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## High-tech data collection in AAC

Tools for analysing & applying computerised language data

Merryn Gibson | Speech Pathologist  
Liberator Pty Ltd  
[www.liberator.net.au](http://www.liberator.net.au)

merryn@liberator.net.au | 0450 506 447

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## Assessment in AAC is ongoing, complex and multi-faceted

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## Assessment in AAC

The topic of assessment for individuals with limited speech who need augmentative and alternative (AAC) systems is a **huge subject**. Multiple day conferences have been held on the subject, with resource manuals published and training courses developed. For the very beginner in the field of AAC, it is important to note that **an initial assessment is conducted to evaluate the person's speech and language skills and factors related specifically to operation and use of augmentative and alternative communication systems**.

Then, **ongoing assessments are conducted to outline the person's progress in his/her communication development**.

- Gail Van Tatenhove

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## Assessment in AAC: not a one off!

- Initial Assessment for Today
- Detailed Assessment for Tomorrow
- Follow-up Assessment

Beukelman & Mirenda 2013. *Augmentative and alternative communication: Supporting children and adults with complex communication needs*. Baltimore, MD: Brookes.

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## International Classification of Functioning, Disability and Health (WHO ICF)

The diagram illustrates the WHO ICF model. At the top is 'Health condition (disorder or disease)'. Below it are three interconnected boxes: 'Body Functions & Structure', 'Activity', and 'Participation'. 'Activity' is in the center, with double-headed arrows connecting it to 'Body Functions & Structure' and 'Participation'. Below these three boxes are 'Environmental Factors' and 'Personal Factors', with arrows pointing up to 'Activity'.

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## Model for AAC evidence-based practice – Hill and Romich 2006

The flowchart shows a process starting with 'Client Goals', leading to 'Client Profile Development', then 'Step 1: EBP Questions', 'Step 2: Research/Client, Practitioner & Stakeholder', 'Practice/Performance', 'Evaluation/Change', and finally 'Step 3: Client/Practitioner/Client Support'. A feedback loop goes from 'Evaluation/Change' back to 'Step 1: EBP Questions'.

- 1) Ask EBP questions
  - client oriented
- 2) Locate & review external evidence
  - Evaluate the research, case studies etc
- 3) Collect & review personal evidence
  - Client & family identify values, goals & expectations
  - Collect performance data on use of AAC
  - Allows for reporting of baseline data
- 4) Use of Evidence for assessment/intervention
  - Analyse and report data to make decisions about success of the intervention
  - Can adjust and modify intervention to ensure client is achieving maximum benefit

Hill 2006 – A Case Study Model for Augmentative and Alternative Communication Outcomes. *Assistive Technology Outcomes and Benefits*, Fall 2006, Vol 3, Num 1.

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### Communicative Competence

Janice Light (1989) extrapolates **communicative competence** as:

- Functionality of communication
- Adequacy of communication
- Sufficiency of knowledge, judgement and skill: **Linguistic, Operational, Social & Strategic Competence**

<p><b>Linguistic Competence</b></p> <p>Receptive and expressive language skills as well as the ability to use the symbols of a communication system to create messages with complex meanings.</p>	<p><b>Operational Competence</b></p> <p>Technical skills to operate AAC systems - including physical and cognitive skills.</p>
<p><b>Social Competence</b></p> <p>Skills in the social rules of interaction. Knowledge and judgment needed to initiate, maintain, and end interactions, and using communication for a variety of purposes.</p>	<p><b>Strategic Competence</b></p> <p>Compensatory strategies that AAC users require to overcome communication breakdowns and be an effective communicator.</p>

Rocky Bay Positive AACtion kit

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### What kind of data collection method?

Low-Tech? High Tech?

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### Low tech data collection

<p><b>PROS</b></p> <ul style="list-style-type: none"> <li>• Can be highly qualitative</li> <li>• Can be easily adjusted based on client &amp; assessor need</li> </ul>	<p><b>CONS</b></p> <ul style="list-style-type: none"> <li>• Can be time-consuming to collect</li> <li>• Can interfere with interaction between client/ therapists</li> <li>• Can be difficult to analyze</li> </ul>
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### High tech data collection (automated data logging)

<p><b>What can be tracked:</b></p> <ul style="list-style-type: none"> <li>• Time</li> <li>• Output</li> <li>• Action</li> <li>• Input</li> </ul>	<p><b>Privacy</b></p> <ul style="list-style-type: none"> <li>• Clinician-client confidentiality continues to be part of the therapeutic process</li> <li>• Must be optional with client permission</li> <li>• Encryption/password protection</li> </ul>
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Leisher et al 2000. A universal logging for augmentative communication. Paper presented at the 2000 CSUN Conference, Los Angeles. <http://www.csun.edu/~2000csun/comm/2000/psu/00leishy00088/leisher.htm>

Cross & Segalman, 2016. The Realize Language System: An Online SGD Data Log Analysis Tool. *Assistive Technology Outcomes and Benefits*, Volume 10, Summer 2016, Volume 2 pp 74-93. Available online: [www.atlas.org/utob](http://www.atlas.org/utob)

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### High tech data collection (automated data logging)

**PROS**

- Easy to collect
- Can collect large samples
- Doesn't interfere with the interaction
- Can capture highly specific information
- Easy to analyse & present with Realize Language

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### High tech data collection (automated data logging)

**CONS**

- May not capture the type(s) of data you need or want
  - Input from communication partners
  - Multi-modal elements of communication
  - Social / environmental context
- Not easy to adjust based on client need
- May capture data other than client's

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### High tech data collection

- Automatic Data Logging - available on all Liberator devices
  - Accent devices (and legacy PRC systems)
  - NOVA chat & Liberator Rugged 7 devices
- Can turn on and off as desired, will have visual indicator when on

**Accent devices**  
 Chat devices (NOVA, LR7)  
 Menu > Settings > Data Logging.

**Data Logging**  
 Enables collection of language usage

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### High tech – analysing data

- Realize Language: web service for analyzing automated data logs
- [www.RealizeLanguage.com](http://www.RealizeLanguage.com)
  - \$84 USD/ year (30 day free trial)
  - Up to 10 different clients per account
- Provides tools to:
  - Track progress and communication
  - Compare different aspects of communication
  - Create a dashboard summary of performance
  - Share information with the team
  - Quickly create simple reports
- Allows for data to be analysed in terms of
  - Word frequency
  - Parts of speech
  - Performance against target vocabulary
  - Daily/weekly/monthly device use
  - Search for specific instances of words

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### Answering questions with Realize Language

- Which words does my client/child use the most / least?
- If we create a target list of words, how can we see if they are being used?
- How do we compare communication from one day to the next?
- How often is my client/child trying to spell words out? Is he/she successful at doing so? Do these words needed to be accessible in another way?
- How can I find out how and when specific words are used, even when I can't be present?
- Is my client's communication improving over time?
- When is my client most communicative?
- How can I present my client's information in a simple, visual manner?

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Collect Data on an AAC Device → Upload Data to Realize Language Website → Create Easy-to-Use Reports and Analysis

<http://realizelanguage.com/info/login>

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### Realize Language - Use

Page	Widget	Function
Use	Daily	Sums every 15 minute period in which the device was used, during any day chosen using the Date Range selector
	Weekly	Sums every 15 minute period in which the device was used, during any week chosen using the Date Range selector
	Monthly	Sums every 15 minute period in which the device was used, during any month chosen using the Date Range selector

Cross & Segalman, 2016. The Realize Language System: An Online SGD Data Log Analysis Tool. Assistive Technology Outcomes and Benefits, Volume 10, Summer 2016, Volume 1 pp 74-93. Available online: [www.ata.org/ataob](http://www.ata.org/ataob)

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### Realize Language - Words

Page	Widget	Function
Words	Cloud	Word Cloud: Shows the most frequently used words during any time period set by the Date Range Selector.
	Top 10	Horizontal Bar Chart: Shows the 10 most frequently used words during any time period set by the Date Range Selector.
	A-Z	Alphabetized list: Shows all the different words used during any time period set by the Date Range Selector.
	List	Frequency-order list: Shows all the known words (in the database) and non-words, as well as words generated by pre-stored items vs. spelling.

Cross & Segalman, 2016. The Realize Language System: An Online SGD Data Log Analysis Tool. Assistive Technology Outcomes and Benefits, Volume 10, Summer 2016, Volume 1 pp 74-93. Available online: [www.ata.org/ataob](http://www.ata.org/ataob)

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## Realize Language - Log

Page	Widget	Function
Log	Week	A calendar showing 15 minute periods where the device is used during any week set by the Date Range Selector.
	Month	A calendar showing 15 minute periods where the device is used during any month set by the Date Range Selector.

Cross & Segalman, 2016. The Realize Language System: An Online SGD Data Log Analysis Tool. Assistive Technology Outcomes and Benefits, Volume 10, Summer 2016, Volume 1 pp 74-93. Available online: [www.atia.org/atob](http://www.atia.org/atob)

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## Realize Language - Analysis

Page	Widget	Function
Analysis	Parts of Speech	Horizontal Bar Chart: Shows parts of speech by frequency for any time period set by the Date Range Selector.
	Word Groups	Alphabetised display: Shows words used by the client from a Target List of words set using the Manage Goals widget.
	Manage Goals	Alphabetised list: Shows list of targeted words set by choosing Goal List from drop down menus, or by creating a customised list.

Cross & Segalman, 2016. The Realize Language System: An Online SGD Data Log Analysis Tool. Assistive Technology Outcomes and Benefits, Volume 10, Summer 2016, Volume 1 pp 74-93. Available online: [www.atia.org/atob](http://www.atia.org/atob)

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## Future directions for Realize Language

- Working to make other devices and language systems compatible
- Finer analysis of pre-stored vs. spelled words
- Analysis of logs in other languages (German, Spanish)
- Calculation of MLU?
- Filter out modelled data?

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## Feedback on Realize Language

*"I found the ability to look at data a number of ways very valuable. Having visual data enabled me to talk with ABA therapists, working with many of my clients, in a way they could understand."*  
-Phyllis W., CCC-SLP

*"What an incredible help Realize has been for (my child)! I can't wait to share the program with his IEP Team at his school."*  
-Debbie, Mom of AAC device user

- Davidson & Hettenhausen 2016 –
  - Word cloud made data more approachable for parent, was motivational for aide
  - Increased communication between team members reported
  - Were able to identify need to increase certain parts of speech

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## Measuring change

"To make a statement about change in the absence of some kind of metric is *speculation* and not evidence, and it is important that *evidence* drive educational and clinical practice."

The challenges are:

- a) What should we measure
- b) How do we measure it

– Cross & Segalman, 2016. The Realize Language System: An Online SGD Data Log Analysis Tool. Assistive Technology Outcomes and Benefits, Volume 10, Summer 2016, Volume 1 pp 74-93. Available online: [www.atia.org/atob](http://www.atia.org/atob)

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## More information

- [www.realizelanguage.com](http://www.realizelanguage.com)
- [www.liberator.net.au](http://www.liberator.net.au) / [info@liberator.net.au](mailto:info@liberator.net.au)
- Facebook Group: "Realize Language Users Group"