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Augmentative communication methods as a teaching strategy for individuals with autism

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San Jose State University

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for individuals with autism**

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San Jose State University, 1994

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**AUGMENTATIVE COMMUNICATION METHODS AS A
TEACHING STRATEGY FOR INDIVIDUALS WITH
AUTISM**

A Thesis

Presented to

The Faculty of the Division of Special Education
and Rehabilitative Services
San Jose State University

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts

by

Jayashree Ramesh

May, 1994

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ABSTRACT
AUGMENTATIVE COMMUNICATION METHODS AS A TEACHING
STRATEGY FOR INDIVIDUALS WITH AUTISM
by Jayashree Ramesh

This thesis explores alternative avenues to teach communication skills to individuals with autism. It aims to help teachers working with individuals with autism in India, develop new and innovative methods of teaching. This study reviews teaching strategies and case studies. In addition, it describes conditions in India that will help or inhibit the implementation of various communication systems.

Research on this subject reveals that there is little emphasis on teaching methodology compared to communication systems. There is no consistency of research by repeated investigation. For individuals with autism, there are more options available now than before.

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CHAPTER I

Introduction

Our eagerly awaited son Mark had been born after a picture-perfect pregnancy. Mark was a beautiful, picture-perfect baby, except for the screaming. He started screaming in the hospital nursery and rarely stopped. He screamed so violently that it was difficult to nurse him. The screaming continued, many hours a day, during most of his early childhood. Hard as we tried, we could discern no reason for his crying. Holding him didn't help. He just struggled and cried harder. The only thing that would placate him was placing him face down in his carriage and rolling him back and forth until he fell asleep (Rimland, 1964, p. x).

Mark was autistic.

Mark began speaking at about eight months, pronouncing with perfect diction, the words "spoon," "all done," "teddy bear," and "come on, let's play ball." At age two he could repeat anything said to him, with remarkably clear pronunciation, even the word "hippopotamus." It soon became evident that Mark's speech was like that of a tape-recorder just repetition of words, phrases, sentences, and even nursery rhymes, without any real idea of what they meant (Rimland, 1964, p. x-xi).

Mark was autistic.

What is Autism? Autism is a syndrome of childhood characterized by a lack of social relationships, a lack of communication abilities, persistent compulsive rituals, and resistance to change. A child with these characteristics does not relate to surrounding people, preferring instead to play repetitively with an object, a toy, or his or her own body. Language, if present, is severely impaired. The child is aware of the environment to the extent that if the child's ritualistic play is interfered with, or even if familiar objects are changed in the environment, an upset or temper tantrum results. The syndrome's onset is usually in infancy - could be from birth, but certainly evident in the first three years of life.

Augmentative Communication and Autism

Augmentative communication refers to all communication that supplements or augments speech. Everyone uses augmentative communication aids and techniques. Long before children have access to speech, they interact with their caregivers by means of nonverbal augmentative techniques such as smiles, eye gaze behavior, and differential vocalizations. Such communication is evidence of early intentions and is powerful in its communicative effect.

According to Vanderheiden and Lloyd (1986), special augmentative components generally consist of transmission techniques such as manipulation of the hands or pointing on a board. These techniques work in conjunction with communication symbols or a representation system such as gestures, American Sign Language, Blissymbols, or pictures. Various strategies are necessary to help an individual use the system effectively. Such strategies include cueing or combining symbols to communicate ideas

Such strategies include cueing or combining symbols to communicate ideas outside of the vocabulary.

Just as able-bodied individuals must rely heavily on augmentative communication techniques in certain situations where speech does not work well for them, those with speech / language-impairments must also rely heavily upon augmentative techniques. Communication is essential for the expression of basic needs and conversation. Individuals with speech impairments get isolated socially, but may also be unable to receive appropriate education or be employed. Teaching these individuals to use augmentative communication aids and techniques can greatly enhance their ability to communicate and, subsequently, improve their chances for leading independent and more rewarding lives.

A 14-year-old Swedish boy with autism was able to develop alternative and augmentative communication methods for social communication. After difficulties in using manual signs, the boy was introduced to Blissymbols (form of graphic representation), which developed his ability to communicate and his interest in written words. Although still autistic and non-speaking, the boy developed his ability to ask for things and to relate his experiences. He became very resourceful in using all the communication tools introduced to him, and he also invented new ones. His case study shows the importance of presenting a variety of communication means and the importance of being persistent in conducting communication therapy (Jennische, 1988).

Hailing from a developing country like India, where special education is in its infancy and awareness of autism is minimal, communication using

augmentative methods has certainly made an impact on the author who is convinced that when this method of teaching is introduced in India, many children with autism and their families will be greatly benefited. This approach will give the teachers in India a sense of direction. In the author's experience, special educators in India are extremely dedicated. However, due to lack of knowledge, they feel frustrated and helpless as they attempt to teach children with autism.

Problem Statement

Evidence shows that communication skills of children with autism are seriously impaired and interaction between autistic persons and other human beings is distorted, defective or absent. Approximately 40% of children with autism do not speak at all. Others have echolalia, a parrot like repeating of what has been said to them. Speech may be present but it is not used for communication. The autistic child typically does not mimic, gesture, use posture, use intonation, or attempt to convey meaning by any other mode of verbal or body language.

In India, educators have started work in the field of autism only recently. Lack of training courses and trained personnel makes it difficult for teachers to adapt new methods and strategies.

Purpose of Study

The purpose of this study is to explore alternative avenues to teach communication skills to children with autism. The results of the research will be presented in a booklet designed to assist teachers responsible for teaching children with autism in India.

Research Questions

1. Do augmentative communication methods help autistic children develop communication skills?
2. What are the various teaching procedures that ensure effective use of augmentative approaches to meet communication needs?
3. What conditions in urban India will help promote the implementation of augmentative communication approaches?
4. What conditions in urban India will inhibit the implementation of augmentative communication approaches?

Significance of the Study

This study will provide information for special education teachers who work with children with autism. In India, services for individuals with autism are practically nonexistent. This study will help teachers deal with students with autism in an organized manner. The rationale for this comprehensive study of literature is to present a critical review of various teaching strategies and the effects of augmentative systems on the communication of individuals with autism.

Definition of Terms

Autism

The American Psychiatric Association (APA) describes autism as a pervasive developmental disorder. APA lists the following characteristics of autism:

1. Individuals with autism fail to develop interpersonal relationships.
2. Gross impairment in communicative ability.

3. Bizarre responses to various aspects of the environment.
4. Onset before the age of 30 months.
5. Hallucinations, delusions, loosening of associations, and incoherence, as in schizophrenia.

Communication

The giving and receiving of information, signals, or messages. It is an exchange between people, but is not limited to oral or written words (Rieke, 1978).

Augmentative communication

Augmentative communication refers to the use of aids or techniques that supplement existing vocal or verbal communication skills (Vanderheiden & Yoder, 1986).

CHAPTER II

Design of the Study

Communication is the process of exchanging information. It is the means by which people affect each other's thoughts and actions. For most people, communication is so effortless that it is rarely given much thought. Only when a person is encountered who does not understand typical communication or whose communication is not readily understood by other individuals do people begin to appreciate the importance of this most fundamental interpersonal skill (Seigel-Causey & Guess, 1989).

Augmentative communication refers to the use of aids or techniques that supplement existing vocal or verbal communication skills (Vanderheiden & Yoder, 1986).

Autistic children exhibit a constellation of learning challenges. Nowhere are those impairments more apparent than in the area of communication. For most applied researchers, autism remains something of a mystery syndrome. For the teacher and the psychologist, it becomes all too clear during initial encounters that the struggle focuses on a persistent inability of the autistic child to communicate effectively. The communication disorders are of such magnitude that, in general, such children have little option but to pull, tug, whine, cry, or tantrum to express and convey their needs. Research shows that communication disorders associated with autism range from a total absence of speech to minor problems in articulation, from elective mutism to persistent echolalia (Fay, 1969). Children with autism may need an augmentative

communication system. They may benefit from being taught to communicate using signs, symbols and gestures (Mustonen, Locke, Reichle, Solbrack, & Lindgren, 1990).

In India, individuals with autism do not have any specified educational program or curriculum. In fact, according to Sutaria (1984), government documents do not mention autism in their definition of disabled individuals.

This study is designed to review teaching strategies appropriate for children with autism. Case studies presented will include information regarding the nature of the communication system used and if it helped the individual. Keeping in mind the present status of special education in India and the cultural differences between United States and India, the study will include a description of conditions that will help promote the implementation as well as conditions that inhibit the implementation of various augmentative communication systems. For the teachers in India, this study will be presented in the form of a comprehensive booklet to assist them in formulating appropriate augmentative communication systems for the autistic population.

Procedures

The descriptive method of research will be used in the proposed bibliographical study. Descriptive research describes past and present events, situations and conditions, satisfies people's curiosity to know what is or was and provides a basis for making decisions (Charles, 1988). The data collected for this research is based on published literature and related research studies.

Since this study describes various teaching strategies and selection criteria for formulating and establishing appropriate augmentative communication systems, background information about the communication problems of individuals with autism will be provided. In addition, a brief description of various augmentative communication systems and the status of special education in India will also be provided. This will help the reader understand the topics and the population of the study.

The literature search includes the following databases: Educational Research Information Center (ERIC), Psychological Abstracts (PsycLit), Resources in Special Education (RISE), as well as published books. Additional material was collected from professionals currently working with individuals with autism and using augmentative modes of communication. Materials unavailable at San Jose State University Libraries were collected through the Inter Library Loan Department (ILL) and the public libraries in the Santa Clara County.

Relevant literature concerns all autistic or autistic-like individuals, augmentative communication systems, and a brief look into the Indian society and culture. Due to the limited number of published articles, limitations on the age of the population or on the time period are not possible.

Categories of relevant resource material include the following sub-topics: 1) characteristics of language and communication in individuals with autism, 2) augmentative communication modes and systems, 3) special education in India, 4) teaching strategies currently used for individuals with autism in United States, 5) selection criteria for establishing augmentative communication systems, 6) case studies explaining the type/s of

augmentative communication system/s used and if it benefited the individual with autism, 7) characteristics that promote the implementation of augmentative communication systems in India, and 8) characteristics that inhibit the implementation of augmentative communication systems in India. All qualitative data will be discussed in the narrative form.

The literature review will be the basis for a handbook designed especially to help teachers in India introduce a new and dynamic approach to teaching individuals with autism. The handbook will briefly describe various augmentative communication teaching strategies and give references for further information.

CHAPTER III

Literature Review

Leo Kanner (1943) was the first to delineate patterns of behavior he called *early infantile autism*. He described infantile autism as a psychological disorder characterized by "an extreme aloneness from birth," along with language and perceptual abnormalities and ritualistic, obsessive behaviors (p. 231).

History

Prior to Kanner, the term *autism* had been used to describe a symptom of certain types of mental disorders, but it had not been applied to describe a syndrome. Bleuler (1913) used the term *autism* to describe a symptom of a psychiatric disorder in connection with schizophrenia in adults. In this disorder, the patients seemed unable to relate to others, though they had, at one time or another in their lives, related normally as members of the social community. With the onset of the disorder, they withdrew or removed themselves from relationships. The failure to communicate was a manifestation of their extreme absorption in themselves.

Kanner noted that this withdrawal did not precisely fit the young children he had observed, but the aloneness he observed in these children was similar to that of the patients described by Bleuler. He was convinced that, rather than choosing to withdraw from the world, these children were innately incapable of creating or responding to social relationships (Kanner, 1973). Because the affective characteristics of these children resembled those of Bleuler's patients, and because Kanner was unable to find a more suitable word to describe the illness with which these children were

afflicted, he applied the term *autism* to the disorder. In an effort to accentuate the early onset of the disorder, Kanner called the syndrome *early infantile autism* (Hinerman, 1983).

Kanner believed the autistic child was the product of a "parent type" characterized as cold, intellectual, ego-oriented, driving, and ambitious. Others have regarded autism as childhood schizophrenia (Bender, 1947), atypical ego development (Rank, 1949), childhood psychosis and emotional disturbance (Hassibi & Breuer, 1980). In the four decades since Kanner first described the syndrome, autistic children, and their parents, have been psychoanalyzed, psychotherapized, institutionalized, drugged, deprived of sensory stimulation, over stimulated, treated with electroshock therapy, treated with operant conditioning, fed special diets, and given megavitamins. Somehow, the condition survives (Hinerman, 1983).

Characteristics of Autism

According to Johnson and Koegel (1982), autistic disturbance is generally considered to include some combination of the following symptoms:

1. Autistic children exhibit a profound failure to relate to other people, which is often apparent from birth. They may show delayed social smile and in many cases smile is absent. They may not reach upwards in anticipation of being picked up. Some children fail to form emotional attachments to significant people in their environment. For example, they may show no distress when their mother leaves the room. Similarly, a child might play in the vicinity of other children without interacting or participating with them.
2. Autistic children commonly show various levels of impaired or

delayed language acquisition and comprehension. Many autistic children are mute and others may exhibit *echolalia*. For example, a child may repeat numerous phrases or conversations previously heard without indication that the words convey meaning. Immature grammar, pronoun reversals, and/or the inability to use abstract terms may also be apparent.

3. Many autistic children show apparent sensory dysfunction, as if they do not see or hear some environmental events. They may exhibit under- or over-responsiveness to touch, light, sound, or pain. For instance, the child may not exhibit a startle response to a loud disturbance, but may respond to the sound of a candy wrapper, or may tantrum excessively every time a siren goes by.

4. Many children with autism show inappropriate and/or flat affect. They may not display appropriate facial expressions and may not exhibit fear in dangerous situations, such as crossing the street. They may respond to even simple requests with severe, prolonged tantrums. They may also laugh and giggle uncontrollably in the absence of any apparent eliciting stimuli, or cry inconsolably for hours.

5. Typically, autistic children will occupy themselves for hours in stereotypic, repetitive self-stimulatory behaviors, which serve no apparent purpose other than providing the child with sensory input. Commonly, self-stimulatory behaviors take the form of manipulation of hands or fingers in front of the eyes, eye crossing, repetitive, meaningless vocalizations (e.g., "aeh, aeh aeh,..."), suspending or spinning objects in front of the eyes, mouthing objects, hand tapping, body rocking, and other stereotypic behavior. Such behaviors have been found to significantly impair learning in

autistic children (Koegel & Covert, 1972, cited in Johnson & Koegel, 1982).

6. Children with autism often fail to develop normal appropriate play. They may forsake toys altogether, preferring instead to spin a lampshade or flick a light switch on and off. If they do interact with toys, they may do so in an abnormal manner. For instance, the child may arrange, stack, or sort stimuli repetitively, over and over in the same pattern, and may show extreme disruption if the pattern is altered. Or they may turn a truck over and spin the wheels rather than roll it on the ground. Social play with peers may develop spontaneously, but usually does not.

7. Finally, autistic children commonly show obsessive, ritualistic behaviors which have been characterized as a profound resistance to change in the environment or to normal routines. Familiar bedtime routines, insistence on one type of food, one type of furniture arrangement, and particular routes to familiar places are examples of routines which, when altered even in minor fashion, can create extreme disruptions in a child's behavior.

Language and Autism

Kanner (1943) reported that a distinctive feature of autistic children was their failure to use language for the purpose of communication. He outlined features of the language of 11 children whom he diagnosed as autistic. His observations included:

1. Mutism, which is rarely interrupted by the production of a full sentence, usually in situations that the child perceives to be highly stressful.
2. Literalness, including an inability to accept synonyms or differing

connotations of the same utterance.

3. Echoic repetition of whole phrases.
4. Utterance of sentences that appear to have no meaningful connection to the situation in which they are said due to the child's idiosyncratic reference system. These utterances can often be understood only when a listener can trace them to their original context.
5. Pronominal reversals, primarily involving the child's reference to him or herself as "you."
6. Failure to use speech, when present, for communicative purposes.

Mutism

A large proportion of individuals with autism, estimated from 28% (Wolff & Chess, 1965, cited in Paul, 1987) to 61% (Fish, Shapiro & Campbell, 1966, cited in Paul, 1987) remain essentially mute. The term *mute* generally indicates "a lack of useful speech" (Baker, Cantwell, Rutter & Bartak, 1976, cited in Warren & Warren, 1985) and applies to children who: 1) produce neither communicative nor non communicative vocalizations ("totally mute"), 2) produce vocalizations that are void of meaning and are generally used for self-stimulation and sound play ("functionally mute"), and 3) use a limited repertoire of words and word-approximations in a functional manner to express immediate desires or dislikes ("semi-mute"). A high correlation exists between the lack of useful speech by age five and mental retardation, with both of these factors being associated with poor prognosis in language development, educational attainment, and social adjustment (DeMyer, Barton, DeMyer, Norton, Allen, & Steele, 1973).

Echolalia

Echolalia is one of the most characteristic behaviors observed in the autistic child. Echolalia occurs when the child repeats words, phrases, or sentences previously spoken by others. Three types of echolalia emerge from numerous studies on the echolalic behavior of autistic children (Baltaxe & Simmons, 1975; Fay & Schuler, 1980).

1. *Immediate echolalia* is the verbatim repetition of utterances following their occurrence. Immediate echolalia may involve the repetition of the whole or part of the utterance. Kanner (1946) interpreted some of his patients' exact echoes as "affirmation by repetition" employed in the absence of a "yes concept" for expressing affirmation (cited in Fay & Schuler, 1980). Although few exact echoes can be so regarded, children occasionally express communicative intent in this fashion. Thus, a mother about to serve her child asks "Do you want a drink?" to which the reply is an exact repetition of the question. This immediate, communicative echolalia - communicative if he does wish a drink - is at a level of signal behavior and thus seldom reflects linguistic processing beyond the simple interpretation of a label (Fay & Schuler, 1980).

2. *Delayed echolalia* involves the literal repetition of an utterance sometime after the original utterance. Repetition of commercials, lines from familiar songs, or parts of television programs are typical examples of delayed echolalia. Autistic children have been known to flawlessly repeat zip codes or addresses that they have heard on radio or television. A classic example for delayed echolalia was Kanner's subject (1946) who said, "Don't throw the dog off the balcony" to check himself from doing something

wrong. This was traced back to the time when his mother said the phrase with some irritation because he persisted in throwing his toy dog from the balcony of their hotel room (cited in Fay & Schuler, 1980).

Delayed echoing is often viewed as a sign of possessing an internalized, albeit rigid, model. The delay in production from time of registration suggests at least the fidelity of long term verbal storage and retrieval. Delayed echoes can be and are used as a communicative device by some children who associate a phrase and situation instrumentally and then "recreate" the favored situation by repeating the stored verbal signal. Systematic research on delayed echolalia is scant because of "the difficulty of tracing the history of usage and identifying the original occurrence of model utterances which helps to distinguish delayed echolalia from creative productions" (Prizant, 1983). The limited evidence available suggests the possibility of linguistic competence at a minimal level.

3. *Mitigated echolalia* involves the repetition of utterances that deviate slightly from the original. Variations of the original are accomplished by deletions, additions, or intonation changes (Schuler, 1979, cited in Hinerman, 1983). It is sometimes difficult to recognize mitigated echolalia for what it is, since the repetition is not exact, nor does the repeated utterance have to occur immediately following the original utterance. The following exchange between an autistic adolescent and his therapist may serve to illustrate the phenomenon:

Therapist: David, if you want to earn points, you have to first clear off the table.

