


Supporting Literacy in Communication: Visual Scene Displays with Dynamic Text

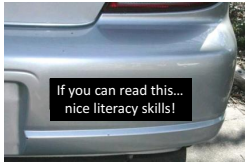

- The Case of Tony -

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Let's think about literacy

How many times – and in how many different ways – have you relied on literacy skills since you woke up this morning?

Let's think about literacy

- Reading the news
- Checking/responding to your email
- Referring to the conference program
- Ordering breakfast
- Texting your colleagues about which sessions you will attend
- Tweeting/checking Twitter
- Getting/following directions to the Sheraton Station Square
- Following the conference signs to find the correct room
- Reading these slides




Literacy

Essential for educational, social, and vocational opportunities, and most occupations require at least rudimentary literacy skills^{1, 2, 3}

Higher literacy⁴ =

- Greater likelihood of employment
- Employment in professional fields
- Higher income



Literacy

Individuals who use AAC are “at risk” for poor literacy outcomes⁵

90% of individuals with CCN do not enter adulthood with functional literacy skills⁶

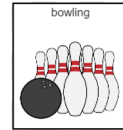
Adults with cognitive or speech disabilities are more likely than the general population to lack functional literacy skills⁴



Sight Words and AAC

Individuals with CCN can and do acquire sight words, and these literacy skills enhance their lives across contexts^{7, 8, 9}

Static sight words in AAC systems ≠ learning of sight words⁷



How do we support sight word learning in AAC apps?



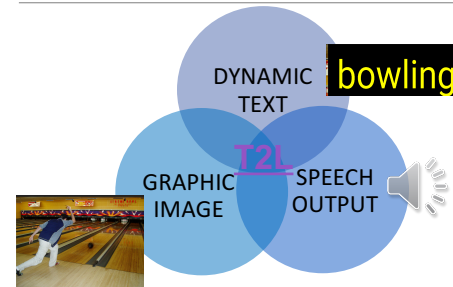
Sight Words and AAC

Does exposure to **dynamic text paired with voice output within a VSD-based AAC app (EasyVSD)** support learning of high-interest sight words for an adult with Down syndrome?

Intended to complement, not replace, direct literacy instruction



Transition to Literacy (T2L) Feature



Tony

45-year-old male with Down syndrome

Communicates using speech


- Composed predominately of a small number of rote, repetitive phrases
- Highly unintelligible to unfamiliar partners

Attends a day program for adults with disabilities

- Study location
- Part of a larger study including 5 other adults with developmental disabilities, 4 of whom also attended the same day program

Literacy skills

- <10 letter-sounds correspondences
 - Not independently decoding
- <20 sight words





Tony

Ten high-interest sight words – movie and music connoisseur

- Note all the movie-related sight words!
- Sight words introduced two at a time

Marv	movie	music
Subway	sing	
Danny	dance	
watch		
Buzz		
Kevin		


Study Characteristics

AB design

A: Baseline – no exposure to EasyVSD app; probes to assess sight word knowledge


B: Intervention – exposure to the EasyVSD app; probes to assess sight word knowledge

- Generalization – probes to assess sight word knowledge using different images
- Maintenance – probes to assess sight word knowledge (1 and 2 month)





Probes

- Baseline
- Intervention
- Maintenance


watch dance bowling sing

- Generalization (during baseline and intervention)


