Publisher's Authorized Copy
Augmentative Communication, Inc.

Augmentative Communication News

November, 1988 Vol. 1, No. 5

INSIDE THIS ISSUE . . .

UPFRONT

A primary focus of this issue is the process of vocabulary selection, particularly for individuals unable to spell. In preparing **Clinical News** I learned anew the meaning of phrases "opening Pandora's box," "awesome," "the expanding universe." Ever feel like the more you learn the less you know? If Gary Poock, *your publisher,* had not gently reminded me that November was almost over, *your editor* might still be massaging this issue. Many thanks to the clinicians and researchers who shared their philosophies, experiences, research results, and practices. (See references and resources)

In the **Equipment** section, auditory scanning techniques are explored. You'll find basic information about this method of accessing messages, a composite "wish list" of desired features in auditory scanning programs from master clinicians familiar with the technique, and a description of commercially available programs.

The **University and Research** section highlights research activities at the Augmentative Communication Service in Canada. The staff of this well-known program continues to contribute exciting research to AAC.

Again, the **Governmental** section focuses on the U. S. (This will not continue indefinitely.) However, subscribers in the U.S. face times of uncertainty and change. We have elected a new president who hasn't told us much about what he may *(or may not)* do for disabled citizens. We have new faces in Congress and have lost a major supporter, Sen. Lowell Weicker from Connecticut. We have a new law (P.L. #100-407), a new organization USSAAC, the U.S. Chapter of ISAAC, (cont. pg. 2)

Clinical News

Vocabulary Selection: Current Practices and a Glimpse at the Future

Vocabulary is defined as the "stock of words USED by a particular person.[1]" Crystal (1986a) said vocabulary is the problem that currently most hinders progress in AAC.[2] Without an ability to speak, spell, or use sign language, access to language remains forever restricted. Selecting the "right" words and phrases is critical. For those who can spell, communication restrictions still exist because letter-by-letter spelling is so slow. Selecting vocabulary to enhance rate becomes the challenge. The vocabulary selection process in AAC is an attempt to find the lexicon and strategies that "best" enable individuals to do what they need to.

Vocabulary selection is a BIG topic and the more I talked to people, read and thought about it, the bigger it got. Here's some reasons why!

- Vocabulary selection decisions necessarily include consideration of multiple variables: the *individual* (needs, personal style, goals, preferences, capabilities); the *contexts* within which communication occurs; *partners*; *equipment features*; and the *communication task(s)* that need to be accomplished.
- Research demonstrates that vocabularies of individuals (including those who use AAC techniques) are unique, idiosyncratic, and dynamic.[3] Ready-made vocabularies or "source lists" (i.e., lists compiled from language samples from specified groups, word frequency lists, surveys, subjective judgments, dictionaries, curricula, (continued on page 2)

Upfront (from page 1)

and new hope for the future.

We enjoyed the opportunity to see and talk with many ACN subscribers from around the world at the ISAAC Conference in Anahcim. Thanks so much for the enthusiastic comments about ACN. Some of you were even able to visit us in Monterey after the conference. That was great fun!

If your subscription began with Vol. 1, #1, you may find a renewal notice in this issue. If so, it means your 1-year subscription ends AFTER the next issue. Don't let that happen! Just fill out the enclosed form and send it in today. Please include the label from this issue so we can easily update your subscription. Thank you very much for your continued support. Tell a friend to subscribe!

Finally, we sincerely wish you and your family great happiness, peace, and joy during the holiday season. Keep in touch! Remember the HOTLINE number is **(408) 649-3050.**

Vocabulary Selection (cont.)

vocabulary stored in AAC devices, and so on) may be a "guide" or "place to start," but vocabularies must be individualized and constantly updated. This is a clinically time-consuming, demanding task.

- Obviously, vocabulary selection issues for a physically disabled three-year-old just learning language are different from those of a severely retarded ten-year-old, a head-injured adult recovering in a hospital, an adult with aphasia returning to work, and so on.
- Nonspellers who use augmentative aids rarely have access to more than 500 symbols. This represents only a small percent of the different words spoken each day by very young children.[4] However, if the right 500 words are selected, individuals can become very powerful communicators.
- Vocabularies are comprised of a list of (a) "core"* words, which occur frequently and may have some universal utility and (b) "fringe"** words, which are necessary for a particular individual in particular circumstances.[5] Fringe words are often dictated by an individual's activities, interests, environment, and personal style. Note: The more variable a person's lifestyle, the more unique and dynamic vocabulary is likely to be.[6]
- Conversationally competent, aided communicators do not use "vocabularies" in the same way as normal speaking persons. Features of devices, access techniques, and output options affect how language can be used. For example "chatting", joking, free-form comments and quips occur far less frequently. In addition, certain vocabulary items that repair conversational breakdowns, maintain discourse, etc. are likely to be unique to the vocabularies of AAC users.
- Unlike the human brain where language is stored & retrieved without effort, a finite amount of space/time is available in machines and on overlays. Storage, retrieval, and rate enhancement techniques for electronic and non-electronic aids place little understood cognitive, visual, auditory and social demands on users and their partners. Technological advances should increase the size of an individual's vocabulary and decrease the amount of time required to send messages. However, larger vocabularies make selection, arrangement, storage, and retrieval a much more complicated and time consuming process.