David: Yes, Debbie. If you want to earn points, you have to clear off table, don't I, Debbie?

Fay and Schuler (1980) have suggested that, while mitigated echolalia is not a useful communication device for the autistic individual, it demonstrates that language does intervene. Often, proper names or personal pronouns are omitted or exchanged. The result is linguistic chaos. Nevertheless, the utterance may reflect the partial ability or emerging potential to comprehend the relationships expressed in syntactic or structural rules for language usage.

Echolalia seems to have a functional purpose in normal development. Normal echolalic behavior, which disappears by the end of the second year of life, seems to serve as a means of testing the structure of language and of evaluating one's own language as it stacks up against other language users in the environment (Menyuk, 1978, cited in Hinerman, 1983). In summary, theories about the relationship between communicative intent and echolalia produced by autistic persons are being re-evaluated. Until recently, the predominant position was that echoic utterances are produced automatically with little or no communicative intent, as opposed to more creative utterances believed to be produced with communicative intent. "What is so painfully evident about higher functioning autistic persons is that if we consider their linguistic skills alone, it seems as if they should be much better communicators than they are. For many autistic persons, the problem is clearly one of using language skills for communicative purposes rather than simply acquiring such skills" (Prizant, 1983).

Description of Augmentative Communication Systems

People generally use more than one technique for communication. In designing a communication system for individuals with communicative disabilities, it is important to remember that their systems, too, must be composed of many symbols, aids, techniques, and strategies if they are to effectively address a multitude of communication needs and situations. The communication system for a disabled individual, therefore, should not consist of a single technique or aid, but rather a collection of techniques, aids, symbols, and strategies that the individual can use interchangeably (Vanderheiden & Lloyd, 1986).

One component of an augmentative communication system is the symbols. Symbols can either be static or dynamic. According to Vanderheiden and Lloyd (1986) *static symbols* include both graphic symbols and objects that are permanent and enduring. They do not have to be changed or moved in order to convey meaning. *Dynamic symbols* convey meaning by change, transition, and/or movement, and therefore cannot be considered permanent and enduring. Oral speech and most gestures and manual signs are dynamic in nature. The dynamic and static symbols are also defined on the basis of the importance of various dimensions such as speed, portability, adaptability, etc., (Table 1).

Table 1. Functional Dimensions of Individual System Components¹

DIMENSION	DEFINITION	IMPORTANCE
Openness	Ability to express any thought	-Reduces topic limitations -Allows individual to advance on own
Speed	Rate of communication	-Provides more effective system
Assertability	Ability to interrupt, resist interruptions and control conversations	-Provides more effective system and prevents frustration and shutdown
Projection	Ability to communicate from a distance	-Allows communication to/with groups and allows communication at a distance
Portability	Ability to conveniently stay with the person at all times	-Can be with the user in all environments
Independence	Ability to be used without an assistant or interpreter	-Increases effectiveness, motivation and lowers cost to use
Intelligibility/Obviousness	Ability to be understood by strangers	-Increases potential communication partners, strangers and facilitates learning
Appropriateness	Appropriate to individual's current and future abilities (physical, cognitive, language, etc.)	-Increased effectiveness and facilitates growth
Adaptability	Ability to be customized to individual's needs, abilities and constraints	-Facilitates adaptation to user's other aid and vocabulary customization

¹ From Augmentative Communication: An Introduction (p. 60) by S.W Blackstone and D. M Bruskin (Eds.), 1986, Rockville, MD: American Speech Language Hearing Association. Copyright ASHA. Reprinted by permission.

Dynamic Symbols

Dynamic symbols are production-oriented (the individual produces the symbols) instead of selection-based (where the individual simply selects the symbol from symbols that are displayed or stored). As such, dynamic symbols can generally be transmitted more quickly (speed) and provide access to a larger vocabulary (openness) than static symbols. Use of dynamic symbols assumes that the individual has the physical ability to produce the symbols, and the cognitive ability to encode and decode a large number of symbols.

Various dynamic and static symbols have been listed in Table 2. The symbols have been organized in the following way:

1. from those demanding the lowest to those demanding the highest cognitive ability;
2. for the dynamic symbols, from those requiring the lowest to those requiring the highest level of motor control;
3. from the more concrete to more abstract;
4. from the more iconic to the more opaque.

Some of these symbols have been used with individuals with autism. These symbols will be discussed briefly. For in-depth descriptions of these various symbol sets and symbol systems the reader is referred to other general chapters and texts (see Fristoe & Lloyd, 1979; Jones & Cregan, 1986; Kiernan, Reid, & Jones, 1982; Lloyd 1976; Musselwhite & St. Louis, 1982; Schiefelbusch, 1980; Tebbs, 1978; Vanderheiden & Grilley, 1976).

Table 2. Dynamic and Static Communication Symbols²

DYNAMIC	STATIC
Gestures	Objects
-Pointing	-Actual objects
-Yes/no head shakes	- Miniature or representational objects
-Mime	Pictures (photographs & drawings
-Generally understood gestures	-simple (or basic) rebus
-Amer-Ind gestures	-other picture sets
Natural Sign Languages (ASL, BSL, CSL)	Sigsymbols
Gestuno	Pictogram Ideogram Communication (PIC)
Manually coded English (Signed English, SEE- I, SEE - II) or	Picsyms
manual coding for other spoken languages (manually coded Swedish)	
Modified signs and esoteric (or idiosyncratic) signs	Blissymbols
Synthetic manual signs and/or gestures	Graphic representations of manual signs and/or gestures
Fingerspelling or manual alphabets (partially dynamic)	(HANDS, pictures of signing, Sign writer, Sigsymbols, & Worldsign)
Eyeblink, gestural, and/or vocal alphabet codes (Morse Code)	Modified orthography and other symbols

² From Augmentative Communication: An Introduction (p. 72) by S.W Blackstone and D. M Bruskin (Eds.), 1986, Rockville, MD: American Speech Language Hearing Association. Copyright ASHA. Reprinted by permission.

Table 2. Dynamic and Static Communication Symbols (cont'd)

Eye blink, gestural, and/or vocal word and/or message codes	Complex (or expanded) rebus
Oral speech	Abstract logo graphs and abstract shapes
Synthetic speech	Traditional orthography (written & printed words)
Tadoma and other dynamic vibrotactile codes	Fingerspelling or manual alphabets (mostly static)
Speech reading and hand -cued speech	Graphic representations of fingerspelling
Auto-cued speech	Braille and other static tactile codes
Electronic speech recognition and display	

Sign languages. Sign languages are not directly related to the native spoken language of the country of origin. American Sign Language (ASL) is not a mechanism for signing English, although there are systems to manually sign an approximation of English. American Sign Language has its own vocabulary, syntax, and grammar, which are totally different from English. Sign languages are not universal and various countries have developed their own sign language. Sign languages rank very high for *assertability*, *availability*, *independence*, *openness*, *portability*, *projection*, and *speed* (Table 1). They do require manual dexterity, although signs can be made with limited manual dexterity as well. Sign language systems are generally not intelligible or obvious to individuals not trained in or familiar with the system.

According to Musselwhite and St.Louis (1988), candidates for ASL should possess the following skills, or should be expected to acquire them:

- Good motor control of both hands, in order to produce the variety of handshapes.

- Good range of motion with both arms, in order to produce signs at a variety of locations and with a number of movement patterns.
- Good control over facial musculature, in order to achieve nuances of meaning through facial expressions.
- Good visual acuity and visual discrimination, if the individual is to receive as well as produce sign.

Signed English. The signed English system is an attempt to represent English manually. Signed English, as conceived by Bornstein (1973) is a "language-like tool" consisting of two types of signs: more than 3,100 sign words (e.g., DISNEY, LAUGH, and REPTILE), and 14 sign markers (past tense, -ed, and adjective, -y). This formal, contrived system is intended to parallel spoken English more closely than ASL. The signs do not represent sounds, syllables, or phonemes, nor do they represent only the specific English word with all its various meanings. The basic vocabulary list was assembled from published lists of the spoken language of children and from "language logs" provided by parents and teachers, listing vocabulary used in the homes and classrooms of deaf children. Several additional rules were used in sign selection (Bornstein, Saulnier, & Hamilton, 1983):

1. One sign (gesture) is designed to represent one English word (e.g., different ASL signs are used for GLAD and HAPPY)
2. Where possible, a sign from American Sign Language is used (to encourage signing with pidgin ASL users)
3. Signs represent meaning, rather than sound or spelling of a word (e.g., the noun LAND and the verb LAND have different sign representations).

The potential of Signed English for use by people having severe communication handicaps appears quite broad, due to its simplicity and available support materials.

Synthetic speech. There are two basic techniques for creating voice output from communication aids. The first and oldest technique is digitized speech. This is essentially speech recorded in digital format. Digitally recorded speech is potentially the clearest speech. However, this high quality is achieved at the cost of a very high electronic storage capability. The memory constraints can be reduced by limiting the amount of information stored, but this reduces the quality of the speech, giving it an artificial sound.

The second approach is true synthetic speech. True synthetic speech is never spoken by a human being, but is generated using mathematical and phonological rules that model the human speech production system. Synthesized speech aids do not have direct limitations on their vocabulary. Any word that can be spelled by the user can be pronounced by the aid. As a result, synthetic speech aids rate very high in the *openness* category if the user is able to "spell" out the words using the standard alphabet or a phoneme alphabet. Otherwise, the individual will be limited to the words whose spelling has been prestored (Vanderheiden & Lloyd, 1986).

Gestures. Gestures can be understood by individuals with similar cultural backgrounds and experiences. They are not universally understood. Wundt (1973) has described four levels of gesture as mime, demonstrative, descriptive, and symbolic. *Mime* uses the whole body in direct imitation. *Demonstrative gesturing* involves pointing or indexing, showing form and size, or displaying an object. *Descriptive gesturing* may involve drawing in

the air, shaping hands into a three-dimensional representation, imitating movement of a person or thing, or using a secondary trait (connotative form). *Symbolic gesturing* involves higher-level associations with an intermediate step between the concept and the gesture.

Pointing. Pointing is a gesture simple in nature and plays a significant role in early pragmatic behavior. Its uses range from direct indexing of a referent to pointing to one referent to represent a broader class of referent(s) not present. Pointing is limited because a referent must be present (i.e., person, object, or place) to send the message. Pointing can be used by individuals with limited motor ability, and rates fairly well on dimensions such as *position independence*, *durability*, and *intelligibility* (Vanderheiden & Lloyd, 1986).

Yes/no head shakes. Yes/no head shakes are culturally based. They occur relatively early in the developmental sequence and are easy to produce. They are limited because the communicating partner must pose questions that can be answered with yes or no, and because they can only be used for responding. In general, yes/no head shakes rate relatively high on *intelligibility/obviousness* and *portability* but rate poorly on *independence*, *openness*, *permanence*, and *speed*.

Mime. Mime is a special form of gesturing. According to Silverman (1980), mime uses the musculature of the entire body, the gestures tend to be dynamic, more gestures are needed to convey a message than with manual systems. Use of pantomime as a primary communication system has not been documented, and would not be expected, due to its relative inefficiency and limited scope (Musselwhite & St. Louis, 1988). Pantomime needs rich

experiential background for communication. It rates relatively poorly on *independence, openness, permanence and speed*.

Static Symbols

Static symbols are selection based instead of production-oriented. The most common static symbols are graphic representations. Graphic symbols permit individuals who are not able to produce symbols to select them using some pointing technique.

A number of decisions confront the interventionist designing a graphic mode communication system. Some of the important decisions include, a) what type of symbols will be used? A number of different symbol options exist, including actual objects, miniaturized objects, line drawings, product logos, photographs, pictures, traditional orthography (written words). In general, the more a symbol directly resembles the item it is intended to present, the easier it is to learn. b) How large should the symbols be? The size of the symbols used is determined largely by the learner's visual acuity and the precision of his or her pointing skills. c) How will the symbols be displayed? If there are motoric considerations, the interventionist should decide how to display the symbols depending on how much the student can access.

Objects. According to Vanderheiden and Lloyd (1986), actual or full size objects and miniature objects may be used for symbolic representation. Objects rate fairly high on the intelligibility dimension, but are relatively low on *openness, portability, projection and speed*.

Actual objects. Objects are powerful learning tools that enters early in the developmental sequence. Objects will sometimes stand for itself (e.g., a

child might point to a toy or food) and at other times may represent something else (pointing to the door may indicate the child wants to go outside). Therefore, it is necessary to check all answers with a yes/no questions.

Miniature objects. Miniature objects can be used to represent real objects. Care must be taken to ensure that the miniature object really represents the actual object. Although adults are familiar with the many forms the object can take, children or individuals with disabilities may not be able to generalize. Objects cannot be used to represent many concepts such as *more, want, and pain*.

Pictures. A variety of pictographs can be used for symbolic representation. A pictograph is a picture that is used to represent a thing or a concept and may range from photographs and hand-drawn symbols to prepackaged sets of symbols. According to Mirenda (1985), pictorial systems can generally be divided into two categories - (a) those that are commercially available, and (b) those that are constructed using commonly available materials. The former category includes systems such as *Talking Pictures* (Crestwood Co.), *Peel & Put Pictures* (Communication Skill Builders), *Touch 'N Talk Stickers* (Imaginart Press), *Picture Communication Symbols* (Mayer-Johnson Co.), and some pictures available in the *Hands On Teaching Materials* kits. The advantages of such systems include ready availability, relatively low cost, and excellent picture quality. Disadvantages include, with the exception of the *Hands On* pictures, lack of color cues (they are all black and white pictures). Most of the pictures are small in size (between 1/2 inch to 2 inch square) and perhaps most critical, the

predetermined nature of the packaged systems may encourage those responsible for design and vocabulary selection to confine the lexicon to that included in the system, regardless of individual needs.

The second category of picture systems includes those that incorporate magazine cutouts, coupons, food labels, photographs, black and white or colored line drawings, and other types of pictures that are either handmade or obtained from commonly available sources. Such systems can be totally individualized both with regard to the type and the size of the picture. They can be constructed for very low cost, in most cases families and caregivers contribute to designing the system. The lexicon can be expanded or updated simply by finding new pictures. The disadvantages of this system are - first, that it is often time-consuming to locate and compile the necessary pictures and second, if the system is misplaced, it may be difficult to duplicate because of the uniqueness of the pictures.

It must be noted that the advantages and disadvantages of commercially available or handmade picture systems are of secondary importance to considerations for choosing the appropriate system for an individual student.

Sigsymbols. The Sigsymbol system was developed to serve as an alternate to primarily pictographic systems (simple rebus, PCS), in which it is difficult to depict abstract referents, and more complex systems such as Blissymbolics and traditional orthography (TO) (Cregan & Lloyd, 1988). *Sigsymbol* is a contraction of "sig," from manual signs, and "symbol," from graphic symbol. Individual symbols are called sigs.

A Sigsymbol is an outline drawing depicting a single concept. Each

symbol is enclosed within a square box or on an individual card. The drawings are executed in black with red insertions to emphasize certain aspects of significance; in an alternative version for photocopying, the red lines are replaced by black lines of a contrasting thickness to the rest, consistently either finer or bolder. Use of a photocopier with a reducer-enlarger allows the interventionist to alter symbol size. Interventionists should be encouraged to add their own symbol drawings to children's display as needed. Color cues can easily be added by the interventionist to any of the commercially vended symbols.

Three types of Sigsymbols are (a) Simple Pictographs, used where a referent can appropriately be pictured, (e.g., CAT, RUN), (b) Simple Ideographs, used for pronouns, possessives, and directional or relational terms, following rules such as using blobs to represent unspecified things, and using red (or bold) lines for specific purposes (e.g., for the significant aspect in adjectives), (c) Sign-Linked Symbols, used for more complex or arbitrary referents, but drawn with a minimum of detail.

According to Musselwhite and St. Louis (1988), full use of the system requires:

1. Minimal visual discrimination skills since symbols are not visually complex, and are designed to avoid distinctions based on a single feature.
2. Moderate motoric control of both hands. This would be necessary if the signing component of the system is to be used.
3. Receptive and/or expressive use of a core of signs which would allow the sign-linked symbols to be meaningful.

Blissymbolics. Blissymbolics is described by McNaughton and Kates (1980) as a "graphic non alphabet communication system" (p. 305). The system consists of pictographic, ideographic, and arbitrary symbols. Blissymbolics were first developed by Charles Bliss in 1965 as an international second language. The first application of Blissymbolics as an augmentative communication system was in 1971 at the Ontario Crippled Children's Center (Kates & McNaughton, 1975).

The symbols are related to meanings and ideas, and fall into four categories: (1) simplified representational pictographs, (2) simple ideographs relating to an idea, (3) arbitrary symbols, (4) internationally recognized symbols (Jones & Cregan, 1986).

The most common method of use is for the symbols to be displayed on a communication board to be pointed at and read by users and recipients. Symbols are arranged in a grid, the number of symbols depend on the ability of the user. The upper limit is dictated by the practicalities of size and clarity and is normally no more than 400 symbols. Word categories may be grouped and color coded for quick selection.

This limited number of symbols can be enlarged by the use of indicators and strategies making it possible to express an infinite number of new ideas. Indicators specify the part of speech or tense of a verb which is represented by the symbol. The strategies include the "combine" strategy, which enables the user to choose an *ad hoc* series of symbols to represent a new meaning. As Blissymbols represent concept rather than a precise word, they have a range of meaning and can be given a number of synonyms. For

example, one symbol-combine might mean PRETTY, HANDSOME, ATTRACTIVE, PLEASING etc. In a whole sentence combines are enclosed within "combine indicators," so as not to become confused with the rest of the sentence structure. Combines, are virtually an art form, and the flexibility of the symbols is only limited by the creativity of the user (Jones & Cregan, 1986).

According to Musslewhite and St. Louis (1988), several factors determine symbol meaning. The most important of these are configuration, size, location, distance, size of angle, orientation/direction, pointer, numbers and positional reference.

In summary, Blissymbolics, originally designed for the purpose of international communication, is currently used with a wide range of augmented communicator. Blissymbolics is a logical, visual-graphic system using symbols formed from a small number of basic components.

Traditional orthography. Traditional orthography means spelling in accord with the regular printed letters of the English alphabet. The use of printed words, phrases, and letters to construct messages is a powerful communication technique if one has the ability to spell and read. Printed words bear no relationship to the concepts they represent; thus, orthography is a totally abstract system. It is one of the highest ranking symbol systems on the *openness* dimension and has the distinct advantage of being understood by public at large. It is easily supported when used with simple and complex electronic devices providing for correctable displays, printed output, and conversion to speech.

India and Special Education

The Disabled in India: Who are they?

According to government documents, the disabled are those individuals who have orthopedic handicaps, who are blind, partially sighted, deaf, partially deaf, mentally retarded, cerebral palsied, multiply handicapped, or who belong in other non-specified categories (Sutaria, 1984).

