months in the six months they spent in the program, but severely retarded children showed no improvement.

In one of the few studies that randomly assigned subjects to integrated and segregated settings, Jenkins, Speltz, and Odom (1985) found no differences in the development of disabled preschoolers on measures of cognitive, preacademic, language, and fine motor ability. Interestingly, disabled children from integrated settings were found to engage in more frequent social play with unfamiliar nondisabled

peers than children from segregated classes. The authors attribute this to the integrated children being more familiar and comfortable with normally developing children. This is an important outcome if we hope to see disabled children eventually become fully participating members of society.

While research into preschool integration does not as yet provide definitive conclusions on the relative effectiveness of integration as opposed to segregation, the trends found so far are supported by the large body of research on older children. Dunn (1968) in his review of the literature found that children labelled as educable mentally retarded performed as well or better in regular classes compared to special classrooms. In a more recent meta-analysis involving 50 studies and about 3,400 children, Wang, Anderson, and Bram (1985) found a significant advantage in educational achievement for students in integrated settings compared to those in segregated settings. Additionally, students who spent all their time in regular classrooms performed significantly better than those who were integrated only part of the time.

Similar findings were reported by Carlberg and Kavale (1980) in a meta-analysis of 50 studies selected from an initial pool of 860. The authors found significant differences in the academic achievement of students with mild mental disabilities in integrated compared to segregated settings. For example, segregated students with IQs between 75 and 90 lost 13 percentile ranks, while those with IQs between 50 and 75 lost 6 percentile ranks as a result of being denied integration.

In addition to studying the effects of integration on disabled children, it is important to determine if being educated with disabled peers has negative consequences for normally developing children. None of the studies reviewed reported negative outcomes for nondisabled children. Odom, DeKlyen, and Jenkins (1984) conducted a systematic study of the effects on normally developing children of being

integrated into classes consisting largely of disabled children (eight disabled children to four nondisabled). Any negative effects are more likely to occur in such classes than those with a majority of nondisabled children, but a series of developmental measures including the Stanford-Binet, the Preschool Language Scale, the Uniform Performance Assessment System, and the California Preschool Scale of Social Competence, showed no differences in the rate of development of nondisabled children in the integrated classes compared to children in classes with only nondisabled children.

There is also little evidence of nondisabled children imitating the inappropriate behaviors of their disabled peers. Peterson, Peterson and Scriven (1977) found that both disabled and nondisabled preschoolers were more likely to imitate the nondisabled. Strichart (1974) showed that nondisabled children will imitate disabled children but only if they are perceived as being more competent in the task at hand.

In summary, disabled children appear to develop well in integrated settings and their presence does not appear to have negative effects on their normally developing peers. There is also little evidence that disabled children develop better in segregated programs.

Integration and social interaction

The social integration of disabled and nondisabled children is a vital issue to consider in determining the efficacy of educational integration. Many studies have looked at social interactions between disabled and nondisabled children and a fairly consistent finding is that nondisabled children prefer their nondisabled peers especially for more complex play (Cavallaro & Porter, 1980; Faught, Balleweg, Crow, & van den Pol, 1983; Ispa, 1981). Cavallaro and Porter (1980) suggest that children select playmates whose cognitive levels approximate their own.

There is little evidence of direct rejection, however, and disabled children were found to participate in a substantial proportion of interactions. Peterson and Haralick (1977) found that play activities which included both disabled and nondisabled children occurred in over half of all nonisolate play observed in their study. This finding was later replicated by Faught et al. (1983).

While disabled children may be less than totally integrated with their normally developing peers, they have not been found to fare better in segregated settings in terms of the frequency and nature of social interactions. Within-subject comparison studies show that the social and play behaviors of disabled children are either the same or slightly more advanced in integrated groupings when compared to segregated groupings (Field, Roseman, De Stefano, & Koewler, 1981; Guralnick, 1981a).

A more recent study by Guralnick and Groom (1988), however, found that mildly delayed children's rate of social interaction in integrated settings was over twice that which occurred in segregated classrooms. Positive social interactions have also been found to increase over time in integrated settings (Beckman & Kohl, 1987). In addition, Dunlop, Stoneman, and Cantrell (1980) found that over a period of six months, the social interaction patterns of disabled and nondisabled children became almost indistinguishable from each other.

In contrast to these generally optimistic findings, Sinson and Wetherick (1981) found a disconcerting pattern of increasing isolation among Down syndrome children in mainstreamed playgroups. The researchers found that normally developing children initially made "heroic" attempts to establish eye contact with the disabled children but gave up after meeting with little success. The disabled children eventually became isolated from their peers and interacted only with adult helpers.

This study was based on a subjective analysis of videotaped interactions with no attempt to document the reliability of the observations. Therefore, while the

results argue for a careful assessment of integration efforts, it is difficult to know how accurate and generalizable the findings are.

In summary, normally developing children tend to prefer other normally developing children over their disabled peers when choosing playmates. But disabled children in integrated settings are not totally isolated from their normally developing peers and there is some evidence that positive interactions may increase over time. Also, there is no indication that disabled children perform better in segregated settings.

Integration and communication

Few studies have compared the effects of integration as opposed to segregation on the development of language and communicative competence. Research shows that normally developing children communicate differently in different settings (Coggins, Olswang, & Guthrie, 1987; Scott & Taylor, 1978). The same appears to apply to disabled children. Bernard-Opitz (1982) found that the pragmatic behavior of an autistic girl varied with different settings as well as with different communication partners.

It would seem reasonable to expect that disabled children would communicate differently in integrated as opposed to segregated settings. However, Harris et al. (1990) found no differences in the language development of autistic children in integrated and segregated preschool settings. Guralnick (1981a) found no differences in the frequency and nature of communicative interactions when children were in mixed groups compared to segregated groups.

These findings are surprising considering that disabled children in integrated settings are exposed to more varied and complex language and have the opportunity to interact with more competent peers. A possible reason for the failure to find

differences is the lack of sensitivity of the measuring instrument. As Harris et al. (1990) pointed out, the Preschool Language Scale used as a criterion measure in their study may not have tapped the domains of language development affected by peer interactions.

Guralnick's (1981a) study looked at the communication patterns of children at four developmental levels: (1) severely delayed, (2) moderately delayed, (3) mildly delayed, and (4) normally developing. In general, the results showed that more advanced children communicated more and received more communications from other children. In addition, more advanced children directed fewer communications towards less advanced children than would be expected based on availability. It is possible, therefore, that less able children in this study did not benefit from linguistically advanced peer models because there was little communicative interaction between the two groups.

This possibility is supported by the results of a study conducted by Jenkins, Odom, and Speltz (1989). The authors found that disabled children displayed superior language development when a program to facilitate social integration was implemented compared to a condition where children were free to choose their playmates. The integration program ensured that children of different developmental levels interacted with each other in structured play groups. The authors suggested that the improvements in language could have been due to two factors. The interactive play treatments may have exposed lower functioning children to a more complex linguistic environment, or the treatment may have produced more frequent talking and listening which stimulated language development.

However, it is interesting to note that the improved language development found in this study applied to disabled children in both integrated and segregated settings. This suggests that program factors may be more influential than peer

composition for language development. This is supported by the Harris et al. (1990) study. The authors found that autistic children in both integrated and segregated settings improved their rates of language development with the implementation of an intensive language program although there was little difference in performance across settings.

In order to gain a deeper understanding of the effects of integration on the communicative development of disabled children, it is necessary to look at the nature of interactions in these settings. Guralnick and Paul-Brown (1980, 1984) examined the communicative competence of normally developing preschoolers in their interactions with disabled peers. They found that normally developing preschool children were able to make adjustments in their communications with disabled children so that messages were more likely to be understood.

When talking to delayed peers, normally developing children were found to use less complex utterances (Guralnick & Paul-Brown, 1980). They were also more likely to use behavior requests rather than information statements. These modifications parallel adjustments made by children to younger listeners and are believed to enhance communicative effectiveness. For example, Guralnick and Paul-Brown (1980) suggested that extended information exchange is not an effective communicative strategy when used with children having limited comprehension abilities. Behavior requests would appear to be the more adaptive choice in helping normally developing children to achieve their communication goals.

The communicative adaptability of normally developing children is also apparent when communication with disabled peers breaks down. Guralnick and Paul-Brown (1984) found that normally developing children were able to use a variety of strategies in diverse ways to achieve compliance in a tutorial situation. The strategies included

repetition, adding relevant information, providing demonstrations, and using physical guidance.

In their series of studies, Guralnick and Paul-Brown suggested that the communicative modifications normally developing children made in their communications with disabled peers were adaptive and appropriate to the lower developmental levels of the disabled children. However, in a later study, Guralnick and Paul-Brown (1989) found that the adjustments made in communications with disabled peers were not made in conversations with younger nondisabled children at the same developmental level as the disabled children.

For example, more strong directives were used with disabled peers than with younger children. These directives were defined as direct requests that required an immediate response. They were not mitigated or softened with polite forms. The authors suggested that the adjustments were more closely related to interpersonal and social status factors than to cognitive abilities. It still remains to be determined how these communicative adjustments affect the linguistic development of disabled children.

In summary, the few studies that looked at the communicative development of disabled children in integrated versus segregated settings found that the children generally performed at similar levels in both settings. It is possible that the benefits expected from placement in the linguistically richer environment of the integrated setting was not realized because of a low level of interaction between disabled and nondisabled peers. Besides developmental level, it is believed that interpersonal and social status factors affect these peer relations. However, there is evidence that specific integration programming can increase peer interactions and facilitate communicative development.

Models of integration

Attempts to integrate young disabled children have resulted in a variety of programs differing from each other on numerous variables. McLean and Odom (1988) identified four potential options for early childhood integration:

1. Mainstreamed educational programs. These occur in settings for normally developing preschoolers such as kindergarten and Head Start programs where there are educational programs for all the children. Typically, disabled children form a minority of the total class population in these programs.

2. Mainstreamed noneducational programs. These occur in settings for normally developing children that typically do not include an educational program, for example, day care and nursery school. Disabled children in these programs generally form a minority of the child population. They may attend segregated intervention programs where their individual education plans are implemented.

3. Reverse mainstreamed programs. Here normally developing children are enrolled in special education classes for disabled children. The nondisabled children are regular members of the class who may also serve as peer models for the disabled children. In these programs, nondisabled children generally form a minority of the class population.

4. Nonintegrated special education programs located in regular elementary schools. In this option, disabled preschoolers are educated in segregated classrooms but provisions are made for social integration at various times of the day.

Only one study was found that attempted to determine the relative effectiveness of some of these models of integration. Rule et al. (1987) compared mainstreaming in day care centers with mainstreaming in Headstart and educating children in self-contained classes. They found no differences in the developmental and

educational achievement of disabled children in the day care centers compared to children in the other two programs. The children also had similar social skill ratings.

However, it must be pointed out that the day care program did include an educational component not normally found in day care centers. This component consisted of special education services, basic developmental skills training, social skills training, and home support. The training was delivered through small group instruction and incidental teaching, where skills were taught when the opportunity presented itself in the course of a normal day. The program appeared to work well, with parents and teachers expressing satisfaction. The authors also claimed that program costs were lower than those of self-contained classrooms.

Most researchers do not distinguish between the first three models described by McLean and Odom (1988). The tendency has been to label all programs containing both disabled and nondisabled children as being integrated or mainstreamed. But as pointed out by Odom and Speltz (1983), data from programs with high proportions of disabled children are probably not generalizable to programs with low proportions of disabled children.

Guralnick (1981b) identified 13 programmatic factors that are believed to influence peer interactions in integrated settings. These include: teacher-child ratio, ratio of disabled to nondisabled children, types of handicapping conditions, level of teacher training and preparation for mainstreaming, developmental model of the program, layout of the classroom and toy selection, severity of disabilities, chronological ages of the children, quality of the program, preparation of disabled and nondisabled children for mainstreaming, resource specialists, interpersonal skills of the participants, and the match between the developmental levels of disabled and nondisabled children.

Only two of these variables will be considered in this review: teacher-child ratio and the ratio of disabled to nondisabled children. A higher teacher-child ratio is often cited as a major advantage of segregated programs. The presence of more adults allows teachers to conduct structured one-on-one instruction which is believed to be important in ensuring skill acquisition in disabled children.

However, "more is not necessarily better for facilitating social interactions among children" (Guralnick, 1981b, p. 74). In a study examining the social interactions of normally developing nursery school children, O'Connor (1975) found that significantly more child-child interactions occurred when the teacher-child ratio was 1:7 compared to 1:3.5. The availability of highly responsive adults, it appears, has a tendency to inhibit child-child interactions.