* Core lists are small, don't change very much over time, include many "structure words," (i.e., articles, pronouns, prepositions, auxiliary verbs, interrogatives), words that provide the framework for language, but carry little information, and words for items most individuals find important

** Fringe lists may be large with new words frequently added for particular situations. They are made up almost exclusively of "content words" (nouns, verbs, adjectives)

State of the Practice

During telephone interviews with 12 master clinicians,[7] most of whom work in AAC Centers, I asked two questions: 1. *how do you select an initial vocabulary for clients unable to spell?* and 2. *how do you subsequently update it?* The sample is small, but the results are interesting.

Initial Selection

Two basic approaches were described. Some begin by identifying a *comprehensive list* of words, phrases, etc. From this list, smaller vocabularies are generated for training. Others begin by identifying a *small set of vocabulary related to a specific context or activity*. This group gradually adds new activities/contexts and related vocabulary. Although these approaches may appear juxtaposed, clinicians in both groups agree an organized approach to vocabulary selection is necessary, and vocabulary selection is not an end in itself. Appropriately selected vocabulary may be our best strategy for teaching the power and pleasure of communication.

Beukelman[8] suggests decisions about an individual's vocabulary should be made after investigating the following:

1. What others in similar situations use (e.g., nonspeaking & speaking peers in the lunchroom, patients in intensive care units).
2. What partners think needs to be used (e.g., parents, teachers, spouse).
3. What is already being used to communicate (e.g., all modalities).
4. What are the contextual demands (e.g., during math class, on the bus).

The twelve clinicians reported using a total of 13 different

AUGMENTATIVE COMMUNICATION NEWS is an independent, non-membership publication.
Editor, Sarah W. Blackstone, Ph.D. Publisher, Gary K. Poock, Ph.D.
Graphics Consultant, A.I. Harris Group., Pittsburgh, PA..
Published by Sunset Enterprises, One Surf Way, Suite #215, Monterey, CA 93940
Personal check orders: U.S. $37 (1 yr), U.S. $67 (2 yrs), or U.S. $97 (3 yrs). Single issues are $8.
Overseas: - U.S. $47 (1 yr.), U.S. $85 (2 yrs.), or U.S. $123 (3 yrs.).
Institutions, libraries, schools, hospitals, companies, all others: Add $20 per year.
ISSN # 0897-9278 Telephone: (408) 649-3050

Table I. Techniques used by master clinicians to select initial vocabularies for nonspellers.

Number/Percent who report using technique		DESCRIPTION OF TECHNIQUE
12	100%	1. Conduct structured, face-to-face interviews with caregivers (family, speech language pathologists, and teachers). For example, caregivers are asked "if ___ could talk, what would __ say." Questions are structured by context/environment, communicative function (how does__ get information"), semantic category (places, people, foods), etc.
8	67%	2. Conduct structured interview with individual. Note: responses were dependent on client's age & abilities.
5	42%	3. Directly observe individual in natural context/role-playing activity.
4	33%	4. Review vocabulary from an available source list(s).
3	25%	5. Ask caregivers to complete a questionnaire.
3	25%	6. Observe normal speaking individuals in the same activity.
3	25%	7. Ask caregiver to maintain a communication diary.
1	8%	8. Ask individual to select symbols they want to use from a book of symbols. Note: Faith Carlson reports giving preschoolers this responsibility. She tries to influence selection to some degree; however, the final decision is the child's. Clinician initiated boards are used for teaching language and to accomplish other goals..
1	8%	9. Observe what vocabulary adult & peers need to provide models.
1	8%	10. Develop (with caregiver) a script for a context.
2	16%	11. Ask caregivers to prepare a list of vocabulary (words, letters, numbers, phrases, sentences) needed.
1	8%	12. Review previous records.
1	8%	13. Conduct (or train caregiver to conduct) a formal environmental inventory.

techniques to select initial vocabulary. Table I provides a brief description of each technique and the number and percent of clinicians who reported using it. Note that **interviewing caregivers** is the only technique everyone mentioned. Although client characteristics and the type of clinical setting clearly influence selection techniques, most clinicians report using the same combination of familiar techniques across their clients.

