The Effect of Motion in AAC Displays on Visual Attention: Preliminary Findings

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RATIONALE

- Commonly, AAC systems are **grid-based arrays**, consisting of **picture-symbols with written text**.
- These often impose **high visual cognitive processing demands** on users that detract from communication (Light & McNaughton, 2013).
- AAC system displays should be designed to optimally support communication and **minimize cognitive demands**.
- Evidence shows that aided **AAC modelling is beneficial** for AAC users (O'Neill et al., 2018), but *only* if they attend visually.
- Visual attention to motion appears early in development and is robust. Hence, **motion can be a useful tool for attracting visual attention for learning.**
- Prior studies indicate that motion is a helpful tool for early literacy learning (e.g., sight words; Light, McNaughton & Caron 2019).
- **Eyetracking research technologies offer a non-invasive tool** to determine which aspects of AAC displays capture visual attention (Wilkinson & Mitchell, 2014) for learning.
- This study predicted that pairing exposure to novel picture-symbols with motion of the selected picture-symbols would increase visual attention.

RESEARCH QUESTION

What is the effect of motion of selected picture-symbols in AAC grid displays on visual attention to novel symbols?

MATERIALS

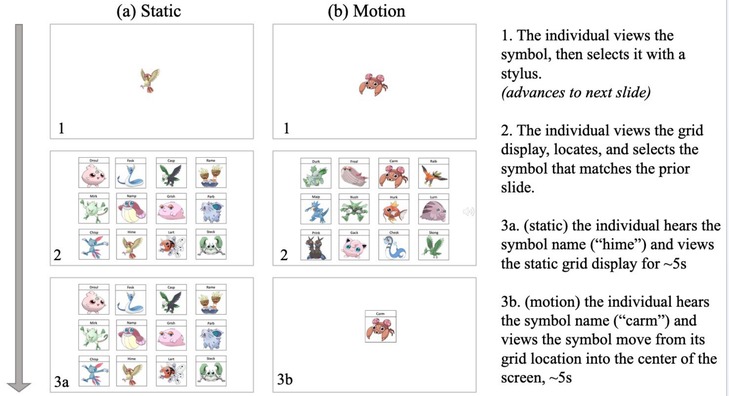
- **Technology:** Automated **research-based eyetracking technology** (i.e., Tobii Spectrum + Tobii Pro Lab software). See Figure 1.
- **Stimuli:** 2 balanced sets of 12 'pocket monsters' (1 for static and 1 for motion) with text. See Figure 2 for examples.

Figure 1: Example of Research Technology

METHOD

- **Design:** within subjects experimental group design with repeated measures.
- **Participants** were young adults. Specifically, college students (n=10), individuals with autism spectrum disorder (n=1), and individuals with Down syndrome (n=1).
- **Procedures**. All participants attended 2-3 sessions that consisted of an exposure task followed by a probe task.
- A 9-point calibration was obtained for each participant.
- During the exposure task all participants engaged with **3x4 AAC display grids** consisting of 12 picture-symbols with written text (half were static representing the current state of practice, and half had targeted motion of the symbol upon selection).
- There were a total of **24 different picture symbols** during exposure. See Figure 2.
- Visual attention data during the exposure task was collected.

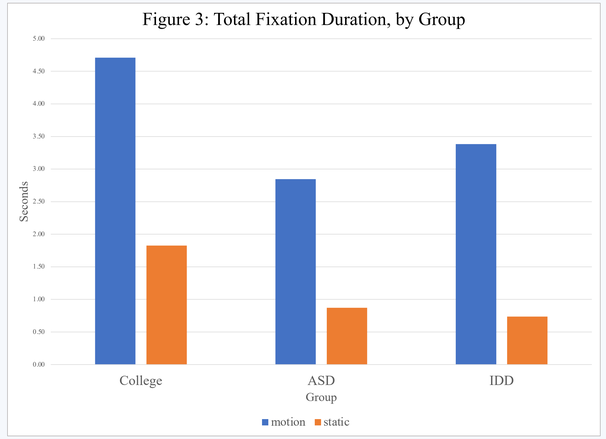
Figure 2: Examples of static and motion exposure trials



PRELIMINARY RESULTS

- Data collection is ongoing. Preliminary visual attention results are presented in **Figure 3** for college-aged students, ASD and DS.
- All participants demonstrated **increased duration of visual attention to targets during the motion condition** compared to the static. (See Figure 3)
- Observation of visual patterns showed similar attention to stimuli eyes across all participants. (see video)
- Accuracy data analysis is in progress to determine learning.

Figure 3: Total Fixation Duration, by Group



CLINICAL IMPLICATIONS

- The use of motion has the potential to support increased visual attention for learning.
- Motion may be an effective support for aided language modeling during AAC symbol instruction.

CONCLUSION

- Preliminary findings suggest that **targeted motion may be a powerful tool to attract visual attention** in order to facilitate learning.
- **Future research is needed** to deepen understanding of the effect of motion on symbol learning in individuals with developmental disabilities utilizing AAC.

FUTURE DIRECTIONS

- Analyze accuracy data for learning in individuals with developmental disabilities when exposed to motion.
- Investigate visual attention to distractors vs target icons.
- Analyze visual attention to eyes in the 'pocket monsters.'
- Utilization of motion in AAC grid displays to support aided AAC modeling.
- Further investigation to determine the effect of motion on visual attention during literacy learning.

REFERENCES (SCAN QR CODE)

ACKNOWLEDGEMENTS

The contents of this presentation were developed under a grant from the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR grant number #90REGE0014) to the Rehabilitation Engineering Research Center on Augmentative and Alternative Communication (RERC on AAC). NIDILRR is a Center within the Administration for Community Living (ACL), Department of Health and Human Services (HHS). The contents of this presentation do not necessarily represent the policy of NIDILRR, ACL, HHS, and you should not assume endorsement by the Federal Government

Huge thanks to all the participants and their families, and thanks to the Centre Region Down Syndrome Society.

The first author was also funded by the AAC Doctoral Leadership grant, US Department of Education H325D220021