A similar effect is likely to occur with disabled children and it would be important to determine if special programs provide sufficient opportunity for children to interact with each other. According to Hartup (1978) peer interactions play a central role in child development. Long term studies show that inadequate peer relations can lead to social and emotional maladjustment. Also, interactions with peers provide an opportunity to acquire and practice communicative and social skills in a manner that cannot be replaced by adult interaction.

Peer characteristics may be another factor influencing how children relate to each other. The optimum ratio of disabled to nondisabled children, for example, has not been determined. But the 10% guideline used by Headstart is often recommended (Guralnick, 1981b). There seems to be some agreement that the proportion of disabled children in regular classrooms should not exceed 33%, and in reverse integrated programs, nondisabled children usually make up at least 33% of the class population (Guralnick, 1981b).

The importance of this programmatic variable is highlighted in a study by Guralnick and Groom (1988) which found the rate of positive social interactions among disabled children in mainstreamed playgroups to be twice that which occurred in segregated settings. The authors attributed part of the cause for this dramatic difference to the high proportion (80%) of nondisabled peers in the mainstreamed playgroups. However, the presence of a high proportion of normally developing children could lead to the social isolation of disabled children, as nondisabled children have more nondisabled peers to choose from for playmates (Odom & Speltz, 1983).

In summary, numerous models of integration have been delineated but little research has looked at the relative effectiveness of these options for various children. Teacher-child ratio and the ratio of disabled to nondisabled children appears to have important effects on peer interactions and more research is necessary to determine the effects of these two variables on the development of disabled children.

Prelinguistic communication

"Communication involves the intention to convey an idea to someone else" (Sugarman, 1984, p. 27.) And it seems that young children are capable of communicating their intentions and needs before they use their first words (Bruner, 1981). They accomplish this through gestural and vocal means and appear to be efficient communicators at least in their familiar social environments (Mahoney, 1975). And when communication breaks down, nonverbal children make persistent efforts to achieve their goals (Golinkoff, 1983). For example, Golinkoff described a 14-month-old's attempt to get an object by pointing in its direction. Because it was not clear what he wanted, the child's mother offered him several alternatives which the child rejected. He continued to point until it appeared that he was given what he was asking for.

This ability to coordinate person and object in social interaction has been found to precede the development of speech in normally developing, institutionalized, and autistic children (Sugarman, 1984). This suggests a link between preverbal intentional communication and language development. The specific nature of the relationship between the two forms of communication is not clear although it seems reasonable to assume that before children learn to use language to communicate they must know what communication is.

Sugarman (1984) suggests that children might be motivated to learn language as they search for a more precise way to express their needs. Similarly, Golinkoff (1983) believes that children might be pushed to try new means of communication when their prelinguistic attempts to achieve desired goals are frustrated. However, there is little empirical evidence delineating the development from prelinguistic to linguistic communication.

Many taxonomies have been developed in an attempt to describe and measure the various categories of communicative intent displayed by children learning language (Chapman, 1981). However, most of the categories fall into the three broad areas identified by Bruner (Wetherby, Cain, Yonclas, & Walker, 1988):

1. Behavioral regulation, which refers to acts aimed at getting others to help the child achieve a certain goal. These include "Request for Action" and "Request for Object."

2. Social interaction, which refers to acts used to attract and maintain someone's attention for affiliative purposes. These include "Greeting" and "Showing Off."

3. Joint attention, which refers to acts aimed at directing another's attention in order to share focus on an object or event. These include "Comment on Object or Action" and "Request Information."

Attempts have been made to profile the development of intentional communication in young children. Wetherby et al. (1988) found that the rate of communication increased substantially with advancing age and language abilities. The 15 normally developing children in their study displayed some acts in all the three categories of behavioral regulation, social interaction, and joint attention at the prelinguistic, one-word, and multiword stages. The number of different functions used were comparable in the prelinguistic and one-word stage but had increased by the multiword stage. This is consistent with Dale's (1980) finding that the range of pragmatic functions expressed grows steadily during the one-word and early two-word phase.

Carpenter, Mastergeorge, and Coggins (1983) conducted a longitudinal study aimed at determining if the emergence of communicative intent followed a developmental sequence. Six preverbal normally developing infants were observed at monthly intervals between the ages of eight and 15 months. The study found a statistically significant trend suggesting that early communicative functions develop in the following sequence: "Protest," "Request for Action," "Request for Object," "Comment on Action," "Comment on Object," and "Answering." However, it is important to note that there were individual differences in the sequence of emergence.

In terms of mode of communication, gesture alone and gesture and vocalization were the primary means of communication at eight months. By 15 months gesture alone was infrequently used. Gesture and vocalization remained the primary mode of communication accompanied by the use of one-word utterances.

In summary, normally developing infants can communicate their needs and intentions before they acquire speech. However, these primitive forms of communication are often imprecise and it is believed that children may be motivated to speak as they search for a more effective means to achieve their communicative goals.

There is some evidence of a developmental sequence in the development of intent but individual differences exist.

Communication and Down syndrome

Most children with Down syndrome experience delays in the acquisition of language compared to normally developing children of the same chronological age (Pruess, Vadasy, and Fewell, 1987). As these children are identified at birth, early language intervention holds hope for ameliorating the deficit. Attempts have, therefore, been made to profile the early communicative development of children with Down syndrome to determine if their language deficiencies are related to preverbal communicative competencies.

There is some evidence that infants with Down syndrome provide fewer prelinguistic cues to their parents, are less responsive to communicative invitations from their mothers, and have difficulty with turn taking (Jones, 1980.) Greenwald and Leonard (1979) found that children with Down syndrome relied more on gestures than vocalization to communicate. In addition, it appears that these children are less likely to request objects or assistance with objects than normally developing children of similar mental age (Mundy, Sigman, Kasari, & Yirmiya, 1988; Smith & von Tetzchner, 1986).

More importantly, these studies indicate a relationship between nonverbal requesting and expressive language skills. Smith and von Tetzchner (1986) found a significant correlation between measures of nonverbal requesting skills at 24 months and Reynell Expression scores one year later. In a subsequent study, Mundy et al. (1988) found significant correlations between the frequency of nonverbal requests and expressive and receptive language skills. It is believed that deficits in preverbal

communication may result in reduced opportunities for experiencing contingent caregiver responsiveness which could, in turn, hinder language development.

However, several studies comparing the communicative profiles of normally developing and Down syndrome children found no differences between the two groups (Coggins, Carpenter, & Owings, 1983; Owens & MacDonald, 1982; Wetherby, Yonclas, & Bryan, 1989). The children in these studies were matched on language level while the studies mentioned earlier matched the subjects on mental age. This could have resulted in the contradictory results found. Also, most of the children studied had undergone early intervention experiences which may have differentially affected their communicative development. In addition, the subjects in the Coggins et al. (1983) and Owens and MacDonald (1982) studies were a little older and possibly had a wider range of life experiences which may have had positive effects on their communicative functioning.

In order to participate in conversation, it is necessary that children learn to relate their utterances to preceding utterances from other speakers (Scherer & Owings, 1984). Studies have attempted to determine if children with Down syndrome display any deficiencies in their ability to respond appropriately to requests from conversation partners. The children showed delayed response performance when compared to normally developing children of the same chronological age (Leifer & Lewis, 1984). But when compared to normally developing children matched on language level, Scherer and Owings (1984) found that children with Down syndrome responded to their mothers' requests in the same manner as normally developing children.

Leifer and Lewis (1984) found that children with Down syndrome displayed significantly better response abilities than language-matched normally developing children: They produced more appropriate responses and fewer inappropriate

responses than the normally developing children. This is attributed to social-experiential factors which facilitated the development of communicative skills while language remained delayed.

In addition to making appropriate responses, children need to learn clarification and repair strategies that help to maintain conversational interaction when communication breaks down. These strategies include repetition and revision when an utterance is not understood. Coggins and Stoel-Gammon (1982) found that children with Down syndrome understand the necessity of clarifying misunderstood utterances by the time they are beginning to produce two-word utterances. The authors conclude that children with Down syndrome use language no differently from normally developing children in conversational situations.

In summary, children with Down syndrome often display delays in language development when compared to children of the same chronological age. However, when matched on language level, children with Down syndrome appear to have similar communicative competencies.

Summary

The presence of normally developing peers in integrated settings affords much opportunity for disabled children to learn age-appropriate behaviors. Research indicates that disabled children develop well in these settings and their presence does not appear to have negative effects on their normally developing peers. Studies on the communicative development of disabled children found that they performed at similar levels in integrated and segregated settings. In terms of social interaction, however, studies show that normally developing children prefer other normally developing children over their disabled peers when choosing playmates.

While much research has been conducted on the effects of integration as opposed to segregation, few studies have looked at the relative effectiveness of the various models of integration. The present study seeks to determine the effects of two of these models -- mainstreaming and reverse integration -- on the communicative development of one child with Down Syndrome.

III. METHODOLOGY

Sample

A convenience sample of one was selected. The child is a four-and-a-half-year-old boy with Down syndrome who attends a mainstreamed day care center in the morning and a reverse integrated preschool in the afternoon.

In terms of communicative development, the child is estimated by a speech pathologist to be functioning at the 12-24 month level expressively and at the 24-36 month level receptively. The child communicates primarily through gestures, facial expressions and vocalizations. Although he has a small vocabulary of spoken words and can use some signs (American Sign Language), the child was not observed to use any of these spontaneously during the study. He did, however, occasionally imitate words spoken by teachers and peers.

Despite the child's delay in speech development, he displays a high level of communicative competence. He is able to make his needs and wishes known and can respond appropriately to requests and comments made by adults. The child can take turns in a conversation and appears to enjoy communicative interactions with peers and adults. The child is fully mobile and displays no behavior, hearing or speech mechanism problems that might interfere with his communicative development.

In addition to his communicative competence, the child also displays independence and good play skills. In both settings, the child showed the ability to make choices among available activities and was observed to play appropriately with various play materials. The child is also able to follow the routines in the two settings although he tends to get restless during structured in-seat activities in the reverse integrated preschool.

The child displays a great deal of interest in the activities of peers especially in the mainstreamed setting. He tries to join in these activities and can be quite persistent even in the face of rejection. He seldom resorts to aggression, however, preferring to stand in the periphery until he finds an opportunity to enter the play without too much protest from peers.

Settings

The mainstreamed day care setting consists of a fairly large, bright classroom organized into permanent centers (house, blocks, and a loft for reading) various craft and toy areas, as well as areas for water and sand play. The classroom is organized around themes (e.g., dinosaurs and space) which are changed periodically. There are 16 children in classroom, ranging in age from two to five, who are supervised by three teachers. The subject of the study is the only child with special needs in the classroom and he follows the same routines as the other children.

The children are free to move from activity to activity with the teachers available to provide guidance and resolve conflicts when needed. The teachers adopt a learning through play approach. Activities are organized so that children exercise various manipulative skills and discover concepts as they play. The classroom is usually abuzz with activity with, for example, one group of children playing doctor; another group pretending they are taking off into space in a rocket; while yet another group moves trucks through the dirt tray.

The children are engaged in almost continuous conversation with each other as they laugh and play and, occasionally, break into raucous squabbles. Teachers generally let the children deal with minor conflicts themselves, but when intervention is necessary, the children are encouraged to talk to each other. The children are also

advised to talk to the subject of the study when any disagreement arises but more teacher mediation is often required because of the child's limited speech.

Within the flow of activities that occur every day, teachers try to achieve some of the goals set out in the subject's individual education plan. The child's keyworker has primary responsibility for helping the child achieve these goals. The keyworker generally weaves unobtrusive teaching sessions into the child's normal activities. For example, water play becomes an opportunity to model and elicit imitation of words like "bubbles" and "pop." When the keyworker needs assistance with designing and implementing the child's education program, she has access to a special education consultant. On average, the consultant visits the day care center about 10 times a year.

The reverse integrated preschool classroom is about one-third smaller than the day care center and is divided into a table area where crafts and other in-seat activities are carried out; a quiet area where roll call, music, reading and some teaching activities take place; and an area where different centers are set up as needed including water play, sand play and climbing.

There are eight children in the preschool classroom, ranging in age from three-and-a-half to five-and-a-half. Six of the children have special needs while two are normally developing children from the community. Only seven of these children were observed in the study as the parents of one of the disabled children did not want him to be involved. Of the children with special needs, two have Down Syndrome, two show global developmental delay, one is hemiplegic, and one has an undefined syndrome. With the exception of the normally developing children, the preschoolers generally communicate through gestures and vocalizations and the occasional single word.

The children are supervised by a teacher and two aides who direct the children through a series of short structured activities, such as coloring, music, gym, and choice of centers. The class is taken through the activities as a group with free choice available only during about 20 minutes of center time.