- The orthopedically handicapped are defined as having a physical deformity which interferes with normal functioning.
- The blind are those with (a) total absence of sight, or (b) visual acuity of 20/200 and 70/200 or less in the better eye with corrective lenses, or (c) the field of vision of 20 degrees or less.
- The partially sighted are those with visual acuity between 20/200 and 70/200.
- The deaf are those in whom hearing is non-functional for ordinary purposes of life. Their hearing loss exceeds 70 decibels in the better ear.
- The partially deaf are those with an auditory acuity between 40 and decibels.
- The mentally retarded are those with sub-average general intellectual functioning, usually with an IQ below 75, which originates during development years and which is associated with maladaptive behavior.
- The cerebral palsied are those whose motor function is impaired due to brain damage during prenatal period or early infancy.

- The multiply handicapped are those who suffer from more than one disability.

The other categories include any other disability conditions certified by physicians which appear to reduce the individual's capacity for normal or gainful employment. Among these are included the chronically ill and the speech handicapped.

While the above-named categories are recognized for some services, for the most part, the orthopedically handicapped, the blind and the deaf appear to be the primary recipients of the government's efforts on behalf of the disabled. Private organizations and institutions, on the other hand, are more diverse and cover more varieties of disabilities.

The Ministry of Social Welfare is the primary body responsible for providing services to the disabled, either directly or indirectly (Sutaria, 1984). Direct services refers to programs of scholarships, training, employment, and other benefits specifically made available to the disabled. Indirect services refers to financial incentives given to private organizations and agencies which cater to needs of the handicapped. Other ministries or government departments have been involved to some degree or another, most notably the Ministry of Labor, which has sponsored and supported vocational rehabilitation centers in various parts of the country.

Sutaria (1984) also described the programs and services offered by 16 government and five private agencies. According to her, the list is not exhaustive and the information incomplete. But the services offered seem to concentrate on the orthopedically handicapped, blind and partially sighted, deaf and partially deaf, mentally retarded and cerebral palsied. Autism is not

widely recognized and is not mentioned in the government documents. However, " Developmental Center For Exceptional Children," a privately run non-profit organization offers guidance to parents of autistic children. They assess the level of functioning and follow it with remedial teaching based on behavior modification strategies to enhance communication. Details of the assessment material or the strategies used are not available. No further information on other private agencies is available at this point in time.

Strategies to Enhance Communication in Individuals with Autism

Twelve strategies are discussed in the following pages.

- Strategies 1 - 5 address Beginning Communication Skills. These strategies are appropriate for children whose skills are limited and who are functioning at early stages of development.
- Strategy 6 helps develop Conversational Skills using modeling and role-playing techniques.
- Strategies 7 and 8 deals with Classroom Implementation and suggests ways to insure that students have access to operational communication aids everyday and provide opportunities to improve communication skills.
- Strategies 9 and 10 helps individuals interact with the community at large. It increases community awareness and fosters independence and self-esteem in individuals using communication aids.
- Strategy 11 (Mechanics) provides ways to develop the operational skills necessary to use computers.
- Strategy 12 (Facilitated Communication) is used with children with autism who are not able to access a communication aid independently and meaningfully.

1. Bradkte's Intensive Play strategy³

The strategy described here is Bradkte's Intensive Play, a method designed to facilitate communication between children with autism and their caregivers and family members (Udolf. L. K, cited in Augmentative Communication: Implementation Strategies, 1988). This method of teaching is also used for severely intellectually impaired. The child's poor ability to generalize new behaviors necessitates the participation of family members and more than one teacher. Family participation includes observation of sessions, participation with the teacher in some sessions, and completion of assigned activities with the child at home. For this strategy to be successful, family members and teachers who work with the child need secure social-emotional support systems for themselves to minimize the effects of inadequate social reinforcement from their children, The adults must support each other until the children begin to provide them with an adequate level of support.

Required materials. Audio tapes with music to suit different activities; a small audio cassette player/recorder; videotaping capability (helpful, but not essential); a variety of edible reinforcers; a large gym mat; a carpeted floor area; a large mirror mounted flush to the floor on one wall; open floor-to-ceiling shelves mounted on one wall; a rocking

³ From Augmentative Communication: Implementation Strategies (pp. 5.1:3-16) by S. W. Blackstone, E. L. Cassatt-James and D. M. Bruskin (Eds.), 1988, Rockville, MD: American Speech-Language-Hearing Association. Copyright 1988 by ASHA. Reprinted by permission.

chair; a bean-bag chair; a soft blanket; a small throw pillows; and a variety of play materials (e.g., pieces of cloth, facial tissue, toys, lotion, shaving cream, paper cups, and a plastic cups, and a plastic wash tub).

The objectives and activities of Intensive Play are individualized for each child. No standard sequence of objectives is suitable for all children. There are six stages involved in Intensive Play; Appendix A, from Bradtke's Intensive Play strategy, (p. 43) lists sample objectives that have been developed by teachers for each of the six stages. The procedures described below are used for each stage of Intensive Play (IP):

1. The teacher talks and vocalizes to the child using child-oriented highlighting devices like rhyming, singing (see Appendix B, from Bradtke's Intensive Play strategy, p. 44) to capture and maintain attention, to interest and amuse the child, and to create an aura of intimacy between the teacher and the child.

2. Tape-recorded music, prepared in advance, is used to complement the activities of each session. Listening to music with the teacher and responding to it through movement give IP a unique dimension.

3. The teacher comments on the child's or the teacher's own behavior with words and phrases that are common in early parent-child interactions. These words and phrases are uttered as the actions that they relate to occur. Appendix C, from Bradtke's Intensive Play strategy, (p. 45) lists examples of frequently used words and phrases.

4. Instruction includes the shaping of new behaviors needed to meet the criteria of each stage of IP. (Shaping is the systematic reinforcement of successive approximations to target behaviors.) For example, a target

behavior might involve independently operating a jack-in-the-box toy or requesting that the teacher get a particular toy off the shelf. To strengthen newly shaped behaviors, edible reinforcers are paired with social reinforcers, such as praise, smiling, stroking, patting, hugging, and nuzzling. As target behaviors become stronger and are integrated into play routines, the teacher tries to maintain them with social reinforcers alone.

5. Family members are highly valued colleagues and are included in any sessions they may attend. Eventually, family members view IP as a method for themselves as well as for the child. IP encourages the family and the child to enjoy their involvement with each other.

Children progress at their own rates through the six stages of Intensive Play. While each stage has a different emphasis, they blend together with no abrupt transitions. To progress from one stage to the next, the child must complete the criteria of all previous stages (see Appendix D, from Bradkte's Intensive Play strategy, p. 46). Each session, regardless of which stage the child is in, is composed of several common design elements: an opening, a warm-up play routine, an intense physical contact play routine, a cool down, an object play routine (either teacher- or child-led), and a closing (Appendix E, from Bradkte's Intensive Play strategy, pp. 47-48).

Stage one: adaptation. The goal of stage one is to make the child feel comfortable with the teacher, the activities, and the setting. Activities might include rough-and-tumble mat play, rocking in the rocking chair on the teacher's lap, dancing, singing, and clowning in front of the mirror. Criteria for movement to stage two include absence of crying during the session;

absence of physical resistance when handled by the teacher; and absence of escape attempts.

Stage two: attending. The goals of stage two are to have the teacher identify a menu of positive reinforcers for the child and to have the child attend to specific stimuli and stimulus events. Attending, as used here, means that the child will physically and visually orient or turn toward the stimuli. The teacher may choose activities that build on those introduced in stage one, or the teacher may introduce totally new activities. Objectives might involve turning toward the tape recorder when the music begins or stops, looking at a mirror when the teacher draws on it with shaving cream, looking at a flashlight when the light is turned on or off, gazing at a mechanical toy when the toy begins to move or make noise, and looking at the teacher's face when the teacher makes a sound. Suggested criteria for movement to the next stage include maintenance of stage one criteria plus attending to 80% of at least 20 stimuli or stimulus events, with a latency of no more than 20 seconds, in each of three consecutive sessions.

To compile a menu of reinforcers for the child, the teacher observes the child's preferences among edible reinforcers, such as ice cream, pudding, potato chips, crushed ice, frosting, banana, yogurt, popcorn, cookie crumbs, broken pretzel bits, sips of cola, and other foods and beverages. Family members can be helpful in suggesting foods and other reinforcers idiosyncratic to the child, such as scents, textures, and vibratory stimuli. The teacher also notes the musical selections that seem to calm, stimulate, and interest the child and the play routines that seem to amuse, comfort, and please.

Stage three: touching. The goal of stage three is to have the child independently touch the stimulus materials. Again, the teacher may choose activities that build on those already used or introduce new ones to accomplish stage three objectives. The objectives pertain to reaching out and touching various objects. For example, the child may pat the mirror, touch a switch, touch the rocking chair, or touch the teacher's foot. Touching, as used here, refers to the child's attending to and touching an object with his or her hands. Object refers to any tangible stimulus in the setting, including the teacher. Suggested criteria for movement to the next stage include maintaining criteria from earliest stages plus independently touching at least 10 objects in each of three consecutive sessions.

Stage four: acting on objects. The goal of stage four is to have the child independently manipulate or handle objects to produce change, actions, or effects. The teacher may design activities based on the objects used in the previous stage or may introduce totally new activities using new objects. The child might learn to operate independently a jack-in-the-box, or climb into the rocking chair, or turn the light switch on or off, or activate a switch that operates a mechanical toy or the tape recorder. A second goal is to eliminate self-stimulating and self-injurious behaviors during the sessions. Suggested criteria for movement to the next stage include maintenance of earlier criteria and performance of at least 20 unprompted, appropriate actions over no more than three consecutive sessions.

Stage five: imitation. The goals of stage five are to have the child make eye contact with the teacher and to imitate behaviors modeled by the teacher. A response qualifies as imitative when it occurs after a similar

response is modeled by the teacher in the same session. The teacher may choose activities related to those used in stage three or may introduce new ones that encourage eye contact and the imitation of actions. The actions to be imitated may include production of speech or nonspeech sounds or facial expressions, or they may be fine or gross movements. Edible reinforcers may be used to shape new responses; however, only social reinforcers are used to reinforce responses that meet criteria in this stage. Suggested criteria for movement to stage six include maintenance of earlier criteria and imitation of at least 10 new actions modeled by the teacher over three successive sessions.

Stage six: communication. The goal of stage six is to have the child communicate with teacher and family members during familiar play routines. Activities during this stage include the child's favorite play routines and the routines that the teacher thinks are especially productive for the child. Objectives pertain to the child's sending and responding to a variety of messages in a social context with the teacher. Criteria for successful completion of this stage include the maintenance of criteria of earlier stages plus at least 20 responses in each of 10 consecutive sessions that can be described as communicative and pragmatically appropriate.

During this stage, if the room is large enough, more than one child/teacher team can work at the same time. The advantages of doing this include the opportunity to observe and respond to changes in the child's behavior in the presence of others; the opportunity for the teachers to trade children without being completely separated from them; the opportunity to strengthen the child's attending behaviors in the presence of distractions; the opportunity to observe the child's tendency to attend to and imitate the actions

of others; and the opportunity to observe the child's tendency to interact with others. Suggested criteria for successful completion of this stage include the maintenance of criteria of earlier stages plus at least 20 responses per session for 10 successive sessions that can be described with words and phrases.

The stage is set for a child to learn language when the child, the family members, and the teachers discover and use mutually agreeable communicative modes; messages are sent and received with or without words; the child and family seem happier and more relaxed than before; the child's eye contact with family members and teachers is spontaneous and comfortably quick; smiling is reciprocal; and motor and vocal imitation are evoked easily in play.

Appendix A

SAMPLE INTENSIVE PLAY OBJECTIVES

STAGE 1: ADAPTATION

- o Child relaxes while being rocked in teacher's arms.
- o Child relaxes while being held and stroked by teacher.
- o Child tolerates manipulation of hands by teacher, such as rubbing them or making them clap together.
- o Child tolerates physical contact with no crying.

STAGE 2: ATTENDING

- o Child is alert to teacher's voice and turns toward teacher.
- o Child looks at foot when teacher removes child's sock.
- o Child is alert to sound of mechanical toy and watches toy while it is moving.
- o Child watches teacher polish mirror with spray and a cloth.

STAGE 3: TOUCHING

- o Child touches teacher's hair, face, or throat.
- o Child touches mirror.
- o Child touches doll.
- o Child touches mechanical puppy while still.

STAGE 4: ACTING ON OBJECTS

- o Child opens box lid.
- o Child shuts door.
- o Child initiates play routine with doll.
- o Child removes stocking cap pulled down over eyes.

STAGE 5: IMITATION

- o Child imitates teacher's "making faces" in the mirror.
- o Child imitates teacher's /m/ sound.
- o Child imitates teacher's "putting doll to bed" and covering with a tissue.
- o Child imitates teacher's swaying to music.

STATE 6: COMMUNICATION

- o Child greets teacher with eye contact and smile.
- o Child turns teacher's face toward himself.
- o Child communicates request to be put down during physical contact play.
- o Child communicates request for toy during object play routine.

Appendix B

CHILD-ORIENTED HIGHLIGHTING DEVICES

Exaggerating and varying voice inflection, pitch, stress, rate, and loudness

Rhyming, repeating, and alliterating

Using facial expressions, gestures, posture, and movement

Whispering

Singing

Dancing

"Freezing" posture, facial expression, and voice

Using nonspeech noises, such as animal noises, motor noises, silly smacking or popping noises

Talking about what is happening

Telling secrets

Waiting silently for as long as 10 seconds for the child to respond

Signing

Using finger play

Appendix C

EXPRESSIONS FREQUENTLY USED DURING INTENSIVE PLAY ROUTINES*

Hey!
 Here. Right here. Here it is. You
 got it!
 There. There it is. Right there.
 There you are!
 This. This one.
 That. That one.
 Uh-oh. You hurt yourself!
 It fell.
 It's broken
 Hi, there. Hello!
 Bye! Bye-bye!
 Whee! This is fun!
 Here we go!
 You did it!
 You like that!
 Thank you!
 You're welcome!
 Ahhhh! Oooooo! Look at that!
 Ooooo! That's pretty!
 Ooooo! It's dark in here!
 Yuck! Dirty! We don't like that!
 Yuck! Hands dirty!
 Uh-oh. I got it on my dress.
 You're wet!
 It's broken.
 All done. We're finished.
 Oh, no. Sorry.
 Mmmm. That's good. I like that.
 Look at that!
 Wow! New shoes!
 Shhh... Listen. I hear something
 It's so quiet. I like it.
 You're happy now!
 You want more!
 Please!
 Is that better?
 You want to go, don't you.
 Do you want this?
 Again? You want more?
 You want to help.
 You're tired of this, huh?

You want a little help there.
 You want up! You want to see?
 You want down?
 You want out of there!
 Do you want more? More? Yes, you
 want more.
 You don't want any more. No. No
 more for you!
 Again? You want me to...again?
 No. No more of that, huh. No.
 You want another one? Another? Yes
 you want another...
 Enough, huh? Finished.
 All gone. You ate/drank it all gone
 It's gone? (vanished) Where is it?
 Where is it? Help me find it.
 I'm looking. I can't find it!
 Here it is!
 I'm finished! All done.
 Enough of this! You want something
 else now. Show me. Tell me what
 you want.
 You want me to stop! Stop!
 This is not the one you want! No.
 Look at that! You're so pretty!
 This one. No. This one.
 That's mine! Leave it alone! Give
 it back!
 It's my turn! Your turn?
 Let me see!
 Too loud! It hurts your ears!
 Turn it off! Make it quiet.
 Thank you!
 Let go of me! Put me down!
 I'll do it. I can do it by myself!
 Don't stop. More. Do it more.
 Up! Pick me up.
 Help me.
 Fix it. It's broken?
 Open this!
 You're silly!
 You're my honey!
 Aaaaaaa...BOO!!

*No order or sequence is implied.

Appendix D

SUGGESTED CRITERIA FOR STAGES OF INTENSIVE PLAY

STAGE ONE: ADAPTATION

- o absence of crying during session,
- o absence of physical resistance when handled by teacher, and
- o absence of escape attempts.

STAGE TWO: ATTENDING

- o all of the above, plus,
- o child attends to 80% of at least 20 stimuli or stimulus events with a latency of no more than 20 seconds for three consecutive sessions.

STAGE THREE: TOUCHING

- o all of the above, plus,
- o child independently touches at least 10 objects in each of three consecutive sessions.

STAGE FOUR: ACTING ON OBJECTS

- o all of the above, plus,
- o child independently acts on 20 different objects over no more than three consecutive sessions.

STAGE FIVE: IMITATION

- o all of the above, plus,
- o child imitates at least 10 actions modeled by teacher over three consecutive sessions.

STAGE SIX: COMMUNICATION

- o all of the above, plus,
- o child makes at least 20 responses in each of 10 consecutive sessions that can be described as communicative and pragmatically appropriate.

Appendix E

SAMPLE ROUTINES FOR SIX INTENSIVE PLAY SESSIONS

OPENING

- o Child makes eye contact with teacher and smiles on entry.
- o Child acknowledges greetings appropriately.
- o Child separates easily from family member when necessary.
- o Child exchanges farewell gestures.
- o Child removes shoes and puts them away.
- o Child turns on light.
- o Child turns on music.
- o Child looks at teacher.

WARM-UP PLAY ROUTINE

- o Warm-up routines are gentle, physical contact activities. Background music should be toe-tapping, but not fast; folk music, peppy waltz, or march works well. There should be lots of animated talking and laughter to accompany this very intimate kind of play. Routines and music can be changed as appropriate.
- o Teacher assists child in applying body lotion to arms and legs; child is encouraged to apply to self and teacher's arms; socks may be removed and child's feet massaged.
- o Teacher may lead into finger play activity.
- o Teacher may lead into peek-a-boo activity with blanket.
- o Teacher may lead into mirror activity, playing with body lotion or shaving cream on mirror.

INTENSIVE, PHYSICAL CONTACT PLAY ROUTINE

- o These are high energy activities with music to match. Vary the pace within but keep energy level high until music signals transition to cool down routine. Try some symphonic music. Take advantage of crescendos! End with a bang! Change routine and music as you like.
- o Child notices change in music.
- o Teacher leads into active movement routine; movements match the music; teacher may at first dance alone, focusing on the child, and may then pick up the child and continue dance routine holding child close.
- o Teacher may lead into swinging the child out from teacher's body and lifting child up.
- o Teacher may lead into mat play, moving away from and back to the child; teacher may tumble alone at first, focusing on the child, and then guide child through tumbling routine.
- o Teacher may lead back into dance.

COOL DOWN

- o Music becomes calm and soothing, slow; may be hum-along or sing-along type music.
- o Teacher may need to lead transition to cool down.
- o Teacher engages child in finding the cushions, finding the blanket.
- o Teacher and child move to the rocking chair.
- o Child gets into teacher's lap in rocker.
- o Teacher and child snuggle with blanket, rocking, cuddling, stroking child's hair and face.
- o Humming, singing.
- o Teacher responds to change in tempo of music in preparation for transition to Object Play Routine.

