

Augmentative Communication News

September, 1988 Vol. 1, No. 4



INSIDE THIS ISSUE . . .

For Consumers



Individuals with Dual Sensory Impairments (DSI).

Clinical



Augmentative interventions adapted for those with DSI.

Governmental



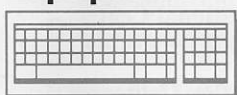
P. L. 100-407
Guess What? Guess Who?

University and Research



University of Delaware's Rehabilitation Engineering Center for AAC.

Equipment



No tech, light tech and high tech for persons with DSI.

UPFRONT

AAC teams typically do not work with individuals whose primary handicapping conditions are severe hearing impairment or blindness.* Highly trained specialists and considerable resources are available to both these groups. Individuals with dual sensory impairments (DSI), i.e., those who are both deaf and blind need AAC interventions. It is hard to imagine a more severe barrier to communication.

In this issue the **Clinical News**, **For Consumers**, and **Equipment** sections focus on this group. Professionals with special expertise interviewed for this issue willingly have

* Note: The technical expertise on AAC teams is sometimes sought by individuals with visual impairments.

shared their ideas, opinions, and suggestions. The literature also has been helpful in preparing this issue. See list of references and resources.

In the **University and Research** section, exciting research and information programs at the University of Delaware's Rehabilitation Engineering Center on Augmentative Communication are described.

Speaking of excitement! At the Biennial ISAAC Conference in Anaheim, CA next month (October 23-26), more than 600 AAC types will convene. Don't miss the "kick off meeting" for the recently established U.S. Chapter- USSAAC. All are welcome!

On August 19, President Reagan signed P.L. #100-406, (cont. pg 2)

For Consumers



**People First!!
Individuals with
Dual Sensory Impairments**

Federal legislation in the United States still refers to "deaf-blind individuals." However, "deaf-blind" is considered by some an unacceptable label.¹ Individuals with dual sensory impairments (DSI) are of course, people first.

"Deaf-blind" is also a misnomer and a potentially dangerous one. Very few (only 6.1%) of those with DSI are deaf and blind. Nearly all (93.8%) have some residual hearing, residual sight, or both.¹ Obviously, some vision and hearing sensation/perception will facilitate and influence one's experiences (and the instructional process). Professionals feel too few children with DSI are being fitted with hearing and visual aids.

Etiologies

Maternal rubella, specifically the epidemic in the early 1960s, caused more than 2,500 individuals to be born with severe hearing and visual problems. Many have multiple problems, e.g., mental retardation. In 1988, with the advent of neonatal intensive care units and aggressive interventions, prematurity and its complications are now a major cause of DSI. For example, more than 50 percent of children identified as DSI in Mississippi were low birth weight infants.² Other etiologies for congenital DSI are intrauterine problems, congenital infections, cyclomegalio virus (CMV), toxoplasmosis, genetic diseases, and birth trauma. The prevalence of DSN in children (according to the U.S. National Registry) is 5000-6000. However, the actual number of children in the U.S. who could benefit from DSI (continued page 2)

Upfront (from page 1)

the **Technology-Related Assistance for Individuals with Disabilities Act of 1988**. Read about what happens next in the **Governmental** section.

Gary Poock (ACN publisher) and I hope to see many of you at the ISAAC Conference. We welcome your comments, ideas, and suggestions! If you plan to travel before or after the conference, visit us in beautiful Monterey and have a cup of tea . . . glass of wine . . . tour of ACN! Call first on the "Hotline" (408) 649-3050. 

People First (cont.)

instruction (*as estimated from a more specific count within 9 states*) is 8,000 - 10,000.³

When the onset of DSI occurs after birth, drowning, head trauma, asphyxia, measles and mumps, and diseases related to aging are among the causes. Usher's Syndrome, a combination of congenital deafness and retinitis pigmentosa, a progressive eye condition leading to blindness, is the leading cause in the adult population. Five% of those with congenital deafness have Usher's Syndrome I (severe-profound hearing loss and decreasing vision resulting in night blindness and tunnel vision) or Usher's Syndrome II (mild - moderate hearing loss at birth with a continuing, progressive loss of both hearing and vision).⁴ Individuals who acquire DSI often have at least partially intact language systems and benefit from sign language, Braille, and available technologies.

Characteristics

The needs and characteristics of individuals with DSI will depend on the age of onset, severity of vision and hearing problems, and concomitant handicapping conditions

(e.g., mental retardation, orthopedic impairment). Many individuals with DSI are multihandicapped. For example, of the 57 children identified with DSI in Mississippi over the past 2 years, 65 percent also have severe motor handicaps.² This group is diverse, however, and generalizations must be made cautiously.