Each child has an individual education plan which is implemented through a combination of incidental teaching and one-on-one instruction. As an example, incidental teaching occurs during snack time when children are offered a choice of various tasks such as distributing napkins or handing out juice. Besides these self-help skills, children are taught social skills such as saying or signing "Thank You" when appropriate.

One-on-one instruction is carried out both in and out of class. For example, the teacher might take a child aside to practise fine motor skills, or the speech pathologist might take a child out of the class for speech training. Occasionally, the speech pathologist conducts small group speech sessions in the classroom. Often during these sessions, the normally developing children are held out as peer models for the children with special needs.

Generally, the reverse integrated preschool is more structured compared to the mainstreamed day care although the activities engaged in are similar. There is more in-seat work in the reverse integrated preschool and children have to follow a more rigid schedule. However, during the study, children in the reverse integrated preschool were given free choice of various available activities for about half an hour each day. Data was collected during this period of free play.

Design

The child was videotaped during free-play sessions in both settings. During these sessions, children in the two settings moved at will among the activities

available. Teachers generally stayed in the background although they occasionally manned activities (e.g., craft) which the children were free to participate in. It was felt that data obtained under these circumstances would be ecologically valid (Genishi, 1982) unlike controlled experiments where children's abilities are measured under conditions bearing little resemblance to their everyday life (Sackett, Ruppenthal, & Gluck, 1978).

Also, young children make good subjects for videotaped observations as they appear less self-conscious than adults. In fact, the researcher found during the study that the children, including the subject of the study, habituated to the presence of the camera very quickly. There were many questions initially, but once their curiosity was assuaged, the children seemed to go about their day without paying the researcher much attention.

The teachers, however, appeared uncomfortable with the presence of the camera. Initially, some of the teachers tried to avoid the camera but they eventually became accustomed to it although they remained a little self conscious throughout the study. This could have affected the teachers' interactions with the child. H vever, as the teachers in both settings reacted to the camera in a similar way, it is believed that the "on camera" effect did not differentially affect results obtained in the two settings.

The child's activities and interactions were videotaped on seven different days over a period of three weeks. This resulted in a total of 330 minutes of data (165 minutes in each setting). Most of the data was collected in the two settings on the same days in order to minimize time-related effects on the child's communication. On two occasions, data from the settings were collected one day apart but these were done in a counterbalanced order.

Coding system

A coding form (see Appendix A) was designed which allowed for the recording of several aspects of communication, the primary one being the various communicative intents based on those described by Coggins and Carpenter (1981), Guralnick and Paul-Brown (1989), and Wetherby, Yonclas, and Bryan (1989). Several preliminary observations were carried out to determine which of these categories to include in the coding form. A continuous record of the subject's interactions was made and subsequently coded into the various categories. An attempt was made to code all the communicative functions displayed by the child and his communication partners. The categories that were finally selected were those indicated by the various authors as being used by normally developing preschoolers. The definitions of these categories are presented in the next section.

The other data coded were number of interactions, number of turns in the interactions, the person who initiated the interaction, whether the communication partner was a peer or an adult, and the communication mode used. An interaction was defined as a series of communicative acts which occurred within three seconds of each other. A communicative act which occurred more than three seconds after a previous communication, was coded as the start of a new interaction. The initiations and responses in each interaction were coded in sequence linked by arrows indicating the direction of the interaction (Appendix A). The number of communicative acts within each interaction constituted the number of turns in the interaction.

Communication mode referred to the means the child used to express a communicative function. Gestures were defined as conventional and unconventional movements of the hands and body which were used to express intents. Vocalizations referred to non-speech sounds that appeared to be attempts at communicating.

Speech referred to the use of the formal language of the child, in this case English. Finally, signs referred to specific formal signs found in American Sign Language.

The researcher began coding each interaction the moment either the child or a communication partner made an initiation that was clearly intentional and directed at the relevant person. The child, for example, might look at the person, touch him or otherwise indicate that he is waiting for some kind of response. Vocal or gestural behavior that did not appear to be directed at anyone was not be recorded.

Definition of categories

The definitions of the following categories are largely based on those found in Coggins and Carpenter (1981), Guralnick and Paul-Brown (1989) and Wetherby, Yonclas and Bryan (1989). These definitions were found to adequately describe the communicative behaviors of the child studied:

Request action or object (Req): An intentional behavior aimed at getting a listener to perform a particular act or obtain a particular object, where the child awaits a response. For example, the child holds out his shoes towards the communication partner and waits for help to put them on, or the child vocalizes and points to a toy that is out of reach.

Demand action or object (Dem): A forceful request that does not give the recipient an option to refuse. For example, the child commands, "Give me that!" or he may grab a desired toy from a peer.

Comment on action or object (Com): An intentional behavior that directs the listener's attention to an object or the performance of an act. For example, the child vocalizes and points to his crayon, or the child winds up a toy and excitedly draws attention to how he made it move.

Request for information (RI): "An intentional behavior that directs the listener to provide information about an object, action or location" (Coggins & Carpenter, 1981.) For example, the child fails to find a toy in its usual place so he vocalizes and points to the spot with a questioning look on his face.

Request attention (RA): Gestures or utterances that appear to be aimed at getting attention. For example, the child vocalizes and reaches out in the direction of a peer as if calling the child's name.

Answer (Ans): Gestures or utterances made in response to a comment or request from a communication partner. For example, the child points to the picture of the water table when asked to choose an activity.

Protest (Pro): Gestures or utterances that express refusal to comply with a request or disapproval of the speaker's action or utterance. For example, the child pushes his plate away when asked to eat.

Request clarification (RC): Gestures or utterances that seek to elicit clarification, repetition, or revision of a previous utterance that was not understood. For example, the teacher asks "What do you want" when she fails to understand the child's gestures and vocalizations.

No response (NR): The child ignores or does not notice gestures or utterances directed at him. For example, a peer calls the child by name but gets no indication that the child heard him.

Offers help (OH): Gestures or utterances that indicates the child's desire to help. For example, the child holds out coat for a peer when it is time to go outside.

Repetition and clarification (Rep): Gestures and utterances that seek to explain or otherwise make clear what has not been understood in a previous communication. For example, a child tell his peer to "Stir" but gets no response. He then repeats "Stir, stir" and demonstrates how to stir.

Invitation to play (IP): Gestures or utterances that indicate the child's desire to have someone play with him. For example, a child offers a toy he is playing with and points to a chair to indicate that the peer should sit down.

Reliability checks

While naturalistic observation is believed to be the best means of answering the questions posed by this study, it is recognized that the methodology poses some problems. The most serious of these is the influence of the observer on the findings (Hollenbeck, 1978). Sources of observer bias include errors of commission (miscoding a behavior) and errors of omission (failing to record a behavior when it occurs). Observer drift is another potential source of error. The observer may lose sight of the original behavior definitions over time resulting in inconsistent coding. There can also be errors resulting from observer expectancy, where an observer basically sees what he or she wants to see.

Both intra-observer and inter-observer reliability checks were carried out to control for these possible sources of error. Inter-observer reliability was measured by having another observer independently code random segments of tape comprising 15% of the data (about 50 minutes). The segments included recordings from both settings. Before coding, the second observer was asked to study the definitions of the various categories. She then participated in two practice sessions, one on site and one using practice videotapes. Questions and clarifications were raised during these sessions which resulted in refinements of some of the categories.

The researcher subsequently coded the videotapes and two more practice sessions were held using the researcher's coding as a criterion. Few disagreements arose during these sessions and the reliability observer was asked to code a random sample of tapes which were not used during training.

Interactions were coded in three-minute intervals and the reliability of each communicative intent was calculated by dividing the sum of the smaller frequencies in each interval with the sum of the larger frequencies, multiplied by 100. This provided a more conservative estimate of reliability than if the sum of the frequencies as coded by the second observer were divided by the sum as coded by the researcher, because absolute measurement of error is cumulative and therefore errors do not cancel out other errors.

Initial reliability calculations indicated low reliability for some categories. This resulted in the decision to drop the following communicative functions: "Offers Help," "Clarification," and "Request Attention." In addition, the categories "Request action or object," "Request Information," and "Request Clarification" were collapsed into a general "Request" category.

The decision to drop "Offers Help" and "Request Attention" resulted in some loss of information. "Offers Help" was originally included to determine if normally developing peers displayed an unequal "helping" relationship with disabled peers. "Request Attention," which included greetings, would have provided information on the child's use of communication for affiliative purposes.

"Request Information," "Request Clarification," and "Clarification" were included to determine if the child and his peers used these repair strategies to maintain interactions. Preliminary analysis indicated that these categories were infrequently used in the communications of the child and his peers. Therefore, it is felt that little data was lost in collapsing and dropping these categories.

The inter-observer reliability figures obtained for the various communicative functions ranged from 56% to 100% with an overall average of 77%. Detailed results are found in Table 1. Inter-observer reliability figures were also obtained for the following categories: number of interactions, number of turns, number of subject

initiations, and number of peer initiations. These ranged from 69% to 87%. Detailed results can be found in Table 2.

Table 1

Inter-observer reliability (communicative intents)

Comment	Request	Demand	Protest	Answer	No Response	Invitation to Play
70%	82%	82%	77%	80%	56%	100%

Table 2

Inter-observer reliability (aspects of communication)

No. of interactions	No. of turns	No. of subject initiations	No. of peer initiations
87%	80%	69%	71%

The inter-observer reliability figures appear to be generally adequate although the lower reliabilities reported for "No Response," "Comment," "Number of subject initiations," and "Number of peer initiations" argue for caution in the interpretation of these categories.

Intra-observer reliability was calculated to determine the extent of observer drift that may have occurred. Two weeks after all the tapes were coded, the researcher randomly selected tapes from the two settings and recoded 10% of the data.

Reliability figures for the various communicative functions ranged from 80% to 100%, with an average overall reliability of 91%. The detailed results are found in Table 3. Reliability figures were also obtained for number of interactions, number of

turns, number of subject initiations, and number of peer initiations. These ranged from 71% to 94%. Detailed results can be found in Table 4.

Table 3

Intra-observer reliability (communicative intents)

Comment	Request	Demand	Protest	Answer	No response	Invitation to play
83%	89%	91%	95%	97%	80%	100%

Table 4

Intra-observer reliability (aspects of communication)

No. of interactions	No. of turns	No. of subject initiations	No. of peer initiations
84%	94%	82%	71%

With the possible exception of "Number of peer initiations," intra-observer reliability appears to be good thus enhancing confidence in the consistency of the coding carried out in this study.

Data analysis

Frequencies of the various communicative categories were calculated, and when appropriate these were expressed as a proportion of total communications. The data examined in this study were basically of two kinds. The first was the proportional distribution of one communicative category, for example number of interactions, in the two settings. The second was the distribution of the seven communicative intents as a proportion of all communicative intents in one setting compared to the distribution in

the other setting. The data are presented in tables and bar graphs which allow for a visual analysis of the results found.

In addition, two statistical procedures were employed to determine if differences found between settings were significant. As the data were measured on a nominal scale only nonparametric tests were applicable. The z test of proportion (Glass & Hopkins, 1984) was used when comparisons were made between the proportional distribution of one category of communication in the two settings. The frequencies were first converted into proportions. For example, if there were 40 interactions in the reverse integrated setting and 60 in the mainstreamed setting, the proportion of the total number of interactions occurring in the reverse integrated setting would be 40 divided by 100 or .4. This is the sample proportion (p) which is compared to a hypothesized value of .5, which is the expected proportion if there were no difference between the settings.

A significance level of .05 was selected, and a z value was then computed. A z value greater than the critical z value of 1.96 indicates that any difference found is statistically significant. A significant z at the .05 level indicates that if repeated samples were taken, there is only a 5% chance that a similar "p" value would be obtained.

The chi-square test of association was used to compare the proportions of communicative intents found in the two settings. This test allows for the simultaneous comparisons of three or more categories (Glass & Hopkins, 1984.) The test determines whether any differences found exceed those expected from chance or random deviations (Siegel & Castellan, 1988.)

A chi-square value is computed and then located on a chi-square distribution which indicates the significance level of any difference found. For example, a significance level of .001 indicates that discrepancies in the sample proportions and

their expected values as large as those found would occur by chance in less than 1 in every 1,000 replicated studies (Glass & Hopkins,1984.) It would, therefore, be reasonable to conclude that there is a relationship between communicative intents and the settings in which they were recorded.

Limitations of the study

The major limitation of the present study is its lack of generalizability because only one child was studied. However, it was hoped that the research would uncover important aspects of communicative functioning not previously studied. These could then be explored under more controlled conditions involving more subjects. In addition, an attempt was made to include as much relevant information as possible on the child and the settings studied. This allows a reader of the study to determine if the findings can be applied to his or her own situation, thus enhancing the reader generalizability of the study (Merriam, 1988.)

