Augmentative Communication News

September, 1990 Vol.3, No.5

INSIDE THIS ISSUE . . .

UPFRONT

The slow rate with which messages are constructed and conveyed by individuals who use communication aids and techniques is one of many interaction factors affecting communication competence.* Therefore, increasing the *communication rates* of people who use AAC aids and techniques has been, and continues to be, a major technical and clinical concern. The focus of this issue is "rate". The topic is complex. In fact, I'm now very aware that "rate" is a four letter word!

*Note: Rate is by no means the only factor affecting communicative competence. Intelligibility, vocabulary, operational competence, linguistic/cognitive factors, personality, shared knowledge with partners, interpretation skills of partners, and a myriad of interactive concerns (nonverbal behaviors, speech acts, discourse patterns), influence the success or failure of communication.

Many, many thanks to the master clinicians, researchers, and manufacturers I interviewed for their ideas and insights *(see page 8)*. In **For Consumers**, important issues related to rate are discussed. The **Clinical News** section examines strategies currently being used by master clinicians to optimize rate for communication aid users. In the **Equipment** section commercially available products with rate enhancement features are highlighted. **University and Research** summarizes work in rate enhancement underway at facilities around the world.

This August, ACN staff attended three conferences sponsored by the *International Society for Augmentative and Alternative Communication (ISAAC)* in Stockholm, *(cont. pg. 2)*

For Consumers

The role of rate in communication

What does *rate. . .* as in *communication rate* mean? It's a lot more than speed and a lot less than communicative competence. The dictionary says rate is:

> a certain quantity or amount of one thing, considered in relation to a unit of another thing, and used as a standard or measure.

Communication rate is a relative notion. It varies according to the persons involved, task requirements, and the tools and techniques employed. We hear or read that able-bodied adult speakers converse at rates approximating 125 to 180 words per minute (wpm) while the typical rate with which messages are selected and conveyed using electronic communication devices is 5 to 25 wpm.[1] Of course, wpm or speed of information transfer is not equated with effective communication. However, slow rates also cause asynchrony, which has a major impact on interaction. Thus, rate considerations involve information transfer and the rhythm and synchrony of turn transfer (i.e., how turns are distributed, the length of a turn). To date, most attention in AAC has focused on increasing information transfer through better keystroke efficiency *(i.e., decreasing the number of selections required and increasing the amount of language the user can select)*. However, keystrokes are: 1) not necessarily directly related to the rate of communication possible, and 2) do not account for real world situations, when other variables require the user's attention.[2,3,4,5] Keystrokes tell us about equipment, not the human factors involved in using devices to communicate. A person's rate of communication depends on *(cont. pg. 2)*

Augmentative Communication News

UPFRONT (from page 1)

Sweden: *Developing Countries Conference*; *4th Biennial Conference*; and *Research Symposium*. The **Governmental** section contains reflections on AAC's official governing body. Enroute, we were fortunate to visit with colleagues in Norway, Sweden, and Denmark and to experience the beauty of Scandinavia and the warmth and talent of its people. Thanks especially to ISAAC-Sverige; Fred and Ewa Lundin; Stephen von Tetzchner; Karen Rygaard; Mogens Hygum Jensen; and staff at DATCH for their graciousness. I suppose "the party's over for now!" It's back to work and a very busy time of year! Remember...the ACN Hotline number is (408) 649-3050. If we're not in the office, the answering "machine" picks up on the 4th ring. If you hang up before then, you won't pay for the call. Have a great month!

Sarah Blackstone, Ph.D., Author/Editor of ACN

For Consumers (cont. from pg. 1)

variables related to learning and functional use of rate enhancement techniques, as discussed below:

People related issues. Rate, and factors affecting rate, are user and partner dependent. For years, interaction studies have confirmed rate related problems in the interaction patterns of AAC dyads, particularly those who use communication aids. Studies of able-bodied[6,7,8,9,10] and disabled[11, 12,13,14] persons learning to use machine-based rate enhancement techniques suggest that:

- Performance improves over time [7-14]
- Each AAC user is truly unique in ways that are often qualitatively, as well as quantitatively different. Studies with able-bodied subjects do not generalize to individuals who use AAC.
- In a study of the learning patterns over ten sessions for 3 sequential coding techniques, 9 of 10 adult AAC users with physical disabilities performed significantly better retrieving messages using 80 letter codes than iconic codes. Most subjects with limited spelling (1st grade) also performed better with letter codes. One subject, a long time user of Blissymbols, preferred and recalled iconic codes better.[11]
- Personalized codes are not recalled better. People are inconsistent in selecting codes, even with clinical guidance.[8,11]
- Able-bodied college students took from 2 to 14 hours to become proficient users of certain rate enhancement techniques. For scanning, prediction yielded better scores than coding techniques. For direct selection, some subjects did better with coding, others with prediction.[8] Different cogntive styles were observed.

Partners are important. To date, the "best" rate enhancement technique is a skilled, human partner, i.e., someone familiar with the user's unique communication style, who predicts (and confirms) from information the user provides.

Task related issues. Communication tasks are motivated by needs that are social (conversation, greetings), academic/vocational (writing, lecturing), and personal (grocery list, journal). Rate requirements for transmitting information and transferring turns vary with each task.

A major focus in AAC has been on social interaction, which has four purposes:[15]

1. Communication of needs/wants
2. Information transfer
3. Social closeness
4. Social etiquette

Because social communication involves more than one person, *rhythm* and *synchrony* as well as *speed* are needed. Speed is important for transmitting wants and needs, saying "please and thank you", exchanging information, requesting assistance, introducing oneself, and when being humorous.[16] Other communication tasks may emphasize rhythm more than speed. For example, a lecturer often speaks slowly and pauses frequently, while a comedian may speak in an idiosyncratic fashion (exaggerating rate or speaking in bursts with long pauses). Finally, when the purpose of interaction is to initiate, maintain, or develop social closeness, timing of turn exchanges may be primary. In fact, some researchers are suggesting the rate and rhythm of turn exchange may be a more important index of social ability than the speed of message selection and retrieval.[6,11]

Academic and vocational tasks generally involve writing. Writing (or drawing) always requires the use of a tool. Tools affect rate. That is why conversational rates (in wpm) achieved by those using communication aids can compare favorably with writing and not speaking rates. Average typing rates for transcription are 50-60 wpm *(good typist)*.[17] However, the average *good* typist's expressive rate is 27 wpm; the poor typist's is 18 wpm.[1] For hand writing, the average adult's rate is 35-40 wpm.[18]

- Sloan's[19] 1986 study provides writing norms for males and females enrolled in grades 1,2,3,4 and 5. For example, first graders wrote 2.4 wpm (males) and fifth graders wrote 10.4 wpm. Standard deviations ranged from 1 to 3 wpm,. Note: Data are available upon request from Nahum Sloan, Erinoak, 2277 S. Millway, Mississauga, ON, Canada L5L 2M5 FAX (416) 820-1333.
- Comparing a 3rd grade physically handicapped student's writing rates to these norms, the student, using a predictive word processing program, was able[13] to demonstrate competitive speed.

When the communication goal is personal expression *(e.g., maintaining a journal, writing poetry)*, rates are generally less of a concern.

Tool/technique related issues. Communication rate is associated not only with the tasks and people involved, but can be enhanced or restricted by the AAC tools and/or techniques selected. Some AAC techniques are more naturally interactive (sign language) than others (machines). Those who use manual signs can converse at normal conversational rates. However, given the features of current devices, it is impossible for individuals who select messages from communication devices to approximate real time conversational rates. Thus, we can not look to our machines to solve all our problems with rate.

Some Considerations

1. Automaticity. Persons who use AAC symbols, aids, and techniques need to become experts, i.e., communicatively competent so they are free to focus on their partner

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and the interaction. The road from novice to expert is a long one and requires lots of practice. Developing automaticity, using manual signs or communication aids, means integrating motor, perceptual, cognitive and linguistic aspects of a complex set of tasks and then using those skills to communicate. Effective teaching strategies with accurate, timely feedback on performance are required.

Note: Once we do something one way, it is very difficult to learn to do it another way. Beware! When you "update" even part of a person's communication system, you may be taking away their automaticity.