After generating an initial list, these 12 master clinician's take another look at it. They reported refining, prioritizing, and balancing vocabulary according to the following factors:

1. Language development
2. Ability of client to express: a range of communicative functions; communication power; individual style & personality
3. Motivational value of items
4. Social validation scale results[9]
5. Provision of specific AAC strategies: enabling individuals to add words, describe words not available (e.g., colors, sounds-like), repair breakdowns, instructions for system use.
6. Caregiver preferences
7. Generic value of individual symbols.
8. Vocabulary that permits "aided stimulation" (clinician modeling)[10]
9. Efficiency and effectiveness of expression in different modes

Updating

Recognizing the dynamic and ongoing nature of vocabulary selection, most of the clinicians trained caregivers to assume major responsibility for updating vocabulary. Some set up structured times to review vocabulary with individuals and caregivers at regular intervals. A few observe actual use.

Ideally, updating an individual's vocabulary means knowing what items are used, not used, how frequently and under what circumstances, as well as what items will be needed in the future. These data could be collected and analyzed by machines (even communication devices!), as well as by people. However, this rarely occurs. *Perhaps manufacturers will begin to provide us with a "data collector" feature on the next generation of AAC devices.*

In a recent paper, Romski and Sevcik[11] report evaluating the utility of client vocabulary by taking language samples at regular intervals in the classroom and analyzing the sample according to frequency of occurrence, function, outcome, and partner responses. They also test comprehension and production of symbols. Romski[12] feels caregivers should be provided with these data on a regular basis rather than generate it. Objective data help them to make better choices.

The Future

An enormous amount of clinical time and effort is expended selecting and expanding vocabularies for individuals unable to select their own. However, the efficacy of approaches we use is not yet known. This section reviews some current research activities.

Note: these researchers are actively collaborating with one another in an effort to provide information about vocabulary selection issues.

A major focus of current research is the use of vocabulary source lists. In clinical practice, however, only 1/3 of those interviewed reported using lists to select vocabulary. In the upcoming December, 1988 issue of AAC, an article by Yorkston, Dowden, Honsinger, Marriner, & Smith[13] describes 11 "source lists." Each list was compared to words from the vocabularies of 9 nonspeaking, physically disabled communication aid users. (Note: Subjects used a variety of different aids and methods of symbolization). Results: *1. Extensive overlap was not observed across lists. 2. Nearly 1/3 of words in user vocabularies were not found in even the largest list. 3. The authors suggested further research be carried out to compile clinically useful source lists.*

Note: In addition to this article, a well-organized bibliography of source vocabularies is available from the Trace Center.14 Watch AAC also for Vocabulary Selection: A Case Report, which concludes source lists "may be considered a necessary but not sufficient aspect of vocabulary selection."15

(continued page 5)

Equipment

Auditory Scanning (AS) Techniques

For those with severe physical disabilities who are also blind or severely visually impaired*** (i.e., print blind, cortically blind, visually unstable, or unable to hold their head still enough to use visual scanning), auditory scanning (AS) is an option, particulary if morse code can not be used or learned.

Auditory scanning provides access to messages in a serial (one at a time) rather than parallel (all together) manner. Therefore, AS is not, *I repeat,* NOT a preferred method by which to access messages. It is slow, and cognitive demands on both the user and listener exceed the demands made with visual scanning.[18] For example, AS does not permit the user to locate the desired target in advance and thus, anticipate the need to respond. To date, optimal and typical rates for message transmission using AS techniques are not documented. Cognitive skills (e.g., attention, memory, retrieval, and categorization) needed to operate AS devices effectively are not defined.). Nevertheless, AS is a viable option, may be an individual's only option, and deserves consideration.

Types of AS techniques[19]

1. Listener - Assisted

Partners typically read from a small chart. The user signals (e.g., by blinking or nodding) when the desired message is spoken. Charts should provide clear instructions.

Table II. Sample Instructions

Please read the categories written in red slowly. When I blink, stop & begin to read the words/letters under the red word. When I blink again, read my message. If I close my eyes, it means we should start again. Let's try it a few times. It takes some practice!!