Individuals with DSI are at particular risk for becoming the unwilling recipients of environmental stimulation. Things are done to them rather than with them. Causality must often be taught. As with other multihandicapped infants, the DSI infant produces fewer vocalizations and other behaviors than normal infants.⁵ Thus, they provide fewer opportunities for caregivers to respond. Early, good quality interventions are absolutely critical to these infants and their partners.

In a ten year follow-up study of 49 children diagnosed as "deaf-blind" (rubella) in the early 70s, only one child used speech and one used Braille at followup.⁶ Comparisons between data reported in the initial assessment and data at follow up (in late adolescence) regarding mental retardation, hearing, and visual acuity status suggested: a) children's intellectual abilities were overestimated, b) hearing status was underestimated, and c) visual status was both over and under estimated.

Note: assessment techniques have greatly improved over the past 15-20 years.

Resources

In the late 60s 16 deaf-blind centers were established in the U.S. to deal with the Rubella epidemic. Since then, there has been a changing emphasis from a regional to a state delivery system. Most State Departments of Education maintain a Registry. Many assist consumers and professionals to obtain information and services. For ex-

ample, the California Deaf Blind Services provides training, technical assistance, and resources to educational personnel, care providers, families, and others. They send highly skilled consultants to provide assistance at no charge to the student's educational, community and vocational settings.

Mississippi, a rural service delivery model, uses videotapes (87% of their families have VCRs!) to tape monthly training sessions in the home. Caregivers (grandpa & sister Cindy) can then watch the session and learn new strategies and techniques. Periodically, the team takes tapes back to the center for review by occupational and physical therapists. This allows a child's motor status to be monitored without staff making monthly visits.²

Resources for families & professionals are increasing and include:

1. International Association for the Education of the Deaf-Blind.

Write c/o SENSE, 311 Gray's Inn Road, London, WC1X 8PT, UK

2. Two Technical Assistance Centers in the U.S.:

● **The Association for Persons with Severe Handicaps**

Birth to 22 years. Contact E.J. Bailey (503) 838-1200 x391.

● **Helen Keller National Center**

over age 22. Contact Angela Covert (516) 944-5751.

3. National Information Center on Deaf-Blindness

For materials and information contact Jeanne Marquis, Coordinator, Gallaudet College, 800 Florida Avenue, N.E., Washington, D.C. (202) 651-5289.

4. Final Products of the Multi-Site Research Consortium for Young Children with Deaf-Blindness Project

● **Literature Review**

● **Research Monograph**

200 copies of each will be available at no charge. To request, contact Michael Bullis, Project Director, Teaching Research Publications, 345 North Monmouth Avenue, Monmouth, OR 97361. before 12/31/88. (503) 838-1220 x391.

● **Interactive Videodisc.**

Dr. Charity Rowland, Oregon Research Institute. A curriculum to teach caregivers appropriate interaction skills.

● **Nonsymbolic Communication.**

Drs. Ellin Siegel-Causey & Doug Guess, University of Kansas. A curriculum package

(continued on page 7)

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Clinical News

Communication for Persons with DSI

First, let's take the Shoes Test -- i.e., putting yourself into another's place.⁸ For those who have always been able to hear and see, the shoes test is very difficult. Yet, if we are to assume responsibility for assisting these individuals to communicate, we must try to understand the impact of multiple-sensory impairments on learning, the communication process and augmentative communication interventions.

"With great difficulty, you would sort through and try to make meaning of the stimuli that you experience from movement, smell, taste, tactile sensation, and to a lesser extent, sound and light. While it is likely that you would have some vision or some hearing or some of both you might also have problems with thinking and remembering, or be mentally retarded. Making sense of one's environment and learning to operate in it would be difficult, in part, because the rest of the world functions with vision and hearing intact, and thus with language systems and rule-based interactions that come early and easily."⁹

Sensory handicaps greatly complicate the task of learning (and teaching), particularly when further complicated by physical and/or mentally handicapping conditions.

Expectations

Some individuals with congenital DSI learn to use sign language; others eventually speak. Many remain at a fairly simple level of communication because of their multihandicapping conditions. Master clinicians & teachers caution professionals and families to be prepared for and satisfied with slow progress.

