A study of the social skills of four year old hearing impaired and hearing children in an integrated preschool, Clarke School for the Deaf, Northampton, Mass.

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A STUDY OF THE SOCIAL SKILLS OF FOUR YEAR OLD HEARING IMPAIRED AND HEARING CHILDREN IN AN INTEGRATED PRESCHOOL, CLARKE SCHOOL FOR THE DEAF, NORTHAMPTON, MASSACHUSETTS

A Thesis Presented
By
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Submitted to the Graduate School of the University of Massachusetts in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

February 1979

Department of Psychology
ABSTRACT

Educational delays of the hearing impaired have been studied extensively and remediated in schools for the deaf. In recent years an attempt has been made to understand and improve the social development of the hearing impaired. The objective of the present study was to describe differences in the social skills of four year old hearing impaired children in the integrated preschool at the Clarke School for the Deaf. Social and proximate behaviors were measured using naturalistic observation procedures over eight weeks. The data analysis indicates that hearing impaired children exhibit higher levels of visual explorations and a lower overall incidence of social activity. Social contact was employed more by the hearing than hearing impaired. The proximate patterns indicate hearing impaired children were more likely to be close to other hearing impaired children; although, the hearing impaired children showed no significant preference for interacting with either hearing impaired or hearing children. In many instances, there were no significant differences in the social and proximate behaviors of the hearing and hearing impaired.
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CHAPTER I
INTRODUCTION

Normal social and emotional growth depends upon a match between the child's capabilities and the challenges presented to him by the environment. Not all children possess all the essential capabilities. Some children, such as the deaf, suffer hearing loss. Three primary causes are known to cause deafness: genetic defects, birth trauma and illness or drugs. In addition, there are secondary consequences of linguistic delay and psychological trauma which prevents or delays an adequate adjustment to life situations.

A variety of names and definitions have been proposed to classify hearing conditions. The definition proposed by the 1937 Committee on Nomenclature of the Conference of Executives of the American Schools for the Deaf is widely accepted.

The deaf: Those in whom the sense of hearing is nonfunctional for the ordinary purposes of life. This general group is made up of two distinct classes based entirely on the time of the loss of hearing: the congenitally deaf are those who are born deaf. The adventitiously deaf are those who were born with normal hearing but in whom the sense of hearing becomes nonfunctional later through illness or accident.
The hard of hearing: Those in whom the sense of hearing, although defective, is functional with or without a hearing aid.

This definition is cited to orient the reader to the terminology which is most widely employed. Further definition of deafness is by classification of hearing levels. The relationship between hearing level, speech perception and speech production can be described in terms of the audibility of speech features. The following classification approach is used by the Clarke School for the Deaf, Northampton, Massachusetts.

Moderately deaf: Children whose hearing levels (better ear three frequency average) lie in the range 30 to 60 decibels. Problems in speech perception and production are usually limited to place of articulation consonants.

Severely deaf: Hearing levels in the range of 60 to 90 decibels. This is often accompanied by very poor perception of place articulation and some difficulties with manner of articulation.

Totally deaf: Children without residual hearing, or whose hearing is rendered useless by poor frequency/time resolution or tolerance problems. They are limited to the perception of rhythmic information through the sense of touch. This may be accomplished by a high power hearing aid worn with an air conduction receiver at the ear, or a bone conduction receiver on some other part of the body.

Beyond the degree of hearing loss important descriptive
parameters to consider are: onset of hearing loss, extent and configuration, interpretative function in utilizing residual hearing, nature and extent of delayed speech and language development resulting from hearing loss, developmental growth potential in the areas of receptive and expressive communication skills, potential for learning (intelligence, emotional status, social maturity, level of educational achievement, motor development and perceptual development) and the existence of a secondary handicapping condition (Griffing, 1970). Understanding deafness and its effect on children requires consideration of hearing loss as well as functional level and potential of the individual.

The effect of deafness may be profound or minimal, depending on the parameters offered by Griffing. One serious effect for children is that deafness is a barrier to learning and using language. Language serves two main functions: first, it is a system of responses by which individuals communicate with each other (interindividual communication using expressive and receptive language), and second, it is a system of responses that facilitates thinking and action for the individual (intra-individual communication) (Carroll, 1964).

Educational retardation due to the barrier of language learning has been extensively studied (Birth, 1975; Carson and Goetzinger, 1975; McConnell, 1968; National Advisory
Committee on the Handicapped, 1977; Northcott, 1973, 1977a). Results of the Annual Survey of Hearing-Impaired Children and Youth (1972) indicated that the average amount of educational retardation for the deaf child is $1\frac{1}{2}$ to 2 years in grade level for the moderately deaf and 3 to 4 years for the severe or profoundly deaf. Farrant (1964) and Goetzinger et al. (1975) found that children with moderate hearing loss (hearing loss in the 0 to 25 decibel range) were more similar intellectually to hearing children than to deaf children. This educational retardation is primarily due to language deficiency.

Deaf children have been placed in exclusive settings in which efforts have been primarily directed at the remediation of language deficiency. Historically, children have been placed away from home because local schools and teachers have not been equipped to integrate and educate deaf children. Due to low prevalence (1 per 1000), it has been believed that the most efficient and effective schooling for the deaf child would be in exclusive residential settings (Robinson and Robinson, 1976). In residential settings deaf children have been taught to approach the level of language functioning required to master the oral and written communication skills needed for a formal education. Particular to each exclusive setting is a preferred method of instruction. The two major methods of instruction are the
Auditory/Oral Method or the Total Communication Method, and within each group there are sub-groups.

The Auditory/Oral Method is based on the belief that "the primary, although not always exclusive, channel for speech development is auditory, ... the input is connected speech" (Calvert and Silverman, 1975). The focus is on learning to listen through binaurally aided hearing in a carefully sequenced program of activities designed to foster the child's development of short and long term auditory memory for the English language. The development of speech communication skills is stressed through the use of residual hearing, speechreading, and speech, but it is exclusive of signs and fingerspelling (Northcott, 1973).