Listener assisted AS is more efficient than "20 Questions." Other advantages are *portability, ease of use, low cost, minimal equipment required, active partner involvement during face to face interaction.* Major disadvantages are a *limited number of communication tasks* can be accomplished and *users remain dependent on partners.*****

2. Automatic

Users hit a switch and a machine scans by speaking message units (e.g., letters, words, phrases, sentences). Major advantages of automatic AS are an ability to *store and retrieve messages*, accomplish a *range of communication tasks*, and *communicate* more *independently.* Disadvantages are a *lack of portability, cost, and slow rates.*

To learn the mechanics of an AS program, systematic training of both users and partners is essential. Training (some of the time) in natural environments is strongly advised.

Vocabulary Issues

If more than a few messages are needed, a tree branch configuration is typically used to arrange vocabulary. A list of vocabulary and its locations should be maintained.

Vocabularies are organized and taught in ways meaningful to the user. Clinicians report organizing by context and/or semantic category. They also suggest including a *generic category* for face-to-face communication with greetings, conversational repair and maintenance vocabulary.

For literate individuals, the alphabet should always be included and rate enhancement strategies considered. Letter arrangements may vary in format (e.g., a to z, frequency of occurrence, QWERTY array, or a combination as illustrated in Table III above.)

List 1 contains the most frequently occurring letters. List 2 and 3 divide in half ALL the letters in the alphabet, and repeat those in List 1. This arrangement makes it an easier cognitive task for users and partners.

Table III. Tree branch configuration for alphabet

ALPHABET		
List 1	List 2	List 3
E,T,R,A,N	A,B,C,D	M,N,O,P
I,O,U	E,F,G,H	Q,R,S,T,
S,H,Y	I,J,K,L	V,W,X,Y,Z

Desired Features

I compiled the following "wish list" for AS equipment after speaking with master clinicians and others.[20]

1. Portability
2. Intelligibility of voice
3. Ability to preselect categories for a particular situation.
4. Visual as well as auditory feedback (for facilitator)
5. Editing features
6. Ability to use multiple switches
7. Adequate storage and retrieval capacity to insure flexibility
8. Rate enhancement features. For example,
   (a) A very rapid scan until user hears item and hits the switch. Then, the last few items are repeated more slowly until the desired item is heard a second time
   (b) Prediction by computer software
   (c) Abbreviation expansion. Be careful. this can be confusing
   (d) Preselecting contexts/categories
   (e) Shortening category names using codes (users should help select codes)
9. User friendliness/programming ease
10. Voice control options for user (e.g., earphone, volume control, different voices, external speakers)
11. Ability to carry out various communication tasks (writing, environmental control, computer access, face-to-face conversation)
12. Ability for user to shift tasks
13. Reasonable cost for equipment/training

Note: See also a chapter by Fried-Oken. for further discussion of AS techniques.[21]

Auditory Scanning Devices

Non-computer based

Loop tapes and similar devices (see ACN Vol. 1, # 4) are effective for use as a limited communication aid, for training, and as a tool to facilitate interaction.

Computer-based - (Note: those described use a tree-branch vocabulary)

Audio Scan - Apple II, +, e, gs. Echo II Speech Synthesizer, single

*** Etiologies may include: anoxic encephalopathy, tumor, brain stem and central nervous system damage secondary to trauma; cerebral palsy; developmental disabilities; progressive neurological disorders (e.g., adrenoleukodystrophy, multiple sclerosis), temporary conditions.

**** A team from Capron Institute for Rehab., PO Box 7021, Colorado Springs, Co 80933 shared many ideas on AS at their ISAAC mini-seminar. Contact P. Anderson (719) 630-5000.

switch $95.50. User can store vocabulary in 3-levels: 10 Categories (home, school), 10 key words (mom), and 10 phrases (I'm hungry, let's eat). Don Johnston Developmental Equipment, Inc. P.O. Box 639, 1000 N. Rand Rd., Bldg. 115, Wauconda IL 60084

Note: According to David Gordon, Audio Scan for the Scan Pac is available upon request (no charge) from Adaptive Communication Systems, Inc. Box 12440, Pittsburgh, PA 15231 (412) 264-2288.

AudScan II - IBM compatible computers (including portable models). SmoothTalker voice synthesizer (or any serial port synthesizer). $595 for software only. Level 4 allows user to preselect up to 25 "contexts." The lower 3 levels contain categories, cue words, and finally words/phrases. Earphone and different voices are options. Distributed by: Adaptive Communication Systems, Inc. (address above)

Note: Two speech-language pathologists, Marilyn Buzolich and Jillian King, from the Bridge School in Hillsborough, CA designed this program for their clients. Walt Woltosz President of Words +, Inc. developed it. What a nice collaboration! Marilyn says it is "user friendly and very easy to program." Any questions? Call Marilyn or Jill (415) 342-7317 or 342-7364.

