SWAAAC Evidence-Based Practice

Symbol-Supported Text for Students with Complex Communication Needs and/or Intellectual Disability

The following is a collection of peer-reviewed journal articles addressing the use of symbol-supported text to facilitate the acquisition of reading skills in students with Complex Communication Needs and/or Intellectual Disability. The intent of this document is to provide some foundational information for the implementation of evidence-based practice. Please contact the SWAAAC office if you would like to add an article to the this resource.

**This document contains a variety of resources including, but not limited to peer-reviewed journal articles, magazine articles, academic papers, and conference proceedings. It is the responsibility of the reader to evaluate the sources and use their best judgment with regard to EBP applications.*

Summary:

-mixed findings with regard to sight word learning and paired pictures with text,
-some findings suggest pictures interfere with acquisition of new words,
-adults with moderate-severe intellectual disabilities performed better with traditional orthography alone over words paired with pictures,
-there is evidence that students with significant disabilities benefit from the same evidence-based literacy instruction (reading/writing) as that of their peers.

Evidence Base:

Effects of dynamic text in an AAC app on sight word reading for individuals with autism spectrum disorder
-Caron, Jessica; Light, Janice; Holyfield, Christine; McNaughton, David
Abstract: The purpose of this study was to investigate the effects of Transition to Literacy (T2L) software features (i.e., dynamic text and speech output upon selection of a graphic symbol) within a grid display in an augmentative and alternative communication (AAC) app, on the sight word reading skills of individuals with autism spectrum disorders (ASD) and complex communication needs. The study implemented a single-subject multiple probe research design across one set of three participants. The same design was utilized with an additional set of two participants. As part of the intervention, the participants were exposed to an AAC app with the T2L features during a highly structured matching task. With only limited exposure to the features, the five participants all demonstrated increased accuracy of identification of 12 targeted sight words. This study provides preliminary evidence that redesigning AAC apps to include the provision of dynamic text combined with speech output, can positively impact the sight-word reading of participants during a structured task. This adaptation in AAC system design could be used to complement literacy instruction and to

potentially infuse components of literacy learning into daily communication. (Caron, Light, Holyfield, & McNaughton, 2018)

Sight word reading in children with developmental disabilities: A comparison of paired associate and picture-to-text matching instruction
-Brenda Fossett, Pat Mirenda
Abstract: Numerous instructional techniques have been used to teach sight word reading skills to individuals with developmental disabilities. The results of research incorporating paired associate instruction, in which familiar pictures are paired with unknown print stimuli, suggest that pictures ‘‘block’’ (i.e., interfere with) learners’ ability to recognize novel text. On the other hand, there is some evidence that both stimulus fading and picture-to-text matching techniques can be used successfully to teach sight word recognition. The present study used an adapted alternating treatments design [Sindelar, P. T., Rosenberg, M. S., & Wilson, R. J. (1985). An adapted alternating treatments design for instructional research. Education and Treatment of Children, 8, 67–76] to compare paired associate and picture-to-text matching techniques for teaching a small corpus of unknown words to two children with developmental disabilities. Results indicated that the picture-to-text matching condition was more effective than the paired associate condition for developing a small sight word vocabulary. Follow-up data for one participant showed that skills developed using the picture-to-text matching strategy were maintained 4 months after intervention. Further research is necessary to extend these findings, particularly in terms of the development of larger sight word vocabularies and the transition from sight word reading to more conventional reading skills. (Fossett & Mirenda, 2006)

Integrated Word identification and Communication Instruction for Students With Complex Communication Needs: Preliminary Results
-Gretchen A. Hanser, Karen A. Erickson
Abstract: The current study investigated the effectiveness of an integrated word identification and communication intervention for children with complex communication needs. Using a noncurrent, multiple baseline design, the study involved 3 participants who completed 75 lessons across 4 to 6 weeks of instruction. All three participants improved their skills of word identification, developmental spelling, icon sequencing and expressive communication. Generalization was documented through increases in the frequency of communication using icon sequencing and spelling outside of the instructional program. Implications for the development of integrated word study programs that combine systematic, sequential phonics instruction with instruction in the use of augmentative communication are discussed, along with directions for future research. (Hanser & Erickson, 2007)