2. Cost/benefit ratio. A growing concern in AAC is the cost in money, time and energy that users, professionals, and families spend learning to use AAC equipment *(as well as financial cost of the equipment and training required)*.[11,20] What benefits are accrued? Is communicative competence increased? Does it matter if a person has a message transfer rate of 5, 10, 30, or 80 wpm and a turn transfer rate of 15, 5, or 2 seconds? To whom? Under what circumstances? How fast does someone need to be? What aspects of the interaction affect rate positively/negatively?

3. Faster is not always better. Sometimes, increasing the rate of output is not desirable. For example, if the intelligibility of a communication aid is poor, interactants are not likely to benefit from faster rates. Also, when expert signers or users of communication boards *go too fast*, unfamiliar partners may be unable to interpret their messages.

4. Developmental and remedial issues: Rate becomes a more important issue as chronological and mental age increase. But, young children and persons with cognitive challenges are using rate enhancement techniques. Researchers!

1) How well do children and persons with mental challenges learn and use rate enhancement strategies? Which ones?

2) What impact do coding techniques have on the development of conversation, writing, motor, language skills?

3) Predictive word processing programs seem to provide linguistic support (with or without enhancing rate) to children and adults with language problems. How does this affect the acquisition of literacy skills?

Clinical News

Enhancing rate in AAC: Guidelines and strategies

The process of expressing messages using communication aids involves the continual integration of sensory, perceptual, motor, cognitive and linguistic skills. To use a communication aid the user must:

- 1. Decide what to say and how to say it
- 2. Determine what to select
- 3. Recall the code and/or locate the appropriate item
- 4. Make the selection
- 5. Determine/confirm whether desired selection was made
- and so on step-by-step (e.g., recalling the next code, then making another selection, etc.)

These steps depict only the user and device, rather than the more complex process of communicating. Because many individuals who use communication aids and devices often have multiple disabilities affecting cognitive, perceptual, and motor skills, techniques/strategies need to acount for and support such factors in attempting to improve communication efficiency at each step.

Selecting rate enhancement techniques. Both able-bodied and AAC users have unique skills, experiential backgrounds, abilities, preferences, goals and learning styles (i.e., types of processing and ways of accommodating during learning) that affect the clinical decision-making process. Not surprisingly, certain people find certain machine generated rate enhancement techniques *easier to learn and preferable to use*.[8,11] Multiple trials over time with probes taken during training is required to project potential rates as an expert user. Timing an individual's performance in a one-shot assessment does not reveal much about benefits a user can expect from a particular technique or device.

Implementing rate enhancement techniques and strategies. Rate can be affected positively (or negatively) by clinical decisions related to access, vocabulary selection and organization, nonelectronic/electronic aids, user and partner behaviors. Here are some ideas!

1. Enhancing Rate through Access: For social communication, major improvements can be made by positioning a person, communication display/device, and/or a partner in ways that minimize cognitive, motoric, and perceptual demands. For writing tasks, an ergonomically designed work station is recommended. Both scanning and direct selection techniques provide access to communication displays. Don't assume in all cases direct selection is faster. For some, scanning is faster.[3]

* Position user and partner so motoric demands are minimal, taking fatigue into account
* Position selections on communication displays so user's sensory/ motor skills are optimized
* Keep in mind both interactants' need to use and interpret multiple modes
* Provide more than 1 way to access communication displays, across different tasks and contexts as well as within the same task or context (e.g., head pointer & voice activated switch)
* Go with the fastest access technique as a primary mode. For example, don't forget the power of eye gaze if someone has an automatic scanning device.
* Work towards more efficient access in the future.

2. Enhancing Rate Through Vocabulary Selection/ Organization: Rate issues and vocabulary selection issues go together. Vocabulary selection should yield efficient/effective word sets so individuals have quick access to what they want to say. See volumes 1:5 and 3:2 of ACN on vocabulary selection and organization of symbols, for more in depth information. See also references #21 & 22.

* Select frequently used words in user's language (if possible use vocabulary lists for similar age groups, disability types and contexts)
* Select words most frequently used in person's own communication
* Consider ways to store vocabulary so user can retrieve it efficiently.
* Provide conversational control/error correction vocabulary, e.g., "that's not what I mean," "Please wait 'til I'm finished."
* Place whole words or phrases in single locations
* Use open-ended messages, e.g., "Will you please-----?" "What do you think about----?"