Easy Talker - Apple IIe or IIc. Votrax PSS or Type 'N Talk synthesizer. $135. Auditory scanning alphanumeric matrix display and user specific word, phrase, sentences storage and retrieval. Also, quick retrieval of "emergency" messages possible. Has editing capabilities for written communication. Rehabilitation Institute of Chicago, Alan J. Brown Center, 345 East Superior Street, Chicago, IL 60611 (316) 649-2556

Say It - Apple II +, e, (Echo or Votrax synthesizers) or Apple IIc (Cricket speech synthesizer). $40. 3- levels. Disks may contain up to 10 categories, 10 sentences per category. Sentences have blanks for words to be inserted. During scanning, words or phrases are read "quietly." However, the selected message is spoken "more loudly." Enhance, 1603 Court Street, Syracuse, NY 13208. (315) 455-7591

Scan and Speak - Apple IIe or IIc. DecTalk, Echo, Votrax synthesizers. $75. Operator has display options (i.e., can select no display, large or small text.) User specific vocabulary. 3 levels. Can have 4, 9, 16, 36, 49 targets per level. Communication Enhancement Clinic, Children's Hospital, 300 Longwood Avenue, Boston, MA 02115 (617) 735-7870

Message Maker (scanning version) - Apple IIe or IIc. DecTalk, Echo, Votrax synthesizers. $75. Has a dictionary of words alphabetized). Categories for phrase storage. User can spell, use words, or phrases. Messages up to 200 characters may be created, printed, spoken and saved. Communication Enhancement Clinic (address above)

Talking Scanner - Apple IIe. Adaptive Firmware card, Echo synthesizer. Available with "new" firmware cards or complimentary upon request. Allows creation of customized scanning arrays that talk. The scanner works with most programs that don't use the extended 80 column card themselves. Adaptive Peripherals, Inc., 4529 Bagley Avenue North, Seattle, WA 98103

Note: The Firmware Card is being distributed by Don Johnston Developmental Equipment (see above)

Vocabulary Selection (cont.)

Morrow[16] compared three vocabulary selection techniques to determine which accounted for the largest number of the words selected for 6 nonspeaking physically disabled children by a parent, teacher and speech-language pathologist (N = 18 informants). Each informant was asked to select vocabulary for the child/student by listing words on a (a) blank sheet of paper, (b) by category, (c) checking off words from a "source list." Results: *1. All informants contributed words. Although speech-language pathologists contributed the greatest number of words, teachers and parents provided many important "fringe" words. 2. Informants preferred using source lists to other selection techniques. 3. The source list technique yielded a larger list of vocabulary.*

Melanie Fried-Oken[17] is currently developing a data-base of single-word expressive vocabulary for children 3-6 years who use communication aids. Words selected for nonspeaking children by parents and clinicians are being compared to the language samples of age and sex matched normal speaking peers and nonambulatory speaking peers. In addition, she hopes to examine twin-pairs in an effort to control for varied language input and environmental influences on vocabulary acquisition.

Another area of research is investigating the type of language generated by AAC users. Yorkston et. al. [6], compiled the language samples of 10 nonspeaking adult spellers over an extended period. Results: *1. Single words are repeated more than 80-85 percent of the time, 2. two-word phrases are also repeated although less frequently. (2-word phrases almost always contain verbs and rarely include a noun). 3. Three, four, and five word phrases are rarely used more than once.*

Finally, David Beukelman[8] and others at the University of Nebraska have embarked on an ambitious 2-year project funded by Apple Computer. The goal is to develop a computerized **Tool Box** to assist clinicians to select vocabulary. Briefly, software for the Macintosh computer will be developed to provide:

Tool #1 - a contextually- based vocabulary data base. Clinicians will be able to specify the age and environmental contexts of a client and ask for a list of the most common words used by nonspeaking and speaking peers in similar situations.

Tool #2 - a vocabulary frequency analyzer. Clinicians will be able to "dump" language samples (either by typing them in or from any ASCII file) and receive an analysis of word and phrase frequency and more.

Tool #3 - a guided interview. Informants will be able to work with words entered in the data base through a guided interview. Also, clinicians will be able to "click" on a word and learn the spelling age, developmental range, and source of the item (whether it was recommended by the database, or 3 of 4 informants.)

The project hopes to develop interfaces for various output devices so selected vocabulary can be printed out as graphic symbols or placed on a video disc for training. **Current research promises to make the vocabulary selection process more efficient and effective.**

University & Research

Augmentative Communication Service (ACS) - CANADA

One of the oldest and most successful AAC programs is the Augmentative Communication Service (ACS) in Toronto, Ontario. It is housed at the Hugh MacMillan Medical Centre (HMMC). The ACS has three primary functions: service delivery to children, adults, and their families (approximately 300 yearly); continuing education to professionals, families, and users; and research, this article's focus.