Sight Word Recognition among Young Children At-Risk: Picture-Supported vs. Word-Only
-Meadan, Hedda; Stoner, Julia B.; Parette, Howard P.
Abstract: A quasi-experimental design was used to investigate the impact of Picture Communication Symbols (PCS) on sight word recognition by young children identified as "at risk" for academic and social-behavior difficulties. Ten pre-primer and 10 primer Dolch words were presented to 23 students in the intervention group and 8 students in the control group during interactive games. Assessments occurred at four points and results indicated that children in the control group learned sight words faster under similar conditions of activities and time. These findings are consistent with previous literature and offer further insight into the learning of sight words by this population. Interactive games proved effective with children; they learned quickly over a relatively short time exposure. In the last assessment (word and picture) the intervention group performed better than the control group, indicating that pictures assisted young children to identify and learn new words in a relatively short period of time. (Meadan, Stoner, & Parette, 2008)

Effects of Modified Orthography on the Identification of Printed Words
-Lisa A. Pufpaff, Doreen M. Blischak, Lyle L. Lloyd
Abstract: Research has shown that instructional methods involving pairing pictures with print interfere with identification of written words. Preliminary evidence, however, indicates that use of modified orthography (where a line drawing is superimposed upon the printed word) may be effective for reading instruction with individuals who have mental retardation. In the present study, we used a single-subject parallel treatments design with 4

adults who had moderate to severe mental retardation. They received reading instruction under two conditions—traditional and modified orthography. Results showed that traditional orthography was a more effective method for word identification. The relative advantage of modified orthography over traditional orthography for individuals with mental retardation was not supported. (Pufpaff, Blischak, & Lloyd, 2000)

Negative Effects of Illustrations as Word Cues
-Terry L. Rose, Peggy M. Furr
Abstract: A multiple baseline across students design was used to investigate the relative effects of illustrations on the acquisition of words in isolation in two settings. Words were taught, using picture cues and no-picture cues, to four elementary school-aged learning disabled students. Results in three of four cases indicated that illustrations were related to lower reading performance rates, leading to a conclusion that illustrations interfere with the acquisition of new words in isolation by disabled readers. Results are discussed further in terms of their implications for instruction and research. (Rose & Furr, 1984)

A Dual Coding View of Vocabulary Learning
-Mark Sadoski
Abstract: A theoretical perspective on acquiring sight vocabulary and developing meaningful vocabulary is presented. Dual Coding Theory assumes that cognition occurs in two independent but connected codes: a verbal code for language and a nonverbal code for mental imagery. The mixed research literature on using pictures in teaching sight vocabulary is briefly reviewed, and a possible resolution suggested. The use of concrete, high-imagery words and both verbal and nonverbal contexts are found to be important factors in teaching sight vocabulary along with word decodability. Effective methods of teaching meaningful vocabulary that are consistent with Dual Coding Theory are briefly reviewed, including self-generated imagery, the use of illustrations, the keyword method, and verbal-associative methods. Results are relevant for both normal readers and those experiencing reading problems. (Sadoski, 2005)

Pictures Block the Learning of Sightwords
-Robert T. Solman, Nirbhay N. Singh, E. James Kehoe
Abstract: Young children were taught to name 12 single words, six in the presence of appropriate pictures (compound stimuli) and six in their absence (simple stimuli). There were two compound conditions: one in which the picture was a large line drawing above a small printed word (enhanced salience condition) and one in which it was a small line drawing below a large printed word (reduced salience condition); and two corresponding simple conditions of a large word alone (enhanced salience condition) and a small word alone (reduced salience condition). Each child experienced all four conditions with three different words in each condition in a series of randomly ordered learning and test trials, until each child achieved the criterion of three consecutive correct responses for each of the words in at least one of the conditions. Two experimental studies were completed with 16 children in each, and the percentage of correct responses was calculated for each presentation condition. Comparisons of the compound (picture) and simple (no-picture) conditions showed that twice as many words were correctly recognized in the simple (no-picture) conditions in both experiments. No reliable differences were detected between the different levels of salience, and it was concluded that prior association between the picture and the naming response to the picture 'blocked' the acquisition of a new association between the written word and the naming response to it. (Soloman, Singh, & Kehoe, 1992)