(continued on page 4)

3. Using Nonelectronic and Electronic Devices to Enhance Rate:

In addition to positioning and vocabulary considerations, additional rate enhancement techniques are available in communication devices. Techniques and strategies for electronic and nonelectronic devices are needed to achieve operational competence.

* Provide way to identify topics
* Devise ways to increase automaticity using communication aids
  a) use similar locations across displays
  b) put frequently used words on each display
  c) provide similar ways of organizing vocabulary across displays (categorical or contextual).
  d) consider what user does automatically, if you reorganize
* Position selections on array so user has easy access to frequently used messages (e.g., Direct selection devices should pay more attention to user's physical capabilities and performance, while scanning arrays also should take into account mechanical issues)
* If using a multiple overlay approach, make all vocabulary as accessible as possible. For example, you can use a Handi-Page Holder for the SuperWolf, Touch Talker, Light Talker, Intro Talker, and Real Voice with membrane keyboard. Available from Speech-Language Pathology Dept., Meyer Children's Rehabilitation Institute, 600 S. 42nd St., Omaha, NE 68198
* Use multiple output options (intelligible speech, print, readable display)
* Use rate enhancement techniques to retrieve messages quickly: Sequential Coding, Linguistic Prediction, Automatic generation of speech, words or phrases in single locations, etc
* Develop strategies to assist user to search lists/charts (groups of 5, alphabetic, categories)
* Provide instructions for partners

4. Rate Enhancement Strategies for Users:

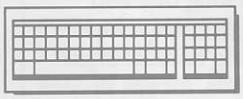
Behaviors of individuals who use communication aids and devices can either facilitate or reduce communication effectiveness and efficiency. As clinicians we need to teach operational competence, but also focus beyond devices in addressing issues related to rate. What can help? Body language, eye gaze, vocalizations, and particularly the user's skill at "reading" a partner and the user's willingness and ability to assume responsibility and be flexible.

* Encourage use of voice and speech approximations
* Encourage use of telegraphic utterances. Teach users to be economic
* Encourage use of multiple modes of communication
* Teach "meta" strategies. Users should learn to judge how the interaction is going and ways to modify it. For example, some listeners are good at co-constructing messages. Others are not. Users should be judicious in their encouragement of listener prediction
* Increase user competencies related to a variety of communication acts
* Increase user competencies related to discourse strategies
* Teach first letter cueing/cued speech
* Teach speed writing (e.g., " u r the 1 4 me!) and use of abbreviations/macros
* Practice until reach level of automaticity using High, Low, and No Tech approaches. This does not necessarily mean "drills." Consider using role playing situations
* Teach use of gestures and eye gaze to code generic phrases and sentences (Can I have that?)
* Teach conversational control strategies, e.g., fillers, repair strategies
* Bring to the level of awareness the subtle codes the user and familiar partners rely on (note: they are often idiosyncratic)
* Teach turn yielding signals (e.g., look at partner, look away, sit back, lift eyes)
* Develop ways to get in the conversation and keep partner's attention

5. Rate Enhancement Strategies for Partners:

Familiar partners can act as facilitator and enable interactants to carry on "normal-like" conversations. Unfamiliar partners often feel incompetent because they do not know what to do, when or how to do it. Thus, training and on-site support are required. Most partners prefer to be doing something (e.g., involved in co-constructing messages) rather than sit passively by while the user prepares a message.

* Make a communication profile of the user. Provide it to primary partners. For a sample copy write Howard Shane, CEC, Fegan 906, Children's Hospital, 300 Longwood Avenue, Boston, MA 02115 ($US)
* Provide instructions on the display so partners know what to do
* Observe. Be aware of what the user does
* Give partners something to do during times the user is constructing a message
* Orient partner toward output modes
* Evaluate partner comprehension
* Encourage partner to practice with the user
* Encourage partner to interpret eye gaze and other cues and ask for confirmation
* Teach partner to predict, confirm messages (or message parts) from information user gives
* Teach partner to provide ways for user to make choices quickly
* Teach partner to wait and follow, rather than lead!



Equipment

Getting language out of a box!