From 1979's staff of 2, to today's equivalent of more than 24 full-time professionals from a wide-range of disciplines, this program has grown exponentially. Several factors have contributed to its success. First, **Penny Parnes**, Director of ACS, takes the deepest bow. Her vision and openness, ability to hire and support a talented staff, and advocacy for those who need AAC services guide this program.

Second, governmental support within the Ontario health care/educational system provides citizens of that province access to services and equipment. In 1984, the Assistive Devices Program (ADP) in Ontario was expanded specifically to include devices that "provide a means to transmit ideas and facilitate communication for persons (23 years old and younger) whose disabilities preclude oral and/or written expressive language." Individuals/families pay only 25% of the cost for "approved" devices recommended by "authorized clinics." An expansion of adult services provided by the ADP has been announced for Spring of 1989.

Third, ACS has increased its educational and basic research activities. This brings in additional funds and maintains ACS as a leader in the AAC community.

Education and Training of Professionals

ACS offers workshops and courses on a regular basis in Ontario. In addition, ACS staff present papers at conferences around the world. Students in speech-langauge pathology, education, and engineering from the University of Toronto participate on ACS research projects. Clinical externships also are available to students who have completed basic coursework in AAC at universities wishing to make such arrangements (e.g., Dalhousie University in Halifax, Nova Scotia). Stipends are not available.

Research and Development

Research is conducted both within ACS and the Microcomputer Applications Programme (MAP).

1. MAP Projects

MAP is co-directed by **Morris Milner**, Ph.D., Director of Rehabilitation Engineering Department and **Penny Parnes**, Director of ACS. Staff includes a multi-disciplinary team of 12 professionals as well as engineering/computer science students. MAP recently concluded a 3-year project funded by IBM, *Towards a Universal Access System for Physically Disabled*

$ Governmental

United States Prepares for Public Law 100-407

Participants from 25-30 states held ad hoc meetings with Carol Cohen, consultant to the National Institute on Disability and Rehabilitation Research (NIDRR), at the ISAAC Conference in Anaheim, California, October 23-26. The goal was to discuss state plans for responding to P.L. #100-407, **Technology Related Assistance for Individuals with Disabilities Act of 1988.** According to Cohen, states seem to fall along a continuum from "just getting started" to "very sophisticated." However, even states with examples of "best" practices in clinical, professional preparation, technical, and service delivery areas could point to unmet needs.

In preparing to apply for monies to improve current practices, a first step is for the Governor of each state to identify a "lead agency" to coordinate and manage activities within the state concerned with this legislation. Remember the intent of the legislation is for consumers, clinicians, families, politicians, manufacturers, agencies, educators, researchers, technical persons, etc. to work together on the development and implementation of a state plan to provide assistive technologies to individuals with disabilities.

What can you do?

1. If you are not yet aware of activities within your state, call the governor's office. Ask if a "lead agency has been appointed." Request to be kept informed. Contact the "lead agency" & offer to help.

2. Think about how your state might address the following 10 areas of greatest need. *Any ideas? Don't keep them to yourself.*
STATE NEEDS: (How would this list compare to needs in other countries? Anyone?)

1. A broad-based knowledge of issues and practices with regard to all populations.

2. Advocacy and marketing skills.

3. Information networks and ways of building bridges among & between agencies.

4. Information management and public awareness tactics - media development.

5. Measurement, replication, and effectiveness management plans.

6. Ways to provide training and education for professionals and families

7. An undertanding of public law and policy as it relates to funding issues.

8. Ways to involve the private sector.

9. Rehabilitation engineering/technical expertise.

10. Ways to meet the unique challenges of service delivery, i.e., models for delivery to families, followup, rural area, providing smooth transitions from schools to workplace, and so on.

3. Look for the regulations for P.L. 100-407 in the (cont. pg. 8)

Persons with Special Needs. The Department of Rehabilitation Medicine from the University of Toronto collaborated with ACS on that project. Goals were to define the principles of alternate access to computer-based technologies for physically disabled individuals. Products include:

- *Clinical Resource Manual* (in press, University of Toronto) - For professionals working with physically disabled individuals. This protocol assists clinical teams to assess access to computer-based technologies. (Contact ACS about availability)
- *Guidelines for Development of Alternative Access Methods* - For rehabilitation engineers and manufacturers. The document gives technical persons information about the requirements of physically disabled persons and the technical requirements of electronic devices, which permit "systems" to operate in different environments. (Available now from ACS.)