The Effects of Direct Instruction on the Single-Word Reading Skills of Children Who Require Augmentative and Alternative Communication
-Karen A. Fallon, Janice Light, David McNaughton, Katherine Drager, Carol Hammer
Abstract: Current literature suggests a lack of empirically validated strategies for teaching reading skills to children who use augmentative and alternative communication (AAC). The current study implemented a single-subject, multiple-probe-across subjects design to investigate the effects of direct instruction in single-word reading on the performance of students who use AAC. The instructional program targeted the reading skills of 5 participants who

had severe speech impairments and ranged in age from 9 to 14 years old. All 5 participants reached criterion for matching targeted written words to corresponding pictures. Three of the 5 participants demonstrated generalization of reading skills to novel-word reading, and 4 of the 5 generalized reading skills to book contexts. Implications and directions for future research are discussed. (Fallon, Light, McNaughton, Drager, & Hammer, 2004).

Literacy, Assistive Technology, and Students with Significant Disabilities
-Karen Erickson, Penelope Hatch, Sally Clendon
Literacy is a national educational priority. During the last decade, unprecedented funds have been committed to ensuring that school children, particularly those at risk for literacy-learning difficulties, have access to research-based instruction that is most likely to support their development as readers and writers. Yet, for the thousands of students across the country with significant intellectual disabilities, literacy instruction is a distant goal, and information regarding research-based instruction is extremely limited. Adding to the challenge is the absence of information regarding the use of assistive technology to support access to the curriculum and learning for students with significant intellectual disabilities. In this article, we review the research and apply understandings and strategies used in literacy instruction for students without disabilities to students with significant intellectual disabilities. (Erickson, Hatch, & Clendon, 2010)

References

Caron, J., Light, J., Holyfield, C., & McNaughton, D. (2018). Effects of dynamic text in an AAC app on sight word reading for individuals with Autism Spectrum Disorder. *Augmentative Alternative Communication, 34*(2), 143-154.

Erickson, K. A., Hatch, P., & Clendon, S. (2010). Literacy, Assistive Technology, and Students with Significant Disabilities. *Focus on Exceptional Children, 42*(5), 1-16.

Fallon, K., 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, Langugae and Hearing Research*, 16.

Fossett, B., & Mirenda, P. (2006). Sight word reading in children with developmental disabilities: A comparison of paired associate and picture-to-text matching instruction. *Research in Developmental Disabilities, 27*, 411-429.

Hanser, G. A., & Erickson, K. A. (2007). Integrated Word Indetification and Communication Instruction for Students With Complex Communication Needs: Preliminary Results. *Focus on Autism and Other Developmental Disabilities, 22*(4), 268-278.

Meadan, H., Stoner, J. B., & Parette, H. P. (2008). Sight Word Recognition Among Young Children At-Risk: Picture-Supported vs. Word-Only. *Assistive Technology Outcomes and Benefits, 5*(1), 45-58.

Pufpaff, L. A., Blischak, D. M., & Lloyd, L. L. (2000). Effects of Modified Orthography on the Identification of Printed Words. *American Journal on Mental Retardation, 105*(1), 14-24.

Rose, T. L., & Furr, P. M. (1984). Negative Effects of Illustrations as Word Cues. *Journal of Learning Disabilities, 17*(6), 334-337.

Sadoski, M. (2005). A Dual Coding View of Vocabulary Learning. *Reading & Writing Quarterly, 21*(3), 221-238. doi:10.1080/10573560590949359

Soloman, R. T., Singh, N. N., & Kehoe, E. J. (1992). Pictures Block the Learning of Sightwords. *Educational Psychology, 12*(2), 143-153.