Opportunities for incidental learning are rare if you can not perceive your surroundings. In one year, only one behavior may be learned, i.e., to extend a hand to request food. Five years later a person's communication repertoire may or may not be greatly increased. This will depend on factors related to cognitive and motor abilities and the quality and quantity of interventions. For children, the progression from no intentional communication --> to use of communication signals --> to use of a symbolic communication system

represents major and complex changes, not yet well understood particularly for those with DSI.¹⁰

Assessment

Interventions should be based on complete assessment data. Of course, but... complete information about individuals who have a limited means of expression is almost a contradiction. AC techniques are often the means through which we obtain information.

Unfortunately, inaccurate assessments result in inappropriate interventions. Clinicians report two common errors occurring because of incomplete/inaccurate assessments.

- Overestimating and underestimating what a person understands or is capable of.

In either case, time and opportunities for learning are wasted. Many blame these "errors" on preservice educational institutions' failure to teach adequate coursework on severe multihandicapping conditions.

Neuro-ophthalmologists, neurologists, audiologists, and otolaryngologists can (and should) provide information about the status of an individual's vision, hearing, and tactile systems. Sophisticated measures should be used (in addition to behavioral observations) to determine how individuals respond to sensory stimuli and under what conditions.

Assessment instruments for children with DSI can assist in determining the present level of communication function:

Callier-Azusa Scale-H (1986). Stillman, R. & Battle, C. Dallas: University of TX.

Wisconsin Behavior Rating Scale (1980). Song, A. et al. Madison: Central Wisconsin Center for the Developmentally Disabled.

Nonverbal Prelinguistic Communication: A guide to communication levels in prelinguistic handicapped children (1983). Otos, M. Salem: Oregon Dept. of Education.

The Preverbal Assessment: Intervention Profile (1984). Connard, P. Portland: A.S.I.E.P. Education Co.

Assessment Log and Developmental Progress Chart for the Carolina Curriculum for Handicapped Infants and Infants at Risk (1986). Johnson-Martin, N. et al. Baltimore: Paul H. Brookes Publishing Co.

Framework for intervention

1. A highly regarded, movement-based approach to instruction developed by van Dijk and his colleagues in Holland is recommended for young children.¹¹ A goal is to enhance the functional communication and social abilities of children with DSI. Movement is viewed as the basis for the development of object meaning, i.e., things become meaningful to children when they can do something with them. The van Dijk program is composed of six major levels (representing a developmental sequence): nurturance, resonance, coactive movement, non-representational reference, deferred imitation, and natural gestures.¹² This approach advocates initiating activities in natural contexts, presenting functional objects and events, and teaching communication throughout the day. It is applicable to all children functioning at a pre-linguistic level although it was originally developed for children with visual and dual sensory impairments.

2. Proponents of an "ecological" approach do not necessarily agree that normal developmental sequences should determine instructional approaches for individuals with severe handicaps, particularly for adolescents and adults. Rather, they suggest identifying and teaching skills that lead toward more independent functioning in 4 life domains: educational & vocational; domestic; community; and recreation & leisure.¹³

The Individualized Curriculum Sequencing Model (ICS) provides a methodology to teach "skill clusters" that are meaningful for the learner.¹⁴ Briefly, curricula are developed for individual learners using the following steps:

- Specifying daily events and locations (arrival at school).
- Identifying activities within each event (get off bus, greet teacher, hang up coat, etc.).
- Breaking down activities, e.g., preparation, participation, and termination phase. (cont. pg. 4)



- Identifying and prioritizing skill components (including communication skills) needed to complete activities (e.g., task analysis).
- Identifying materials/activities/people to teach skills throughout the day.

Receptive Training

The trick is to make input received by the individual meaningful. The use of residual senses is always encouraged.*

1. Use tactile/kinesthetic input. It is obviously the major information source for many individuals with DSI. *Don't forget smell & taste.*
2. Proceed carefully. Some individuals have tactile impairments or are tactually defensive.
3. Don't bombard people with random stimuli (smells, temperature samples, varying tactile surfaces, strobe lights).
4. Before acting on or communicating with a person with DSI, provide cues they can perceive. Use consistent signals so meaning can be derived.
5. During interaction, use more than 1 mode receptively (e.g. speech and gestures). Keep interactions as natural as possible.
6. Clinicians suggest children should be taught normal interaction occurs beside or in front of them. Discourage facilitators from sitting behind children.
7. Provide contingent feedback, i.e., attribute meaning to child's behaviors (i.e., respond to predetermined behaviors as signals). If you don't do this, intentional communication will not occur. If you do, it may or may not. You must try.