The Total Communication Method adds a form of American Sign Language and fingerspelling to the use of residual hearing, speech, and speechreading. This method requires the incorporation of appropriate aural, manual, and oral modes of communication in order to assure effective communication with and among persons with hearing loss (American Annals of the Deaf, 1976). The views of parents of deaf children and local availability of appropriate educational settings have determined placement in either type of program. The advantage of either Auditory/Oral versus Total Communication language remediation is a long standing debate in
the field of deaf education.

Remediation of language and educational deficiencies has been studied extensively, but very little attempt has been made to understand or improve the social development of deaf children. It is logical to assume that a powerful sensory deficiency such as hearing loss has an effect on social behavior.

In this context, it is important to examine the differences in social behavior of infants early in life. The early social development of hearing and deaf children begins at birth. According to Ainsworth (1973) normal infants exhibit social behavior at birth, and attachment commences as a result of the visual and tactile exploration between infant and mother.

Leach (1972) indicated that auditory interaction probably plays a minor role in attachment but maybe important in allowing very young infants to orient to their surroundings. During the first year of life, infants increase their social repertoire in several ways. They learn to identify the primary caretaker using all their auditory and visual cues. Smiling, crawling, and reaching tend to promote contact. Crying or making sounds can signal need. The deaf infant's early attachment responses are the same as a normal infant's. The rooting and grasping reflex is displayed in deaf infants and the deaf infant
exhibits the typical early reflexes and other psychomotor skills at each appropriate stage of development. However, the mother-infant bond for the deaf child is limited to touch, vision, and primitive grasping. Best and Roberts (1976) reported that the 23 and 38 month old deaf child progresses normally through the period of sensorimotor development, except in the area of vocal imitation.

Although the response to sound is limited, deaf infants still produce sounds. The initial sound production stage consists of the birth cry and reflexive vocalizations. There is no evidence that these early sounds have any linguistic significance; they are thought to be responses to physiological states of the child and early readiness skills for language. During this stage, the infant begins to associate to speech sounds and speech movements. This is thought to lay the groundwork for the imitative stage.

From 3 to 6 months infants develop their speech sound productions. By 6 months, most infants enter the vocal play or babbling stage. During this phase, the infant seems to respond positively to the sound and feeling of his own vocal utterances (Van Riper, 1963). Beginning at approximately 6 months, the infant's babbling becomes more repetitive, thus indicating that the infant is hearing his own sound production and is attempting to imitate that which he has heard. Research indicates that comprehension
of language proceeds with evidence of minimal understanding being seen at 8 to 9 months of age (Friedlander, 1968, 197). Between 8 and 9 months, it is evident that speech comprehension has begun to develop with hearing children as they begin to respond to simple words and commands. The first words generally appears around a year of age.

A major difference between the hearing and hearing-impaired child occurs at around 6 months with the decline in spontaneous babbling (Altshuler, 1964). The babbling stage is not related to verbal communication as such but more importantly serves as an oral-aural coordinating stage in which the child begins to link and consciously control the respiratory, phonatory and articulatory systems, to produce and reproduce sounds he has heard. Parents of deaf infants begin to suspect a hearing problem between the age of 6 to 12 months. The diagnosis of deafness can be confirmed at one year but often is not made until the child is 2 to 3 years of age based on lack of speech. The parents' reaction and adaptation to the diagnosis has several developmental consequences which influence the child's ability to cope with the handicap.

Parents often respond to the diagnosis of deafness with sorrow, shock, shame, guilt, and anger (Bolton, 1974). Nine out of ten deaf children have hearing parents, lacking in personal experience with deafness. Mindel and Vernon
(1971) believe hearing parents' reactions are essentially negative: "successful family adaptations to childhood deafness are rare today". By contrast, deaf parents of deaf children appear to expect the diagnosis and to accept it while the child is still an infant or toddler (Schlesinger and Meadow, 1972).

Deaf children with deaf parents receive consistently higher and more positive ratings for maturity, responsibility, and independence than deaf children with hearing parents. Children with deaf parents had all experienced early family communication—i.e., sign language in infancy. Schlesinger and Meadow (1972) found hearing mothers of deaf children to be more controlling, more intrusive, more didactic, less flexible, and less approving of their children than mothers of hearing children. They found that hearing parents feel frustration and irritation in dealing with their hearing-impaired child.

Communicative interaction between most deaf children and their hearing parents is very rudimentary during the important early years of the child's life. While normally hearing children ordinarily have the most consistent and exclusive verbal communication contact with their parents during these years, the deaf child has to cope with reduced verbal contact and, additionally, with the attitudinal responses of parents, peers, and teachers toward their
handicap.

Deafness can have a major impact on a child's developmental outcomes. Buscaglia (1975) wrote about the individual's adaptation based on the quality of social interactions, especially with primary caregivers. Discontinuity in development or experience upsets the equilibrium of the individual and exposes him to the risk of adopting solutions that are dangerous to his future mental health. The quality of social interaction at diagnosis and during crisis periods can have a decisive effect on developmental outcomes. Disturbed relationships within the family, especially but not exclusively between the child and his mother, will enhance vulnerability to most kinds of stress.

As the deaf child matures his social skills development is delayed by his inability to communicate and his feelings about his handicap. Handicapped children learn or sense that they are different very early. The deaf child's self image influences the development of his social skills. The positive or negative meaning attached to his deafness depends on the feelings of parents, and, outside the home, on peers' and teachers' feelings about his handicap (Altshuler, 1974; Jacobs, 1974; Meadow, 1972). It is often the case that parents don't know what to expect of their deaf child. The Vineland Social Maturity Scale was designed to measure children's capacity to care for them-
selves independently. It measures abilities in social relations as well as self-help skills, self-direction, locomotion, occupation, and communication. Meadow (1976) found that in a large number of studies, deaf children receive lower Vineland scores than hearing children of comparable ages. The reasons given for the lower scores are lower patience and lower expectations of parents and teachers.

Because of lower expectations from parents and teachers the deaf child has often been placed in protective settings. These settings may be appropriate educational placements based on the deaf child's degree of impairment; however, development of social skills may be neglected. There are fewer opportunities to practice social skills with a variety of persons in exclusive residential settings.