OBJECT PLAY ROUTINE

- o Object Play Routines may be teacher- or child-led. Teacher chooses one routine; if it seems to work, same routine is used for several sessions. Teacher develops an order or sequence for the routine. Routine will develop differently with different children. New routine is introduced before old one gets boring. Each routine should have its own theme music. By Stage Six, most children will have a preference for certain routines and will be eager to lead the routine. Materials and toys are placed on shelves on the wall out of the child's reach. Child must communicate preference to teacher by referring to items on shelves.

EXAMPLES OF OBJECT PLAY ROUTINES

- o water play with plastic dishpan and assorted objects.
- o comb/brush play beside mirror; child works on own and teacher's hair and vice versa; doll may be used.
- o doll play routine; feeding, dressing, bathing, reading book, putting to sleep; choose no more than two per session.
- o tea party routine: mixing "tea," or juice, stirring, setting table or spread on floor, pouring from pitcher, drinking from cups, using napkins.

CLOSING

- o Closing is signaled when music stops.
- o Child turns off tape player.
- o Clean up time: Child helps teacher straighten room.
- o Toileting or diaper change as needed.
- o Child puts on shoes.
- o Child puts on outer clothing.
- o Child turns off light.
- o Expressions of leave taking for everyone present: hugs, pats, kisses, waves as appropriate.

2. Use of Visual-Spatial Symbols to Communicate⁴

Mirenda and Schuler (cited in *Augmentative Communication: Implementation Strategies*, 1988) made two generalizations about the application of communication aids with autistic students. First, many students with autism seem to learn visual-spatial symbols more easily than spoken words. Secondly, communication skills should be taught in social contexts because generalization of appropriate symbol use is often a problem for students with autism.

This instructional strategy emphasizes the spontaneous use of the communication aid from the onset of training, thus avoiding the need for programming stimulus transfer from an instructional to a natural cue. The strategy consists of four general phases that can be adapted for individual clients. Phases one through three are conducted in structured training sessions, while phase four is conducted in generalization environments (home, school, etc.).

Phase 1: establishing a spontaneous touch response.

- A. Place a picture of a high-preference item on the table in front of the student so that it is "in the way." Place the corresponding high-preference item off to the side in view of the student.
- B. Do not provide verbal cues or refer to the picture or the item.

⁴ From *Augmentative Communication: Implementation Strategies* (pp.5.1: 17-25) by S. W. Blackstone, E. L. Cassatt-James and D. M. Bruskin (Eds.), 1988, Rockville, MD: American Speech-Language-Hearing Association. Copyright 1988 by ASHA. Reprinted by permission.

C. Engage in a simple activity during which the student is likely to touch the picture accidentally.

D. If the student touches the picture, either deliberately or accidentally, immediately provide the high-preference item for a brief period of time.

E. Once the student consistently touches the picture several times over several sessions, fade the high-preference item gradually until it is no longer visible.

Criterion for proceeding to Phase 2: The student will touch one symbol spontaneously in order to receive the referent (e.g., high-preference item).

Phase 2: teaching search and locate behavior.

A. Mask the picture used in Phase one with a translucent page (e.g., onionskin paper). The student must now lift the page and touch the picture. The clinician provides no verbal cues but does provide differential reinforcement (i.e., the high-preference item) for all attempts at page-lifting.

B. Once the student consistently lifts the translucent page and touches the picture, change to an opaque page and repeat the shaping procedure as necessary.

C. After mastery of these two steps, mask the picture with two opaque pages and repeat the shaping procedure.

Criterion for proceeding to Phase 3: After lifting two opaque pages to find a picture, the student will then touch the picture to receive the referent (high-preference item).

Phase 3: increasing the number of symbols.

A. Place the original symbol and a blank "dummy " card of the same size and color on the table under two opaque pages.

- B. Provide the high-preference item if the student touches the picture. Provide nothing if the dummy card is touched. Alternate positions of the picture and card randomly and continue to refrain from providing verbal cues.
- C. Once the student consistently touches the picture and avoids the dummy card, provide the original picture and a second high-preference picture. Provide the item corresponding to the picture touched.
- D. Gradually add pictures, one at a time, or as rapidly as possible without losing the search-locate-touch-response. Be sure the pictures are added in accordance with the student's preferred visual scanning/motor response patterns.
- E. Continue to provide the item corresponding to the picture touched and refrain from providing verbal cues.

Criterion for proceeding to Phase 4: The student will be able to choose one of several pictures arranged on one or more pages and should receive the item/event requested.

Phase 4: generalization.

- A. Provide instruction to family members, school staff, and all involved individuals regarding the purpose of the aid and how the learner can be expected to use it (i.e., to request items).
- B. Provide the student with the aid across environments.
- C. Continue to expand the picture vocabulary gradually, based on student interests, needs, and so on.
- D. Gradually begin to establish practical parameters regarding affirmative responses to pictures touched. For example, begin to refrain from providing

the item requested during inappropriate times. However, continue to respond affirmatively to the student's initiations as often as possible.

Phase four is ongoing and requires long-term monitoring on the part of those involved. During this phase, new vocabulary is identified, and the symbol display is updated and maintained.

3. Communication Aids to Facilitate the Development of Oral Expression

After assessing each student's language skills and identifying appropriate augmentative aids and techniques, develop a variety of different communication boards for the students. Train use of the communication aids in multiple functional environments.

1. Activity sequence boards. Depict classroom activities and routines using a step-by-step picture sequence. Pair each step of the direction or routine with a symbol. Construct the display so that the symbol for each step of the routine can be removed from the display after the step is completed. Initially, introduce familiar routines containing a limited number of distinct steps (e.g., lunch procedure). Gradually, use more complex, multi-step activities (e.g., setting a table, using the computer, going grocery shopping).

Use the activity sequence board to foster the student's ability to relate experiences verbally and in sequence. Show the student that the vocabulary display can be used as a visual cue representing each step in the activity. The student can use the symbols to: retell how an activity was completed; predict the next step in the routine; or direct the execution of the activity.

2. Activity schedule boards. Provides the individual with time frame-work; an understanding of beginnings, endings, and sequences of events.

Schedule boards teach the concept of time, informs the individual of the events of the day, decreases anxiety, rigidity and challenging behaviors, fosters independence, decreases transition difficulties from one activity to another.

3. Transition boards. Transition from one activity to another can be extremely difficult for children with autism especially if the present activity is enjoyable. When attempting transitions to new activities, it is sometimes helpful to offer the individual a board with desirable choices that will be available at the next environment. While still at the original activity the individual can then choose a desired activity at the next environment . Knowing that there are desirable choices ahead frequently offsets the fear and discomfort associated with transitions.

4. Classroom communication boards. Select vocabulary to represent daily classroom routines and activities. Chose vocabulary that is generic to the classroom. Construct vocabulary displays so they can be accessed using any message selection technique (i.e., direct selection by the students, scanning via the communication partner), and locate the board in a central area of the classroom so that it is easily accessible to all students (e.g., on the wall, portable flip chart, etc.,).

5. Academic boards. Construct an academic board that includes vocabulary for key questions and comments appropriate to routine academic situations.

6. Communi-belts. Use communi-belts with students who have a limited expressive vocabulary (up to five items). Attach high-frequency vocabulary words to wide belt that is worn by the student throughout the day.

Employ the communi-belts and classroom communication and academic boards as a means to facilitate the student's ability to make requests, ask questions, and direct routines. Demonstrate to the student how the vocabulary display can be used to initiate conversation and facilitate formation of spoken messages.

7. Group discussion boards. Specific communication displays can be used to stimulate group discussions, promote conversational skills, and facilitate use of expressive syntax and vocabulary. Gear boards toward specific activities (e.g., holiday board, calendar board). For example, to design a weekend activity board:

- A. Interview the student's caregivers to determine typical weekend activities experienced by the group.
- B. Ask parents/caregivers to submit weekly communication notebooks describing the student's weekend activities.
- C. Prior to each session, add any additional symbols needed for the discussion.

Demonstrate to each student how communication aids can be used to facilitate and enhance spoken communication. Model the use of vocabulary displays during all interactions. Employ incidental teaching techniques as well as structured, intervention activities. Train the student's communicative partners (e.g., general education teachers and peers, special education peers) to integrate the communication aid into their daily routine.

8. Individual communication boards. Develop portable, individualized communication displays for each student. Encourage the student to carry the board at all times.

Examples of individual communication boards include:

- A. Key phrase boards: Vocabulary that focuses on a student's specific needs.
- B. Communication notebooks: Communication notebooks are blank mini-notebooks with a pencil attached that are used with students who are able to write at least a one-word response. When an autistic student is angry, frustrated, or confused with a task or situation, the blank notebooks provide a usable, immediate option for expression. Communication books can be elaborate and include expanded categories of nouns, adjectives, verb in a format that will allow the student to generate sentences.

Teach the student how to employ the communication notebooks and key phrases boards to repair conversational breakdowns. Model the use of these displays as a technique for asking questions and clarifying response. Demonstrate how the system can be used as a visual cue for a spoken response.

4. Establishing Initial Communicative Control with a Loop-Tape

System⁵

According to Fried-oken, Howard and Prillwitz (1988), this strategy can be used to teach children with autism to use voice output communication aid (VOCA) to participate actively in and control their environment

⁵ From *Augmentative Communication: Implementation Strategies* (pp. 5.1: 45-51) by S. W. Blackstone, E. L. Cassatt-James and D. M. Bruskin (Eds.), 1988, Rockville, MD: American Speech-Language-Hearing Association. Copyright 1988 by ASHA. Reprinted by permission.

linguistically. This strategy is successful when introduced in a structured, routinized, individualized activity. It may occur in any of the child's daily environments (e.g., home, school).

Communication partners. The partner must be able to receive the spoken message (i.e., hear and understand language) and to carry out a student's instructions (i.e., carry out requests that may require motor control).

Augmentative aids, symbols, and techniques. A loop-tape VOCA is needed. This loop-tape communication system is devised by using a standard tape recorder that is equipped with a loop-tape cassette. The tape recorder is controlled by a switch (e.g., a Zygo CM-1 that is connected to the remote part on the tape-recorder). A 1/8" to 3/32" sub miniature, jack-to-plug adapter may be required to allow interface of the switch cable and the tape recorder. This adapter is available from Radio Shack (#274-327). A 10 or 15 seconds looptape (also available from Radio Shack) can be used to record a message. When the switch is activated, the message on the tape becomes the student's "voice."

A switch latching mechanism may be added to the system if the child cannot consistently depress the switch for more than 2 seconds. The TASH switch latch will change the switch function so that a single pulse turns the device on and off.

Other considerations. The student must be able consistently to activate and demonstrate purposeful use of a switch.

Description of strategy.

Preparation: 1. Select a single reinforcing message that can be used throughout the day. Select a target message that encodes what the student

routinely requests after gaining the attention of a communication partner. Phrases should be 1 to 3 words in length. The message should be recorded 3 to 4 times on a 15-seconds Radio Shack loop-tape with 3-to-4 seconds silent pause between each repetition. Sample phrases include:

- A. coat off
- B. bathroom time
- C. brush hair
- D. more music

2. Attach a switch to the remote jack of the tape recorder. A graphic or object representation of the message should be affixed to the switch with Velcro so that the student can associate the prerecorded verbalization with some symbol. For example, physical items that could be attached on the switch may include:

- A. A square of wool or doll-sized coat for "coat off";
- B. A piece of diaper or miniature dollhouse toilet for "bathroom time";
- C. A small hair brush for "brush hair";
- D. A miniature dollhouse record player for "more music."

Training: 1. Elicit the student's nonlinguistic request behavior (e.g., reaching, vocalizing) by placing a desirable event/object in view, but not in reach.

2. Pair the actual object/event requested by the student with the representation of the object/event (e.g., a smaller toy, plastic food, etc.). Place the representational object in reach of the student. The cue, "What do you want?" may be given. Prompt the student to touch the representative object. Then, the real object can be given or the real event can occur.

3. Place this representational object on top of a switch that is attached to a loop tape with a recorded message of the student's request.

4. During each occurrence of the routine, activate the loop-tape message. For example, the switch with a doll-sized coat is placed in front of the client as he or she enter the room. The switch is hit, and the message, "Take off my coat, please," is heard as the student's coat is removed.

A response-shaping paradigm can be implemented for meaningful switch closure, if necessary. At first, only the facilitator hits the switch. When the message is heard, the facilitator responds by taking off part of the student's coat. The entire sequence can occur 5 to 10 times during a single routine. After the student understands that the message is expected for the routine, he or she can begin to activate the switch with physical assistance from the facilitator. Gradually, the facilitator will no longer assist the student but may provide prompts. The prompts are slowly faded until the student alone initiates coat removal by using the VOCA.

5. As the student progresses, the facilitator should begin to train message production for three additional routines in a similar manner. Remember that the ultimate goal is to teach the student functional use of a communication aid (in this case, a taped message) in order to produce a desired change in the student's environment or state.

6. After several messages have been strongly established in the student's behavioral repertoire, the facilitator can begin to train the student to make choices. Begin with two choices. For example, when client enters the room, give him two switches, one with the doll-size coat and the other a miniature toilet. Ask what the student would like to do. Through modeling,

shaping, physical prompts, and fading, teach the student to respond to the question "What do you want?" with his or her choice of messages. Always provide the consequence that matches the chosen message. Initially, the two-message choice procedure should be introduced in one routine only.

7. Ultimately, using two recorders, two switches, and two loop tapes, a choice activity may be used in other routines. For example, during meal times, one tape recorder is loaded with a tape containing the message, "I want milk," and the second tape recorder is loaded with a type containing the message, "Cheesecake, please."

Two switches are used; each switch controls a tape recorder. A representational object or picture of an item is placed on each switch, which is positioned for easy activation by the student. The communication routine begins as the facilitator offers the student a choice, saying, "Which would you like?" The student may require some initial training, but as this routine is established and used consistently, the student will become more independent. Before receiving the item, the student is required to hit and hold one switch or the other until the message is conveyed. The facilitator then reinforces the student by serving the indicated food. It is important for the facilitator to respond to the message, even if the student indicates the "wrong" message. This teaches the relationship between the spoken message and the result of that message. If, for some reason, the student makes a consistent error in indicating a message (which becomes evident after several attempts), the facilitator should cue for the correct response.

As the student demonstrates an ability to make a choice consistently, generalize the procedure to another familiar routine. Continue this procedure

until the student consistently chooses one appropriate message from a choice of two in each of four routines.

8. Introduce three messages to choose from once the student has mastered step 7. Again, start offering three choices in a single routine. Add a second routine when the first routine is mastered. Continue this exercise until the student can indicate the appropriate message using the correct switch from among four choices in all four routines.

9. Three future goals can then be set:

- A. Additional messages can be trained on individual loop tapes.
- B. One loop tape can be made that contains more than one message. The same loop tape may say "record player" and "play drum" or "yes" and "no." Thus, the loop tape can be used as an auditory scanner.
- C. The four loop tapes and their physical representations can be placed on a large pegboard or flannel board that the student can see and point to. This "communication board" can be constructed of items that the student can see or, if visually handicapped, feel (raised objects with different textures), that stand for very different messages, and that result in immediate changes in the environment after the student points to an item. The student can be taught to communicate with a limited direct-selection board at this time. Thus, loop tapes can serve as an inexpensive VOCA.

5. Establishing an Initial Repertoire of Requesting

Objects and activities in the environment that learners make some effort to pursue can be described as "liked" or "preferred." Obtaining such preferred items often requires the mediation of a listener. In the request, preferred items are presented as reinforcement of the response.

Reasons for teaching requesting:

- Provides the learner with a means of obtaining access to preferred objects;
- Provides the learner with a means of obtaining needed objects or actions;
- Allows the learner to exert some measure over the environment;
- Allows initial intervention demands to be associated with receipt of preferred items, perhaps facilitating future efforts;
- May replace existing repertoires of attention or object-motivated excess behaviors.

Modes of requesting offered objects. In a prototypic request, a preferred item is offered, the learner makes the appropriate request, and the preferred item is received. The actual requesting response occurs either in a vocal mode, a manual sign (gestural mode), or the selection of a given line drawing or photographs (graphic mode). Specific intervention techniques in all three modes will be discussed in the following pages.

Vocal mode: Requesting in the vocal mode is straightforward - a preferred item is offered and delivered after the learner utters or vocalizes the appropriate response. Intervention is often needed to establish this sequence, because many learners will not vocalize a request.

To learn to request preferred objects or activities vocally, the learner must be capable of producing vocal behavior, and the interventionist must prompt the learner's vocalization at the appropriate time. These two requirements mean that either the learner will independently produce some consistent vocalization or imitate the interventionist's modeled speech. In the

first case intervention will focus on bringing vocalization under the control of appropriate motivational or contextual variables and in the second case intervention will focus on fading the imitative prompt and bringing the vocalization under appropriate stimulus control. For learners who do not vocalize or who do so infrequently, efforts will first be directed at increasing the frequency of vocal behavior. For learners who vocalize but do not imitate speech, efforts should be directed at teaching vocal imitation.

Gestural mode: To request in the gestural mode, the learner makes an appropriate gesture, and the gesture is reinforced by access to the preferred object or activity. Gestures might consist of formal signs (i.e., American Sign Language, Signed Exact English signs), natural gestures (e.g., nodding one's head up and down to indicate "yes"), or idiosyncratic movements (e.g., raising an arm to a certain height).

Sign languages and sign systems are understood by a relatively small number of people, and the signs themselves are for the most part not highly guessable. Repertoires of requests consisting of manual signs may not be reinforced by listeners unfamiliar with the sign, and hence such repertoires may be extinguished. Similar problems may be faced by learners whose idiosyncratic gestures are understood by only a few close friends, family members, educators, or caregivers. Thus, although their breadth and specificity is limited, natural gestures appear to have the largest potential audience.

Candidates for gestural mode requesting might engage in some acceptable motor behavior. Intervention efforts focus on the transfer of stimulus control from the current controlling variable to the offer and

subsequent receipt of preferred items. In case they need to be taught a completely new gesture, intervention efforts could follow a more standard prompt and fade procedure. It is not clear whether it is easier to change the stimulus control of existing gestures or to establish new gestures. In either case, a wider range of prompts is available in teaching requests in the gestural mode than in the vocal mode.

To prompt a correct request, an interventionist might display an object, speak or sign a specific instruction, or model appropriate behavior (by demonstrating the correct sign or telling the learner what to say). Should these prompts prove ineffective, the interventionist can physically prompt the desired response by taking hold of the learner's hands and arms and guiding them through the correct movement. Because gestures can be physically prompted, procedures to teach requesting can be implemented with learners who do not vocalize or imitate speech.

Eventually, of course, the learner should request without the assistance of an instructional prompt. Instead, the natural cue of an offered item should be sufficient to evoke a request, provided the item offered is an effective reinforcer. Instructional prompts must therefore be faded or eliminated. Such fading can begin shortly after a few initial responses have been successfully prompted. Once a learner has been prompted to make a gestural mode request, that prompt can then be delayed a few seconds and delivered at a slightly lower intensity on the next opportunity. If successful the delay interval is increased and the magnitude of the prompt decreased. If at some point the now delayed and reduced prompt fails to recruit the request, the interventionist can return to a previously effective level of prompting and

continue to fade, this time more gradually. Fading continues in this manner until eventually the learner requests offered objects by producing the correct gesture without having to be prompted. Fading has proved to be effective in eliminating the need for response prompts.