*For information about methods used to train functional vision in natural contexts and orientation and mobility techniques, read chapters by Goetz & Gee and Gee, Harrell, & Rosenberg (see reference #1 for book, etc.). I think AAC professionals working with this population, as well as other multihandicapped populations with visual impairments (e.g., cortical blindness as a result of head trauma), will find this information pertinent, helpful, and interesting.

8. The meaning of tactile signals (gestures, textures) & symbols (parts of objects, textures, thermoform shapes**, signs) must be taught. Repeatedly pair a signal/symbol to multiple examples of its meaning within natural environments. Be patient. It takes time.

9. Group programming is possible. Opportunities should be provided. During group activities, group members must be tactually discriminable to each other.

Expressive Training: Signals

1. Observe what a person does in response to actions, objects, and routines.
2. Initially, select a signalling behavior within the individual's current repertoire.
A signalling strategy by Faith Carlson and others in Pittsburgh, PA will be published "soon." 15 If you want it "sooner," send me \$1 and a self addressed envelope.
3. If motor restrictions exist, select discernable and reliable movements and/or vocalizations as signals.
4. Provide a large number of opportunities to use targeted signalling behaviors during functional activities. Remember incidental learning does not occur. Opportunities for practice must be provided.
5. Teach caregivers to read signals and respond (note: they don't have to comply, but should respond).
6. Don't become so focused on targeted behaviors you fail to respond to other behaviors. For example, if an individual initiates something, be flexible. If someone is being creative, don't intervene.
7. Once a child uses a signal consistently to communicate (e.g., using your hand to do something), go to a higher level strategy (e.g., touch you and then an object to request it).

**Thermoform machines (i.e., machine used to produce Braille, generally available at Commissions for the Blind) can be used to make plastic molds of objects (limited in height) or symbols (Blissymbols).

8. Continue to expand signalling repertoires. For example, put a dif-

ferent texture on two treadle switches (e.g., sand paper and satin). Make each switch cause a different effect (e.g., turn on a fan, set off a buzzer to call a caregiver).

9. Observe and probe to see if signals become symbols.

10. When training a higher level response, you may wish to ignore lower levels of responses; however, don't ignore attempts to communicate even if a lower level response is used.

Expressive Training: Symbols

1. When selecting a symbol set, consider residual hearing, vision and tactile sensation/discrimination, motor abilities, and preferences. Think shape, size, texture, color, sound, and ability to access, as well as level of abstraction and portability. (Remember the shoe test when selecting symbols or you will make mistakes, e.g., *miniature objects may not be meaningful if you've never seen the real thing.*)
2. Determine which type of symbol to start with; first guesses are often incorrect so you'll need to keep probing.
3. Initially select vocabulary/symbols for training likely to occur over and over again each day.
4. When going from 1 to 2 symbols, begin with a highly preferred object and a non-preferred object or activity. Then, go to equally preferred symbols.

5. Progress from actual objects to more abstract, more conventional, and smaller/portable symbols. For example, **Hot dog:** Real hot dog--> toy plastic hot dog--> thermoform impression of the hot dog shape--> shallower thermoform impression of the same shape--> put in a book of thermoform pages & pair with sign, etc.¹⁶

6. When an individual is ready to use a more abstract mode, don't inadvertently abandon current modes. For example, if you move to manual signs from (cont. pg. 5) tangible symbols, pair the sign with the symbols already acquired or in-

roduce a few manual signs for new vocabulary items. Two or more modes of communication should be used indefinitely to enable individuals to communicate with as wide an audience as possible.

7. Arrange symbols to facilitate their use.

8. Remember, children (and adults) continue to use prelinguistic modes of communicating before, during, and after learning speech, signs and other abstract symbols.

Electronic Devices

Assistive devices for individuals with DSI, particularly if they have motor impairments, should be introduced at a young age. A recent study was carried out to determine if a child (C.A. = 7 to 8 years; sensory motor stage 4; spastic quadriplegia; DSI) would a) show a preference for tactile surfaces and b) learn to associate a tactile surface with an event. Specifically a preferred texture was placed on a switch, which activated a speech synthesizer to call a caregiver who provided a few seconds of tactile stimulation (paired with the child

touching the tactile surface). Over three months (1 hour sessions, 5 days per week) the child showed a clear preference for texture and demonstrated an ability to associate a texture with the contingent social reinforcement. This study shows, among other things, the importance of systematic training procedures.¹⁷

Ms. Mathy-Laikko et al. are presenting this study at the ISAAC Conference in Anaheim. See you at the session.