Another area of concern was the lack of control over the time of day when the child was in either setting. The child spends his mornings in the mainstreamed day care and the afternoons in the reverse integrated preschool. Any communicative differences found could reflect the time of day rather than the nature of the setting. The child could be too tired in the afternoon to engage in communicative interactions, for example. The researcher did not notice a higher level of fatigue in the afternoons, and there did not appear to be other time-related behavior differences.

Ethical considerations

Ethical clearance was obtained from the Ethics Review Committee of the Department of Educational Psychology, University of Alberta. Formal permission to conduct the study was then sought from the authorities at the day care center and

preschool. In addition, parents of the child studied and those of his peers were asked to sign an informed consent form (Appendix B) which explained the purpose of the research and specified the nature and amount of commitment expected. It was made clear that participation was voluntary and that data collected would be kept confidential. Parents were assured that none of the children or their families would be named or otherwise identified in the research report. The parents of only one child declined to participate.

IV. RESULTS

The results of this study will be organized into three broad areas: (1) general interaction patterns, (2) nature of peer interactions, and (3) pattern of interactions with adults. Results for each area follows.

General interaction patterns

1. Frequency and duration of interactions

The child participated in a similar number of interactions in the mainstreamed setting (114) as in the reverse integrated setting (113) (Table 5).

Table 5

Frequency and distribution of child's total interactions

	Frequency		Percentage	
Interactions	**M**	**RI**	**M**	**RI**
Total	114	113	100.0%	100.0%
Adult + child	51	65	44.7%	57.5%
Peer + child	49	41	43.0%	36.3%
Peer + adult + child	14	7	12.3%	6.2%

Note: M refers to the mainstreamed setting; RI refers to the reverse integration setting

Interactions in the mainstreamed setting were of longer duration as measured by the total number of turns: 694 in the mainstreamed setting compared to 636 in the reverse integrated setting, resulting in an average of 6.1 turns per interaction in the

mainstreamed setting and 5.6 turns per interaction in the reverse integrated setting (Table 6).

A z test of proportion indicated that the distribution of the total number of turns between the two settings is not significantly different from .5 at the .05 level of significance.

Table 6

Number of turns in interactions

	Frequency		Ave. per interaction	
No. of turns	M	RI	M	RI
Total	694	636	6.1	5.6
Adult + child	326	458	6.4	7.0
Peer + child	187	115	3.8	2.8
Peer + adult + child	181	63	12.9	9.0

Note: M refers to the mainstreamed setting; RI refers to the reverse integration setting

In summary, the child engaged in a similar number of interactions in the two settings. Interactions in the mainstreamed setting were more sustained as indicated by a larger number of turns but the difference was not statistically significant.

2. Proportion of peer and adult interactions

The distribution of interactions among adults and peers differed in the two settings as can be seen in Table 5. There were more interactions with adults in the reverse integrated setting (65) compared to the mainstreamed setting (51). Proportionately, interactions with adults made up 57.5% of all child interactions in the

reverse integrated setting compared to 44.7% in the mainstreamed setting. Conversely, there were more interactions with peers in the mainstreamed setting both in terms of frequency (49) and proportion (43%) compared to the reverse integrated setting (41 or 36.3%) as indicated in Figure 1.

A chi-square test of proportion indicated that there is no statistical difference ($p = .05$) in the distribution of peer and adult interactions in the two settings. However, when the distribution of turns in the three types of interactions found in the settings (Figure 2) were subjected to a chi-square analysis, they were found to be significantly different at the <.001 level.

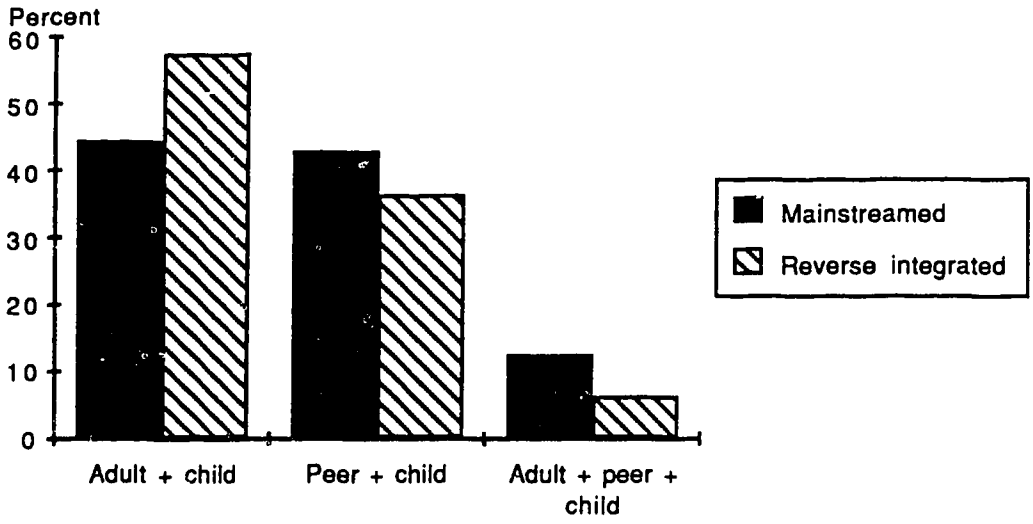

Figure 1. Types of interaction as a percentage of total child interactions

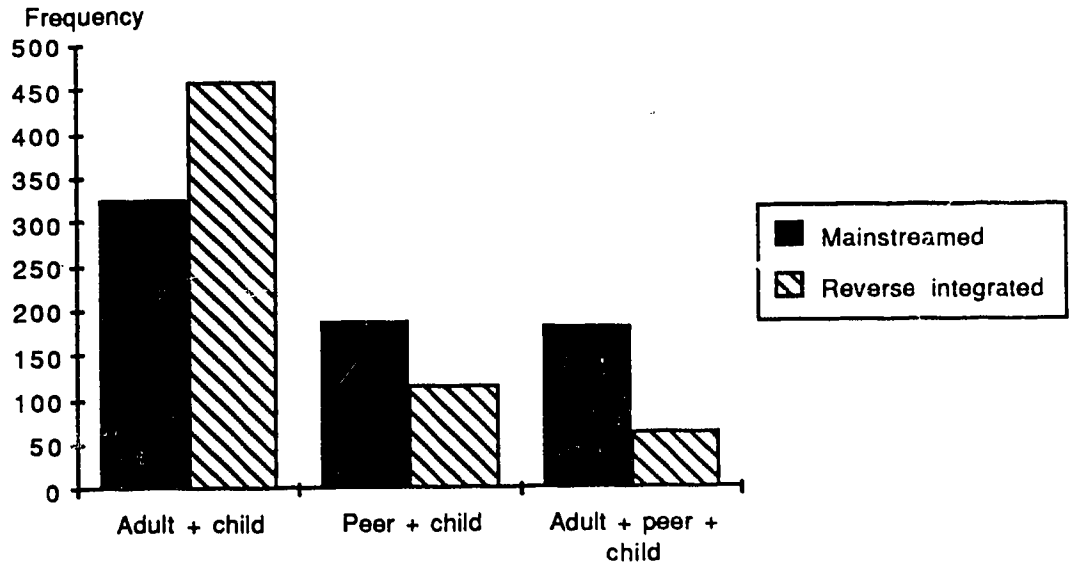

Figure 2. Number of turns in the various types of interactions

To determine if the distribution of turns in each category of interaction was significantly different across the two settings, z tests of proportion were carried out. In all three instances, the proportion of turns was found to be significantly different from .5 at the .05 level.

In summary, the child engaged in significantly more interactive turns with adults and less with peers in the reverse integrated setting compared to the mainstreamed setting.

3. Frequency and proportion of communicative intents

The child engaged in a larger number of communicative acts in the mainstreamed setting (320) compared to the reverse integrated setting (289) (Table 7). A z test of proportion indicated that the proportion of communicative acts in the two settings is not significantly different from .5 at the .05 level of significance.

Table 7

Distribution of child's communicative intents

	Frequency		Percentage	
Intents	**M**	**RI**	**M**	**RI**
Total	320	289	100.0%	100.0%
Comment	50	43	15.6%	14.9%
Request	16	15	5.0%	5.2%
Demand	14	17	4.4%	5.9%
Protest	41	29	12.8%	10.0%
Answer	164	153	51.3%	52.9%
No Response	24	31	7.5%	10.7%
Invitation to Play	11	1	3.4%	0.3%

Note: M refers to the mainstreamed setting; RI refers to the reverse integration setting

In terms of the distribution of the various communicative intents, there appears to be little difference between the two settings (Figure 3). This was confirmed by a chi-square analysis. The patterns of communicative intents in the two settings were not statistically different at the .05 level.

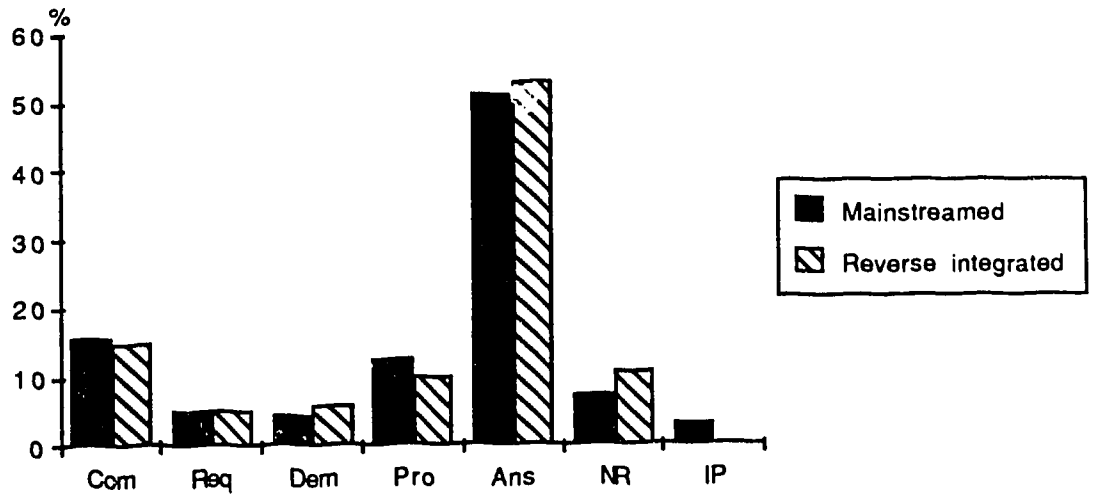

Figure 3. Distribution of child's communicative intents as a percentage of total communicative acts

In summary, there was little difference between the two settings in the number and distribution of communicative intents displayed by the child.

4. Frequency of communicative initiation

The child made more communicative initiations in the reverse integrated setting (43) compared to the mainstreamed setting (32). Detailed results are contained in Table 8. The proportion of total initiations in two settings is not significantly different ($p = .05$) from .5. It is believed that the lack of statistical significance is partly a function of the small sample size. In fact, when the frequencies were tripled, it was found that the difference in proportion was significant at the .05 level.

While the lack of statistical significance argues for caution in interpretation, it is believed that the difference in frequency of initiations in the two settings is important. There were 11 more initiations in the reverse integrated which represents 34% of all initiations in the mainstreamed setting.

Table 8

Distribution of child's initiations

	Frequency		Percentage	
Initiations	**M**	**RI**	**M**	**RI**
Total	32	43	100.0%	100.0%
Towards peers	20	23	62.5%	53.5%
Towards adults	12	20	37.5%	46.5%

Note: M refers to the mainstreamed setting; RI refers to the reverse integration setting

The child made more initiations towards both peers and adults in the reverse integrated setting (Figure 4). Z tests of proportion indicated that the differences in proportion were not significantly differently from .5 at the .05 level of significance.

In terms of the percentage of total initiations, the child made proportionately more initiations towards adults in the reverse integrated setting (46.5%) compared to the mainstreamed setting (37.5%) (Figure 5). A chi-square analysis indicated that the patterns of initiation in the two settings are not significantly different at the .05 level of significance.