Graphic mode: The requesting relationship in the graphic mode follows essentially the same sequence as in the vocal and gestural modes. In the prototypic sequence, the offer of preferred objects or events provides optimal conditions for a request to be reinforced. The only difference is that instead of the requesting response consisting of some distinct vocalization or gesture, the requesting response typically consists of the learner selecting a particular symbol, line drawing, or photograph. In the generalized request, for example, access to an array of preferred objects is made contingent upon selection of a "want" symbol.

Typically, learners are taught to select a symbol by pointing to it with an isolated index finger. Some learners will not be able to do this, and may instead point with a group of fingers or an assisting device, such as a head or mouth stick, or brush the symbol with their hands. Other learners may have to look at the symbol (eye gaze) for a predetermined length of time. As long as at least one reliable method can be identified for selecting symbols, the graphic mode can be considered.

In teaching a repertoire of requests, the interventionist can use a variety of response prompts, including physical prompts. As in the gestural mode, learners can, if necessary, be prompted to point to a symbol by actually guiding their fingers to touch the line drawing, photograph, or other type of symbol. Other prompts that may be effective include the modeling of a

symbol selection (e.g., the interventionist points to the correct symbol), or verbal prompts (e.g., telling the learner to point to "want"). In addition, several types of stimulus prompts are available to recruit the desired behavior. As in other modes, prompts are delivered initially to recruit a correct symbol selection, and then gradually faded to obtain independent performance.

6. Enhancing Interaction Through Role Playing⁶

The purpose of this strategy is to facilitate the interactive competency of persons who use communication aids by using role-playing techniques and scripted dialogues (Frumkin, 1988).

Setting. For training, several routine activities/communication environments are selected, as well as vocabulary, lexical items, and dialogues that are appropriate to the student's participation in activities.

Communication Partners: The availability of staff, peers, and family (if possible) is considered an integral component for the success of this strategy. Individuals with whom the user can interact should be available throughout the training period.

Augmentative aids, symbols, and techniques. Any type of non electronic or electronic communication device with vocabulary and lexical entries that can be determined and programmed by the user or supportive personnel. Symbol selection, type of display, and access factors should

⁶ From *Augmentative Communication: Implementation Strategies* (pp. 5.3: 13-18) by S. W. Blackstone, E. L. Cassatt-James and D. M. Bruskin (Eds.), 1988, Rockville, MD: American Speech-Language-Hearing Association. Copyright 1988 by ASHA. Reprinted by permission.

not affect the decision to employ this strategy.

Description of strategy.

1. Selecting Communication Environments/Activities: Factors that affect the selection of activities include the student's age, the settings in which the student spends a majority of time, and the individuals with whom the student communicates in those settings. Examples of communication environments are illustrated in Appendix A (from *Enhancing Interaction through Role Playing*, p. 74).

Considerations regarding the listener and listener's role during conversation will depend upon the particular activity and the listener's familiarity with the student.

2. Incorporating communication environments into a role-playing activity: After identifying and selecting a communication environment, the speech-language pathologist prepares a script to be used in that environment, presents it to the student for approval, and then prepares the vocabulary display and programs it onto the communication aid, if necessary. For example, a child, age nine, using a Phonic Ear VOIS 135 may select utterances related to a lunch time routine. The role-playing activity is programmed into the VOIS and presented as "let's pretend it's (lunch time). I'll be your (schoolmate) and this is what we might say." The dialogue for the listener's role is organized to prompt the production of the selected utterances by the aid user. In general, the vocabulary and dialogues will be personalized and the context made specific, depending upon the student's situation and needs.

The following are examples of scripted dialogues:

Communication environment: playtime

Materials suggested: beads, string

The scripted dialogue for playtime is an identified communication environment for a child, age four. This child is using a picture communication board, with Picsym symbols and colored pictures, accessed directly with an index finger. The symbols placed on the board represent the entire utterance. For example, the sentence "I want to watch you make a necklace" is represented by the Picsym symbol want and a picture of a necklace incorporated into one picture (Appendix B, from *Enhancing Interaction through Role Playing*, p.75). This enables the youngster to select messages efficiently using only one directed point. The burden of selecting more than one symbol for one utterance would interfere with the progression of conversation, thus impeding effective interaction. The individual who trains the child to use this strategy reviews the picture symbols, identifying them a whole sentences during the initial training process. Complete sentences are used in the following example to facilitate the use of the script. (key: S = student; P = partner)

P: What shall we play with now?

S: I want to watch you make a necklace. (want/necklace)

P: You will have to help me do it. What should I do first?

S: Take a bead and put it on the string. (bead/rope)

P: I have lots of beads here. Tell me something about the beads that you would like.

S: I like big beads. I want beads to wear on my neck. (big/necklace)

P: You want a big necklace. It will take some time.

(Partner deliberately does not tie a knot at the end of the string.)

P: Oh no! What happened?

S: The beads fell down. There isn't a knot at the end. You're silly!
(down/silly)

P: You can help me. Please hold the end and we'll see if we
can make it work.

S: We did it. Make another one. (make)

P: I'll will put these beads in the can and shake it up. What a lot of
noise.

S: That's loud music! Put on the radio too. I like that music.
(music/like)

Communication environment: lunch time.

The script may be used with a 9-year-old child in a lunch time communication environment. The augmentative communication device selected is a Light Talker with Minspeak software and spoken output is accessed indirectly with a single switch (rocking lever in a row-column scanning mode).

A combination of Minsymbols and Rebus symbols are used for utterance retrieval on the device display. Whole utterances are programmed into the Light Talker, requiring selection of an appropriate symbol sequence for expression. The utterances are reviewed during training with the user. Minspeak provides the user with a finite number of symbols that are used to represent concepts specific to the individual's situation and experience. The symbols are programmed in a sequence that is dependent upon utterances

desired by the user. The selected utterances are summarized by the concepts or symbols most associated with their meaning. It is suggested that each script be designed according to a specific symbol theme, a feature that allows the user to categorize similar sentences with a concept grouping (e.g., sentences can be programmed under a theme of "dressing"; subsequent selection of symbols will recall programmed utterances related to that concept).

(key: S = student; P = partner)

S: I'm hungry.

P: Me too. Let's go eat.

S: Will you help carry my lunch?

P: Sure.

S: Thanks. What do you have to eat? I hope my food is good.

P: My lunch looks okay .

S: I wish we could go to Burger King instead.

P: Oh yeah. Me too. Their new Whoppers are great.

S: I think so too. I really like the milk shakes, especially chocolate.

Maybe we could go to a restaurant together sometime.

P: Okay. Maybe. Let's eat.

3. Expanding the use of dialogues: Once the role-playing script is successful within the training context, the student is placed in "real" communication environment(s) (e.g., a 9-year-old child becomes involved in a lunch time routine with another youngster).

A. Initially, personnel involved with the training should be present; the user can then be assisted, reinforced, and praised during the interactive

situation. Although a new partner's dialogue will vary from the script, the user will find the selected utterances available and useful within that setting. Vocabulary selected for that activity can be enhanced and modified by other lexical items available on the communication aid.

B. As persons with communication aid become more adept at using practiced scripts and other vocabulary items, interaction in settings other than the original one will be facilitated. In this way, students begin to establish a repertoire of utterances that nurture the development of appropriate pragmatic behaviors in various communication environments.

Appendix A

EXAMPLES OF COMMUNICATION ENVIRONMENTS

Communication environment	Client	Primary partner	Discourse objective
1. Playtime	Child	Caregiver (mother/father, etc.)	Topic Development/ turn-taking
2. Lunchtime	Child	Schoolmate	Initiation of conversation
3. Recreation time	Adolescent	Rehabilitation counselor/aide	Conversation repair
4. Work station	Adult	Manager	Topic relevancy/ clarification

Appendix B

"I WANT BEADS TO WEAR ON MY NECK"

7. Insuring Operational use of Communication Aids through
Daily Set-Up Procedures⁷

The purpose of this strategy is to ensure appropriate positioning of equipment on a daily basis and is operational at all times (Hunt, Hinchcliff & Botti, 1988).

Setting. School

Communication partners. Clinicians, teachers, peers and aides.

Augmentative aids, symbols, and techniques. Those that require adaptive equipment, especially electronic aids and accessing techniques.

Description of strategy.

1. Set-up procedures: Upon entering the school building each morning, each student goes to a designated person who is responsible for setting up his or her device in the correct position and checking to determine if it is operational. Students have an opportunity to discuss with the staff member any problems they might be having with the device. The student is responsible for presenting problems to the staff member, and together they troubleshoot any difficulties the user may be experiencing. In this way, the user becomes knowledgeable in troubleshooting his or her own problems.

2. Operational check: The student responds to a "Daily System Checklist." Some examples of questions on the checklist are:

⁷From Augmentative Communication: Implementation Strategies (pp. 5.5: 1-3) by S. W. Blackstone, E. L. Cassatt-James and D. M. Bruskin (Eds.), 1988, Rockville, MD: American Speech-Language-Hearing Association. Copyright 1988 by ASHA. Reprinted by permission.

- A. Was the device charged according to manufacturer's directions?
- B. Are you having any problems with the position of the device? What are they?
- C. Has there been any time in which the system malfunctioned? When? How?.
- D. Were you able to solve the problems? If so, how? Did you need help to solve the problems? From whom?
- E. Are there any supplies you need for the day or for later at home? Paper for printers? Ribbons? Light bulbs?
- F. Do you have adequate vocabulary? Should any words or phrases be added? Deleted?

After the daily check, a conversation with the staff member insures that the student's communication device is operational. The entire procedure should not take more than 20 minutes.

3. Back-up/loan systems: At the Pioneer School in Pittsburgh, the Speech Department substitutes devices for students who may be experiencing difficulty with their own communication aid. A substitute device need not be exactly the same as the student's aid, but should be a device with which the student is familiar. The device must be operational and usable for a short period of time until the problem with the student's own device is solved.

Index cards are used to list each device with which an individual student is familiar. The cards are maintained and available to staff so that a loaner device can be selected easily.

Another strategy is to provide generic and classroom-specific vocabulary displays for use with low-tech communication aids. The

vocabulary is developed by the teacher and speech-language pathologist at the start of the school year and updated regularly. The display is designed to be used with any message selection technique (i.e., direct selection, scanning via the communication partner). When a student's electronic system breaks down, a low-tech system is readily available.

8. Implementing a Daily Communication Enhancement Program in the Classroom⁸

Nicholas and Bushey (cited in *Augmentative Communication: Implementation Strategies*, 1988) state the purpose of this strategy is to provide daily language and communicative skills training sessions in the classroom for students who use communication aids and techniques. Because of physical, speech, and language impairments, students who use augmentative aids often have restricted experiences exploring their environment, both verbally and physically. Consequently, their perceptual, language, and communication skills require direct intervention and extensive training. Opportunities must be created during the day to provide this training.

Setting. Special education class, speech therapy group with outside contacts in the school and community.

Communication partners. Special education teacher, speech-language

⁸ From *Augmentative Communication: Implementation Strategies* (pp. 5.5: 35-41) by S. W. Blackstone, E. L. Cassatt-James and D. M. Bruskin (Eds.), 1988, Rockville, MD: American Speech-Language-Hearing Association. Copyright 1988 by ASHA. Reprinted by permission.

pathologist, classroom aides, non speaking and speaking peers, school personnel, parents, siblings, caregivers, and members of the community.

Augmentative aids, symbols, and techniques.

Low-tech aids: Communication boards.

High-tech aids: Direct selection and switch-activated scanning communication devices, microcomputer with special needs software and adapted peripherals, switch-activated toys with switch latch, training aid for environmental controls, call signal, video camera and recorder, and variety of switches.

Symbols. Pictures, Blissymbols, traditional orthography, and in some instances, sign or gestural language.

Description of strategy.

1. Program Planning: Considerable prior planning is required for implementation of the Communication Enhancement Program (CEP). The special education teacher and speech-language pathologist:
 - A. Develop a program philosophy and curriculum goals (Appendix A, from Communication Enhancement Program, p. 85);
 - B. Select core vocabulary (Appendix B, from Communication Enhancement Program, p. 86);
 - C. Design daily and weekly time schedules based on curriculum goals;
 - D. Develop short-term objectives and plan a tentative schedule of events for the school year;
 - E. Determine and secure necessary staff, materials, and equipment;
 - F. Arrange for periodic videotaping;

- G. Provide in service training for staff on program goals, philosophy, and their responsibilities;
- H. Give staff in service training on the use of augmentative communication aids or other technologies to be used;
- I. Schedule time each week for development of lesson plans, in services, and so on;
- J. Write a letter to parents explaining the Communication Enhancement Program;
- K. Make advance arrangements for field trips;
- L. Develop progress report form (Appendix C, from Communication Enhancement Program, p. 90); and
- M. Administer a pretest.

2. Program Description: This program is designed for a full school year, but may be adapted for a semester or summer session.

- A. Setting. The setting is a self-contained special education classroom. The communication class meets daily for 90 minutes. Three half-hour segments, each focusing on a different skill, are provided.
- B. Staff. The class is co-taught by the classroom teacher and the speech-language pathologist. The speech-language pathologist instructs the class two hours each week, while the teacher is responsible for the remaining 5 1/2 hours. Two aides are assigned to the program.

The ongoing responsibilities of the staff are to develop weekly lesson plans; design and prepare materials; update vocabulary items on communication aids; complete a progress report at the end of the each marking period; consult with parents; report to, train, and update staff on

program changes and outside communication assignments as they occur; repair equipment; secure new or additional equipment (if child's needs change); provide daily instruction; complete year-end progress report; complete post-test with same instruments; and evaluate program effectiveness (with parents, staff, and client, when appropriate).

C. Participants: Participants in the program include severely speech-or-writing impaired students from various classrooms. While the communication class is in session, other special education teachers instruct the speaking students not involved in the program.

D. Daily schedule: The following is a brief description of the student's daily schedule. The Communication Enhancement Program is divided into three half-hour segments each day:

Vocabulary development session (teacher-directed group activities): Each week a small number of vocabulary items are selected from the core vocabulary list, such as items describing outside play, spatial concepts, verbs, etc. (see Appendix B, from Communication Enhancement Program, pp.86-88). Multisensory, experiential (hands-on) activities are presented to develop these linguistic concepts, and children are provided with opportunities to experience the meaning of each vocabulary item. For example, when teaching the polar opposites dirty/clean, each child plays in mud and then washes up. Students are encouraged to express ideas at their own level of functioning.

Conversation time (student directed group activities): This part of the program allows students to select structured and spontaneous conversational activities that require the use of augmentative communication aids, symbols,

and techniques. The focus is on the development of conversational strategies, such as taking turns, initiating, and completing conversational repairs.

Technology training session (teacher-directed individual training):

Three learning stations are made available to students:

Toy table: activities involve switch activation,

- when the student desires,
- on command, or
- in a structured game (e.g., stopping the toy when it reaches the red light). Activities that involve two children also are developed.

Computer table: Software is chosen that reinforces concepts, motor training, Blissymbol recognition and use, visual perceptual skills, creative expressions, word processing and reading skills (when appropriate). The mode of access to be used may also be trained. Examples of software used: Pic Man, Delta Drawing, MECC Bliss Concepts and Drills, Motor Training Games, Sunny Days, Laureate's First Categories and Micro Lads, Caris.

Augmentative aids: Activities are designed that develop the student's skills at using their communication aids. Specific problems are addressed individually. Games are played to increase the use of certain vocabulary items. In some cases, students learn the mechanics of operating their communication aids. Data on accuracy and skill level are collected. Mechanical and cognitive training is provided in the use of computers, software, and environmental controls.

Students are assigned to areas based on their specific training needs (no more than three children per station). They work at each station at least once per week. Each station is managed by a special education teacher,

speech-language pathologist, or classroom aides.

E. Special event day. Another component of the program is the 'special event day' that takes place once each month and is designed primarily to meet various communication partner needs. Popular 'special event day' topics include:

"What is a communication enhancement program?" - an orientation to the program.

Shopping at the mall - parents and caregivers observe their child communicating in public.

Toy workshop - training parents and caregivers to adapt battery-operated toys for single-switch input.

Post office trip - touring a facility that enhances communication, including mailing personally "written" valentines to family members.

Individual parent training sessions - individualized problem solving with each parent/caregiver. Appointment times vary.

Awareness day - non handicapped peers learn about the special equipment and techniques of the students in the program. Peers ride in wheelchairs, operate communication aids, and talk with the students.

"Becoming Better Communication Facilitators" - a three part workshop for parents on being better communication facilitators with their children.

Part I - Viewing and discussing videotapes of professionals and students role-playing situations that may arise at home. Various communication strategies are demonstrated.

Part II - Parents and students practice communication interaction with the support of professionals.

Part III - Role playing occurs at home. Topics are selected in advance by the parent and child. Videotapes of the session are made to share with other family members, neighbors, friends, etc., who communicate with the student.

Appendix A
CEP CURRICULUM GOALS

COMMUNICATION

Language Development

1. Comprehension
 - Improve vocabulary
 - Improve conceptual skills
2. Integration
 - Improve ability to process information and formulate ideas
3. Expression
 - Improve ability to relay information in a meaningful, sequential manner

Use of High/Low Technology

1. Mechanical training
 - Develop motoric skills for:
 - accessing switches
 - eye gaze
 - direct manual selection
2. Cognitive training
 - Develop understanding of how technology operates
 - Develop understanding of cause/effect

Integration into Social and
Academic Environments

- ability to integrate content, form, and use in structured or naturally occurring situations

Appendix B

COMMUNICATION ENHANCEMENT PROGRAM CORE VOCABULARY

Selection of this vocabulary has been based on the language development needs of students in the Communication Enhancement Program. Representation of the vocabulary will be in the form of pictures, Blissymbols, or words.