Voice output/sound "gets the attention" of caregivers and is a way of communicating recognized by everyone. I observed a young girl with DSI at the California School for the Blind. She used signs and a direct selection, voice output communication aid. This young girl's roommate is blind. Voice output keeps them "in touch." Her opportunities for interaction and mainstreaming experiences are increased even if she does not "hear" the voice.

Buzzers and speech output can also be used as call or alarm systems.

Communication Training Strategies

Training strategies will follow basic principles of AAC interventions (i.e., teaching partners as facilitators, teaching within functional activities, using topic specific arrays and multiple modes, etc.) Experience suggests if we set goals realistically and concentrate on achieving our objectives (even if only 2-5 per year), measurable progress will occur. Continuous assessment *not only of the individual, but also of the effects of intervention programming* is critical.

A Final Thought...Transitions from Child to Adult Services

Typically, what is valued in adult service programs is independence and conformity . . . get the job done and don't bother anyone. Goals of communication programs, on the other hand, involve "going through" another person. We must recognize and attempt to reconcile these goals so children with DSI have opportunities to succeed as adults.



Governmental

AAC's Cohen Beckoned to Washington Reagan signs P.L. 100-407 in August

Guess Who's is going to Washington? AAC's Carol Cohen, Director of Adaptive Service of Enable, UCP in Syracuse, NY will consult with the National Institute on Disability and Rehabilitation Research (NIDRR). Her task is to write the REGS (regulations interpreting the law) for P.L. 100-407, the **Technology Related Assistance for Individuals with Disabilities Act of 1988**. Congratulations to Carol and to NIDRR for knowing who to tap on the shoulder. *We've got a friend in Washington.*

NIDRR administers the program because it represents all ages and disability types. Reportedly, **5.2 million dollars** are available to fund Title 1 projects, i.e., grants to states to develop "con-

sumer responsive state-wide programs". However little, if any money, will be available this year for Title 2 projects (e.g., funding, demonstration, and training grants) because nearly 5 million dollars were not appropriated.

Only states (through the governor's office) can apply for these monies. States who wish to compete for Title 1 monies should prepare to submit proposals in the early Spring of 89. Awards will probably be made next Summer. Proposals will be peer reviewed and grants awarded on the basis of merit with an effort to include states with a range of demographic characteristics. Up to 10 (*it could easily be fewer*) grants will be awarded. Initial grants are for 3

years, with a 2 year continuation possible.

According to P.L. 100-407, by 1990 all states in the U.S. should be developing a plan to provide technologies to their citizens. By 1997, all plans should be implemented. Participating states gradually will be expected to assume financial responsibility for their service delivery plan.

Future appropriations must dramatically increase to fund this program. We will need to **continue our advocacy efforts**, working within states and professional and consumer organizations, to insure the rights of severely speech impaired persons are addressed and met. USSAAC, in its infancy, will confront major challenges as it works alongside other U.S. group's (ASHA, UCP, ARC) to implement P.L. 100-407 fairly for all U.S. citizens with disabilities.



University & Research

REC on Augmentative Communication

The U.S. National Institute on Disability and Rehabilitation Research (NIDRR) in the U.S. now supports 17 Rehabilitation Engineering Centers (RECs). The purpose of RECs is to advance the state of the art and contribute to the solution of rehabilitation problems within certain priority areas (e.g., seating and mobility, augmentative communication, computer access and control, evaluation, technology transfer). Each REC must develop a coordinated program of research, scientific evaluation and education. RECs are expected to be "Centers of Excellence" and to disseminate research results and other information. Their technical assistance and educational activities are meant to support the clinical needs of service providers and consumers.

REC on Augmentative Communication (AC)

Last year, NIDRR awarded a 5 year grant (3.5 million) for the REC on Augmentative Communication to the University of Delaware. The Center is located within the Division of Applied Science and Engineering Research at the Alfred I. DuPont Institute in Wilmington.

Richard Foulds, Ph.D. is Director, and Patrick Demasco is Associate Director. Both were formerly at the Tufts New England Medical Center in Boston. Their contributions to the field of AC are highly respected. Presently, the Center employs 5 additional full time staff, 5 faculty on a part time basis, and 7 graduate students.

Laboratories

The REC on AAC has 4 "Laboratories," representing major activities within the Center.