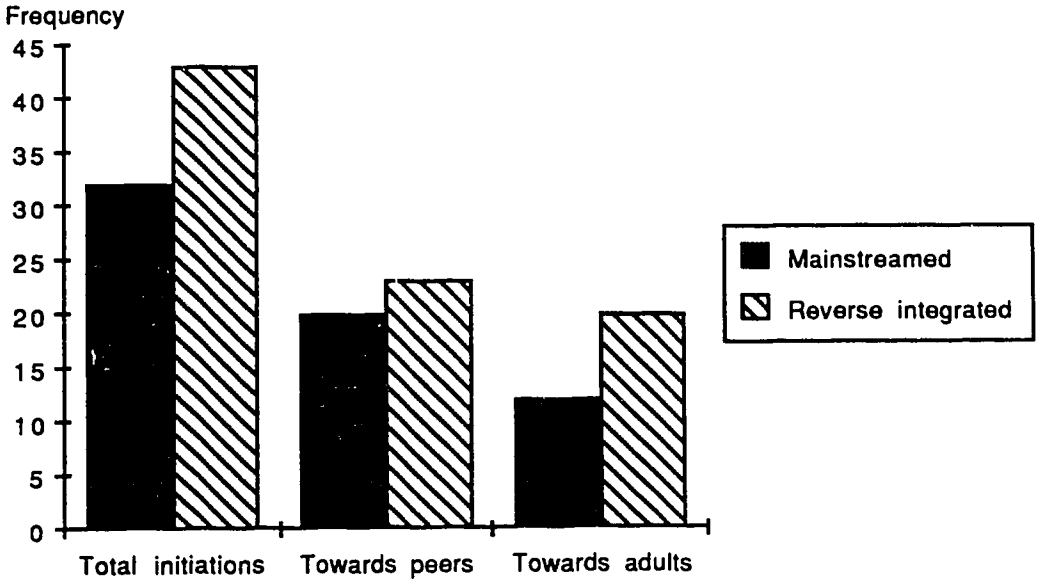

Figure 4. Frequency and distribution of child's initiations

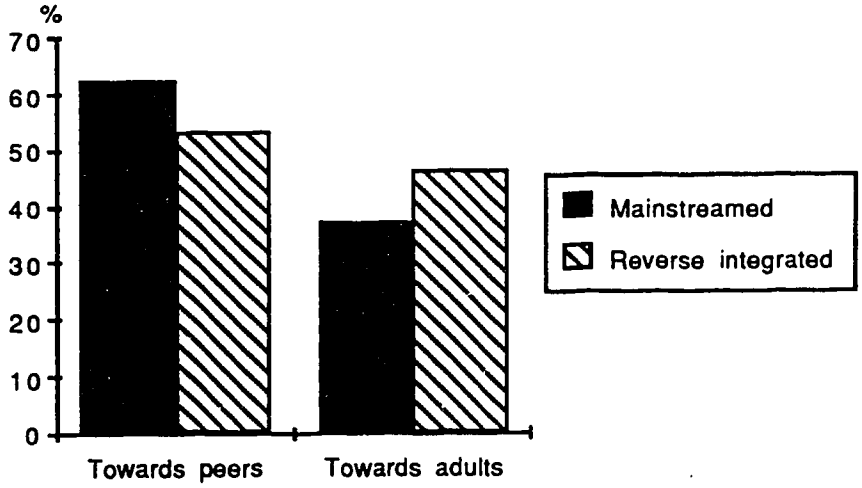

Figure 5. Types of child initiations as a percentage of total initiations

Defining successful initiations as those which did not result in negative responses ("Protest," "Demand," and "No Response") it was found that there were 27 successful initiations in the reverse integrated setting compared to 18 in the mainstreamed setting. A z test of proportion indicated that the distribution of successful initiations was not significantly different from .5 at the .05 level.

As a percentage of total initiations in each setting, the success rate was 62.8% in the reverse integrated setting and 56.3% in the mainstreamed setting.

In summary, the child made more communicative initiations towards both peers and adults in the reverse integrated setting compared to the mainstreamed setting, although the difference was not statistically significant. A larger proportion of the child's initiations in the reverse integrated setting was successful compared to the mainstreamed setting.

5. Mode of communication

The child communicated primarily with the use of gestures alone or a combination of gesture and vocalization. More gestures were used in the mainstreamed setting (52%) compared to the reverse integration setting (39.7%), while more gesture/vocalization combinations were used in the reverse integrated setting (57.9%) compared to the mainstreamed setting (44%). Speech was more evident in the mainstreamed setting (3.5%) compared to the reverse integrated setting (1.5%). A z test of proportion indicated that the proportion of speech frequencies in the two settings was not significantly different from .5 at the .05 level. Signing was a rare occurrence in both settings. Detailed results can be found in Table 9.

Table 9

Communication modes used by child

	Frequency		Percentage	
Mode	**M**	**RI**	**M**	**RI**
Gesture	150	103	52.0%	39.7%
Gesture/ vocal	127	150	44.0%	57.9%
Speech	10	4	3.5%	1.5%
Sign	1	2	0.3%	0.8%

Note: M refers to the mainstreamed setting; RI refers to the reverse integration setting

In summary, the primary mode of communication used by the child in both settings was gestures and a combination of gesture and vocalization. Speech was more frequently used in the mainstreamed setting compared to the reverse integrated setting although the difference was not statistically significant.

Nature of peer interactions

1. Frequency and duration of interactions

As shown in Table 5, there were slightly more peer interactions in the mainstreamed setting (49) compared to the reverse integrated setting (41). The proportion of interactions in the two settings is not significantly different from .5 at the .05 level.

But peer interactions in the mainstreamed setting were of longer duration. A total of 187 turns were recorded in the mainstreamed setting compared to 115 turns in the reverse integrated setting (Figure 2). A z test of proportion indicated that the

distribution of turns was significantly different from .5 at the .05 level. On average there were 3.8 turns per interaction in the mainstreamed setting compared to 2.8 turns in the reverse integrated setting.

In summary, the child engaged in more interactive turns with peers in the mainstreamed setting compared to the reverse integrated setting.

2. Pattern of communicative intents (child to peers)

The child directed 112 communicative acts towards his peers in the mainstreamed setting compared to 73 in the reverse integrated setting (Table 10.) The proportion of communicative acts is significantly different from .5 at the .05 level.

Table 10

Distribution of communicative intents (child to peers)

	Frequency		Percentage	
Intents	**M**	**RI**	**M**	**RI**
Total	112	73	100.0%	100.0%
Comment	14	4	12.5%	5.5%
Request	6	3	5.4%	4.1%
Demand	11	12	9.8%	16.4%
Protest	20	20	17.9%	27.4%
Answer	42	30	37.5%	41.1%
No response	8	3	7.1%	4.1%
Invitation to play	11	1	9.8%	1.4%

Note: M refers to the mainstreamed setting; RI refers to the reverse integration setting

A chi-square analysis indicated that the patterns of intents in the two settings were not significantly different at the .05 level. Despite this lack of statistical significance, it is felt that the trends in the distribution of some positive and negative intents could to be important.

In interactions with his peers, the child displayed a greater percentage of negative acts such as "Protest" (27.4%) and "Demand" (16.4%) in the reverse integrated setting compared to the mainstreamed setting ("Protest": 17.9%; "Demand": 9.8%) (Figure 6). However, there was a smaller percentage of "No Response" in the reverse integrated setting (4.1%) compared to the mainstreamed setting (7.1%).

In terms of positive communicative acts, there was a smaller percentage of "Comment" (5.5%) in the reverse integrated setting compared to the mainstreamed setting (12.5%). There was also a smaller percentage of "Invitation to Play" in the reverse integrated setting (1.4%) compared to the mainstreamed setting (9.8%). On the other hand, there was a larger percentage of "Answer" in the reverse integrated setting (41.1%) compared to the mainstreamed setting (37.5%).

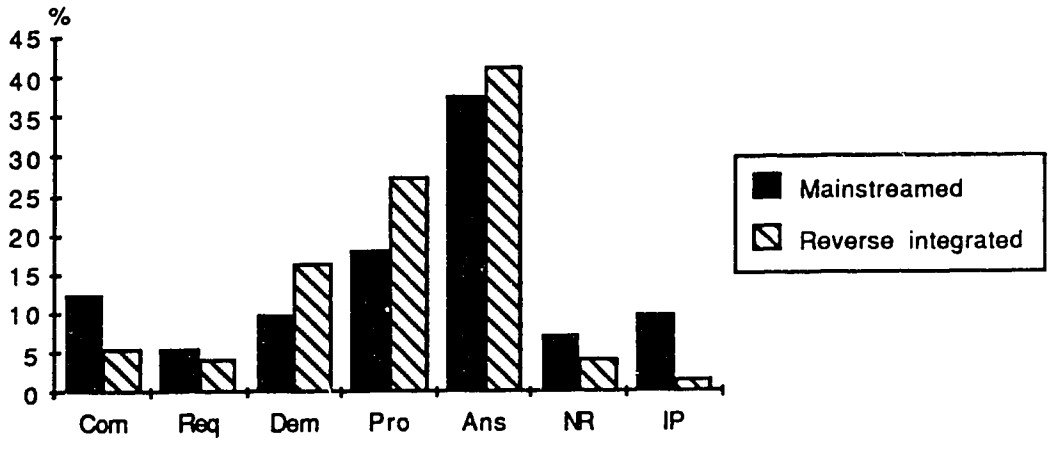

Figure 6. Distribution of communicative intents as a percentage of total communicative acts (child to peers)

In summary, the child engaged in significantly more communicative acts with peers in the mainstreamed setting. With the exception of "Answer" and "No Response," there were proportionately more positive acts in the mainstreamed setting and more negative acts in the reverse integrated setting.

2. Pattern of communicative intents (peers to child)

Peers in the mainstreamed setting directed more communicative acts towards the child (110) than peers in the reverse integrated setting (75) (Table 11.) A test of proportion indicates that the distribution of communicative acts is significantly different from .5 at the .05 level.

Table 11

Distribution of communicative intents (peers to child)

	Frequency		Percentage	
Intents	**M**	**RI**	**M**	**RI**
Total	110	75	100.0%	100.0%
Comment	4	4	3.6%	5.3%
Request	8	9	7.3%	12.0%
Demand	24	10	21.8%	13.3%
Protest	45	16	40.9%	21.3%
Answer	18	19	16.4%	25.3%
No response	7	8	6.4%	10.7%
Invitation to play	4	9	3.6%	12.0%

Note: M refers to the mainstreamed setting; RI refers to the reverse integration setting

A chi-square analysis indicated that the patterns of intent in the two settings are significantly different at the .01 level. In interactions with the child, peers in the mainstreamed setting displayed almost twice the percentage of "Protest" (40.9%) compared to peers in the reverse integrated setting (21.3%) (Figure 7). The percentage of "Demand" in the mainstreamed setting (21.8%) was also higher when compared to the reverse integrated setting (13.3%). But there was a smaller percentage of "No Response" in the mainstreamed setting (6.4%) compared to the reverse integrated setting (10.7%).

Peers in the reverse integrated setting directed more positive communicative acts towards the child. There was a larger percentage of "Invitation to Play" in the reverse integrated setting (12%) compared to the mainstreamed setting (3.6%). There was also a larger percentage of "Request," "Answer" and "Comment".

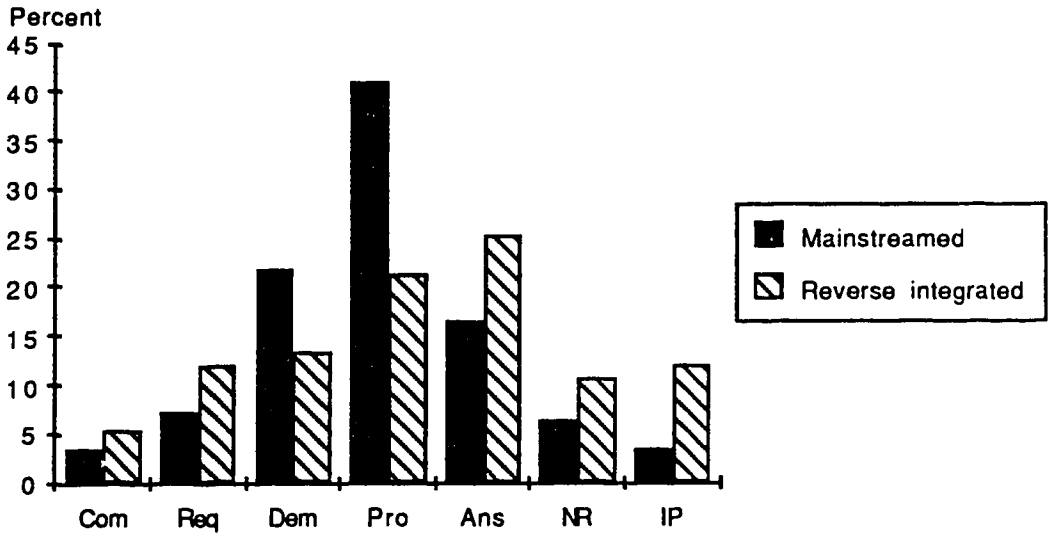

Figure 7. Distribution of communicative intents as a percentage of total communicative acts (peers to child)

In summary, peers in the mainstreamed setting engaged in significantly more communicative acts with the child, but a significantly larger proportion of these acts were negative when compared to those of peers in the reverse integrated setting.