PEOPLE	him	ground	shoes
	we	field	bib
mother	they		accessory
father	them	THINGS	jewelry
sister	those		pajamas
brother		Furniture	swimsuit
grandfather	myself	chair	purse
grandmother	yourself	table	wallet
aunt	herself	desk	pocket
uncle	himself	couch	belt
cousin	themselves	bed	bag
		dresser	umbrella
teacher	PLACES	lamp	
aide		mat	Food
therapist	school - music, hall,	cupboard	ice cream
principal	lunchroom, gym	shelf	pie
secretary	home	curtain	cake
	office	rug	candy
doctor	library	tray	sandwich
dentist	restaurant	microwave oven	meat
police officer	movie/theatre	refrigerator	hamburger
barber	church	stove	hot dog
hairstresser	store	walker	peanut butter
minister	car wash	wheelchair	jelly
priest	gas station		fruit juice
counselor	hospital	Room	pop
	motel	floor	milk
babysitter	post office	ceiling	cereal
friend	museum	wall	bread
visitor	bank	corner	cookie
neighbor	barn	door	cheese
boss	zoo	window	fruit
	farm	roof	vegetable
woman	Sunday school	stairs	fish
man	beach	ramp	egg
girl	camp	elevator	soup
boy	mall		breakfast
child	circus	Clothing	lunch
baby	carnival	underwear	dinner
adult		shirt	
	backyard	blouse	Animals
I	country	pants	pet
me	city	dress	insect
he	forest	socks/stockings	horse
she	park	coat/jacket	bird
it	lake	sweater	cat
you	mountain	snowsuit	fish
your	sky	boots	dog
ner		gloves	snake
nis		hat	

TOYS &
RECREATION

doll
blocks
record
game
tapes
(cassette)
playing cards
ball
bat
puppet
crayon
balloon
kite
bowling
swing
swimming pool
skis
sled
sandbox
slide
tricycle
wagon

TRANSPORTATION

car
truck
van
bus
airplane
rocket
train
boat
motorcycle

TOOLS AND
MACHINES

ladder
ruler
thermometer
rake
shovel
saw
screwdriver
hammer
pliers
nail

screw

scissors
radio
typewriter
record player
computer
television
tape recorder
telephone
projector
calculator

MATERIALS

wood
metal
steel
concrete
glass
fabric
plastic
leather
rubber

MISC.

group
problem
suggestion
vacation
appointment
program
film
screen
surgery
money
medicine
luggage
ticket
decision
job/work
responsibility

DOING WORDS

HELPING WORDS

is	are	will
was	were	do
did	does	have
had	would	could

NOT

add	choose	drink	hang
ake	clean	drop	hear
athe	climb	dry	help
egin	close		hide
ite	color	eat	hit
low	comb	end	hold
ounce	come	erase	hunt
ox	cook		hurt
reak	copy	fall	
ring	cough	feed	improve
rush	count	fish	increase
uild	cross	fix	interest
utton	cry	fly	
uy	cut	frown	jump
	decrease	get	kick
amp	dig	get ready	kiss
arry	draw	give	knock
atch	dress	go	know
hase		grow	

laugh	plant	shrink	tie
learn	pour	sit	touch
lift	pray	skate	turn
look	pretend	sleep	
lose	print	slide	understand
love	pull	smell	
	push	smile	wait
make		sneeze	walk
melt	rake	stand	wash
mop	read	stop	watch
move	repair	sweep	water
mow	ride	swim	wear
	roll	swing	win
open	run		wish
		take	work
paint	see	talk	write
paste	sew	tear	
pet	sharpen	tell	zip
pick	show	throw	

DESCRIBING WORDS

above	first	out	HEAR
across	forward	outside	
after	from	over	loud
alike	front		soft
almost		pair	noisy
around	half		quiet
as many		right	
at	in	row	FEELS
away from	in order		
	inside	same	heavy
back		second	light
backward	last	separated	sharp
before	least	several	dull
beginning	left	side	soft
behind	less	skip	hard
below		some	rough
beside	many		smooth
between	matches	third	wet
bottom	medium-sized	through	dry
by	middle	to	clean
	more	top	dirty
center	most	toward	full
corner			empty
	near	under	hot
different	nearest	up	cold
down	never	upside down	
	next		SMELLS
edge	none	widest	
equal	not alike	with	sweet
every	not many		sour
		zero	good
far	off		bad
farthest	on		strong
few	other		

Appendix C
COMMUNICATION ENHANCEMENT PROGRAM
PROGRESS REPORT

Student _____

November, 1985

January, 1986

March, 1986

June, 1986

This form allows for a narrative of skills the client is working on and suggestions for home follow-up. It was attached to the school's report card for each client.

A checklist of specific items based on program objectives could be developed.

9. Facilitating Information Exchange with Families⁹

Information should be exchanged with families of individuals who use augmentative communication aids, symbols, and techniques on a continual basis. Sharing of information should occur as collaborative effort among staff and families. Inherent to the intervention process is the involvement of each client's family as well as those who live and work with the client. Parents, teachers, siblings, peers, scout leaders, ministers and other often can, and do, make the difference between interventions that are successful and those that are not (Lake, Curley, Carlson, Lytton, & Pensa, 1988).

Description of strategy.

1. Contents of information exchange: Successful implementation of a program will be affected by the viewpoints of professionals and family members with regard to the child and to the intervention program itself. An atmosphere of compromise should be fostered as information is exchanged in the following areas:

A. The student and the student's family:

1. current communication and academic needs,
2. future communication and academic goals,
3. family constitution and dynamics,
4. primary language in the home,

⁹From *Augmentative Communication: Implementation Strategies* (pp. 6:11-16) by S. W. Blackstone, E. L. Cassatt-James and D. M. Bruskin (Eds.), 1988, Rockville, MD: American Speech-Language-Hearing Association. Copyright 1988 by ASHA. Reprinted by permission.

5. cultural/familial beliefs,
6. daily routines,
7. special activities and preferences,
8. established communication patterns.

B. Developing and maintaining realistic goals:

1. designating one team member to be the primary liaison between the home and school;
2. determining the family's expectations and understanding of their child's abilities;
3. listing treatment goals for the school and home;
4. prioritizing program goals to convey the child's primary needs;
5. obtaining funds for equipment purchase;
6. determining the best method for achieving parent participation in implementing goals; and
7. discussing long-term goals, as well as short term objectives, that relate to parental as well as student behavior.

C. The student's communication program:

1. symbol selection and training;
2. operation of a communication aid, including maintaining the aid (charging batteries, transporting, repairing), programming and positioning the aid for optimal use , facilitating operational use;
3. interaction patterns with various communication partners; and
4. carryover of program goals in a variety of environments for a variety of purposes.

2. Mechanisms for information exchange: At least five mechanisms can be used to exchange information. Each has advantages and disadvantages, and some are more effective than others in conveying certain types of information. All mechanisms may be used at different times for different purposes.

A. One-to-one dialogue method: The dialogue method provides an interactional means of exchanging ideas. It is perhaps the optimal method to use during assessment and when teaching families intervention techniques.

B. Conference method: The conference method provides families with large amounts of information in a standardized, efficient manner. Due to its formality, the presence of a large number of professionals, and the large amount of information that is often presented, it is considered one of the least effective means of sharing information with families.

C. Written method: By providing written information to families, the nature of the information shared at a face-to-face meeting can be documented. Written material can also be an efficient means of keeping a record of the student's progress and informing families about specific activities or recommendations made for school and home.

D. Demonstration method: Demonstration is an effective way to share information about intervention techniques. It can also help families understand how a student interacts with different individuals.

3. Manner of information exchange: The manner in which information is conveyed directly influences the degree and success with which it will be accepted by the family.

A. Techniques for exchanging information: Two general methods of sharing

information can be used, an instructive method and a sharing method. However, in most cases a combination of techniques is employed. The instructive method teaches and allows specific content to be conveyed; the sharing method allows for a give and take of information at a more emotional level.

B. Factors affecting interaction: Many factors affect the manner in which information is exchanged. These include:

1. staff members' sensitivity to family needs and goals;
2. parents' level of acceptance of the child's abilities;
3. parents' desire and ability to carry out program goals;
4. cultural, economic, emotional, and educational level of participants;
5. family dynamics - siblings, family constellation, extended family;
6. bilinguals in the home - need for interpreters;
7. biases and comfort level of the staff in working with families of different backgrounds.

C. Optimizing the interaction: All participants should work to create a comfortable atmosphere. Obviously, it is difficult to create a feeling of equality when a professional "authority figure" is meeting with a person who perceives him-or herself as "just a parent." However, attempts should be made to equalize the situation.

10. Facilitating Communication during Community-Based Experiences¹⁰

According to Barry (cited in *Augmentative Communication: Implementation Strategies*, 1988), persons with severe speech impairments can be independent (or more independent) in the community if they use a communication aid. Using a communication aid in the community can facilitate development of communication skills and using a communication aid can allow persons with severe speech impairments to interact socially.

Description of strategy.

1. Interview student's parents/caregivers. Use a parent questionnaire (Appendix A, from *Communication during Community-based Experiences*, pp. 97-99) to determine which community sites and activities the family visits or would like to visit (e.g., recreational site, restaurant, theater, store, etc.,). This interview can be conducted in person or by telephone.
2. Complete a task analysis for each activity and setting (Appendix B, from *Communication during Community-based Experiences*, pp. 100-105),
3. Establish communication and educational goals for successful, independent participation in chosen activities. Delineate the communication needs for each site and activity. Select achievable goals. Although expectations should be high, do not select too many goals at once.

¹⁰ From *Augmentative Communication: Implementation Strategies* (pp. 5.7: 1-15) by S. W. Blackstone, E. L. Cassatt-James and D. M. Bruskin (Eds.), 1988, Rockville, MD: American Speech-Language-Hearing Association. Copyright 1988 by ASHA. Reprinted by permission.

4. Develop situation-specific vocabulary displays that can be used in conjunction with the student's existing communication aids and techniques. For example, at a restaurant, available vocabulary should allow the student to order a meal, snack, or drink and to converse with a waitress. At a grocery store, the students will need vocabulary that pertains to specific food items and that enables them to converse with patrons and the cashier. In a retail store, students will need a shopping list and ways to talk with patrons and salespersons.

Make adaptations, as necessary, for each individual student (e.g., larger communication boards, fewer vocabulary items per display, pocket or purse-size portable boards, and so on).

5. Orient the student in advance by teaching the communicative use of necessary pictures, symbols, and signs. For example, in preparation for a visit to a restaurant, review menu items and practice scenarios that are likely to occur (e.g., asking for a glass of water). This preparation is not meant to be extensive because the intent of the strategy is to facilitate naturalistic communication rather than create unnatural situations.

6. Take the student into the community. Observe the student during all aspects of the experience. Prompts (verbal, gestural, pictorial) can be given if necessary and faded as appropriate.

7. Encourage the student to be as independent as possible. If the physical characteristics of the student prohibit total independence, partial independence is encouraged.

8. Using the checklist based on the task analysis (see Appendix B, pp. 100-105), evaluate each student's performance. On the initial visit, circle

the goal or objective to be targeted. After each trip, rate the student for each area noted on the checklist, as follows:

- + - skill accomplished independently
- ± - skill accomplished after prompting
- N/A - not applicable
- o - skill should be worked on during the next trip

Additional information that would allow the student to be more successful is recorded as well (e.g., "restaurant was very busy so the waitress could not wait for the student to complete his or her response, change time of visit to allow this interaction to occur. The waitress suggests coming in at 11: a.m.").

9. After several successful sessions, expand the number of communication tasks to insure that additional interactions between the student and others occur. For example, direct the student to:

- A. ask a waitress for a straw, ketchup, a napkin, more water;
- B. ask for the location of specific food at that grocery store; or
- C. ask the salesperson for a different size, color, or type of item at a retail store.

Appendix A

PARENT QUESTIONNAIRE FOR COMMUNITY EXPERIENCES

Adapted from:
Dr. Lou Brown
University of Wisconsin/Madison

TO: Parents/Guardians

As teachers of the severely handicapped, we are becoming increasingly aware of the need to provide opportunities for our students to participate (with varying degrees) in a variety of community based environments (e.g., restaurants, grocery stores, leisure/recreation programs, etc.).

In addition to our regular school activities, we realize that educational programs for adolescent and young adult severely handicapped students should in particular focus on preparation to function as independently and as productively as possible in non-school and post-school environments.

In order to determine the most appropriate program and to set up realistic educational goals for each student, we need your input and insight into what your child currently participates in with your family as well as what expectations or hopes you may have for your child to more fully participate with you in the future.

1. Does your son or daughter spend time with nonhandicapped siblings, relatives, or friends after school or on weekends either playing games, watching T.V., or engaged in some leisure activity? Circle one.

frequently occasionally never

2. How does your child usually spend his or her leisure time?
What activities are typical? _____

3. What leisure time activities would you like your child to learn to do by his- or herself? _____

With the family? _____

4. Please check any of the following community environments in which your son or daughter participates or interacts with other nonhandicapped children or adults. Mark the appropriate column.

Community environment	Participates in activity and acts appropriately	Participates but withdraws or has inappropriate behaviors	Rarely goes
Grocery store			
Shopping mall			
Retail store			
Hardware			
Drugstore			
Library			
Church			
Movie theater			
Dr./Dentist office			
Bowling alley			
Roller/Ice rink			
Restaurant - sit down			
Bus or public transportation			
Restaurant - fast food			
Laundromat			
Park			
Other:			

5. If your son or daughter does not go with you to a specific location what is the main reason for this? _____
6. If at present you do not take your son or daughter with you on errands, etc., would you like us to work on anything in particular that would enable you to take him or her with you to these places? _____
7. Please check any of the following home/neighborhood environments in which your son or daughter sometimes interacts with nonhandicapped children or adults.

Community environment	Participates in activity and acts appropriately	Participates but withdraws or has inappropriate behaviors	Rarely goes
--------------------------	---	--	----------------

Interacts with relatives/neighbors:

in own home _____
 in own yard _____
 in neighbor's
 house _____
 in neighbor's
 yard _____
 eating at home of
 neighbor/relative _____
 stays with baby
 sitter _____
 helps relatives
 (dishes, cooks,
 wash, etc.) _____
 helps neighbors
 (lawn, cleaning) _____
 Other: _____

8. What do you think that your son or daughter should learn to help him or her to interact more with other children or adults in the community or home/neighborhood environments? _____

9. Does your son or daughter have any jobs or simple tasks around the home?
 Yes _____ No _____
 If yes, please list those jobs/tasks _____

10. What jobs would you like to see your child learn or improve on?

Appendix B

RETAIL STORES
TASK ANALYSIS SHEET

Student's name: _____

Adaptative equipment used: _____

Communication system utilized: _____

Code:

- NA skill not applicable at this time
- + skill accomplished independently
- skill not accomplished
- o circle the number of the skill to be worked on next trip

In the space provided after each step
note student's response (+, -, o, NA).

Date and Location

1. Student locates own coat when time to leave for store. _____
2. Student puts own coat on. _____
3. Student checks to see if he or she has own wallet or purse and money. _____
4. Student goes to bus or car independently. _____
5. Student locates empty seat and buckles own seat belt. _____
6. Student answers questions pertaining to impending trip (e.g., Where are we going? What are you going to buy? etc.). _____
7. Student unbuckles own seat belt upon arrival at store and exits vehicle. _____
8. Student locates entrance and opens correct door (or steps on electric mat). _____
9. Student loosens or removes appropriate clothing when in store (hat, gloves, etc.). _____
10. Student locates specific area in store needed for purchase. Asks for help if needed. _____
11. Student makes choice of item needed. _____
12. Student locates salesperson and cash register. _____
13. Student places items on counter. _____

This image shows a single sheet of white paper with horizontal blue or grey ruling lines, typical of notebook paper. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

14. Student retrieves money from wallet or purse.
15. Student hands money to cashier.
16. Student waits for change and accepts it.
17. Student places change into wallet or purse.
18. Student picks up purchase and thanks cashier.
19. Student carries own bag while browsing.
20. Student looks at store items but does not handle them while browsing.
21. Student locates exit door and opens it.
22. Student boards waiting bus or car.
23. Student buckles own seat belt.
24. Student can answer questions pertaining to trip after its completion (Where did you go? What did you buy? etc.).
25. Student exits bus or car and returns to classroom.
26. Student's behavior was appropriate during trip.

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RESTAURANT - SIT DOWN
TASK ANALYSIS

Student's name: _____

Adaptative equipment used: _____

Communication system utilized: _____

Code:

- NA skill not applicable at this time
- + skill accomplished independently
- skill not accomplished
- o circle the number of the skill
to be worked on next trip

In the space provided after each step
note student's response (+, -, o, NA).

Date and Location

1. Student locates own coat when time to leave for restaurant.	_____
2. Student puts own coat on.	_____
3. Student checks to see if he or she has own wallet or purse and money.	_____
4. Student goes to bus or car independently.	_____
5. Student locates empty seat and buckles own seat belt.	_____
6. Student answers questions pertaining to impending trip (e.g., Where are we going? What are you going to buy? etc.).	_____
7. Student unbuckles own seat belt upon arrival at restaurant and exits vehicle.	_____
8. Student locates entrance and opens correct door (or steps on electric mat).	_____
9. Student finds empty table and seats self. Student waits to be seated by hostess.	_____
10. Student loosens or removes appropriate clothing and puts it next to self. Student removes appropriate clothing and hangs it up.	_____
11. Student makes a decision as to choice of food and drink prior to waitress coming.	_____

Blank lined paper for writing.

- Blank lined paper for writing.

GROCERY STORE
TASK ANALYSIS

Student's name: _____

Adaptative equipment used: _____

Communication system utilized: _____

Code:

- NA Skill not applicable at this time
- + skill accomplished independently
- skill not accomplished
- o circle the number of the skill
to be worked on next trip

In the space provided after each step
note student's response (+, -, o, NA).

Date and Location

1. Student locates own coat when time to
leave for store.
2. Student puts own coat on.
3. Student checks to see if he or she has own
wallet or purse and money.
4. Student goes to bus or car independently.
5. Student locates empty seat and buckles own
seat belt.
6. Student answers questions pertaining to
impending trip (e.g., Where are we going?
What are you going to buy? etc.).
7. Student unbuckles own seat belt upon
arrival at store and exits vehicle.
8. Student locates entrance and opens correct
door (or steps on electric mat).
9. Student loosens or removes appropriate
clothing when in store (hat, gloves,
etc.).
10. Student locates grocery cart.
11. Student maneuvers grocery cart through
aisles of store.
12. Student locates item desired (matches
object to object or picture to object).
13. Student carefully removes item from shelf.

[illegible]

14. Student place item in cart.
15. Student locates check-out counter.
16. Student maneuvers cart to counter:
17. Student waits in line appropriately if necessary.
18. Student puts items onto convey or counter.
19. Student presents coupons prior to ring up (if applicable).
20. Student takes money from wallet.
21. Student hands money to cashier.
22. Student waits for change.
23. Student places change in wallet or purse.
24. Student pushes cart or carries bags to car or bus.
25. Student loads bags into car or bus.
26. Student boards car or bus and buckles own seat belt.
27. Student answers questions pertaining to trip after its completion.
28. Student exits bus or car upon arrival and goes to classroom.
29. Student's behavior was appropriate throughout trip.

COMMENTS:

11. Using Computers and Related Software with Preschool Children with Speech Impairments¹¹

According to Zippiroli and Mastrett (cited in Augmentative Communication - Implementation Strategies, 1988), computers can be used as an equalizer to facilitate social interactions between speech-impaired preschoolers and their non handicapped peers. Computers can increase a child's positive self-concept as her or his independence and success rates increase. Children interact most effectively with the computer when the software is compatible with their developmental level.

Description of Strategy.

1. Position children so that they are at eye level with the screen. It is important to maintain total body stability without restricting necessary movement. Repositioning the input device, tilting the screen, positioning the child slightly to the left or right of the keyboard, or adjusting the seating can help achieve proper eye-level screen placement.

2. Determine a reliable method of accessing the computer before the child uses the computer. A variety of adaptive peripherals is currently available that allows children to use their strongest and most controlled body part to interact with the computer. Examples of peripherals (keyboard emulators) that have been successfully used with preschool children include;

¹¹ From Augmentative Communication: Implementation Strategies (pp. 5.9: 1-3) by S. W. Blackstone, E. L. Cassatt-James and D. M. Bruskin (Eds.), 1988, Rockville, MD: American Speech-Language-Hearing Association. Copyright 1988 by ASHA. Reprinted by permission.