1. Information and Education.

Coordinator, Beth Mineo, Ph.D. will work with the Trace Research and Development Center and others to develop and maintain a data-base and update the well-known Resource Books.¹⁸ We can look forward to yearly State of the Art Papers on pertinent topics and periodic updates on the Communication Aids Chart.¹⁹ Also, workshops and seminars will be offered. A "state of the art" conference is planned for the fall of 1989 at the DuPont Institute. This

invited conference will result in a report, which should be available for dissemination in early 1990.

Dr. Mineo, previously at the Association for Retarded Citizens in Texas, joined the staff this month. She hopes to see *"more of an emphasis on the needs of the mentally retarded"* at the Center.

2. Speech Communication.

Coordinator, Richard Foulds, Ph.D. will lead the Speech Communication lab's effort to develop a high quality, multi-lingual, diphone-based speech synthesizer. The plan is to make speech synthesizers available that are intelligible, natural sounding, permit different voices to be selected (e.g., child, adult, female, male), and speak Spanish as well as English. A first generation system by these researchers is available in the Real Voice by Adaptive Communication Systems in Pittsburgh.²⁰ A major goal of the lab is to create an automatic diphone generator.

(For more information on existing speech synthesis technologies, including diphones, see issue #1 of ACN).

3. Natural Language Processing.

Coordinator, Patrick Demasco, M.S. will oversee research to improve the speed and accuracy of expression possible by means of print and synthetic speech. Methods such as abbreviation expansion, semantic compaction, and letter/word prediction are considered "first order" techniques. Today, these rate enhancement techniques generally require the clinician/user to "program in" what the message is e.g., *lg = let's go; boy icon + shovel icon = I really dig that man!* In the proposed "second order," new rate enhancement techniques based on the processing of natural language will be available through "smarter" communication aids. "Machines" will use linguistic rules to expand or predict a user's utterances from a limited number of "key strokes." Goals are decreasing time clinicians must spend, as well as increasing the speed with which messages are transmitted.

4. Systems Development and Evaluation Laboratory.

Coordinator, Patrick Demasco, M.S. also heads up this laboratory. A major activity is to apply results of research from other labs to actual communication systems. Software modules (e.g., abbreviation expansion, joystick input, scanning, prediction) will be developed for researchers, manufacturers and others with technical expertise to "build" desk-top and portable communication aids. The idea is to make various features of current communication aids available and prevent wheels from being reinvented! Software will be developed for MS-DOS computers; however, specs will be available to programmers who wish to adapt software for use with other computers. The systems development lab will also develop communication devices from lap top and desk top computers using these software modules. Some products are anticipated to be available early next year.

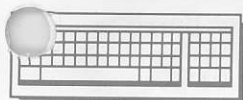
Carol Sargent is responsible for the second major activity of the laboratory, i.e., evaluation of products developed by the REC. Field testing of products will occur in cooperating clinical facilities. Plans are to develop and implement an evaluation model that will enable information on the effectiveness of devices to be quantified.

Other Activities

Other major areas of staff research (funded by sources other than the REC grant) are in the areas of robotics and telephone transmission of sign language.

Educational and clinical opportunities

There is no degree program or course in AC offered by the University of Delaware. However, present degree programs in computer science, mechanical and electrical engineering, and educational studies involve students in AAC research projects. Under consideration is a plan to establish an AAC clinic at the Dupont Institute. (*continued on page 8*)



Equipment

Symbols and Aids

Tangible symbols have a physical relationship to the visual or tactile properties of the referent.

Symbol	Referent
Shoe lace	Shoes
Raisin glued to card	Raisins
Cup screwed to base	Cup
Coat hook	Hang up/get your coat, let's go
Thermoform pretzel	Pretzel
Bracelet	Mommy
Plastic star	Plastic star on door of office

Tangible symbols allow individuals with DSI (and those with visual and speech impairments) to refer to objects/people/activities that are spatially or temporally distant. For some, tangible symbols may bridge the gap between gestural communication and formal language systems. For others, tangible symbols may represent an ultimate level of communicative competence. Disadvantages are they are bulky, not portable, and unconventional.¹⁶ Don't miss Dr. Rowald's presentation at the ISAAC Conference!

Graphic symbols can be used by individuals with some residual vision. *Pictogram Ideogram Communication* symbols were developed for the visually impaired.²¹ White on black minimizes figure-ground visual confusion. Large pictures, line drawings (colored & black and white), enlarged on a screen may work for some individuals with low vision.

Textured surfaces may be "tangible symbols" or have no obvious association to their referent (i.e., be abstract symbols).