4. Pattern of initiations (child to peers)

The child made slightly more communicative initiations towards peers in the reverse integrated setting (23) compared to the mainstreamed setting (20) (Table 12). The distribution of initiations was not significantly different from .5 at the .05 level.

Table 12

Distribution of child initiations towards peers

	Frequency		Percentage	
Initiations	**M**	**RI**	**M**	**RI**
Total	20	23	100.0%	100.0%
Positive initiations	15	6	75.0%	26.1%
Negative initiations	5	17	25.0%	73.9%

Note: M refers to the mainstreamed setting; RI refers to the reverse integration setting

In order to look at the nature of the child's initiations, those that consisted of "Protest" and "Demand" were defined as negative initiations while all other initiations were considered positive. In the reverse integrated setting, 73.9% of the child's initiations were negative. These negative initiations made up 25% of the initiations

towards peers in the mainstreamed setting. Conversely, 26.1% of the child's initiations in the reverse integrated setting were positive compared to 75% in the mainstreamed setting (Figure 8). A chi-square analysis indicated that the patterns of positive and negative initiations in the two settings are significantly different at the <.001 level.

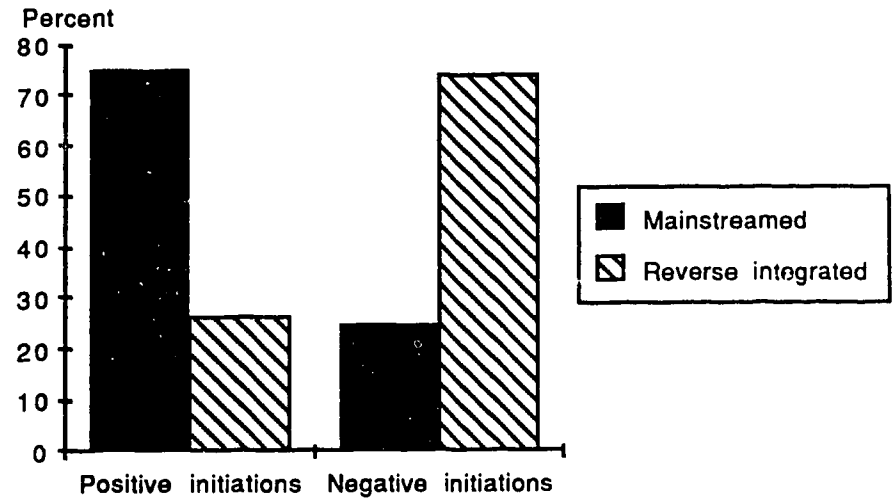

Figure 8. Distribution of positive and negative initiations as a percentage of total initiations (child to peers)

The communicative acts that immediately followed the child's initiations were examined to determine the success of the initiations. All responses other than "Protest," "Demand," and "No Response" were considered positive. Therefore, initiations that resulted in "Comment," "Request," "Answer," and "Invitation to Play" were defined as successful initiations. The results of this analysis are presented in Table 13.

Table 13

Distribution of successful initiations (child to peers)

	No. of successful initiations		Percent of total initiations	
Initiations	M	RI	M	RI
Total	8	14	40.0%	60.9%
Positive initiations	6	4	40.0%	66.7%
Negative initiations	2	10	40.0%	58.8%

Note: M refers to the mainstreamed setting; RI refers to the reverse integration setting

A larger percentage of the child's initiations towards peers in the reverse integrated setting were successful (60.9%) compared to the mainstreamed setting (40%). The greater success in the reverse integrated setting applied to both positive and negative initiations (Figure 9).

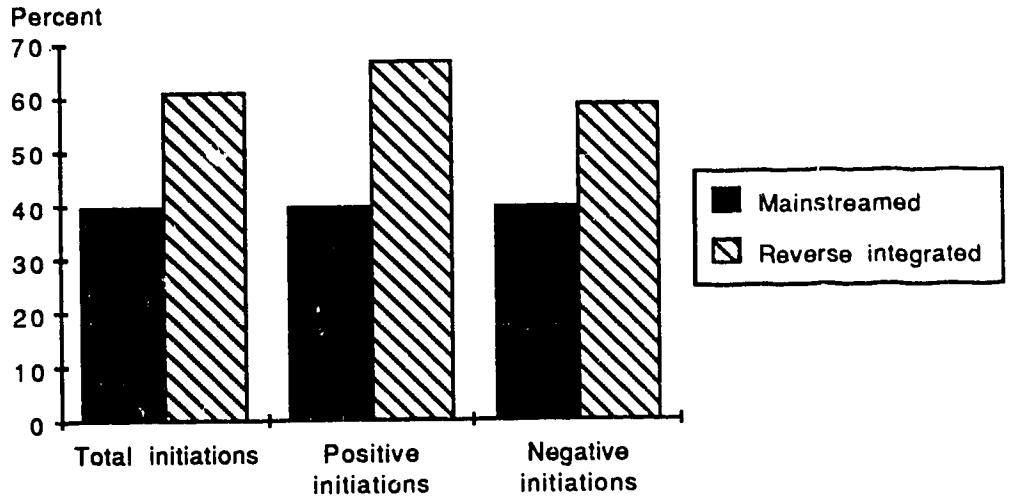

Figure 9. Percentage of initiations that were successful (child to peers)

In summary, the child engaged in a similar number of initiations in both settings. A significant proportion of initiations towards peers in the reverse integrated setting were negative. There were significantly more positive initiations in the mainstreamed setting. Data on the success of both positive and negative initiations does not explain the differential distribution of these initiations in the two settings. Both positive and negative initiations resulted in a similar proportion of success in each setting.

5. Pattern of initiations (peers to child)

Peers in the mainstreamed setting made more initiations towards the child (32) compared to peers in the reverse integrated setting (19) (Table 14). The proportion is not significantly different from .5 at the .05 level.

Table 14

Distribution of peer initiations towards child

	Frequency		Percent of total initiations	
Initiations	**M**	**RI**	**M**	**RI**
Total	32	19	100.0%	100.0%
Positive initiations	8	13	25%	68.4%
Negative initiations	24	6	75%	31.6%

Note: M refers to the mainstreamed setting; RI refers to the reverse integration setting

About 75% of peer initiations in the mainstreamed setting were negative compared to 31.6% in the reverse integrated setting (Table 14). Conversely, 25% of peer initiations in the mainstreamed setting were positive compared to 68.4% in the reverse integrated setting.

The pattern of initiations by peers in the mainstreamed setting mirrored the child's initiation pattern in the reverse integrated setting (Figure 10). In both instances, negative initiations made up about 75% of total initiations.

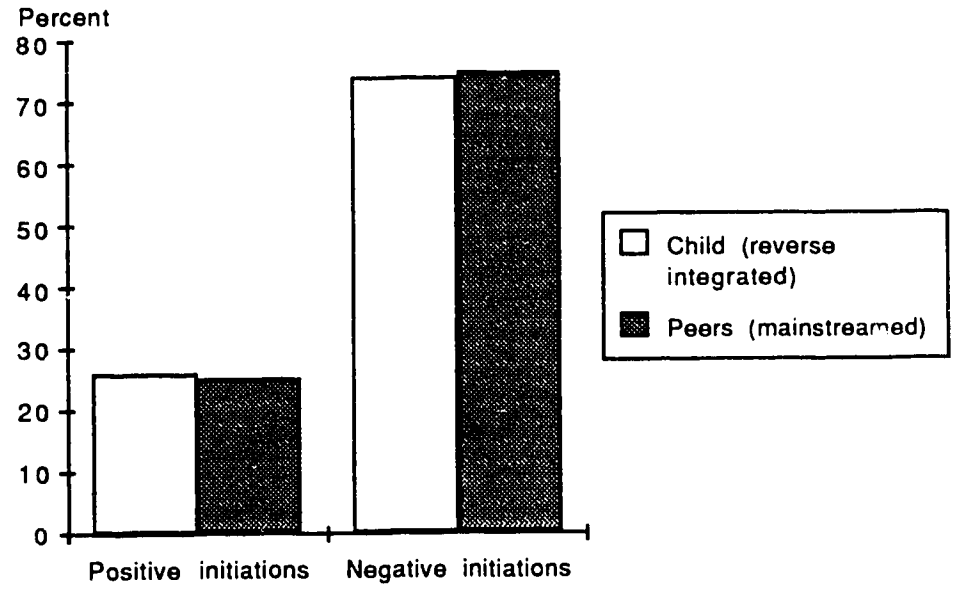

Figure 10. Percentage of positive and negative initiations displayed by the child in the reverse integrated setting compared to initiations made by peers in the mainstreamed setting

Peers in the reverse integrated setting were more successful in getting positive responses to their initiations. About 73.7% of their initiations were successful compared to the 53% success rate of peers in the mainstreamed setting (Table 15).

Table 15

Distribution of successful initiations (peers to child)

	No. of successful initiations		Percent of total initiations	
Initiations	**M**	**RI**	**M**	**RI**
Total	17	14	53.0%	73.7%
Positive initiations	4	11	50.0%	83.3%
Negative initiations	13	3	54.2%	50.0%

Note: M refers to the mainstreamed setting; RI refers to the reverse integration setting

The positive initiations of peers in the reverse integrated setting met with greater success (83.3%) compared to those of peers in the mainstreamed setting (50%.) The success rate of negative initiations by peers in the two setting showed little difference (Figure 11.)

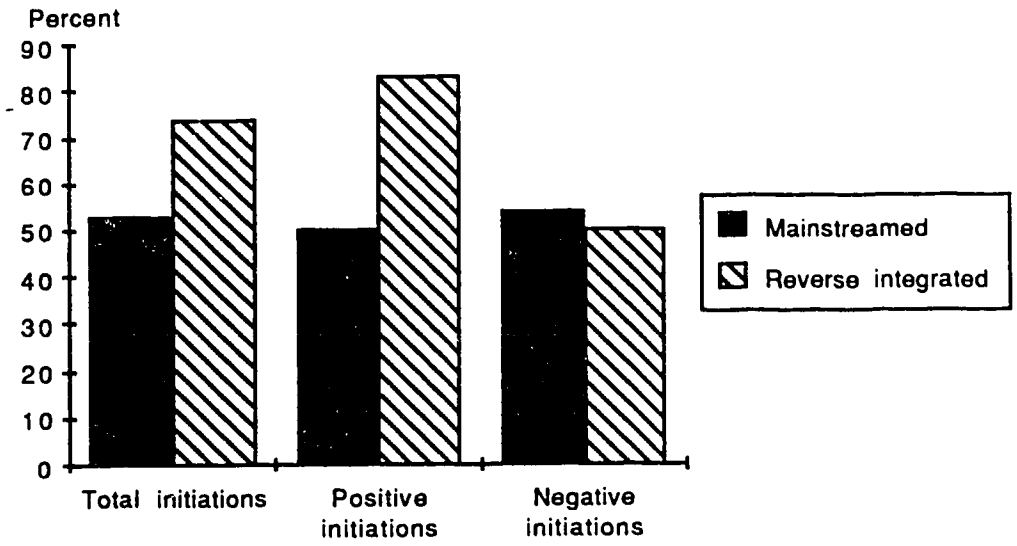

Figure 11. Percentage of initiations in each category that were successful (peers to child)

In summary, peers in the mainstreamed setting made more initiations towards the child, but the difference was not statistically significant. About 75% of peer initiations in the mainstreamed setting were negative compared to 31.6% in the reverse integrated setting. Conversely, 25% of peer initiations in the mainstreamed setting were positive compared to 68.4% in the reverse integrated setting.

Success of initiations does not appear to affect their total frequency. Peers in the reverse integrated setting met with more success but engaged in fewer initiations. However, there was a positive relationship between the frequency of positive initiations by peers in the reverse integrated setting and their success rate.

An interesting finding was that the distribution of positive and negative initiations of peers in the mainstreamed setting mirrored that displayed by the child in the reverse integrated setting.

Interactions with adults

1. Frequency and duration of interactions

As indicated in Table 5, the child had more interactions with adults in the reverse integrated setting (65) compared to the mainstreamed setting (51). The proportion of interactions is not significantly differently from .5 at the .05 level.

Interactions with adults in the reverse integrated setting were more sustained. The interactions involved a total of 458 turns or 7 turns per interaction (Table 6). In the mainstreamed setting, there were 326 turns resulting in an average of 6.4 turns per interaction. The distribution of turns is significantly different from .5 at the .05 level.

In summary, the child engaged in more interactive turns with adults in the reverse integrated setting.