A major focus of AAC manufacturers is to enable individuals who use communication devices to say what they want to say as quickly as possible. Most AAC companies offer techniques that allow the storage and retrieval of messages using one or more rate enhancement techniques.
(Note: these techniques are used with direct selection and scanning devices)

Rate Enhancement Technologies
(Characteristics, advantages, and disadvantages)

1. LEVELS: Letters, words, phrases, messages are stored under single "keys" over multiple levels.

   Advantages: Limited cognitive demands. Increased access to vocabulary. Disadvantages: Need for multiple displays. Time spent changing displays to access vocabulary. Dependence of user on others.

2. SEQUENTIAL CODING (abbreviation expansion): multiple signals specify stored vocabulary

   1. Morse code: dit/dah - rule-based - requires spelling
   2. Alphanumeric codes: letters/numbers - rule-based - requires some linguistic awareness/skills
   3. Iconic codes: graphic symbols - idiosyncratic - requires multiple semantic associations
   4. Color/number codes: color/number combinations - idiosyncratic - for limited vocabulary - requires recognition of color/number

   Advantages: Limited number of key strokes to access large vocabulary. Reduced motor requirement. No need to change overlay. Increased user independence. Disadvantages: Significant cognitive demands on user: Need to learn code for each message or use a chart. Time requirement for learning and teaching. Difficulty retrieving codes in real situations. Collisions among codes. Need for organization (rules) in coding schema. Need for error correction features.

3. LINGUISTIC PREDICTION: Machine offers a short list of the most likely next letter/word/phrase/story, any of which can be selected. Predictions can be made on the basis of letter, word, syntax, and pragmatic information stored in the computer.

   1. Fixed: Predictions remain the same, (e.g., based on frequency of occurrence in language). User can learn as a code
   2. Dynamic: Predictions based on recency of occurrence so they change. User needs to attend to display
   3. Pseudodynamic: Predictions updated periodically (e.g., every 6 months) based on user's utterances. This requires device to collect statistics that can be reviewed by family, user, professional prior to making decisions. This is not yet available.

   Advantages: Minimal memory requirement, machine assumes some of cognitive load. Linguistic support provided. Reduced motor requirement (not good for those who are fast). No

need to change overlay, independence of user. May be powerful tool for those with language difficulties (dyslexia, 2nd languages, etc.)
Disadvantages: Perceptual/motor task, i.e., looking back and forth at display interferes with automaticity and can actually impede speed. Need for error correction features. Vocabulary lists need to reflect individual users lexicon and style.

This next section briefly describes some of the AAC products with sequential coding and/or linguistic prediction features available from leading AAC manufacturers.

Zygo, Industries, Inc. *P.O. Box 1008, Portland, OR 97207-1008.* (800)234-6006 FAX (503) 684-6001 The **Lightwriter** is the only device with two displays. This allows face-to-face communication so user can speed write and partner can predict from the display. Sequential coding (abbreviation expansion) techniques are available on most Zygo products: **Talking Notebook** and **PolyCOM and PolyTALK** use simple letter-number codes. **The Macaw,** with its digital speech, allows for iconic coding, as well. The **PACA** is a prediction program in the Epson HX-20 computer with a rule-based letter and word anticipation feature. It also permits coded messages.

Words +, Inc. *P.O. Box 1229, Lancaster, CA 93584 (800) 869-8521 FAX (805) 949-0973.* The EZ Keys family **[E Z Keys, Morse WSKE, Scanning WSKE, Expanded Keyboard Emulator]** are programs for IBM-compatible PC's that allow literate users to run standard software (i.e., keyboard emulators with special communication and rate enhancement features).* They offer both static and dynamic prediction and abbreviation expansion. The **Equalizer**, a dedicated communication program, has similar features. **Talking Screen** offers sequential coding and a dynamic display. Graphic symbols (on the monitor) can be accessed directly or sequenced as codes to retrieve programmed messages. Autolinking features link symbol sequences not previously programmed.

* See Table I. for products (most are new) designed exclusively for word processing applications.

Future: Words + plans to add communication grabbers in SideTalk (EZ Keys family), allowing users to carry on a conversation without leaving their application program). These "grabbers" organize vocabulary by branching. For example, if user wants to say hello to several people, he can select F1 to access a list of greetings and choose from among 10 different ways to say hello or goodbye. Also, the addition of natural language processing to current programs will provide syntactically-based prediction.