The current project at MAP, *Guidelines for the Requirements of Computer-based Systems to Accommodate Direct Manipulation as a Means of Alternative Access*, is a collaborative effort with the University of Toronto. The coordinator of this initiative is Fraser Shein, a rehabilitation engineer at HMMC and doctoral student at the University of Toronto. Project goals are to propose and evaluate software and hardware to give 3 groups of AAC users (those who use a: *single digit or head stick*, *head controlled light beam/sensor*, or *single switch*) a way to use devices such as the mouse, track ball, light pen.

2. ACS Clinical Research Projects

Janice Light, Consultant and Research Coordinator, oversees all clinical research activities carried out at ACS. Projects are funded primarily through external sources (e.g., Easter Seal Research Institute, the University of Toronto, the National Health Research and Development Program, the Hospital for Sick Children Foundation, the Ontario Ministry of Community and Social Services, and the Ontario Ministry of Education.) These ongoing projects focus on identifying physical and cognitive demands placed on individuals using augmentative techniques.

Information Processing Demands of Message Retrieval Techniques (J. Light, P. Lindsay, P. Parnes). Results of a pilot project were presented last month at the ISAAC Conference. Briefly, 6 nonspeaking functionally literate, physically disabled adults were found to be significantly more accurate, after a short learning period, in recalling salient letter codes (e.g., using logical letter coding techniques) than they were in recalling letter category codes (e.g., using FP (food) (pizza) as code for "I want a pizza") or iconic codes (e.g., Minsymbols™). Note: This study has obvious clinical implications; however, it is premature to interpret the significance of the results of the pilot project (and risk misinterpretation) until additional information from the current project becomes available.

The current project looks at 12 nonspeaking, physically disabled clients over a 6 month period. Variables being manipulated include (as before) the encoding technique and the type of message. In addition, the degree to which a code is personalized, the effect of a larger corpus of messages on recall, and the shape of learning curves over time are being examined.

Teaching Automatic Linear Scanning for Computer Access to a Severely Physically Disabled Preschooler (J. Light). This case study investigates the cognitive demands scanning places on preschoolers and will suggest training strategies. The results of this project should assist clinicians to help young children make a transition to scanning techniques.

Effect of Auditory Feedback on the Spelling of Nonspeaking Physically Disabled Individuals (S. Koke, J. Neilsen, students, University of Toronto.) Results indicate auditory feedback (even using a low cost synthesizer, *Votrax PSS*) has a positive influence on spelling accuracy.

Effect of Voice Output on Peer Communicative Interaction Patterns with Nonspeaking Children.(A. Kewin, student, University of Toronto). Results demonstrate that when voice output is **not** available to nonspeaking children, their rate of initiations decreased to peers and increased to adults. That is, without voice output, children need adults to assist them in their interactions with peers. With voice output, they interact more independently.

Investigation of Social and Familial Factors on the Literacy Development of Young Nonspeaking Physically Disabled Children. (J. Light, A. Kelford Smith). This project compares the experiences of 2 to 6 year old nonspeaking children to their able-bodied peers with regard to early literacy skill development. Among the variables being considered are: parental priorities, access to printed materials, kind of questions asked children, and access to augmentative systems during book reading activities.

Retrospective evaluation of a computer facilitator training program. (P. Reed, student, University of Toronto). This project examines the effectiveness of ACS's facilitator training programs for computer use.

Another research project at ACS *(Toward Further Development of a Modular Wheelchair Tray for the Severely Physically Disabled*; P. Parnes & S. Nauman, REC), done in collaboration with the Rehabilitation Engineering Department, will result in the fabrication and clinical assessment of a wheelchair tray that can be partially tilted to various positions and be folded away beside the wheelchair by a caregiver. Clinical trials will begin in January.

For further information about ACS, write or call Augmentative Communication Service, Hugh MacMillan Medical Centre, 350 Rumsey Road, Toronto, Ontario CANADA M4G 1R8. (416) 425-6220. Address inquires about clinical research projects to Janice Light. All other inquiries may be directed to Penny Parnes.

(cont. from pg. 6)

Federal Registry together with an announcement of state grants. For those planning to pursue the $500,000 Technical Assistance Contract, look for an announcement in the *Commerce Business Daily.* Note: An anticipated 45 day turn around time is expected. Each state planning to apply should be actively working on their plan NOW. For additional information, call Carol Cohen at (202) 732-2197.