2. Pattern of communicative intents (child to adults)

The child directed a similar number of communicative acts towards adults in the reverse integrated setting (216) compared to the mainstreamed setting (208) (Table 16). The distribution of communicative acts is not significantly different from .5 at the .05 level.

Table 16

Distribution of communicative intents (child to adults)

	Frequency		Percentage	
Intents	**M**	**RI**	**M**	**RI**
Total	208	216	100.0%	100.0%
Comment	36	39	17.3%	18.1%
Request	10	12	4.8%	5.6%
Demand	3	5	1.4%	2.3%
Protest	21	9	10.1%	4.2%
Answer	122	123	58.7%	56.9%
No response	16	28	7.7%	13.0%
Invitation to play	0	0	0.0%	0.0%

Note: M refers to the mainstreamed setting; RI refers to the reverse integration setting

In terms of proportion of communicative acts, the child displayed generally similar patterns in the two settings except for two categories. The child engaged in more "Protest" in the mainstreamed setting (10.1%) compared to the reverse integrated setting (4.2%), and there was more "No Response" in the reverse integrated setting (13%) compared to the mainstreamed setting (7.7%) (Figure 12). A chi-square analysis showed that the patterns of intents in the two settings were not significantly different at the .05 level.

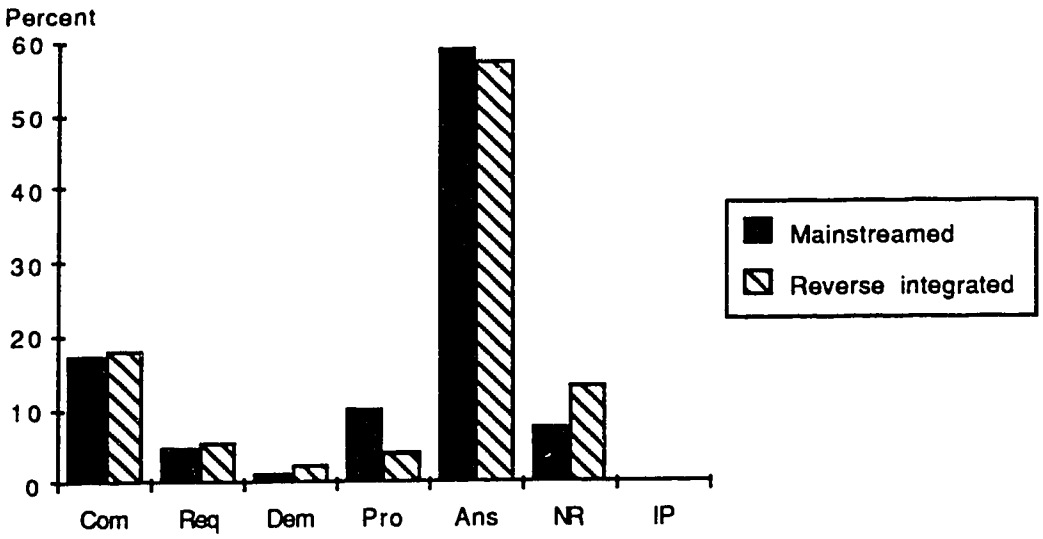

Figure 12. Distribution of communicative intents as a percentage of total communicative acts (child to adults)

In summary, there was little difference in the frequency and pattern of communicative acts displayed by the child towards adults in the two settings. The child engaged in more "Protest" in the mainstreamed setting, while there was more "No Response" in the reverse integrated setting.

2. Pattern of communicative intents (adults to child)

Adults directed more communicative acts towards the child in the reverse integrated setting (262) compared to the the mainstreamed setting (252) (Table 17.) The proportion of communicative acts is not significantly different from .5 at the .05 level.

Table 17

Distribution of communicative intents (adults to child)

	Frequency		Percentage	
Intents	**M**	**RI**	**M**	**RI**
Total	252	262	100.0%	100.0%
Comment	73	77	29.0%	29.4%
Request	114	118	45.2%	45.0%
Demand	5	8	2.0%	3.1%
Protest	17	25	6.7%	9.5%
Answer	39	25	15.5%	9.5%
No response	4	9	1.6%	3.4%
Invitation to play	0	0	0.0%	0.0%

Note: M refers to the mainstreamed setting; RI refers to the reverse integration setting

A large proportion of adult communications with the child in the two settings consisted of "Request" and "Comment" (Figure 13). There was a larger percentage of "Answer" (15.5%) in the mainstreamed setting compared to the reverse integrated setting (9.5%). There were also small differences in the proportion of "Protest" and "No Response," with more of these communicative acts being found in the reverse integrated setting. A chi-square analysis indicates that the pattern of communicative intents in the two settings is not significantly different at the .05 level of significance.

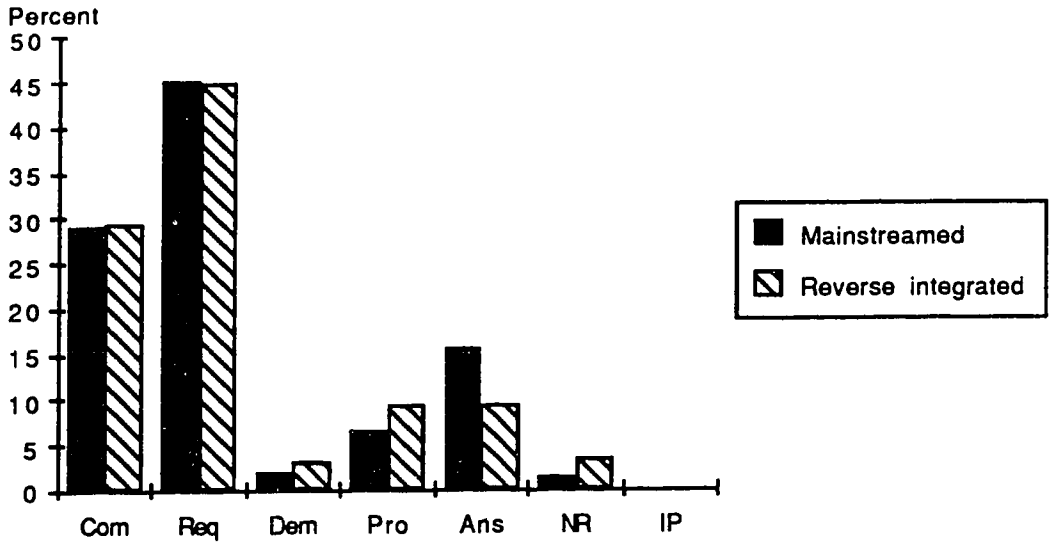

Figure 13. Distribution of communicative intents as a percentage of total communicative acts (adults to child)

In summary, adults in the reverse integrated setting engaged in slightly more communicative acts with the child compared to the mainstreamed setting, but the difference was not statistically significant. In both settings, the communicative acts were dominated by "Request" and "Comment". Adults in the mainstreamed setting appeared more responsive as indicated by the larger proportion of "Answer" and the smaller percentage of "No Response". However, the "No Response" category must be interpreted with caution because of its low reliability.

Summary

In terms of total communication and communication with adults, the child displayed largely similar patterns in the two settings although there were significantly more interactive turns with adults in the reverse integrated setting.

The child engaged in significantly more communicative acts with peers in the mainstreamed setting. He displayed proportionately more positive acts in this setting

and more negative acts in the reverse integrated setting. Peers in the mainstreamed setting also engaged in significantly more communicative acts with the child, but a larger proportion of these were negative compared to the communication of peers in the reverse integrated setting.

Peers in the mainstreamed setting made more initiations towards the child compared to peers in the reverse integrated setting, but the difference was not statistically significant. About 75% of peer initiations in the mainstreamed setting were negative compared to 31.6% in the reverse integrated setting. The distribution of positive and negative initiations of peers in the mainstreamed setting mirrored that displayed by the child in the reverse integrated setting.

The significance of these findings are discussed in the next section.

V. DISCUSSION

General interaction patterns

The pattern of the child's total communications, including interactions with both peers and adults, appears very similar in the two settings. The child engaged in a similar number of interactions and although interactions in the mainstreamed setting were more sustained in terms of the number of turns, the difference is not statistically significant. The child engaged in slightly more communicative acts in the mainstreamed setting but again the difference is not statistically significant. And the patterns of intent displayed in the two settings are highly similar.

The child engaged in proportionately more interactions with adults in the reverse integrated setting but the difference is not statistically significant. However, the child engaged in significantly more interactive turns with adults and less with peers in the reverse integrated setting compared to the mainstreamed setting. Detailed analyses of these interactions are presented in the sections on peer and adult interactions.

The child made more initiations in the reverse integrated setting compared to the mainstreamed setting. While the difference is not statistically significant, it is believed to be worthy of consideration. There were 11 more initiations in the reverse integrated setting which is more than one-third of all initiations in the mainstreamed setting.

Initiations can be considered a measure of the power of the participant in an interaction because the initiator decides what the interaction is going to be about (Conti-Ramsden, & Taylor, 1990.) The child, therefore, appears to be more assertive in the reverse integrated setting. This could reflect the greater success rate of the child's initiations in that setting. When success is defined as the child's ability to

obtain non-negative responses to his initiations, it was found that 62.8% of the child's initiations in the reverse integrated setting were successful compared to 56.3% in the mainstreamed setting.

Gestures and a combination of gesture and vocalization were the major modes of communication used by the child in the two settings. Speech was a rare occurrence, but more words were spoken by the child in the mainstreamed setting (10) than in the reverse integrated setting (4). The difference in frequency is not statistically significant.

The speech acts consisted of elicited imitations, where the child was asked to imitate the teacher, and spontaneous imitations of adults and peers. It was noticed that spontaneous imitations tended to occur when the child was happily involved in an activity and was highly motivated to express his feelings. While the child primarily imitated teachers, he was observed to occasionally imitate his normally developing peers. If this peer imitation could be encouraged, it might facilitate the speech development of the child.

Nature of peer interactions

There were slightly more interactions with peers in the mainstreamed setting but the difference is not statistically significant. However, the child used significantly more communicative acts with peers in the mainstreamed setting and these peer interactions were more sustained compared to the reverse integrated setting. On average, there were 3.8 turns per interaction with peers in the mainstreamed setting compared to 2.8 turns in the reverse integrated setting. The longer interactions are believed to reflect the greater ability of mainstream peers to maintain interactions and their greater persistence in achieving their communication goals.

Previous research has shown that disabled children tend to show less frequent peer-directed behaviors compared to teacher-directed behaviors (Field, Roseman, de Stefano, & Koewler,1981). Hartup (1978) argues that adequate peer relations play an important role in the acquisition of basic social and communicative skills and that these cannot be replaced by adult interactions. It is important, therefore, that the mainstreamed setting appears to provide the conditions that allow for greater peer interaction.

In addition, the child engaged in proportionately more positive acts in the mainstreamed setting and more negative acts in the reverse integrated setting. For example, the child offered more "Invitations to Play" in the mainstreamed setting (11) compared to the reverse integrated setting (1). This could be explained by the child's observed interest in the play of normally developing peers. The child was often observed to be watching intently as his normally developing peers played and he sometimes made very persistent efforts to join in the play even in the face of protest. The child's interest in the highly creative play of his normally developing peers may have motivated him to make greater efforts to engage them in play activities.

However, this more positive pattern of communication on the part of the child is not reflected in the communications of peers in the mainstreamed setting towards the child. While peers in the mainstreamed setting engaged in significantly more communicative acts with the child, a much larger proportion of these acts were negative when compared to those of peers in the reverse integrated setting.

In the mainstreamed setting, peer communications were characterized by a large proportion of "Protest" (40.9%) and "Demand" (21.8%). "Protest" largely consisted of disapproval of the subject's actions while "Demand" was often manifested as grabbing behaviors. This is congruent with Guralnick and Paul-Brown's (1989) finding that, in interactions among children of different developmental levels,

more disagreements were directed at mildly delayed children than at normally developing peers.

The high level of "Demand" in the mainstreamed setting parallels the findings of Guralnick and Paul-Brown (1989). The authors found that a larger number of strong directives were used with delayed children than with normally developing peers. Strong directives as defined in that study is similar to "Demand" as used in the present study. It appears that normally developing peers in the mainstreamed setting did not feel a need to be polite or to mitigate their requests in their interactions with the child. Similar findings were reported by Guralnick and Paul-Brown (1984) who found that normally developing children justified their requests only to other normally developing children and not to disabled peers. The authors suggest that this behavior could reflect the perceived social status of the disabled children.

Of concern in the present study were negative interactions which escalated because of the subject's inability to resolve disagreements. On a number of occasions, the subject was observed to engage in inappropriate behaviors (e.g., throwing blocks) some time after negative peer interactions. The study did not trace the development of these behaviors and causal connections cannot be made. However, it would be important for further research to determine if there is a link between inappropriate behaviors and negative interactions with peers.