The degree of hearing loss and the educational placement have the greatest effect on delaying the development of social skills. Schlesinger and Meadow (1972) found that deaf children placed in protective settings experienced trauma when separated from the school. The result of this trauma is to become very withdrawn. Fromm (1941) noted that children educated in exclusive and protected settings responded to the trauma of separation by intensifying their impulsiveness, reverting to increased dependency, or conforming in an automaton-like manner. Baker (1953) concluded
that children in protected environments such as residential schools, are likely to be less well adjusted than hearing children, and Meyerson (1963) reviewed studies regarding the personality and social adjustment of deaf children and concluded that "deafness requires a unique kind of social adjustment." Myklebust (1964) suggested that what is normal social adjustment for a hearing child may not be normal for a deaf child. The differences for the hearing-impaired in social maturity are related to the degree of impairment. Meadow (1968, 1975) corroborated this finding, pointing out that one of the most consistent findings is that the deaf and hearing-impaired are less socially mature than the hearing.

Goetzinger and Proud (1975) found that children with hearing losses above 25 decibels for speech frequencies show immaturity in emotional and social areas. Levine (1956) and Altshuler (1974) have described the immaturity in terms of egocentricity, easy irritability, impulsiveness, suggestability, and dependence. Meadow (1976) characterized the deaf child's behavior in the following ways. The deaf child is said to be impulsive; that is, the child's behavior is often rash, not careful, coherent, or planned. This may be due to the child's reduced ability to understand the concept of time; the child may not understand the experience of future plans or past memories. The deaf child is said
to be rigid or inflexible in his ability to adapt or conform to changing situations. These behaviors, which often seem indiscriminate, may be attributed to following rules without knowing reasons. Deaf children exhibit higher rates of behavior problems, such as aggressiveness, hyper-activity, and acting-out behaviors, when compared to hearing children.

In the past deaf children have been socially isolated from hearing children in educational settings. The current trend is away from isolation and toward settings that will enhance the development of social skills as well as academic competence and communication.

Beginning in 1968 a common theme supported by personnel in programs for deaf children was "some form of group experience with hearing children" (McConnell, 1968; Northcott, 1971). The National Advisory Committee on the Handicapped (1977) recommended that all state plans for special education include a section on the delivery of educational services to preschool handicapped children and that "...wherever possible, handicapped children be integrated into regular early childhood education programs" (p. 2). Solitary focus on language remediation to enhance academic achievement in exclusive settings is being challenged federally by P. L. 94-142 and in Massachusetts by Chapter 766. The National Advisory Committee on Education of the Deaf (1976) has resolved to apply the laws to promote
individualized programming for each child and further states "no single method of instruction and/or communication (oral or total communication) or educational setting can best serve the needs of deaf children."

In support of the above laws, there is now ample evidence that medical labels and segregation adversely affect the exceptional child's self-concept, attitudes, and behavior (Jordon and Daily, 1973; Warfield, 1974). To promote success for all special needs children, the need for appropriate programming is essential. Children should be identified on the basis of developmental characteristics and through psychoeducational assessment in essential life skill areas (Ainsworth, 1973; Minnesota Department of Education, 1974). Northcott (1977) dispelled a number of unwarranted assumptions and myths about the deaf child, concluding that self-contained educational settings are not necessary; the deaf do not prefer their own kind; and integration does not "deny one's deafness."

Integrated settings for hearing and hearing impaired children offer several possibilities for enhancing the development of social skills with teacher and peer intervention. McCauley et al. (1976) studied the behavioral

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1The audiological term "deaf" is unsuitable when applied to preschool children who may become partially hearing through suitable training in the development of listening skills (Calvert and Ross, 1973).
interactions of hearing and hearing impaired children in regular classrooms and found that hearing impaired children relied more heavily on the teacher rather than peers for positive social interactions, whereas the hearing children did not. One reason for this may be frustration experienced by the hearing and hearing impaired when difficulty in communication arises (Jacobs, 1974; Levine and Garrett, 1969). Existing research with preschool children has documented that spontaneous interactions are not likely to occur with widely heterogeneous groups of children (Allen, Benning, and Drummond, 1972). This suggests that the systematic arrangement of events and other specialized procedures to encourage and support integration may need to take place, especially if peer interactions are intended to serve as an educational or therapeutic resource (Guralnick, 1976).

Birch (1975) suggested that integration at the preschool level reduces prejudice among children. Integration has the potential for making each child more accepting of another based on shared group activity, and it reduces the deaf child's self-consciousness (Blumberg, 1973; Klein, 1975). Bruner (1972) explained that it permits observational learning to take place and develops the visually directed manipulative skills that have survival value for flexibility in coping with an increasingly complex world.
Currently, empirical evidence to support a rationale for integration as an educational intervention is becoming available. Rister (1975) indicated that the presence of a severe of profound hearing loss is not an automatic deterrent from assimilation into a regular classroom during the elementary school years. In the Minneapolis study, Kennedy et al. (1976) reported the academic achievement data for hearing impaired children in grades 3 and 4 who have been in an integrated nursery school setting since age 3 show no significant differences when compared to their hearing peers except for the MAT worked knowledge measure, on which normal hearing children scored significantly higher.

Few studies are concerned with the development of social skills. One exception is the Michael Reese Hospital in Chicago which has a deaf rehabilitation preschool program. This program exposes the children to tasks specifically designed to teach social skills. Koh (1972) followed 17 of the deaf children who graduated from Michael Reese Hospital and concluded that the social development of the children was comparable to or exceeded the established standards for normal social development.

Social skills development depended partly upon maturity of spatial and psychomotor skills. For the hearing impaired children, the development of social skills required training and exposure to activities with peers and adults over a lengthy
period of time. In order to stimulate the cues for social responses, continued structured social activity should be developed specifically for the hearing impaired (Mindel, 1969).

The Clarke School for the Deaf in Northampton, Massachusetts began an integrated preschool for Hearing and Hearing Impaired Children in 1975. Clarke School provided a unique opportunity to gather data in an exclusive setting serving the Hearing Impaired which has adopted an integrative strategy. Clarke is an example of reverse integration by placing normal hearing children in a preschool designed for the hearing impaired. Historically, Clarke is an environment that encourages good speech attitudes and motivates the children to use expressive language. Integration is an attempt to create a normal social context to prevent the hearing impaired child from being socially isolated from hearing children and to promote such constructive outcomes as peer interaction to enhance the development of social skills (Boothroyd et al., 1977).