- A. Touch window: The child manipulates the software by directly touching the screen. Since all motor and cognitive abilities are directed to a single focal point, young children quickly realize that their touch is causing something to happen, whether it be movement of a character or a line drawn on the screen by their finger. Thus, the Touch Window strengthens cause-and-effect mastery.
- B. Power pad: This touch sensitive membrane keyboard uses special software with pictured overlays. The child touches a picture and immediately sees a replication appear on the screen along with sound and animation. The Power Pad allows the number of picture choices to be manipulated by the facilitator though the use of cardboard masks, which are teacher-made devices that allow specific areas of the board to be shown through cut-out areas on a cardboard panel.
- C. Adaptive firmware card: This keyboard emulator is a card that fits into a slot in the computer and provides multiple input options (e.g., expanded keyboard, scanning, Morse code).
- D. Muppet learning keys: This keyboard acts as a precursor to the standard keyboard and offers an opportunity to explore abstract key symbols by grouping them in a colorful, functional way. Touching certain symbols will enable specific colors, the number of objects displayed, and animation to occur on the screen.

3. Develop computer readiness skills. Classroom performance may provide indications that a child has the ability to begin using the computer as a meaningful activity. Emerging skills may include:

- A. Cause-effect understanding, such as activating a switch toy, responding to commands such as, "knock then over" or " make the bear move," thereby exhibiting control over the objects presented.
- B. Choice selection, such as communicating a yes/no response in some way or choosing between two separate activities (i.e., "go to the zoo or the store").
- C. Picture identification, such as identifying objects, selecting a requested picture from two to five choices in the same category, and identifying an object within a picture (closure).
- D. Developing attention span, including focusing attention on an object or task for a minimum of two minutes.

Note: With the appropriate software, the computer can be used to strengthen these emerging skills.

4. Develop language and cognitive skills using high interest and developmentally appropriate software.

When selecting software, use a developmental progression, as follows:

- A. Cause and effect: a press causes something to happen.
- B. Picture-based: a picture is pressed and a like image appears on the screen.
- C. Exploratory: any number of key presses results in the same change on the screen; no "correct" answer is required.
- D. Choice-making: initially the field of choices is limited to two, with a gradual increase in the number of choices as the child demonstrates success; a "correct" answer is required.
- E. Two-step direction following: requires recalling a minimum of two keys

in sequence; many programs require one key to scan the answers and another to enter the selected choice.

5. Determine skill mastery by observing behaviors. Examples of behavioral indicators of successful responses for any given skill include:

- A. Monitor attending: spontaneously looking at the screen before and after key press.
- B. Visual attending: touching the screen or key at the appropriate place and time. Picture or key scanning should be consistent and clearly evident to the observer prior to key selection.
- C. Auditory attending: using the auditory stimuli of the computer to gain reinforcement and performance cues.
- D. Key press: knowing when, where, and how to activate the screen with an on/off movement. Keyguards and masks are available to increase accuracy.

Appendix A
COMPUTER READINESS CHECKLIST

1. Cause-effect understanding, such as:

- _____ reacting to an activity where the child has affected (caused) the change to occur
- _____ activating a switch toy
- _____ reacting to deliberate starting and stopping of action of a toy
- _____ responding to commands such as, "knock them over" or "make the bear move," thereby exhibiting control over the objects presented
- _____ controlling direction of object manipulated, (i.e., rolling ball in specific direction)
- _____ demonstrating indirect cause and effect by causing something to happen in a removed location (i.e., using a remote control device, or activating a switch a distance away from the toy)

2. Choice selection, such as:

- _____ communicating a yes/no response in some way
- _____ indicating by gesture something he or she wanted
- _____ making a choice between two options in a related activity (i.e., milk/juice)
- _____ producing consistent responses when order of choices is altered
- _____ choosing between two separate activities (i.e., go to the zoo or the store)

3. Picture identification, such as:

- _____ identifying objects
- _____ identifying pictures of objects
- _____ identifying pictures of actions of objects

- _____ selecting picture from 2 to 5 choices in separate categories
- _____ selecting requested picture from 2 to 5 choices in the same category
- _____ identifying an object within a picture (closure)

4. Developing attention span, including:

- _____ focusing attention to an object or task for a minimum of 2 minutes

12. Using Facilitated Communication Techniques

Facilitated communication is a training method, appropriate for individuals who are not yet able to access a communication aid independently and meaningfully, for whom meaningful/independent access is a realistic and desirable goal (Crossley, cited in Biklen, 1992). Facilitated communication practices vary considerably with the student's disability, behavior, style of interaction, personality, and other factors. Consequently, the method is not a uniform approach to teaching or supporting communication that can be used with each person, but rather a range of skills as described (Biklen, 1990):

Description of strategy.

1. Physical support:

- A. Attend to the person's physical location; feet on ground, typing device slanted (e.g., at 30 degree angle), stabilized table, non-slip pad under device and person, relaxed atmosphere, etc.
- B. Initially, and only where necessary, provide physical supports under the forearm, under or above the wrist, or by helping a person to isolate the index finger to facilitate use of communication aid.
- C. Pull back the hand or arm after each choice so that the person takes enough time to make a next selection and also to avoid repeating selections.

2. Being positive:

- A. Progress through *successful* choices of pictures, words, sentences, letters, name spelling, first sentence, pulling back and reminding the person of the question or request whenever an incorrect or nonsensical choice is about to be made. Use semantic common sense (e.g., *m* does not come after *w*). In other words, help the person avoid errors.

- B. Provide encouragement verbally and avoid telling the person that he or she has made an error or mistake during assessment (i.e., Don't say "No," "That was wrong," or "Incorrect"). Relate to the person naturally, conversationally.
- C. Be direct and firm about the tasks: the need for practice, staying on task, focusing eyes, etc. Redirect the person to the tasks (e.g., "I'm going to count to 10 - 1,2,3,...10" or, "You know the house rules, work before play.").

3. Other support:

- A. Keep your eyes on both the person's eyes and on the target (e.g., letter keys). This helps you identify and prevent errors caused by hand/eye coordination problems. It also helps you monitor whether the person is attending to the task.
- B. Facilitated communication often requires the facilitator to do several tasks at once. For example, carrying on a verbal conversation with the person being assisted or with others in the room, watching the person's eyes, looking at the printed output, thinking of the next question or activity and at the same time keeping your mind on the present activity, and so forth. In addition, providing physical support and encouragement.

4. Achieving communication/overcoming problems:

- A. Communication is a process, including support, fading, training receivers, etc. It is important to see it as a process and to recognize that people generally get better (i.e., faster and more independent) at it over time. Ongoing support increases a person's speed; thus, independence is balanced by need for speed. Encourage lots of practice; practice builds accuracy and speed.

- B. If a person is not communicating, is producing nonsensical communication, or is producing questionable or wrong communication (e.g., when you doubt the communication and believe that it might be you, the facilitator, who in initiating the choices of letters and words), revert to set structured curricula (e.g., fill in blanks, math drills).
- C. Look for small differences in communication style or behavior, such as
1. radial ulnar instability - when a person's index finger swings to one side when approaching a letter, thus consistently getting a typographical error;
 2. habitual, meaningless repetitions of certain letters; or,
 3. the tendency to revert to familiar, echolalic words or phrases.
- D. Stop stereotyped utterances by ignoring them and focusing on the task of manual communication.
- E. Ignore "behavior" such as screeches, hand slapping on desk, pushing desk away, and getting up by asking, for example, "What's the next letter you want?"
5. Curriculum:
- A. Don't use teaching or communication situations to "test" the person (e.g., "Is this a cup or a dollar bill?")
- B. Give the student choices of work to do.
- C. Use interesting materials; cartoon to be filled in, caption-less magazine pictures, crossword puzzles, and other activities that would not offend adults, teenagers, or other age groups with whom you are working.
- D. Don't start communication work by focusing on the expression of feelings; wait for feelings to come. Allow the person with whom you are

working to initiate feelings at his or her own choosing.

E. Get non-speaking people working together; group sessions can be encouraging and motivating as well as interesting to people who are developing familiarity with facilitated communication. It is often helpful for facilitators (also called receivers) to work with people other than their usual partners in group sessions.

Criteria For Selecting And Implementing Augmentative Systems

According to Shane and Bashir (1980), the increase in the use of augmentative communication systems within the past 10 years has been significant. The decision to recommend an atypical method of communication has a pervasive influence not only on communicators with handicaps but also on all those with whom they interact. What is needed are specific criteria upon which that decision can be based. Shane and Bashir proposed a preliminary decision-making process (Table 3) for determining an individual's candidacy for an augmentative communication system. Although augmentative communication systems are used with persons having adventitious communication disorders, the described decision process is intended for disorders having a congenital origin.

The Decision matrix. The decision matrix consists of the 10 categories (I-X), the specific components of each category, and the branching alternatives.

Level I - cognitive factors: At the first level, cognitive factors are investigated. The three specific interrelated factors deal with sensorimotor intelligence, mental age, and the ability to represent through pictures. Noncompliance with any of these factors leads to a decision too delay. Such

a decision reflects the lack of cognitive prerequisites necessary for intentional communication or the ability to represent the object world through two-dimensional pictorial information. In this case, attention to facilitating cognitive growth is recommended. Also, teaching specific prerequisite abilities for augmentative communication system use might be suggested, that is, attending behavior, scanning, direct selection, and/or visual discrimination. Compliance with one or more of the cognitive factors leads to level II.

Level II - oral reflex factors: A significant aspect of the oral reflex level of the decision matrix is that of all the factors investigated, obligatory persistence of oral reflexes can, in isolation, lead to a decision to elect an augmentative communication system. No other factor in isolation has such a solitary influence on election. Persistent pathological oral reflexes suggest an extremely poor prognosis for oral speech development. These factors are early predictors of failure to develop speech and as one which leads to election of an augmentative communication system.

Level III - language and motor speech production factors: This level is used to establish whether motor or language factors can account for a discrepancy between receptive and expressive skills. As the nature of the discrepant function is assessed and determined, branching to specified juncture points occurs. In III B and C, the notion of clinical uncertainty presents itself. To counter clinical indecision or possible inappropriate nonspeech system adoption, level IV and V have been included in the decision matrix.

Level IV - motor speech - some contributing factors: In young and

hard-to-test individuals, specifying the presence of a motor speech disorder may be difficult. Consequently, level IV contains a cluster of factors that are thought to contribute to the diagnosis of neuromotor involvement.

Table 3. Decision Matrix¹²

LEVEL I COGNITIVE FACTORS

At least Stage V sensorimotor intelligence?

At least 18 months mental age; or ability to recognize at least photograph level?

Yes --> Go to II

NO --> Delay

LEVEL II ORAL REFLEX FACTORS

Persistent (1) Rooting; (2) Gag; (3) Bite; (4)

Suck/Swallow; or (5) Jaw extension reflex?

Yes --> elect --> Go to X

No --> Continue to III

LEVEL III LANGUAGE AND MOTOR SPEECH PRODUCTION FACTORS

A. Is there a discrepancy between receptive and expressive skills?

Yes --> Go to III B

No --> Go to V

B. Is the discrepancy explained predominantly on the basis of a motor speech disorder?

Yes --> Go to V

No --> Go to III C

Uncertain --> Go to IV

C. Is the discrepancy explained predominantly on the basis of an expressive language disorder?

Yes --> Go to VII

No --> Go to VI

Uncertain --> Go to V

LEVEL IV MOTOR SPEECH - SOME CONTRIBUTING FACTORS

Presence of neuromuscular involvement affecting postural tone and /or postural stability?

Presence of paraxial disturbance?

Vocal production consists primarily of vowel production?

Vocal production consists primarily of undifferentiated sounds???

History of eating problems?

Excessive drooling?

Yes --> Evidence to support motor speech involvement (Go to V)

No --> Evidence against motor speech involvement (Go to V)

LEVEL V PRODUCTION - SOME CONTRIBUTING FACTORS

Speech unintelligible except to family and immediate friends?

Predominant mode of communication is through printing, gesture, facial-body affect?

Predominance of single word utterances?

Frustration associated with inability to speak?

Yes --> (Evidence to ELECT) Go to VII

No --> (Evidence to DELAY OR REJECT) Go to VII

LEVEL VI EMOTIONAL FACTORS

¹² From "Election criteria for the adoption of an augmentative communication system: Preliminary considerations" by H. C. Shane and A. S. Bashir, 1980, Journal of Speech and Hearing Disorders, 49, p. 409. Copyright 1980 by ASHA. Reprinted by permission.

Table 3. Decision Matrix (cont'd)

A. History of precipitous loss of expressive speech	Yes -Go to VII C
Yes --> Go to VIII	No --> DELAY with trial therapy
No --> Go to VI B	C. Therapy progress too slow to enable effective communication?
B. Speaks to selected persons or refuses to speak?	Yes --> ELECT --> Go to X
yes --> Go to VII	No --> DELAY --> continue therapy
No --> Go to V	D. Therapy appropriately withheld?
LEVEL VII CHRONOLOGICAL AGE FACTORS	yes --> ELECT --> Go to X
A. Chronological age less than 3 years?	No --> DELAY with trial therapy
Yes --> Go to VIII A	LEVEL IX PREVIOUS THERAPY - SOME CONTRIBUTING FACTORS
B. Chronological age between 3 and 5 years?	Able to imitate (with accuracy) speech sounds or words; gross motor or oral motor movements?
Yes --> to VIII A	Yes --> (Evidence to DELAY) Go to VIII
C. Chronological age greater than 5 years?	No --> (Evidence to ELECT) Go to VIII
yes to VIII A	LEVEL X IMPLEMENTATION FACTORS - ENVIRONMENT
LEVEL VIII PREVIOUS THERAPY FACTORS	Family willing to implement (use, allow to be introduced) Augmentative Communication System recommendation?
A. Has had previous therapy?	Yes --> IMPLEMENT
Yes --> Go to VIII B	No --> COUNSEL
No --> Go to IX, weigh evidence - (DELAY with trial therapy of ELECT) Go to X	
B. Previous therapy appropriate?	

These factors include neuromotor status, eating history, praxic skills, vocal repertoire, and excessive drooling. The various factors have to be evaluated and the information used for effective decision making.

Level V - production - some contributing factors: Factors included in level V contribute to an understanding of production deficits. Here a communicator's intelligibility, utterance length, frustration, and use of non-verbal communication forms are studied. As in level IV, information derived from this level offers evidence for overall decision making.

Level VI - emotional factors: For some potential nonspeech system candidates, emotional factors exist, for example, elective mutism, that warrant careful study. The decision matrix attempts to account for this in

level VI. Careful historical information, including a detailed account of previous therapy, is crucial for appropriate decision making in cases in which the primary etiology is emotionally based.

Level VII - chronological age factors: In the decision-making process, chronological age should be considered. However, its influence tends to be one of changing the relative influence or importance of other factors at different ages rather than one of having a solitary effect. Accordingly, a 10 year old non-speaking child would be viewed differently from a child with similar clinical symptomatology who is three years of age. With the 10 year old, the discrepancy between physical, cognitive, and linguistic functioning and chronological age would tend to exaggerate the lack of expression and influence the election option. With further research, understanding of how age influences decision making and of the predictive ability potential nonspeakers at an earlier age should improve. The earlier we predict, the sooner augmentative communication system can be introduced that may permit effective communication.

Level VIII - previous therapy factors: Previous therapy is a critical juncture in the decision-making process. The factors at this level imply that the practitioner has knowledge of a myriad of speech therapy practices if therapy appropriateness and outcome expectations are to be systematically considered. Oral communication is preferred. Consequently, knowing the response to previous speech therapy or allowing time for trial therapy seems obligatory before any decision to elect is made. For this reason, a decision to delay is a frequent outcome at this level.

Level IX - previous therapy - some contributing factors: Inability to

imitate relates closely with failure in the orally-based functional language program. The ability to imitate is a useful factor in attempts to determine whether to delay or to elect augmentative communication system.

Level X - implementation factors - environment: Implementation is perhaps the most powerful factor in the decision-making process. At this level, the family must decide whether or not to sanction the actual implementation of a recommended nonspeech communication system. For most families, accepting an elect decision is both painful and difficult. Whenever a family is unwilling to implement a system, counseling, in the form of a review and restatement of the factors that led to the decision, is urged. Stronger advocacy at the implementation level would result in more individuals being appropriately placed and making notable progress with augmentative communication systems.

Case Studies

Alternative Methods for Developing Social Communication

Persistent training has made possible to assist Per, a 14 year old boy with autism, develop alternative and augmentative communication routes for social communication (Jennische, 1988). After difficulties in using manual signs the boy was introduced to Blissymbols that strongly developed his ability to communicate and his interest in written words. Although still autistic and non-speaking, he has a clear desire to ask for things and to relate his experiences. He is very resourceful in utilizing all the communication tools to which he has been introduced and also invents new ones. When Per was four and half years he went for the first time to the clinic at the University hospital. At that time he had already gone through many

examinations in which he had been found having a mental retardation, a retarded motor development and, above all, an extensive retardation in communication development.

His interaction with the surroundings was abnormal in many ways. From his first year he had shown very little interest in contact with others. Although some body contact was accepted, especially from his parents and also initiated by himself, it was obvious from his behavior that the most basic abilities in relating to other people were damaged. One year later he got the diagnosis autism.

Per was almost 5 years old when his therapy started at the clinic. Per had no interest at all in pictures and did not pay attention when spoken to. The therapist thought that gestures and manual signs would be the only way of getting his attention.

After half a year with almost no feedback, the therapist wrote, "I don't really know what I have accomplished. I have tried to stimulate him at his level. I hope that he has caught something." The progress was very slow.

During the following 2 years the therapy continued as before. The therapist was persistent in presenting new manual signs representing different concepts. He learned them but spontaneous use was rare.

After three years of persistent training when Per was a little more than 8 years old, the therapist wrote: "Per's ability to express himself with manual signs has really exploded. He even uses short sentences." From having been extremely distracted he had become cooperative and could work for periods of 10-15 minutes at a time.

Per started attending school in a small group of children with similar

problems in January 1982. Per's interest in pictures and letters that had been very small started to grow. He pointed at words in magazines that he wanted to hear. One of his favorite occupations was to sit and "study" magazines. He wanted to have words repeated to him 100s and 100s of times.

His teaching in signing was accompanied by written words and of course pictures. Per learned common words as word pictures. He also learned the names of all the letters but was not able at all then to use any written words for communication. Because of Per's growing interest in words, the therapist gave him a Canon Communicator. To copy words became a play, a fascinating activity, but most attempts to make him listen to which different sounds built up the words were rejected. Again the therapist acted as a model by writing words, sounding all the letters.

After some time he tried to write words for communication that often caused problems. He only remembered some of the letters and he got very disappointed if the listener could not understand. He chose a book and searched for words and letters that looked right. During those years his drive to communicate grew and became very strong. The difference between what he wanted to express and what he was able to express through signing and writing was large. That was period of fast development. He showed an inventiveness that sometimes surprised people around him and he insisted on making his message come through.

Per's spelling always caused problems and misunderstanding. He also had problems retrieving the words he wanted. He often ran around pointing at things, colors and textures. He needed a systematic presentation of all words and a support for his memory. At that time the therapist introduced

Blissymbols which created a whole new avenue for communication.