Sentient Systems Tech., Inc. 5001 Baum Blvd., Pittsburgh, PA (412) 682-0144 FAX (412) 682-0241. **The EyeTyper 300** has sequential coding.

Future: The **Dyna Vox** [*Dynamic, Voice Output augmentative communication aid*] and **Picture Based Dynamic Display Communication,** the first application program, will be available January 1, 1991. This brand new portable, communication aid with a dynamic display has a backlight fluorescent display and is accessed using a touch screen or 1-4 switch scanning or joystick input. DECtalk output, rechargeable battery, and 2 serial ports. This first application program was developed by Faith Carlson and includes over 800 pictures, animated action words, and allows selection from successive menu screens and sequential coding. Future application programs to look for include: An alphabetic dynamic display with abbreviation expansion, word completion and sentence templates; Alternative picture systems; Larger picture libraries; Games, etc.

Prentke Romich Co. (PRC). *1022 Heyl Rd. Wooster, OH 44691 (800) 262-1984 FAX (216) 263-4829.* The **Light Talker** and **TouchTalker** offer sequential coding. They have 3 application packages based on a MinSpeak approach. MinSpeak is an iconic coding technique developed by Bruce Baker and referred to as semantic compaction. In a recent study,[4] **Word Strategy,** compared favorably to prediction and abbreviation expansion techniques if vocabulary was stored in the device. However, if not (and the user needed to spell), keystroke savings compared less favorably. According to authors Bruno and VanTatenhove, rate enhancement was not a major focus in developing **I.E.P.** and **Power and Play** application packages, but some benefits

Table I. PREDICTION IN WORD PROCESSING

NAME	REQUIREMENTS	PRODUCT DESCRIPTION	COST	COMPANY
Predict It Stand-alone word processing program	Apple 2 series, 128K, 5 1/4" floppy, Echo, Can be used w/ AFC to get added features	40 column word processing program based on work by P. Schwedja. Editing capabilities, Speech output reads text, menu. Static and dynamic displays. Some customization.	Avail. soon $148US	Don Johnston Developmental Equipment, P.O. Box 639, Wauconda, IL60084-0639
Write-away Stand-alone word processing program	MS DOS and Apple 2 GS	40 or 80 column word processing program. Letter prediction, speech output, spell checker. Keyboard & scanning version	Avail. soon $125US	Institute on Applied Technology, Children's Hospital, 300 Longwood, Boston, MA 02115
PAL Use with word processor (PAL-Star recommended)	IBM-PC compatibles (note: PAL-Star comes with PAL)	Developed at Microcomputer Centre, Univ. of Dundee. Enhances speed; provides linguistic support, 3 vocabulary lists, frequency and recency word prediction	Avail. soon $70US/ UK 40 pounds sterling	Scetlander Ltd, 74 Victoria Crescent Rd, Glasgow G12 9JN, UK FAX (44) 41 357 5034
Mind Reader Stand-alone word processing program	MS DOS	80 column, word prediction Note: this program has been available for some time.	Share-ware $5-6	Easter Seal Society, 5755 W. Alameda, Lakewood, CO 80226 (To buy it, costs approx. $50)

(continued on page 6)

have been documented.[25] **The IntroTalker** offers limited coding.

Future: Prentke Romich Company and Semantic Compaction are exploring ways to make the transition from codes to spelling more automatic. They are also interested in adding letter and syntactic prediction to existing systems. Also new at PRC: DecTalk is being offered as a speech option for the **Light Talker** and **Touch Talker**. An updated and improved **I.E.P.+** will be available soon.

Phonic Ear Inc. *250 Camino Alto, Mill Valley, CA 94941 (800) 772-3374 FAX (415) 332-3085.* The **VOIS 160** will soon offer 2 application programs. Already available, **P.A.L.L.S** has sequential coding options (e.g., abbreviation expansion, label sequencing). Other rate enhancement features include: Talk buffers and a call key.

Future: **VoisShapes** (to be released in November, 1990) uses sequential coding (abbreviation expansion, iconic codes) and has a prediction feature. Grabber and hot keys offer quick retrieval of 25 messages.

Innocomp. *33195 Wagon Wheel Drive, Solon, OH 44139 (216) 248-6202 FAX 216 248-0375.* Say-It-All II Plus and Say-It-Simply Plus offer MSL II and CARE Software with sequential coding options. (Note: Their new speech technology will be available soon - male voice).

News

NOW AVAILABLE - 1990 version Wall Chart of Commercially Available Communication Aids

updated by **Arlene Kraat and Marsha Silver-Kogut.**

Describes primary features of over 50 portable AAC devices available in North America. This chart encourages clinicians to consider all options for their clients, not just those they happen to know about.

Price - $5 each, $40 for 10 and $90 for 25 charts. Available from REC - Aug. Comm., A.I. Dupont Insititute, P.O. Box 269, Wilmington, DE 19899.

Adaptive Communication Systems Inc. (ACS) *Box 12440, Pittsburgh, PA 15231 (800) 247-3433 FAX (412) 264-1143.* The **Real Voice** and the **Eval Pac** offer sequential codes (logical letter codes and multiple picture sequencing.) A brochure "*Organizing Abbreviation Expansion*" is available upon request. It provides a structure for coding to save time and help avoid mistakes.

Future: *ACS* will soon be introducing a new device (as yet to be named) with 4 minutes to 60 minutes of digital speech, a built in 3 1/2 " disc drive, LCD display, RS 232 port, sequential codes, picture stringing, and some text to speech capability. Plans are to create a series of applications using basic abbreviation expansion codes which consumers can add to. Note: Because it uses digital speech, this device has multi-lingual applications.

Governmental

Reflections on ISAAC

When I think of "government," I generally think in the upper case "G" sense...like the U.S. Federal Government, California State Government, or Monterey City Government. You, of course, will think about Governments closer to your lives, but you get the idea! This section is about ISAAC. After all, it's the AAC government.

I know something about how each of my "G" governments work (and don't work). I'm particularly aware of the amount of money I pay in taxes to support various governments. And, if I stop and think about it, I can list lots of "government" things I take for granted that my taxes help buy (e.g., roads, tap water, sewage disposal, garbage collection, police and fire protection, schools for children, food and shelter for those less fortunate). Not that it always works well . . . But, the truth is I'm generally happy about my Governments. However, I don't participate very much beyond taking my right to vote seriously and supporting a cause I feel strongly about now and again.

Since the ISAAC Conferences in Stockholm, I've been reflective about our AAC government, the International Society for Augmentative and Alternative Communication (ISAAC) and its growing number of national chapters. In Stockholm, I observed more than 500 delegates from 25 nations come together, not of one mind certainly, but with one heart. Imagine that many people getting together who think augmentative communication is important! The learning, playing, comparing notes, asking questions, agreeing, disagreeing and caring was special. . .very special.

ISAAC is making things happen for you, and for me, and for all those around the world that have trouble communicating, or those who care deeply that some people can't communicate very well (or at all). Without an ISAAC, a central entity that organizes and governs us, the roads to so many countries wouldn't be paved, the food for thought and schools for learning might not have been shared. Consumers, clinicians, educators, researchers, manufacturers, and families belong to ISAAC directly or through ISAAC-UK, USSAAC, ISAAC-Sverige, or other national chapters.

ISAAC is a warmer, more human, more real organization/government than I have ever experienced. It has, of course, some great leaders as Presidents: Shirley McNaughton, Gunnar Fagerberg, Penny Parnes, and Arlene Kraat. It also has an awesome amount of people power! Even if you never think international, think close to home! ISAAC is not just for the world out there. It is for us. Your support brings benefits you now take for granted. As a government, it may have a little "g", but it's a BIG ISAAC. Make plans now to come to the next conference in 1992, Philadelphia, PA. And. . . pay your taxes (a.k.a. dues), if you have not already.