The objective of the present study was to describe the differences in the social skills of 4 year old hearing and hearing impaired children in an integrated preschool during student-directed free play periods. There are several important reasons for observing children during free play. Human behavior is shaped by context; at this
time there is lower teacher direction, and the children have
the opportunity to demonstrate their spontaneous social
skills. As the children interact with their peers, they
display a wide range of behavior patterns, often involving
an original, unsupervised manipulation of objects.

The naturalistic observation technique used in this
study has several advantages. It can be used to measure
a wide range of behaviors. It describes differences and
similarities. It adapts to the spontaneous behavior of
children who are difficult to hold "experimentally" con-
stant.

Naturalistic observation focuses on overt behavior.
This is important because 4 year olds cannot report their
feelings and subjective states reliably. For this study,
it is more important to observe when and how the children
interact with each other based on observed skills rather
than how they feel about each other's differences; it is
more important to know what the children do with play
objects than whether they like the color of the objects.

Naturalistic observation provides a framework for des-
cribing and classifying the children's behavior in a familiar
context. Play events are not contrived but are recorded
as they naturally occur. In this way, behavior is opera-
tionally defined as part of the context, positively or
negatively, rather than as strictly an attribute of the individual.

It records and reveals the complexity of the preschool environment, documenting systems of relationships in which individual children link with their social network. It records the individual's interactions with peers, teachers, and objects.

It is an objective description of each child's behavior independent of expectation or knowledge of an individual's capabilities. Naturalistic observation describes children on the basis of their developmental and behavioral skills rather than on categorical criteria related to handicap.

Naturalistic observation is more comprehensive than rating scales and standardized tests. In this study behavior is quantified based on a range, intensity, and frequency of free play behavior in an investigator-free environment over time (Altman, 1965; Smith and Connolly, 1972). Rating scales can be biased by the teacher's knowledge or expectations (Rosenthal and Jacobson, 1968). Also, rating scales are less complete, less accurate, and less effective than judgements based on observation in a context. Standardized tests can be fatiguing and intrusive, requiring active participation and reaction from the child. Test scores are often not representative and comparisons are not standardized for special needs populations. Tests often empha-
size the atypical and deficit behaviors. Testing deals with the abstractions of cognition and attitudes, while naturalistic observation is expressed in practical meaning rather than abstract terms (Willems, 1974).

In conclusion, naturalistic observation allows for understanding from the descriptions of the effects of intervention and planned change, because the behavior-environment system is observed over time.

Assessment of social skills was accomplished by recording the children's natural behaviors to generate individual social profiles and social interactions as well as proximate patterns. Using three instruments, four differences in social skills due to deafness were expected.

The deaf child out of visual contact with peers cannot use verbal or vocal behavior to maintain contact. As a result it was expected that the deaf children would display higher levels of visual exploration and more social contact.

It was expected that the deaf children would engage in a different level of social interaction such as engaging in less social activity with all peers due to social immaturity (Meadow, 1975; Myklebust, 1964).

It was expected that the deaf children would engage in more social interaction with other deaf children, since their levels of social functioning would be lower than the hearing children and more similar to other deaf children.
(Goetzinger and Proud, 1975; Meadow, 1975; Mindel, 1969).

Interpersonal distance is an additional measure of social interaction. Many studies have demonstrated that close proximity seems to lead to social bonds (Little, 1965; Savitsky and Watson, 1975). In addition, there are tentative findings to demonstrate that aberrant populations in some respects may maintain either greater or lesser distances from others when compared to normals (Beach, 1974; Learea and Ward, 1966). As a result, it was expected that deaf children would be in closer proximity to other deaf children in order to increase the likelihood of social interaction.
CHAPTER II

METHOD

Subjects. The subjects were three girls and seven boys, ranging in age from 3 years 10 months to 4 years 7 months. The mean age was 50.9 months. The children came from white, predominantly middle-class socioeconomic background, and attended the nursery school at the Clarke School for the Deaf in Northampton, Massachusetts.

The subjects were divided on the basis of their hearing capabilities into a hearing and a hearing-impaired group. The hearing group consisted of two girls and three boys, while the hearing-impaired group contained one girl and four boys. Although the hearing-impaired children wore hearing aids, the observers were blind to the degree of hearing impairment (severe and profound), age of onset and cause of hearing loss, other disabilities, and time in the preschool program. Table 1 outlines the demographic characteristics of the hearing-impaired group.

Setting. All children were observed in an integrated playroom setting. Observations were taken from behind a one-way mirror, looking down into a 7.46 meters x 5.33 meters playroom containing standard playroom articles such as small manipulative objects (trucks, planes), books, painting and drawing materials, and several Montessori educational
<table>
<thead>
<tr>
<th>Subject/ Sex</th>
<th>Degree of Impairment</th>
<th>Age of Onset/Cause</th>
<th>Other Disabilities</th>
<th>Time in the Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-52 female</td>
<td>Severe 83dB</td>
<td>Prenatal Unknown</td>
<td>Seizures Brain Damage</td>
<td>42 months</td>
</tr>
<tr>
<td>K-53 male</td>
<td>Severe 85dB</td>
<td>Prenatal Unknown</td>
<td>General Neurological Damage, Motor Disabilities</td>
<td>10 months</td>
</tr>
<tr>
<td>S-54 male</td>
<td>Profound 112dB</td>
<td>Prenatal Probably Recessive Gene</td>
<td>none</td>
<td>47 months</td>
</tr>
<tr>
<td>R-55 male</td>
<td>Severe 83dB</td>
<td>Prenatal maternal rubella</td>
<td>none</td>
<td>49 months</td>
</tr>
<tr>
<td>R-56 male</td>
<td>Borderline moderate/severe 60dB</td>
<td>Infancy Recessive Gene/Meningitis</td>
<td>none</td>
<td>12 months</td>
</tr>
</tbody>
</table>
objects (weights and measures). Three teachers were usually present in the playroom. (See Figure 1 for scaled drawing of the setting).