Per loved to build up the Bliss communication board. He could concentrate for a long time, constantly asking for more symbols. He looked in the Blissymbol dictionary, asked for the meaning of the symbols and chose carefully among them. The problem was to avoid putting too many symbols on the board. As many of the Blissymbols are pictographic and easy to understand, they gave an immediate support for his memory. Per was not interested in listening to long explanations of the shape of the symbols. For the concepts where symbols were missing, the therapist just wrote the words on the board.

The effect on his ability to communicate was considerable. The ease with which he found words helped him through many difficult situations. After two years he had a 500 symbol board. He had separate boards for the kitchen use, with tools as well as foods. He had a separate board for his sewing activity on which he had all the different stitches that he knew. He had a separate binder with many symbols categorized where he put lots of symbols/words for which there was not room enough on his board.

Per turned 15 at that time. He was still a boy with many problems. He was often worried and unsatisfied. Sometimes he got very aggressive and unhappy. He also had a motor problem. His finger and hand motor skills were poor. Periodically he had shown bad behavior like spitting or destroying things, breaking all the pencils and erasers he could find, using a wet finger as an eraser and destroying many books.

So, Per still had many problems. He now had a great desire to ask, to explain and to communicate. The different means of communication helped

him a lot. Most of his bad behavior had in fact disappeared and he was more open to explanations.

Here the therapist stressed the importance of using the same visual means for communication when talking to him. He understood much better when he got the message visually and auditorily.

Per loved to communicate. He had a great desire to show independence. The therapist gave some examples;

1. Per loved to show independence. It was Wednesday, the day when Per and his teacher go shopping in town. Per started in the morning to write BUY. Then he drew a picture of an eraser and wrote GREEN, PINK, PLENTY. He meant a new eraser as used ones do not have the full size. He wanted to go to town to buy an eraser with a special color and shape. He brought the telephone book and looked up a special store where he wanted to go. They went to that store, and four others, but could only find a pink and white eraser.

2. Bliss board inspired Per to think and remember. Per liked to just study his Bliss board. The board brought forth so many thoughts in his mind and he would sit there and smile. One day the therapist interrupted his thoughts and asked him to point and tell what he was smiling at. He pointed NO.

3. Per told things to other people. In Per's school they got a new kitchen one Spring. Per had followed the work very carefully and knew the different steps in the work. On the day when the kitchen appliances were to arrive, Per was in a very happy mood in the bus in the morning. Nobody knew why and looked at him. He then took up his Bliss board and pointed

spontaneously at KITCHEN STOVE REFRIGERATOR. This was the first time that the people in the school bus had seen anybody use a Bliss board and they understood what he meant.

To conclude:

1. The work with Per has shown the importance of alternative means for communication to help a non-speaking autistic child to be happier and to adjust better to the situation.

2. The work has also shown the importance of being persistent in presenting and giving the materials although feedback and response were very rare for several years so that the work seemed worthless.

3. The work has also shown the importance of presenting a variety of communication means. The different means complement each other. This gives flexibility which makes rather fast and efficient communication possible. It gives the child the possibility to choose what is easiest for him.

A Comprehensive Communication Approach for a Ten-Year-Old

Nonverbal Child with Autism

The following case study (Ratusnik & Ratusnik, 1974) demonstrates a procedure, utilizing a communication board, for developing nonverbal language skills as alternate means of communication in a ten-year-old non-verbal child with autism.

David was a patient in Madden's Day Treatment Program for three and half years. The early medical history indicated that the mother's pregnancy with David progressed normally. No unusual circumstances or illnesses that might have contributed to his lack of speech were reported during the first year of life. The parents described David as a quiet, passive baby who

demanding little attention. According to the parents, David responded to environmental sounds, voices, and had sufficient auditory acuity. While most of the early developmental milestones were reportedly normal (sitting, standing, walking, etc.), he did not develop in the area of speech and language. They reported almost no babbling, no vocalizations for pleasure, no imitations, and very little gesturing. He never developed speech. At three years of age, David was evaluated at a pediatric institute, where he was diagnosed as being primarily autistic with some organic brain damage. In February 1966, David was referred by the pediatric institute to a child development center. Upon admission, his behavior was characterized by absence of speech, poor eye contact, negativism, masturbation, poor frustration tolerance, temper tantrums, toe-walking, food fads, poor relationships with adults and peers, autistic and ritualistic behavior, lack of toilet training, and lack of interest in mastery. Between 1968 and 1969, David developed an intense interest in words and spelling. He had a good memory and learned to spell many different words by using plastic alphabets. He began to develop an ability to read as well as understand some sentences. He memorized the keyboard of a typewriter and was able to type some words.

David was seen for an initial speech and language diagnostic evaluation at the Madden Zone Center on February 24, 1972. Although autistic children have frequently been labeled "untestable," several formal and informal assessments were obtained. The results revealed that 1) tests could be administered to this child, and 2) David could be categorized with the vocalization group of autistic children. At that time he demonstrated

reception of single words commensurate with a three-year, one-month level. He was able to correctly identify nouns, such as engineer, trunk and barber, but was unable to correctly identify verbs, such as pulling, hitting, ringing, and baking, or higher level nouns such as tweezers, saddle, captain, and whale. Although he was able to follow simple verbal explanations and directions, he experienced difficulty in decoding information consisting of personal pronouns, such as, "What is your name?", "What is my name? ", as well as wh-questions, who, what, why and prepositions, behind and in front of. With regard to oral expressive language skills, David's spontaneous phonemic repertoire was limited to /bababa/ and /mamama/ at a reduced level of intensity and with lack of prosodic features. These were recurrent utterances and did not appear to be meaningful or associated with any object or want. His ability to produce sounds upon imitation was limited to /da, a and bada/. Use of gesture was minimal. He pointed to himself when asked his name and waved his appropriately in response to bye-bye. He demonstrated good ability in copying verbal material, as well as spontaneously writing his name, and many nouns in response to stimulus picture cards. He did not use verbs, adjectives, designators (here, this, it) or two-word combinations (e.g., big cup). When asked questions, such as "What is the boy doing?" and "What are you wearing?", David was echolalic in response.

Results of audio metric tests indicated that he had hearing within normal limits of acuity bilaterally. Speech Reception Thresholds yielded normal sensitivity. It appeared that his hearing was adequate for all conversational purposes. On a test of auditory discrimination that assesses a

child's ability to differentiate minimal word pairs differing by only one phonemic feature (for example, sox-box), David correctly identified 35 of 36 items, indicating adequate functioning for a child of his chronological age.

Examination of the oral mechanism revealed no significant structural deviations that would impair speech production. Lingual functioning was poor for the voluntary movements of pointing, elevating, depressing, and lateralizing. On a test of visual memory span, he achieved a raw score of 8.5, and an age equivalent of seven years, six months. Fine motor and eye-hand coordination, as determined by tests assessing visual-motor behavior, indicated functioning at the four-year, nine-month level.

David's poor ability to execute voluntary lingual and labial movements appeared to be a serious hazard to speech, and it precluded negotiable, intelligible speech as the major mode of communication. Although he was able to utter a few vowels and consonants that were intelligible, it was a great effort for him to do so; similarly it was extremely difficult for him to integrate these segments into words. Since David's strength appeared to be his ability to write nouns, it was recommended that this modality be utilized in David's remedial program in developing an alternate means of communication. Keeping his limitations in mind, however, it was recommended that he be encouraged and expected to attempt a small core vocabulary of single words (e.g., mama, daddy, bye-bye, baby) that were within his means as an auxiliary to his written expressive skills.

David demonstrated greater potential in the area of expressive language functioning by the end of July 1972. His ability to cooperate, attend, and respond throughout the entire therapy session improved and was

more consistent, The major problem continued to his illegible handwriting. Although he attempted to separate each word, his writing was illegible. Since staff and David's parents had extreme difficulty in deciphering his writing, it was decided that this modality was hampering an effective means of communication. A communication aid was introduced as an alternative approach since David was already familiar with the keyboard of a typewriter and possessed a good capacity for spelling words.

David attended speech and language therapy for four half-hour sessions per week, utilizing the communication board as his primary means of communication. Therapy emphasized improving comprehension of increasingly complex auditory-verbal stimuli; developing use of increased meaningful appropriate nonverbal expressive language employing a transformational grammar approach; establishing consistently correct verbal approximations of six core vocabulary words; and encouraging use of newly acquired speech and language behaviors with other staff, peers, and at home. In order to achieve these goals, a remedial paradigm was constructed capitalizing on David's good ability to spell, his good visual memory, and his ability to accept and learn from structure of visual stimuli.

In summary, the communication board as an alternate method of communication enabled David to express simple wants and needs such as going to the bathroom, what he wants to eat for lunch, etc.; give pertinent information about himself such as name and age; become more amenable to formal testing, which allowed audiologist to obtain a Speech Reception Threshold; relate to his teachers, counselors, and parents (for example, he had gone to church on Sunday, watched a basketball game); relate how he feels;

assume a sense of responsibility by carrying his communication board with him wherever he goes.

The communication board as an alternate means of communication has been demonstrated as effective in developing nonverbal language skills and the beginnings of functional social communication in the above case study.

According to Ratunsik and Ratunsik (1974), before any firm statement can be made regarding application of this approach to nonverbal autistic children who exhibit characteristics similar to David's, well controlled research employing substantial numbers of subjects is required.

Use of Non-Vocal Communication Techniques

Schaeffer developed a program with three mute boys with autism aged 4 yr 6 months, 5 yr 0 months and 5 yr 6 months (cited in Kiernan, 1983). The program is highly structured and characterized by an explicit attempt to transfer from sign to speech. The teachers spoke as they signed. Schaeffer and colleagues use the term "signed speech" to refer to their method. The signed speech program requires teachers to use speech and sign together, to translate the child's signs as he produces them before he can speak and to encourage the child to sign and speak simultaneously when he develops speech. Schaeffer recommends the use of signed English, in which ASL signs are used with additional inflectional markers and spoken English syntax. However, inflectional markers were not used in this program.

The first stage of the program involved in teaching signs and verbal imitation in two separate lesson periods. The first steps in the sign program taught the child to ask for objects and to express negation, followed by expression of reference in labeling objects. This sequence was based on the

idea that nonverbal children should be taught about the relation between social goals and communication at the start of the training. Further steps are built on from this basis.

Scheaffer reports that, after 3-4 months of the program with parallel verbal imitation and sign teaching, the children began to produce approximations to words. At this stage they were taught "signed speech", i.e., to speak and sign simultaneously. The third stage in the program arrived when the children began speaking without signing. This occurred at around 9 months. The children were then discouraged from signing and taught to speak more loudly and quickly.

According to Kiernan (1983), Schaeffer and colleagues have argued that problems of failure of generalization and lack of spontaneous use of language did not occur with their program, but they provide no evidence to back this claim.

Factors That Help Promote or Inhibit The Implementation Of Augmentative Communication Systems For Individuals With Autism In India

India, with one fifth of the world's population, has at least one fifth of the world's challenged persons although no reliable statistical data are available and estimates vary. India has no special legislation for people with disabilities. A person with challenges has the same rights and privileges as other citizens, as spelled out in the constitution. Under the new education policy, special schools are to be established in every district (Ahuja, 1990).

Society and its Attitude

According to Ahuja (1990), Christianity propagates the theory of the sins of the parents being visited upon the children. Hinduism (religion

followed by most Indians) subscribes to the theory of "Karma" - cause and effect, and a belief in the transmigration of the soul and a cycle of life and death. Thus, many Indians believe that handicaps are punishment for sins committed in a previous life. This accounts, in part, for the apathy towards people with handicaps. This also explains why many people turn to religion when they have handicaps. People were ashamed of disabilities and kept handicapped children in hiding.

The joint family system had been an integral part of Indian society; it was the duty of the family to protect and support handicapped persons. This proved to be a beneficial system. Rapid industrialization, movement of people from rural to urban areas, break-up of the joint family system, increased education and literacy has changed society's attitude towards persons with handicaps. People now believe that education, training and opportunities make persons with handicaps self-supporting members of the community.

Services for Persons with Handicaps

Services for the handicapped persons in India developed from early concepts of benevolence and charity. Asylums were established to provide food, clothing and shelter. With India's independence in 1947, changes set in. There has been a tremendous increase in services and programs for handicapped persons. Schools, vocational training centers, rehabilitation centers, and a wide variety of other services now exist. Undoubtedly, quality varies and programs are unevenly distributed. Efforts to improve services and conduct research are individual center based with little or no involvement of other centers across the country. Thus, information is not exchanged and

collective improvement in the quality of services does not take place.

Communication Aids

Special electronic communication aids are not available in India.

Computers - hardware and software are readily available and are being used in schools. Electronic aids like Phonic Ear VOIS 135 and Light Talker and computer peripherals like Touch Window and Muppet Learning Keys are not available. Thus, teachers need to be creative and design their own tools.

Using communication boards will probably be extensive.

CHAPTER IV

Results

Deviant language characteristics, deficits in social interaction and ritualistic and compulsive behaviors are among the definitive characteristics of the autistic syndrome. For the teacher and psychologist, it becomes all too clear during the initial encounters that the struggle focuses on a persistent inability of the autistic child to communicate effectively. Considering their many handicaps, autistic children struggle to learn. Intervention efforts with this population have focused increasingly on augmentative modes of communication. Augmentative techniques include aided (using static symbols) and unaided (using dynamic symbols) systems. This study encompassed an extensive review of the research and literature on various teaching strategies to enhance communication skills of autistic children. This study was undertaken to help special education teachers working with autistic children in India develop different methods to teaching to enhance communication skills.

The conclusions of this literature review present the fact that in the area of augmentative communication in general there has been little emphasis on teaching methodology relative to the attention paid to systems and lexicon selection. Literature mentions the use of systems like Sigsymbols, Picsyms, Signed English and use of gestures with autistic persons but methodology is not available. Within the body of literature available there seems to be no consistency of research methodology by repeated investigation. Strategies described in this study have little or no evaluation review. Little research has been conducted to identify the

variables that promote acquisition and functional use of aided language.

Thus, training decisions are made without clear guidelines.

Success in using Sign language with autistic children has been attributed to the fact that signs are easily molded/prompted and can be shaped even in the absence of verbal language skills. Signs require less sophisticated motor skills than speech and involve kinesthetic and visual feedback rather than auditory. Signs may closely approximate the object or action they represent. However, sign language studies report the following difficulties; generalization remains difficult, and use of signs beyond context-bound requesting or labeling is unlikely, development of irrelevant, repetitive hand movements, failure of all signs to be iconic.

More recently, picture symbol systems have been explored as an alternative communication mode. Advantages include the use of simpler motor response, absence of the temporal dimension involved in processing speech and sign, easy universal comprehension by others, and possibility for total iconicity. Picture communication aids are, however, an external mode of communication and are subject to accidental loss or destruction. Use of aided systems appears widely in the literature pertaining to persons with physical disabilities, but there is scant literature available on their use with individuals with autism. Experimental research on communication boards use has been limited and experimental analysis of training processes is lacking.

Very recently, facilitative communication methods have engaged researchers. This exciting approach has gained a lot of ground in the past two to three years. The literacy skills and thinking abilities of people using

facilitated communication challenge prior assumptions about their cognitive abilities and suggest that they experience difficulties with expression.

However, there are other professionals who feel that facilitative communication procedures lack objective description and the results lack empirical evaluation.

Teachers in India, working with children with autism will certainly find a new direction using augmentative communication techniques. They will probably have more success than before. As there have been changes and improvement in the services provided for the disabled after independence in 1947, new programs using augmentative communication approaches are likely to be accepted.

Recommendations

The variety of symbol systems reviewed in this study offer promising alternatives to non-vocal communication where such a system is absolutely necessary. Educators and parents working with autistic children have another tool to make communication possible for these children. However, the need for more extensive scientific studies is warranted.

Many excellent teaching strategies have been discussed in this study. These strategies have to be evaluated thoroughly, documented and published. If not, many parents and educators and other professionals interested in working with autistic children will not have access to these strategies and the reliability of the strategies will be in question.

It is necessary for special education teachers in India to try new and innovative methods of teaching autistic children. Proper documentation will

lead to improving techniques and developing training programs for more numbers of autistic children.

Summary

Autism is a perplexing life-long mental handicap which is now believed to be caused by brain dysfunction. The spectrum of autistic characteristics encompasses a variety of conditions of which difficulties in communication is one. Autistic individuals have difficulty in verbal and non-verbal communication. Recently professionals working with autistic children have focused their efforts on using augmentative modes of communication.

This study was undertaken to collect information on various augmentative communication methods used to teach autistic individuals in the United States. The results of this study, presented in the form of a booklet will assist teachers in India to develop new ways to teach communication skills to autistic individuals.

Descriptive method of research has been adopted for this bibliographical study. The data collected for this research is based on published literature and related research studies.

Literature review shows the use of various unaided and aided communication systems with autistic individuals but research on teaching methodology is scarce. While certain methods like facilitative communication are gaining ground, there is a definite need for proper documentation and empirical evaluation of the teaching strategies.

Autism is a mystery syndrome. The efforts made by professionals, parents and caregivers to somehow reach the autistic person are

commendable though the condition persists. These efforts prove that people are not ready to give up and there is hope for all individuals under the spell of this condition.

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Appendix A
Permission Letter

JAYASHREE RAMESH
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3rd Jan, 1994

KRISTEN GARDNER
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SUB: Request permission to quote material from books published by ASHA.

Dear Ms. Gardner,

I am a student at San Jose State University, currently enrolled in the Master's Program in Special Education. I need your permission to quote the below mentioned material in my thesis that is a pre-requisite to acquire Master's degree. I had obtained permission from you approximately a year ago for the same material. Unfortunately, I misplaced the letter and hence I have to do it again. I will be really grateful if you could fax me your reply as I am on a deadline. The details are as follows:

From the book, 'Augmentative Communication: Implementation Strategies';

1. Facilitating communication for severely speech-impaired children (pp. 5.1:3-16).
2. Teaching individuals with autism to use visual-spatial symbols to communicate (pp. 5.1:22-23).
3. Using communication aids to facilitate the development of oral expression (pp. 5.1:27-28).
4. Establishing initial communication control with a loop-tape system (pp. 5.1:45-49).
5. Enhancing interaction through role-playing (pp. 5.3:13-19).
6. Insuring operational use of communication aids through daily set-up procedures (pp. 5.5:1-3).
7. Facilitating communication during community based experiences (pp. 5.7:1-15).
8. Using computers and related software with pre-school children with severe speech and writing impairments (pp. 5.9:1-4).

From the book, 'Augmentative Communication: An Introduction',

1. Table: Functional dimension of individual system components (p. 60).
2. Table: Dynamic and static communication symbols (p. 72).

From 'Journal of Speech and Hearing Disorders',

Table: Election criteria for the adoption of an augmentative communication system, Shang, H. C. & Bashir, A. S, Aug, 1980, p. 409.

None of the above mentioned material will be published but will be used for the thesis only.

Thank you.

Sincerely,

Jayashree Ramesh
(JAYASHREE RAMESH)

Permission granted.

Kristen Gardner
Editing Coordinator
1.3.94

Appendix B

Handbook

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**Apx B
pgs. 1 - 27**

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