Manual signs require good motor, tactile, and symbolic skills. Signs are often produced in the individual's hand.

Abstract shapes (e.g., raised Blissymbols,²²) can be tried with higher functioning individuals who can not use traditional codes.

Codes - Traditional orthography, Braille, and Morse Code are used.

Communication aids/symbol arrays

One or two symbols can be loose or attached to a base. For *multisymbol arrays*, symbols can be placed in front of the individual, in a shallow tray, on velcro strips, in compartments, on pages with string to mark divisions between symbols, in a booklet or communication book, in a Calendar Box, on walls, in the car, on electronic devices.¹⁶

Calendar boxes are often used with the visually impaired. Tangible symbols are arranged in temporal order within separate compartments of a box. Symbols represent major activities in a day. Prior to each activity, the student is taken to or goes to the calendar box to collect an object/symbol representing the next activity. After the activity is completed, the student returns the symbol, covers it with a "flap", and retrieves the next object. Interactive exchanges can and should be built into the use of calendar boxes. For example, individuals may give the teacher a symbol for "finished" prior to retrieving the next symbol from the box.

Activity areas throughout the classroom, residence or vocational setting should have symbol arrays and instructions for their use.

Electronic devices

Electronic communication devices permit individuals with motor impairments to exert some control. High tech communication aids typically provide visual and/or auditory output. Although they may not be useful in providing feedback to individuals with DSI, don't discount their use or effectiveness.

Switch technologies

For those with severe motor impairments, place symbols on a single switch. Initially, a buzzer/light, fan, vibrator, etc. can be activated. Tapes, buzzers, synthesizers can result in social reinforcers as well as other types of contingent effects. If individuals are physically capable of activating more

than 1 switch, multiple effects and choices become possible.

- **Loop tape** A short message can be tape recorded (e.g., *Please come here*) using a 10-30 second loop tape and activated with a switch.

A strategy by Melanie Fried-Oken will be published "soon."²³ If you want it now, send \$1 and a self addressed envelope.

- **LOQUITUR.** Watch for this new product from Don Johnston Developmental Equipment.²¹ You can record up to 4 brief messages and use up to 4 switches. It's basically 4 loop tapes rolled up into 1 training device.

Talk Tape Technologies

For those with intact motor skills, try the **Mini Talking Card Reader**, a small hand-held talking magnetic card reader. Put a pressure sensitive strip of Talk Tape across the bottom of any size stimulus card to which you've attached a symbol. Record a message (you have 2 seconds of sound per inch of tape). The user inserts a card in the Reader to play a message.

Available from Crestwood Co. P.O. 04606, Milwaukee, WI 53204-0606. Or, just use your old Language Masters.

Bar Code Technologies

Consider adaptings a **Magic Wand Speaking Reader**.

For ideas, call John Curran (716) 454-5134 or write c/o Tiger Commun. Systems, Inc. 155 E. Broad St., Rochester, NY 14604.

Direct Selection Technologies

Non-graphic symbols also can be used on portable communication aids & expanded keyboards providing access to higher technologies.

(cont. from pg. 2)

for caregivers to foster communication. Paul Brookes Publishing Co.

- **Assessment of Sensory Capabilities.**

Ms. Pam Cress, Parsons State Hospital and the University of Kansas. Guide for conducting auditory and visual assessments.

- **Play Assessment.**

Dr. Rebecca Fewell, Tulane University. Interlocking system of assessment and intervention materials.

- **Emergent Language and Augmentative Communication**

Ms. Pamela Mathy-Laikko, Meyer Children's Rehab. Institute. Activities to foster emergent language.. A manual for practitioners to use when developing AC systems for children with DSI.

All products will be "turned over" to the U.S. Office of Special Education & Rehabilitation Services (OSERS) in Washington, D.C. for "limited distribution. Check with Michael Bullis, Proj. Director (503) 838-1220 x391



REC on AC (cont. from pg. 6)

Although no formal mechanisms exist at this time, those interested in summer internships, post doctoral fellowships, CFY's, etc. ought to inquire, particularly those with rehabilitation engineering aspirations.

Collaborations with other RECs

Plans to collaborate with other RECs include: **Trace Research and Development Center at the Univer-**

sity of Wisconsin in Madison ("first" REC on Computer Access and Control) Gregg Vanderheiden, Director. *Coordinate information dissemination and related projects.*

University of Virginia in Charlottesville (Seating and Mobility) Cliff Brubaker, Director. *Make communication devices and powered wheelchairs work together.*

National Rehabilitation Hospital in Washington, D.C (Evaluation) Samuel MacFarland, Director. *Coordinate efforts to develop evaluation models and protocols.*

For general information, call Dr. Mineo ((302) 651-6830. For information about specific projects, contact the Lab Coordinator at phone number above or write c/o A.I. duPont Institute, P.O. Box 269, Wilmington, DE 19899.