Data collection and summarization. Each child was randomly observed three days per week for five minutes between 9:30 a.m. and 10:30 a.m. in the playroom. Four observers were trained to a concordance ratio of .90. Concordance is defined as the percentage of agreements between two observers scoring a focal child. Concordance was established for each scoring system by subtracting the number of disagreements from the sum of the agreements and dividing by the total possible agreements. An example is $\frac{17 - 1}{18} = .88$. For three weeks, during observer training reliability was calculated on every observation for each scoring system until a .90 concordance ratio was constant. During the eight weeks of data collection, reliability was checked by calculating concordance ratios once a week on each scoring system (see Appendix A).

The social behavior of all subjects was monitored by using three scoring systems. The Social Profile System gathered information about the behavioral repertoire of each subject by focusing on each child three minutes per day, three days per week. During every observation period, a child's behavior falling into one of 20 categories was
scored for its presence in any of 18 10-second intervals that comprised the three-minute observation period. The twenty categories and their definitions are provided in Table 2.

Table 2
Definitions of Social Behaviors

<table>
<thead>
<tr>
<th>Tactile-Oral Explore¹</th>
<th>Orienting to the feel of an object or surface with hands, body, or mouth.</th>
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<tr>
<td>Visual Explore¹</td>
<td>Orienting to someone or something, clearly watching</td>
</tr>
<tr>
<td>Idle Passive¹</td>
<td>Observer cannot identify a visual orientation, the child is in a stationary posture.</td>
</tr>
<tr>
<td>Watching²</td>
<td>Self-directed behavior of a ritualized nature, repetitive hand to face body movement that serves no obvious function, more than 2 seconds in duration, self-mouth and self-clasp.</td>
</tr>
<tr>
<td>Social Play²</td>
<td>Cooperative play, sharing an object or setting, clearly interacting with or without touching and vocalizing (e.g., two children putting a puzzle together).</td>
</tr>
<tr>
<td>Associative Play²</td>
<td>No interaction with playmate but playing with the same objects within 1½ to 3 feet of one another (e.g., two children playing with blocks but not interacting).</td>
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<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
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<tr>
<td><strong>Parallel Play</strong></td>
<td>Playing with different objects than playmates within 1½ feet of one another (e.g., two children in close proximity, one playing with blocks, the other trucks with no interaction).</td>
</tr>
<tr>
<td><strong>Non-Social Play</strong></td>
<td>Manipulation of an object, using mirror images to act out, assuming the role of another character not close to another child (e.g., reading, painting, playing alone).</td>
</tr>
<tr>
<td><strong>Constructive Activity</strong></td>
<td>Purposeful activity, that serves a function in learning a specific task, accomplishes a specific end. Done not in a playful manner with another child or teacher (e.g., snack time to learn social skills).</td>
</tr>
<tr>
<td><strong>Constructive Activity Individual (Non-social)</strong></td>
<td>Purposeful activity done alone (e.g., cleaning up after snack time alone).</td>
</tr>
<tr>
<td><strong>Locomotion</strong></td>
<td>Not part of play, but any steps in any direction, crawling, walking, running.</td>
</tr>
<tr>
<td><strong>Teacher Direction</strong></td>
<td>A verbal direction or physical prompt to action form the teacher to the child.</td>
</tr>
<tr>
<td><strong>Praise</strong></td>
<td>Positive statement from teacher to child, &quot;That's good.&quot;</td>
</tr>
<tr>
<td><strong>Social Contact</strong></td>
<td>Touching another's body with one's own (e.g., hugging and kissing).</td>
</tr>
<tr>
<td><strong>Verbalizing to Teacher</strong></td>
<td>Clearly understood use of language to teacher or peer (e.g., intellectual speech).</td>
</tr>
</tbody>
</table>
Table 2 (continued)

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vocalizing to teacher or Peer</td>
<td>Utterance or sounds directed to peer or teacher (unintelligible).</td>
</tr>
<tr>
<td>Symbolic Gesture</td>
<td>Touching, pointing, nodding to express meaning to another.</td>
</tr>
<tr>
<td>Cries and Screams</td>
<td>Sobs and tears and loud piercing sounds.</td>
</tr>
<tr>
<td>Social Aggression</td>
<td>To Hit, push or pull another person.</td>
</tr>
<tr>
<td>Object Aggression</td>
<td>Destruct, throw an object not at another person.</td>
</tr>
</tbody>
</table>

**COLLAPSED CATEGORIES**

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Activity</td>
<td>Social play and social constructive activity.</td>
</tr>
<tr>
<td>Non-social Activity</td>
<td>Associative, Parallel, object play, and non-social constructive activity.</td>
</tr>
<tr>
<td>Utterance to Peer</td>
<td>Verbal and vocal to teacher.</td>
</tr>
<tr>
<td>Utterance to Teacher</td>
<td>Verbal and vocal to peer.</td>
</tr>
<tr>
<td>Aggression</td>
<td>Social and object aggression.</td>
</tr>
</tbody>
</table>

Summary of the Social Profile categories was by individual child. This was accomplished by adding each day's mean modified frequency score and dividing by 3 for a weekly mean. An example is Tactile/Oral Explore.
Subject number _____

<table>
<thead>
<tr>
<th>Mean Modified Frequency Score</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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</thead>
<tbody>
<tr>
<td>Observation</td>
<td></td>
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</tr>
<tr>
<td>Day 1</td>
<td>6</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
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<td></td>
</tr>
<tr>
<td>Day 2</td>
<td>6</td>
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<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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</tr>
<tr>
<td>Day 3</td>
<td>6</td>
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<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>TOTAL = 18</td>
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</tbody>
</table>

Weekly mean = 6.00
✓ = number of occurrences

For tactile explore

The summary scores for social profiles, interaction, and proximate patterns was, in part, calculated individually to adjust weekly means when the children were absent.

The nature of the children's SOCIAL INTERACTION with others was assessed by focusing on each child's interaction two minutes per day, three times per week. Absolute frequency scores were generated as the focal child was recorded interacting with other children in the playroom and the teachers. Five social categories were scored when the focal subject interacted with others in Social Play, a Social Constructive Activity, Social Contact, Social Utterance, or Social Aggression (for definitions, see Table 2).