In addition to directing more negative communicative acts towards the child, peers in the mainstreamed also seemed less willing to engage the child in play. There were four "Invitation to Play" in the mainstreamed setting compared to nine in the reverse integrated setting. This is consistent with findings in social interaction studies showing that normally developing children prefer their nondisabled peers especially for more complex play (Cavallaro & Porter, 1980; Faught, Balleweg, Crow,

& van den Pol, 1983; Ispa, 1981). Cavallaro and Porter (1980) suggest that children select playmates whose cognitive levels approximate their own.

In the reverse integrated setting, it is interesting to note that of the nine "Invitation to Play," eight came from normally developing peers. Perhaps, in the face of a limited choice of partners, normally developing children were more willing to engage their disabled peers in play.

Initiations in peer interactions

The child made a similar number of initiations in both settings. However the pattern of positive and negative initiations in the two settings were highly dissimilar. About 74% of the child's initiations towards peers in the reverse integrated setting were negative. On the other hand, about 75% of the child's initiations in the mainstreamed setting were positive. Data on the success of both positive and negative initiations does not explain the differential distribution of these initiations. Both positive and negative initiations resulted in a similar proportion of success in each setting.

Peers in the mainstreamed setting made more initiations towards the child compared to peers in the reverse integrated setting, but the difference was not statistically significant. About 75% of peer initiations in the mainstreamed setting were negative compare 31.6% in the reverse integrated setting. Conversely, 25% of peer initiations in the mainstreamed setting were positive compared to 68.4% in the reverse integrated setting.

Success of initiations from peers does not appear to affect their total frequency. Peers in the reverse integrated setting met with [illegible]ccess but engaged in fewer initiations. However, there was a positive relationship between the frequency of positive initiations by peers in the reverse integrated setting and their success rate.

The analysis of the success of initiations was an attempt to determine if the reinforcement value of success accounts for the differential frequencies of initiations by the child and his peers. There appears to be little relationship between frequency of initiations and success. It is possible that this finding is a result of the way success is defined in this study. Only the immediate effect of an initiation was looked at. If the initiation had been traced through to the end of the interaction with success being defined as a positive outcome of the entire interaction, the results may have been different.

However, social status factors may provide another explanation for the pattern of initiations found. The pattern of positive and negative initiations displayed by the child in the reverse integrated setting was an almost perfect copy of the pattern displayed by his peers in the mainstreamed setting.

Negative initiations similar to "Demand" have been found to be used more frequently with peers of perceived lower status (Guralnick & Paul-Brown, 1989). Perhaps, the child's greater use of negative initiations in the reverse integrated setting reflects his higher social status in that setting especially in relation to his disabled peers. In the mainstreamed setting, the child was the recipient of a greater proportion of negative peer initiations, which may indicate his lower social status relative his normally developing peers. It is also possible that the child was modelling the behavior of his peers in the mainstream setting when interacting with his less able peers in the reverse integrated setting.

Interactions with adults

There were slightly more interactions with adults in the reverse integrated setting, but this was not statistically significant. However, interactions in the reverse integrated setting were of significantly longer duration as measured by the number of turns. On average, there were 7 turns per interaction with adults in the reverse integrated setting compared to 6.4 in the mainstreamed setting.

This could have been a reflection of the greater availability of adults in the reverse integrated setting which had a teacher-child ratio of 1:2.7 compared to 1:5.3 the mainstreamed setting. Teachers in the reverse integrated setting were more able to spend time interacting with the child while teachers in the mainstreamed setting had to allocate a greater proportion of their time to the other children in the day care.

However, longer interactions with adults is not necessarily better for the communicative development of the child as peer interactions are believed to play a significant role in such development (Hartup,1978.) O'Connor (1975) found that with normally developing nursery school children, the availability of highly responsive adults had a tendency to inhibit child-child interactions. In the present study, the child engaged in significantly more communicative acts with peers in the mainstreamed setting. However, apart from the lower teacher availability, this finding could also have been the result of the larger number of peers available in the mainstreamed setting.

It is important to note that in both settings, interactions with adults made up about half of all the child's interactions. Further research is required to determine if this proportion reflects the experience of normally developing preschoolers, and whether it is appropriate to the developmental needs of the child. While child-child interactions are considered important for the development of communicative and social

skills, direct adult-child instruction may be more important for the development of pre-academic skills (Jenkins, Odom, & Speltz, 1989).

In terms of the pattern of communicative intents, adults in both settings appeared to behave in a similar manner towards the child. Their communications reflect an instructional approach in their interactions with the child. About 45% of all adult communicative acts in the two settings consisted of "Request," which includes requests for information or questions. Teachers in both settings often used questions to engage the child in interaction. There are mixed opinions regarding the effectiveness of this strategy. Some have suggested that children's language skills can be enhanced if they are presented with stimulating demands in conversation. Others have found that when teachers used questions to maintain dialogues, children displayed less initiative, answered less or answered tersely (Conti-Ramsden & Taylor, 1990.)

In the present study, the child studied showed a high level of responding in both settings. Slightly more than half of the child's communicative acts with adults consisted of "Answer." In addition, about 17% of the child's communications with adults consisted of "Comment," indicating that the child's role in the interactions were not confined to responses to questions.

Adults in both settings appear equally effective in engaging the child in interaction. Their pattern of intents are highly similar and despite the lower teacher-child ratio in the mainstreamed setting, adults there appeared to be slightly more responsive as indicated by the higher proportion of "Answer" and the lower proportion of "No Response."

Summary

Variations in patterns of peer interactions is the most interesting finding in this study. The child engaged in more communicative acts and made more positive initiations in the mainstreamed setting. While peers in the mainstreamed setting also engaged in significantly more communicative acts with the child, more than half of these were negative. In the reverse integrated setting, the child engaged in significantly more negative initiations towards his peers, while peers made more positive initiations. This is believed to be related to the child's perceived social status in the two settings.

VI. RECOMMENDATIONS

It appears that in both settings, there is a need to increase positive communicative interactions between the child and his peers. In the mainstreamed setting, there appears to be a need for a more specific and consistent program to encourage social integration. To maximize the benefits of such a program, all the adults in the day care center should be encouraged to participate. In the reverse integrated setting, it might be important to include more free play in the curriculum. It is clear that when given the opportunity, children in the preschool do interact with each other. Such natural, child-directed interactions provide a powerful opportunity for promoting the development of child-child social and communicative skills.

Some strategies for encouraging positive peer interactions are presented below. An attempt was made to select activities that can easily be introduced in the two settings. There is also evidence that, when implemented consistently, the strategies can produce good results. It must be pointed out that some of the strategies are already being implemented in the two settings and teachers should be encouraged to continue using them consistently.

1. Reinforce positive interaction

This apparently simple strategy has been found to be an effective method for getting children to interact positively with each other. Strain and Timm (1974) found that when teachers provided verbal praise and physical contact every time a behaviorally disordered child and her classmates made positive initiations towards each other, the level of those initiations increased. Praising the child in the presence of peers may also help to improve the child's social status.

2. Use group socialization procedures

Group socialization activities were designed to increase positive social contact between socially withdrawn children and their peers (Brown, Ragland, & Bishop, 1989.) The procedures involve minor changes in group activities already practised in the two settings. For example, when playing "Simon Says" the usual actions can be replaced by asking the children to "Shake hands with the people next to you" or "Give your friends a hug." Teachers should ensure that the target child gets the appropriate positive contact and the child and his peers should be praised liberally when it does occur. Brown et al. (1989) provide scripts for 18 different group games that can be tried out in the two settings.

3. Incidental teaching of peer interactions

Teachers can prompt peers to interact with each other during the normal activities of the day. For example, the child in this study was often observed standing on the fringes of peer activity apparently interested in joining in. Teachers could use this opportunity to teach the child positive initiation strategies. This might be accomplished by teaching the child and his peers the sign for "play," for example, with explanations that the use of the sign indicates the child's interest in joining in the activity. Peers could then be prompted to let the child join in their play. Other signs might be taught to the child and his peers in naturally occurring contexts, such as the sign for "sorry" when disagreements or accidents occur.

While it is important to develop the child's speech, it is believed that this goal should not be achieved at the expense of a functional means of communication between the child and his peers. This might be especially important if the link between the child's inappropriate behaviors and negative peer interactions are borne out.

4. Encourage imitation of normally developing peers

Based on the researcher's observation, highly motivating small group activities appears to be an effective context for encouraging the verbal imitation of peers. For example, spontaneous imitation of peers was observed during a playdough-making session conducted by the child's keyworker in the day care center. When the teacher asked who wanted a turn at stirring the dough, a normally developing child said "I do" which was immediately imitated by the child. This provided an excellent opportunity to reinforce the child for speaking by giving him a turn and commenting on how he was being given a turn because he asked for it.

Specific language targets can also be taught during these sessions. For example, children could be asked to say "My turn" when it is their turn. After being given an opportunity to listen to several of his peers model the phrase, the child might be prompted to imitate. To ensure success, it might be wise to initially accept either a sign or a vocal approximation. As the child gains confidence, the demands can be increased.

5. Try the Integrated Preschool Curriculum

This program consists of a series of structured play activities designed for use with small groups of about four children (Odom et al, 1988.) The groups are designed to include a heterogeneous mix of developmentally less advanced and more advanced children so that the less advanced can learn from the more advanced models. Within the context of the activities, teachers suggest play ideas, model appropriate behaviors, and prompt interaction among the children. While guiding the children through their play, teachers also model and encourage context appropriate language. Teacher modelling and prompting are gradually reduced as the children become more skilled. The program also includes assessment instruments to measure the effects of the play activities.

Suggestions for further research

Based on issues raised in this study, the following appear to be fruitful areas for further research:

1. Examine the possible link between negative interactions and the development of behavior problems.

2. Explore the status factor in peer interactions. Communications towards a disabled child might be compared to that made towards a socially isolated but normally developing child.

3. Examine the specific effects of communicative delay on peer interactions. Peer interactions with a non-English speaking child might be compared with that of a communication delayed child.

4. Conduct an in-depth examination of conflict situations to determine their causes and follow their development so that possible intervention strategies might be discovered.

5. Continue to conduct research on the various models of preschool integration.

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APPENDIX A

Coding form

School: Observer:

Date:

Communication categories

Request (Req)	Comment (Com)	No response (NR)
Demand (Dem)	Answer (Ans)	Protest (Pro)
		Invitation to play (IP)

Child	**Peer/Adult**	**Mode (child)**	**Setting**
IP → Ans		ges/voc	Playing table soccer
Com ← → Dem		ges/voc	with a peer
Pro ←		ges/voc	
	RI		Making bubbles with
Ans ← → CA		speech	teacher at water table
Ans ← → Req		ges/voc	

APPENDIX B

Explanatory letter and consent form

February 21, 1991

Dear Parents,

My name is Elsie Tan and I am a graduate student with the Department of Educational Psychology, University of Alberta. I am working on a Master's thesis that deals with the communication patterns of children with special needs. The study seeks to determine if children with special needs communicate differently in a mainstreamed day care setting as opposed to a reverse integrated preschool. It is believed that the study will shed further light on the important issue of mainstreaming.

As part of the study, I would like to obtain permission to observe your child for about three weeks between February and April. I will position myself so that I can videotape interactions between the children without affecting the normal activities in the classroom. No intervention or other experiment will be conducted. In addition, the study has received ethical clearance from the Department of Educational Psychology.

If you are willing to participate in the study as described, could you please sign the consent form attached. Feel free to call me if you have any questions or concerns regarding this study. Thank you for your cooperation.

Sincerely,

Elsie Tan
Department of
Educational Psychology
University of Alberta
Telephone: 433-7158

Supervisor: Richard Sobsey
Professor
Department of
Educational Psychology
Telephone: 492-3755

Consent Form

Project title: The communicative patterns of a preschool child with special needs in a mainstreamed versus a reverse integrated setting.

Researcher: Elsie Tan
Master of Education candidate
Department of Educational Psychology
University of Alberta
Home phone number: 433-7158

Thesis supervisor: Dr Richard Sobsey
Professor
Department of Educational Psychology
University of Alberta
Telephone: 492-3755

The purpose of the study has been explained to us and we understand that:

1. The study involves the observation of our child for a period of three weeks over three months.
2. All information obtained in the study will be kept confidential. No names will be used on the data sheets and the results of the study will be reported without naming or otherwise identifying the children observed.
3. The family is free to withdraw from the study at any time.
4. A summary of the research report will be made available at our request.

We agree to participate in this study under the terms described above:

Signature:

Name:

Date: