EVERYBODY IN the conversation by using your eyes to talk

Charlene Cullen

Speech Pathologist

Speech Language and AAC Consultant

charlenec@spectronics.com.au

Twitter: @chacullen

How does it work?

- Reflecting invisible infrared light into the eye
- Recording the reflection pattern with a sensor system
- This is then shown on a computer monitor

A brief history

- Last 5 years has seen BIG improvements
- No longer need a specific type of tracking for different eyes
- Can be used in more environments
- Without the need to recalibrate constantly
- Can now be used with glasses, contact lenses, head movements, and one eye

Who is it suitable for?

- People with significant physical disabilities
  - Cerebral Palsy
  - Motor Neurone Disease
  - Multiple Sclerosis
  - Quadriplegic
- Children and adults with varied medical diagnoses

Types of eye gaze systems

- **Integrated eye tracking systems** that will only work with a specific speech generating device

- **Stand-alone systems** that can be used across a broader range of software and hardware choices.

What can you do?

- Communication
- Computer access
  - Email, Word processing, Web browsing
- Control of your environment - ECU
- Text messaging
- Gaming

Video of using eye gaze to playing games

DynaVox VMax with Eyemax

DYNAVOX inter-AACT FRAMEWORK

| | EMERGENT ← → CONTEXT-DEPENDENT ← → INDEPENDENT | | |
	FUNCTIONAL	SITUATIONAL	CREATIVE
YOUNG CHILD 2 - 6			
CHILD 7 - 13			
TEEN 14 - 21			
YOUNG ADULT 22 - 50			
ADULT 50 +			

LANGUAGE USE   LANGUAGE STRUCTURE   LANGUAGE USE   LANGUAGE STRUCTURE   LANGUAGE USE   LANGUAGE STRUCTURE

InterAACt pagesets

- **Language Use:** interactive focus with quick messages and pre-programmed phrases and sentences for conversation

- **Language Structure:** includes grammatical components for language and literacy learning e.g. keyboards, core word vocabularies and dictionaries

Demonstrate Dynavox Pageset

Tobii C12 with Ceye

Tobii C15 with Ceye

PCEye

Tobii Communicator 4

- Included on the C12 and C15 with Ceye
- Add ons
  - Sono Primo
  - Sono Key
  - Sono Lexis
  - Sono Scribe

Demonstrate Tobii Pages

Eye gaze assessment

- Little clinical research
  - www.cogain.org
- Assessment guidelines
  - http://www.cogain.org/w/images/5/5a/Assessment.pdf

Eye gaze assessment

- Considerations prior to trial:
    - Physical – head support, explore alternative access, eye tracking selection method, fatigue tolerance
    - Cognitive – choicemaking, attention, follow instructions, motivation, language level
    - Visual – move eyes in controlled manner
    - Environmental – low tech back up

Eye gaze system

- How sensitive is it to head movement?
- The calibration process
- Is it integrated into the device or is it an add on to a standard computer monitor?

Eye gaze system

- What communication packages can you use with the device?

- Can the device be mounted onto a wheelchair?

- How portable is the device?

- How is the device charged/battery/plug?

Eye gaze system

- Selection Method:
  - Dwell
  - Blink
  - Switch

- Does it track one or both eyes?

- How well does the system cope with glasses or contacts

- Cost

Harry

- Single head switch
- Row/column scanning
- Slow!!!
- Tiring!

Harry

- Competent in using eye gaze for low tech as an direct access method
- Trialled an Eyemax accessory with his own page set
- Good for Harry's positioning

Video of Harry using eye gaze

Benefits of direct selection

- Less pressure on memory load (Jackson & Wagner, 2006)
- Quicker
- Increased Control
- Eye gaze involves less physical effort (for those with tone fluctuation)

Outcomes

"At his cousin's birthday on the weekend I looked over and saw him chatting and laughing away. I walked across and heard that he was really involved in conversation with the group about an AFL footballer – and he had started the conversation! People were amazed as it's the first time we have seen Harry initiate a conversation."

Outcomes

- Easier to talk with his mates in real time
- Increased efficiency at completing school work and answering his teachers in class (continue in Mainstream education)
- More motivated to use his device

Resources

- Available from Spectronics website

www.spectronicsinoz.com/article/eyegaze-system-comparison-chart

- All about eyegaze and a broader comparison chart

www.cerebralpalsy.org.au/__data/assets/pdf_file/0004/6376/2011-TechnoTalk-AprilNewsletter.pdf

Resources

- www.cogain.org
- www.cogain.org/wiki
- http://www.cogain.org/wiki/Eye_Trackers
- www.dynavoxtech.com
- www.tobii.com