Interaction data for each child was summarized on two dimensions, by social category and with whom the child was interacting (hearing or hearing impaired). For example, social play would be summarized by the absolute frequency
of occurrences that a hearing impaired child interacted with another hearing child. Three observation days scores were further calculated into weekly means. Scores were weighted to reflect the number of possibilities for interaction with each group (hearing and hearing impaired). Since a hearing impaired child had at most 5 other hearing impaired children and 6 hearing children to interact with, scores with hearing children were multiplied by 5/6. A hearing child's score with hearing impaired was multiplied by 5/6.

Finally, data were collected on the proximate patterns of the subjects, using a scan-all technique through the one-way mirror. All children's spatial locations were sampled simultaneously on five separate occasions during each daily observation period, for fifteen samples per week. This system generated information about social clustering.

Proximate patterns for each child were summarized in a series of steps. A concentric circle scaled to reflect zone of interpersonal distance was the basic tool. The exact center of the transparent overlay was placed on the first letter of each child's name. This was the standard locator for summarization. The number of children in each zone was counted as a frequency score for each zone. Zone I was 0-18 inches. Zone II was 18-36 inches. Zone III was 36-54 inches. For example, a hearing child's proximate pattern scores for one day would show how many hearing
children were in Zone I with that child. A second Zone I score would show how many hearing impaired children were near the child. A weekly mean on 15 samples was calculated.

Data analysis. A statistical analysis was performed on behaviors generated by the scoring systems. Behavioral scores in the form of eight weekly means for each behavior were analyzed using a one between and one within-subjects analysis of variance design with hearing versus hearing-impaired as the between-subjects variable and weeks as the within-subjects variable. Proximate pattern scores, in the form of eight weekly means for each zone were analyzed using a one between and one within-subjects analysis of variance design with hearing versus hearing-impaired as the between-subjects variable and weeks as the within-subjects variable.
CHAPTER III

RESULTS

Four general findings emerged from the data analysis. First, more visual exploration was exhibited by hearing impaired children. Second, there was lower overall social activity by the hearing impaired children. Third, social contact was observed more in the hearing than the hearing impaired during social interaction. Finally, and most importantly, the hearing impaired showed no significant preference for interacting with either hearing or hearing impaired children. However, the proximate patterns indicate hearing impaired children were more likely to be within 0 to 18 inches of other hearing impaired rather than hearing children.

Figure 2 is a summary of the Social Profile Behaviors in the broad categories of Exploration, Stereotypy, Social and Non-Social activity. This graph displays the significant and non-significant between group differences. Hearing Impaired children showed significantly higher levels of Visual Exploration, $F(1,8) = 9.12, p < .05$, than hearing children. Hearing children show significantly higher levels of Associative Play, $F(1,8) = 5.48, p < .05$, and engage in more Overall Social Activity, $F(1,8) = 6.62, p < .05$, than Hearing Impaired
FIGURE 2. Social Profile Behaviors of Hearing and Hearing Impaired (Capitolized behaviors represent significant between group differences).
children. There were no significant differences between Hearing Impaired and Hearing children for the other displayed behaviors.

Figure 3 is a summary of the Social Profile Behaviors in the broad categories of Communication, Aggression, and Teacher to Child. Hearing Impaired children showed significantly higher levels of Vocal to Teacher, $F(1,8) = 12.40, p < .01$, Vocal to Peers, $F(1,8) = 15.72, p < .01$, and use more Symbolic Gesture, $F(1,8) = 7.43, p < .05$ than Hearing Children when communicating. Hearing children use more Verbal to Teacher, $F(1,8) = 5.43, p < .05$, Verbal to Peers, $F(1,8) = 15.86, p < .01$, with less praise. Hearing children receive more Praise, $F(1,8) = 6.26, p < .05$ but less teacher direction than Hearing Impaired children.

Figure 4 illustrates the significant group by time interactions of the Social Profile behaviors Visual Explore, $F(7,56) = 2.32, p < .05$, and Locomotion, $F(7,56) = 3.07, p < .05$. The Hearing Impaired children generally maintain a higher overall frequency of Visual Exploration than the Hearing children. The Hearing children exhibit slightly more locomotion than the Hearing Impaired children. Week to week differences for both groups are generally stable except for week 4. During week 4, Visual Exploration and Locomotion scores peak for Hearing children when a new student teacher began to work in the preschool.
FIGURE 3. Social Profile Behaviors of Hearing and Hearing Impaired (Capitolized behaviors represent significant between group differences).
FIGURE 4. Time Related Changes in Social Profile Behaviors of Hearing and Hearing Impaired Children during Observation Period.
Figure 5 displays the significant group by time interactions of the behaviors Utterance to Peer, $F(7, 56) = 2.34$, $p < .05$, Associative Play, $F(7, 56) = 3.39$, $p < .05$, and Social Contact, $F(7, 56) = 2.43$, $p < .05$. The hearing children show significantly higher frequencies of Utterance to Peer than hearing impaired children. Week to week differences for both groups are generally stable at a low frequency except in week 4. Associative Play for Hearing children was significantly higher than Hearing Impaired in week 1 and 2 declining dramatically in weeks 3 through 8. Hearing Impaired exhibit no Associative Play. Social Contact for the Hearing and Hearing Impaired fluctuated for both groups during the 8 week observation period.

Figure 6 is a summary of social interactions of Hearing children with other Hearing and Hearing Impaired children. Hearing children engage more often in social interaction with other Hearing children in Social Play, $F(1, 8) = 5.40$, $p < .05$, Social Contact, $F(1, 8) = 5.60$, $p < .05$, and Utterance, $F(1, 8) = 6.40$, $p < .05$. Hearing children engage in Social Constructive Activity, $F(1, 8) = 8.38$, $p < .05$ more often with Hearing Impaired children. There was no significant difference in the low frequency behavior of Social Aggression of Hearing children with either Hearing Impaired children.

Figure 7 is a summary of Social Interactions of Hearing Impaired children with other Hearing Impaired and Hearing
FIGURE 5. Time Related Changes in Social Profile Behavior of Hearing and Hearing Impaired Children during the Observation Period.
FIGURE 6. Interaction Behaviors of Hearing Children Engaged
with Hearing and Hearing Impaired Children
(Capitalized Letters indicate significant between
group differences).
Interaction Hearing Impaired (Engaged with)

- Hearing
- Hearing Impaired

- Social Play
- Social Constructive Play
- Social Contact
- Utterance
- Social Aggression

Mean Absolute Frequency Score
FIGURE 7. Interaction Behaviors of Hearing Impaired Engaged with Hearing and Hearing Impaired (Lack of Capitolized Lettering indicates no significant between group differences).
Interaction Hearing (Engaged with)

- Hearing
- Hearing Impaired

Activities:
- Social Play
- Social Constructive Play
- Social Contact
- Utterance
- Social Aggression

Mean Absolute Frequency Score
children. Hearing Impaired children do not engage significantly more often with either Hearing Impaired nor Hearing children in Social Play, Social Constructive Activity, Social Contact, Utterance, or Social Aggression.

Figure 8 illustrates the Proximate patterns of the Hearing Impaired and Hearing children in Zones I (0 to 18 inches) and II (18 to 36 inches). Hearing Impaired children are found significantly more often in Zone I $F(7, 56) = 3.04$, $p < .01$ with other Hearing Impaired children. Hearing children are found more often in Zone I $F(7, 56) = 3.07$, $p < .01$ with other Hearing children. Proximate patterns for Hearing and Hearing Impaired children in Zone II, $F(7, 56) = 4.09$, $p < .01$, are slightly higher in overall frequency for Hearing Impaired. Hearing children maintain a consistent frequency in Zone II across weeks. Although, week to week differences are not significant Hearing Impaired children maintained a lower rate for weeks 1 through 3 than the Hearing children. Hearing Impaired children's scores rose sharply in week 4 to peak at week 6 then declined to scores similar to the Hearing children's in weeks 7 and 8.
FIGURE 8. Time Related Change in Proximate Patterns of Hearing and Hearing Impaired for Zones I and II.
Proximity to Any Child Zone II
(within 18 to 36 inches)

Proximity to Hearing Zone I
(within 0 to 18 inches)

Proximity to Hearing Impaired Zone I
(within 0 to 18 inches)
CHAPTER IV
DISCUSSION

Hearing impaired children have been characterized as socially immature. The effects of hearing loss are believed to limit the development of social skills, thereby reducing the hearing impaired child's capacity to relate to peers in social activities. The results of this study show that the hearing children engaged in the expected higher level of Visual Exploration. The hearing impaired, also, displayed an overall lower level of Social Activity, with most of this activity taking the form of social constructive activity rather than play. The hearing impaired did not engage in more social interaction with other hearing impaired children. However, the hearing impaired children tend to be found closer to other hearing impaired children in all but the most structured social situations.

The expectation that Visual Exploration (visual orientation to someone or something, clearly watching) would be higher for the hearing impaired children was fulfilled. This might be expected, since visual contact is reinforced in the academic and home environments to facilitate language acquisition. The hearing impaired childrens' behavior is consistent with the notion that visual behavior maintains contact with peers and allows the child to monitor the
environment for change. In this way, Visual Exploration is adaptive and compensates for hearing loss since it is another way in which contact with teachers and peers can be maintained.

The prediction that Social Contact (touching another's body with one's own, a hug, a kiss) would be higher for the hearing impaired was not supported. This suggests that social contact was probably not a viable mode of communication for the hearing impaired.

The hypothesis that the hearing impaired would engage in less Social Activity (Social Play and Social Constructive Activity) than hearing children was fulfilled. In fact, hearing impaired children did exhibit a lower frequency of Social Activity. The differences between the hearing and hearing impaired can be attributed almost exclusively to spontaneous play. Although, hearing impaired and hearing children spent equivalent amounts of time in Social Constructive Activity, the hearing impaired play infrequently compared to their normally hearing counterparts. Four hypotheses may be advanced to explain the lower levels of Social Play in the hearing impaired. First, the less frequent Social Play for the hearing impaired may be a result of the increased time and effort required to communicate with hearing peers. To test this hypothesis, data would have to be gathered during free play bouts on the frequency of
"play initiations" (verbal communications) of hearing impaired to hearing compared with hearing to hearing children. In addition, one could time the length of free play bouts of hearing with hearing children compared to hearing with hearing impaired children.

Second, hearing children may exhibit a preference for interacting with other hearing children because of their experienced ease of communicating. Hearing children have been able to communicate while interacting during play for most of their lives. While the hearing impaired child has had limited communication and play experiences. Thus, it requires less effort for a hearing child to play with another hearing child. This hypothesis can be tested by gathering data on the preferences of the hearing and hearing impaired's social play partners.

The third hypothesis is that the teacher may be channeling the hearing impaireds' social activity in Social Constructive Activity. Support for this hypothesis is based on the finding that Teacher Direction in this preschool was given three times as often to the hearing impaired as to the hearing child. It was the educational philosophy of the preschool that the hearing impaired should receive the most teacher intensive interaction. To test this hypothesis the teachers would have to be instructed not to direct the hearing impaired children's free play activity.
Finally, the hearing impaired may be developmentally delayed in their repertoire of play behaviors. In general, the hearing impaired exhibit a low frequency of spontaneous play with Object/Non-Social Play occurring most frequently, while the hearing seem to be engaged in the more age-appropriate cooperative play. Further, the hearing are able to stay involved for a longer period of time in less teacher structured play. To test this hypothesis, these hearing and hearing impaired children at ages 5, 6, and 7 should be observed to compare the development of their free play behaviors. This would assess whether, as Myklebust (1964) has theorized, limited language reciprocally restricts the hearing impaired's ability to integrate experiences.

Not only did the hearing impaired infrequently engage in social play, but when play is sub-divided into Social Play, Associative Play, Parallel Play, and Non-social Play, we find no Associative Play (playing within 1½ feet of another child with the same materials). Associative Play is considered an important social maturity indicator. It is proposed in the literature that Associative Play is a measure of early peer interaction and a precursor of cooperative social play (Parten, 1932). The hearing impaired exhibited no Associative Play behavior even though they were often close enough to observe and model another child. This suggests that the hearing impaired children may need
teacher or peer direction to prompt Associative Play. It further suggests that modeling may depend on more than visual cues.