NEWS

The U.S. Chapter of ISAAC, USSAAC, held a kick off meeting during the recent ISAAC Conference in Anaheim, CA. What enthusiasm was generated! Congratulations to the newly elected executive committee:

- **David Yoder**, President
- **David Beukelman**, Vice President of Organizational Affairs (& Past President)
- **Judith Montgomery**, Vice President of State Affairs (& Pres. Elect)
- **David Gordon**, Vice President of Financial Affairs
- **Delva Culp**, Vice President of Professional Affairs
- **Carol Cohen**, Vice President of Consumer Affairs

A membership campaign is now underway. For information, write *USSAAC, Barkley Memorial Center, Univ. of Nebraska, Lincoln, NE 68588.*

References and Resources

1 Barnhart, C. (Ed.) (1956). The American college dictionary. New York: Random House.

2 Crystal, D. (1986a). Isaac in chains: The future of communication systems. AAC, 2:4, 140-145.

3 Beukelman, D. Yorkston, K., Poblete, M., Naranjo, C. (1984) Frequency of word occurrence in communication samples produced by adult communication aid users. Journal of Speech & Hearing Disorders. 49, 360-367.

4 Crystal, D. (1986b). Listen to your child. Hammondsworth: Penguin. (cited in 1986a)

5 Mein, R. & O/Connor, N. (1960). A study of the oral vocabularies of severely subnormal patients. Journal of Mental Deficiency Research, 4, 130-143.

6. Yorkston, K. (personal communication, November, 1988.)

7. Beukelman, D., Univ. of Nebraska, NE
Buzolich, M., The Bridge School, CA
Cassatt-James, E., Johns Hopkins Univ., MD
Carlson, F., Rehab. Instit. of Pgh., PA.
Haney, C., Assistive Device Cntr., PA
Henderston, J., Stanford Rehab., CA
Kiernan, S,. Capron Inst. for Rehab., CO
Kraat, A., Queens College, NY
Light, J., Hugh MacMillan Med. Cntr., Ontario, Canada
Musselwhite, C., Irene Wortham Cntr., NC
Romski, M.,A., Emory Univ., GA
Yorkston, K., Univ. of Washington, WA

8 Beukelman, D. (personal communication, November, 1988).

9 Karlan, G. & Lloyd, L. (1983). Considerations in the planning of intervention: Selecting a lexicon. TASH Journal, 8, 13-25.

10 Musselwhite, C. & St. Louis, K. (1988). Communication programming for the severely handicapped. San Diego: College Hill Press.

11 Romski, M.A. & Sevcik, R. Speech output communication systems for children with cognitive disabilities. Paper presented at the Meeting of the International Assoc. for the Scientific Study of Mental Deficiency, Dublin, Ireland, August, 1988.

12 Romski, M.A. (personal communication, November, 1988)

13 Yorkston, K., Dowden, P., Honsinger, M., Mariner, N., Smith, K. (in press). A comparison of standard and user vocabulary lists. AAC.

14 Cress, C. (June, 1986). Bibliography of vocabulary frequency and wordset analysis studies, Madison: Trace Res. & Dev. Cntr.

15 Yorkston, K., Honsinger, M., Dowden, P., Marriner, N. (submitted for publication). Vocabulary Selection: A Case Report.

16 Morrow, D. (1988). Vocabulary selection for augmentative communication devices: A comparison of three techniques. Masters Thesis. University of Nebraska-Lincoln.

17 Fried-Oken, M. (personal communication, October, 1988).

18 Beukelman, D., Yorkston, K., & Dowden, P. (1985). Communication augmentation: A case book. San Diego: College Hill Press.

19. Vanderheiden, G. (personal communication, September, 1988).

20 Buzolich, M., Bridge School, CA
Cohen, C., UCP Syracuse, NY
Gordon, D., Adaptive Communication Services, Inc., PA
Johnson, R., Don Johnston Devel. Equip., IL.
Honsinger, M., Univ. of Washington., WA
Kiernan, S., Capron Inst. for Rehab., CO
Lee, K. for S. Blackstein-Adler, D. McNaughton, L. Norris, D. Thomas, Hugh McMillan Medical Cntr. Toronto, Canada.
Mathy-Laikko, Meyer's Children's Rehab. Instit. NE
Porter, P. State Dept. of Health.. NC
Shane, H. Children's Hospital, MA
Vanderheiden, G. Univ. of Wisc.-Madison
Woltosz, W. Words +, Inc., CA

21 Fried-Oken, M. (1988). Auditory scanner for the nonspeaking visually impaired. In L. Bernstein, (Ed.) The vocally impaired: Clinical practice & research. Philadelphia: Grune & Stratton.

Augmentative Communication News

One Surf Way
Suite #215
Monterey, CA 93940

PLEASE FORWARD