References and Resources

- 1 Fredericks, B. & Baldwin, V. Individuals with sensory impairments. In Goetz, L. Guess, D. & Stremel-Campbell, K. (Eds.). *Innovative program design for individuals with dual sensory impairments.* Baltimore: Paul H. Brookes Publishing Co.
- 2 Kathleen Stremel-Campbell. Personal communication (August, 1988).
- 3 Victor Baldwin. Personal communication (September, 1988).
- 4 Facts About Deaf Blindness. Provided by Patricia Porter (919) 733-3654.
- 5 Siegel-Causey, E., Ernst, B. & Guess, D. (1987). Elements of nonsymbolic communication & early interactional processes. In Bullis, M. (Ed.) *Communication Development in Young Children with Deaf-Blindness: Literature Review III.* Monmouth, OR: Teaching Research Division Oregon State System of Higher Education, 57-89.
- 6 Curtis, W. & Donlon, E. (1984). A ten-year follow-up study of deaf-blind children. *Exceptional Children*, 50:5, 449-455.
- 7 Shelley Barron. Personal communication (September, 1988).
- 8 Ann Turnbull, Univ. of Kansas in ref. #9.
- 9 Snell, M. (1988). Foreword. In Goetz et al. (Eds.). see ref. #1
- 10 Charity Rowland. Personal communication (August, 1988).
- 11 van Dijk, J. (1987). An educational curriculum for deaf-blind multi-handicapped

persons. In D. Ellis (Ed.) *Sensory impairments in mentally handicapped people.* London: Croom-Helm, 375-382.

12 Writer, J. A movement-based approach to the education of students who are sensory impaired/multihandicapped. In Goetz et al. (Eds.). 191-224 see ref. #1.

13 Nietupski, J. & Hamre-Nietupski, S. (1988). An ecological approach to curriculum development. In Goetz et al. (Eds.). 225-253 see ref. #1.

14 Helmstetter, E., & Guess, D. (1988). Application of the Individualized Curriculum Sequencing Model to Learners with Severe Sensory Impairments. In Goetz et al. (Eds.). 255-282 see ref. #1.

15 Carlson, F. et al. (in press). *Developing Signalling Behaviors.* ASHA.

16 Rowland, C. & Schweigert, P. (in press). *Tangible symbol systems.* Tuscon: Communication Skill Builders.

17 Mathy-Laikko, P. Personal communication (August, 1988).

18 Borden, P. & Vanderheiden, G. (1988). *Rehab/Education Resource Book Series 1-4.* Madison: Trace Research & Development Center.

19 Kratt, A. & Sitver-Kogut, M. Comparative chart on commercially available communication aids.

20 Adaptive Communication Systems, Inc. P.O. Box 12440, Pittsburgh, PA 15231.

21 Available from Don Johnston Developmental Equipment, P.O. Box 639, 1000 N. Rand Rd., Bldg 115 Wauconda, ILL 60084.

22 Howard Shane. Personal communication (September, 1988).

23 Fried-Oken, M. (in press). Establishing initial communicative control with a loop-tape system. ASHA.

Baldwin, Victor. Teaching Research Div. Oregon State System of Higher Education. (503-838-1220 x391)

Barron, Shelley. CA State Dept. of Educ. (916-921-0515)

Cohen, Carol. Adaptive Services of Enable, UCP Syracuse. (315-455-7591)

Demasco, Patrick. REC on AC (302-651-6830)

Dublinkse, Stan. ASHA (301-897-5700)

Honsinger, Melissa. Rehab. Med., Univ. of Washington (206-543-3134)

Johnson, Roxanne. Don Johnston Devel. Equipment (312-526-2682)

Marquis, Jeanne. Gallaudet College, (202-651-5289).

Mathy Laikko, Pamela. Meyer Children's Rehabilitation Institute, (402-559-5754)

Porter, Patricia. State of NC (919-733-3654)

Rowland, Charity. Oregon Research Institute, (503-232-9154)

Stremel-Campbell, Kathleen. University of So. Mississippi (601-266-5236)

Apologies to Walt & Ginger Woltosz for not listing them as resources in issue #3!