The expectation that hearing impaired children would engage in more social interaction with other hearing impaired children was not fulfilled. The hearing impaired interacted equally with both the hearing and the hearing impaired; while the hearing interacted primarily with the hearing, except during Social Constructive Activity. Two hypotheses may be advanced to explain this finding. First, communicative limitations affect a hearing impaired child's interaction equally with all peers. Thus, while it is likely that social interaction between hearing and hearing impaired children is enhanced by their visual attention and listening skills they are impeded with all peers by the search for a common mode of communication. Second, the hearing and hearing impaired's activities were selectively directed by the teacher. Hearing impaired and hearing children were encouraged by the teacher to interact with each other during Social Constructive Activity. The most frequent social interaction between hearing and hearing impaired children occurred during Social Constructive Activity. This was a structured activity with several "teacher supervised" rules. A typical structured activity was the daily Snack Time. This
social activity had two basic rules. First, a child had to ask the teacher to be the Snack Time Coordinator. Then the child in charge of snack time was encouraged by the teacher to invite both hearing and hearing impaired peers to participate. Secondly, the Snack Time Coordinator was responsible for setting the table for snack and sharing the clean-up duties. The success of Snack Time as a social activity to integrate the hearing and the hearing impaired supports Koh's (1972) findings that social integration can be encouraged. Further, structured activity reduces the need for communicative interactions that depend strictly on intelligible speech. Thus, structured activity increases integration because each child knows the rules and it reduces indecision.

Communicative interaction is distinctly different between the hearing and the hearing impaired. The hearing function at a higher level of social interaction with other hearing children based, in part, on their selective ability to communicate successfully in one mode. In order to stimulate the cues for social integration, communicative interaction strategies and structured social activities should be developed specifically for hearing and hearing impaired children (Guralnick, 1976; Mindel, 1969; Northcott, 1970). This is especially important for two reasons. First, integration did not appear to generalize from Social
Constructive Activity to Social Play. Secondly, the preference for hearing to play with hearing was very marked.

The prediction that hearing impaired would be found closer to other hearing impaired children was fulfilled. Data on proximate patterns was intended to add perspective to the social interaction data. Surprisingly, though the hearing impaired children tended to be closer to one another the interaction data do not support the contention that they prefer to interact. The data demonstrates that methodological refinements in the measurement of proximate patterns as an indicator of social interaction should include the orientation of each child's body (such as face to face) to another's. This is particularly important when studying children with sensory deficits whose personal space is more narrowly defined. The hearing impaireds' tendency to be closer to each other should not be interpreted as a segregation effect. Visual inspection of the data seems to indicate that the hearing impaired are clustering in areas set aside for Socially Structured Activity. Thus, clustering may enhance the likelihood of social interaction with the teacher as well as peers. To test this hypothesis data would have to be collected which correlates the use of interpersonal space (noting physical orientation) to specific social activities. If successful patterns of interaction exist because of specific activity areas in the use of
interpersonal space, interventions could be designed to teach the critical components.

Another hypothesis from the literature, not supported by this study, is the reported finding of aggressiveness and acting-out behavior on the part of the hearing impaired (Meadow, 1976). Social and Object Aggression and Cries and Screams were extremely low incidence behaviors for both groups. The hearing impaired children exhibited almost no social aggression while neither group displayed object aggression. The preschool environment was not conducive to acting out behavior. Consonant with the goals of the preschool, children were instructed to use the teacher as an arbitrator. Since the hearing impaired were able to use the teacher in this manner these results suggest that the hearing impaired are capable of learning and using the rules of socially appropriate behavior.

This preschool was a protective setting designed to integrate the hearing into a hearing impaired preschool. This study supports Northcott's (1977) contention that self-contained settings are not necessary and that the hearing impaired can interact with hearing children with intervention. Interventions that influence the development of social skills in early education settings are not well understood. However, using the detailed normative social
data gathered in this study, interventions can be more carefully designed to encourage communication and social interaction between the hearing and the hearing impaired. Particular interventions are proposed consonant with the significant findings of this study--such as the hearing impaired's visual exploration behavior.

One intervention might use the hearing impaired's tendency to be observers rather than participants in social play. An important use of their visual orientation might be to teach social games from a picture board. This picture board should display a game from beginning to end showing all the rules and the role of each child. The illustrations should rely only on animated figures not written in language. Games should be taught during group time while the hearing and hearing impaired were attending equally. Two peers (one hearing and one hearing impaired) should demonstrate the game under the teacher's direction. During free play, data would be collected on the children's review of the picture board and their employ of the game. Incidence of use of the picture board during free play would indicate whether hearing and hearing impaired can rely on visual cues to initiate social play.

Data gathered from this proposed educational intervention "Learning Social Games by Picture Board and Peer Demonstration" might provide data for designing Associative Play
(child playing within 1½ feet of another child playing with the same materials) activities. Teachers may have to prepare a specific learning area with sets of activities; then teach using only visual cues. The use of proximate interventions might be to stage activities on a table with chairs positioned (side by side) versus on a rug to determine if either stimulates observational learning or Associative Play. Appropriate reinforcement is a critical factor to a child remaining an attentive observer and participant. Periods of Associative Play at the table or rugged area should be rewarded by teacher participation and praise.

To promote peer interaction, special programming is needed. The hearing and the hearing impaired will increase their interaction if social constructive activities are more available and initially less dependent on intelligible speech. Communication patterns suggest that the hearing impaired children were engaging in a range of communication patterns such as symbolic gesture and verbalizations. The hearing children need increased encouragement and instruction to engage in communicative interaction with the hearing impaired children. An important communicative interaction strategy to increase peer interaction and spontaneous social play between the hearing and the hearing impaired would be to teach basic rules for communicating. Some rules for the
children might be: (1) touch the person's shoulder to whom you wish to communicate, if they are not looking at you; (2) look at the person's face when speaking or when you are being spoken to; (3) respond either physically or verbally to show you understand. Responses should prove reinforcing. Further, increased communication between the children should occur and would probably increase both integrated spontaneous play and structured social activity. Social and language development for the hearing impaired can be enhanced through interventions which are designed to increase integrated social activity.
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