bowling Marv Subway movie

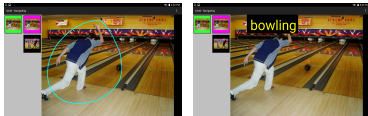


Exposure to the EasyVSD App

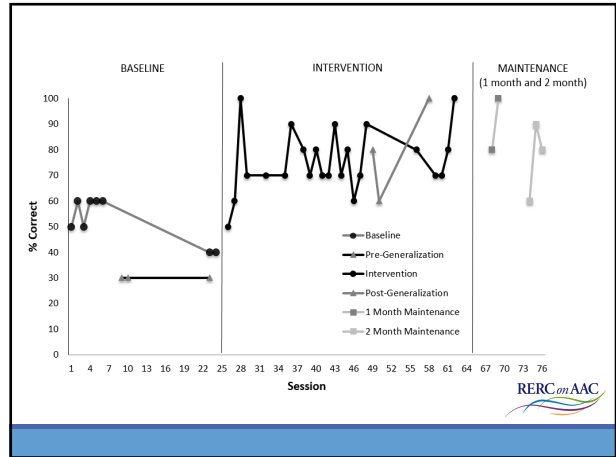
Position tablet
Model 2x

Tony activates hotspot → expand/respond

- 12x each per 2 target sight words (6 VSDs, 2x each)
- 6x each per 2 review sight words (6 VSDs, 1x each)



RERC on AAC



Phase	Number of Sessions	Mean Accuracy	Range
Baseline	8	52.5%	40-60%
Baseline Generalization	3	30%	30-30%
Intervention (all)	23	75.5%	50-100%
Intervention (final 3 sessions)	3	83.3%	70-100%
Intervention Generalization	3	80%	60-100%
1-Month Maintenance	2	90%	80-100%
2-Month Maintenance	3	76.7%	60-90%

RERC on AAC

Results

NAP¹⁰ = **0.95** (strong intervention effect)

Gain scores

- Baseline to intervention = **+23%** (53% → 76%)
- Baseline to final 3 intervention points = **+30%** (53% → 83%)
- Generalization (baseline to intervention) = **+50%** (30% → 80%)

Maintenance performance at or above mean intervention levels

- 1 month = **90%**
- 2 month = **77%**

RERC on AAC

Conclusion

Preliminary evidence that inclusion of dynamically-displayed text paired with voice output and a graphic representation (T2L feature) in AAC systems can promote sight word learning

- Intended to complement, not replace, direct literacy instruction



References

- 1 Mikulecky, L. (1982). Job literacy: The relationship between school preparation and workplace actuality. *Reading Research Quarterly*, 17, 400-419.
- 2 Taylor, M. C. (1989). *Workplace literacy demands*. (ERIC Document Reproduction Service No. ED 330 886).
- 3 Light, J. & McNaughton, D. (2013). Literacy intervention for individuals with complex communication needs. In D.B. Beukelman & P. Mirenda (Eds.), *Augmentative & Alternative Communication: Supporting children and adults with complex communication needs* (4th ed.) (pp. 309-351). Baltimore, MD: Brookes Publishing.
- 4 Kirsch, I. S., Jungblut, A., Jenkins, L., & Kolstad, A. (1993). *Adult literacy in America: A first look at the results of the National Adult Literacy Survey*. US Government Printing Office, Superintendent of Documents, Washington, DC.
- 5 Light, J., & McNaughton, D. (1993). Literacy and augmentative and alternative communication (AAC): The expectations and priorities of parents and teachers. *Topics in Language Disorders*, 13, 33-46.
- 6 Foley, B.E., & Wolter, J. (2010). Literacy intervention for transition aged youth: What is and what could be. In D.B. McNaughton & D.B. Beukelman (Eds.), *Transition strategies for adolescents and young adults who use AAC* (pp. 35-68). Baltimore: Paul H. Brookes Publishing Co.
- 7 Browder, D. M., & Xin, Y. P. (1998). A meta-analysis and review of sight word research and its implications for teaching functional reading to individuals with moderate and severe disabilities. *The Journal of Special Education*, 32, 100-115.
- 8 Fallon, K. A., Light, J., McNaughton, D., Drager, K., & Hammer, C. (2004). The effects of direct instruction on the single-word reading skills of children who require augmentative and alternative communication. *Journal of Speech, Language, and Hearing Research*, 47, 1474-1493.
- 9 Light, J., McNaughton, D., Weyer, M., & Karg, L. (2008). Evidence-based literacy instruction for individuals who require augmentative and alternative communication: A case study of a student with multiple disabilities. *Seminars in Speech and Language*, 29, 120-132.
- 10 Parker, R.J., & Vannest, K. (2009). An improved effect size for single-case research: Nonoverlap of all pairs. *Behavior Therapy*, 40, 357-367.



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Please visit rec-aac.psu.edu for more information

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