For information write: ISAAC Secretariat: c/o Liz Baer, P.O. Box 1762 Station-R, Toronto, Canada M4G 4A3

University & Research

Rate-related research and development projects

This section highlights studies at several institutions where researchers are currently working in the area of rate enhancement. For the most part, studies focus on 1) increasing keyboard efficiency *(including work in natural language processing)* and 2) describing learning factors related to rate enhancement technologies. A third research area, exploring actual/functional use of rate enhancement techniques during real communication tasks, is also an area of concern to researchers. *(Note: This list is not meant to be inclusive, but rather to provide a sample of current projects. Let me know of others! The names listed are, in most cases, not the only researchers involved in these projects.)*

Children's Hospital and IBM Scientific Center, *Boston, MA*. (N. Jarrell and H. Shane). This project is based on the concept that rate could be enhanced if communication aids were more like instruments (and less like typewriters). Researchers are developing a phonetic keyboard so that individuals with good hand or head control can produce phoneme to text translation using a mouse.

Meyer Children's Rehabilitation Institute, *Omaha, NE*. (P. Mathy-Laikko, C. Zellhofer, R. Jones) Using bigram and trigram sets on membrane keyboards, researchers are comparing keystroke and rate savings. They will present results in a paper "*Comparison of two keystroke saving strategies*" at the ASHA Convention in Seattle, WA, this November.

Microcomputer Centre, University of Dundee - Dundee, *Scotland* - (A. Newell, N. Alm, J. Arnott). A major research emphasis of this group is the application of A.I. techniques to the design of more interactive AAC systems by developing: a) CHAT. System that will assist user by predicting suitable conversational narratives (e.g., jokes, stories, the latest gossip, descriptions, directions). Phrases are stored by speech acts. b) TOPIC. A database navigational system relying on a semantic network structure interrelating stored conversational items. c) TALK BACK. Sentence prediction via a social knowledge base. d) PAL (see Equipment section). Applications in special education are showing benefits from providing children with this type of linguistic support.

Queens College - *Flushing, New York.* (A. Kraat). Results from the 1988 paper, which compared two rate enhancement techniques (prediction and letter abbreviation techniques under scanning and direct selection conditions) *(see ref. #8)* led Kraat to observe that subjects had different processing styles during learning:

- a) some seemed to accommodate better than others. For example, some subjects would select a predicted word or use an abbreviation simply because it made the task easier while others decided how they wanted to say something and would spell rather than accommodate to the technique.
- b) some had a difficult time with prediction saying they "kept losing their train of thought."

Further investigation of these data may provide new insights *(or raise additional questions)* for the field to consider.

Rehabilitation Engineering Center on Augmentative Communication, A.I. DuPont Institute - *Wilmington, DE* (P. Demasco). A major emphasis is the use of natural language processing techniques to improve the efficiency and effectiveness of AAC technologies. Projects underway look at transforming conceptual input into English sentences. Disambiguation of characters from a 12 button keypad and improvement of ill formed messages are current research topics.

State University of New York at Buffalo - *Buffalo, New York*. (J. Higginbotham). Investigations focus on the effect of various "outputs" on listener comprehension. For example, what is the effect on a partner's comprehension when messages are conveyed at 80 versus 5 wpm? What output modes contribute to a dyad's style of communication? How does partner inattention and/or scaffolding/prediction cause communication breakdowns? Results will translate into recommendations for improved equipment design re: rate, redundancy, levels of intelligibility, types of displays.

The Royal Institute of Technology, Stockholm, Sweden. (Sheri Hunnicutt). Among the projects underway at the Institute are those looking at the effect of semantic and syntactic information on machine prediction programs. Questions include: the optimal number of choices to provide users; the nature of these choices (e.g., word frequency information, recency information); and the impact of these variables on reducing the number of key strokes.

Trace Research & Development Center, University of Wisconsin-Madison, - *Madison, WI*. (G. Vanderheiden). Trace's major focus of research is the human-machine interface. Multiple projects are underway. In "*Temporal Relationship of the Components of the Selection Act*" *(see ref. #2)*, the need to consider the user's preselection activities and strategies employed in looking at the selection cycle was demonstrated.

NEWS

TRACE Announces New Edition of C.D. Database for the Mac Intosh

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Experimental Glossary - preliminary glossary for AAC terminology

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For more information contact Trace Res. & Devel. Center, University of Wisconsin-Madison, 1500 Highland Avenue, Madison, WI 53705-2280. (608) 262-6066 FAX (608) 262-8848

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