Implications to Montessori Practice and Visual Spatial Skills of Emergent Readers

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Research Question

In response to previous research on the possible influence of visual-spatial ability in the reading processes of students with dyslexia (Tafti, Hameedy, &Baghal, 2009; Facoetti et al., 2009; Von Karolyi, 2008), **we determined to assess whether right hemispheric stimulation during the emergent stage of reading would increase early word recognition.**

Method

The major study consisted of 214 emergent first-grade readers sampled from three public Montessori schools.

Each participant was shown various sequences of three-letter phonetic words: sequences were printed in New Times Roman font, and displayed in black ink on a white background.

Trial One: Participants were presented the sequences in two possible print formats: (1) a three-dimensional print format, presenting perceptual demanding letters identical to the flat print but with shadows and a subtle block appearance, or (2) traditional flat print format.

The order in which the print formats were presented to the participants was random.

Trial Two: Upon completion of the first trial, a second trial was performed in which the participant read the same collection of phonetic words with the following modifications: (1) if the print format in the first trial was the three-dimensional print format, then the first set of print format of the second trial was the traditional flat print format, and vice versa; (2) the sequence was "shuffled"; i.e., the phonetic words were randomly permuted.

These two trials were repeated at a later date, resulting in a total of four experimental measurements for each child.

Findings

Of the 214 students participating in the study, 56 pronounced more words correctly with the three-dimensional print format.

Sixty-three students performed worse with the three-dimensional print, and 95 showed no difference.

When comparing high fluency readers with low fluency readers, there was a statistically significant difference in improvement with the three-dimensional print format ($p < 0.04$).

Among the 23 students who scored in the lowest 10th percentile, 9 increased their score by at least 10% when compared to their traditional flat print score; 5 of them increased by at least 20 %.

However, typesetting format is not a flawless remedy for students with reading difficulties, as demonstrated by the 10 students for whom reading scores decreased with the three-dimensional print format.

Implications to Montessori Practice

Our study begins an exploration that for some students, the abrupt progression from the use of manipulative (sandpaper letters, moveable alphabet) to traditional flat print may create an unnecessary reading difficulty attributed to visual spatial delays, a difficulty that could be addressed by a median step using three dimensional print which creates a right hemispheric stimulation.

This study drew inspiration from Maria Montessori (1967) and her use of the progression from sensory sandpaper letters to the moveable alphabet to abstract traditional print in her early reading curriculum.

Relevance to Current Global Issues

Himelstein (2011), reporting for the Wall Street Journal, stated that some individuals with dyslexia find it easier to learn a language based on characters, such as Japanese, since characters are more like pictures than letters.

According to the reporter's source, Maryanne Wolf, professor of child development and director of Center for Reading and Language Research at Tufts University, individuals with dyslexia are visual thinkers who analyze patterns.

Future studies might look at how Japanese is taught to English speaking children and determine if this methodology based on pattern analysis and the visual-spatial element of the letters is a possible alternate method of reading instruction for those individuals not mastering language with the traditional phonics based, sound blending approach typical of Montessori methods.

Relevance to Future Direction in High Quality Education

These findings on the effect of three dimensional print are not a panacea for students at risk for dyslexia but rather another possible tool to increase early word recognition, a tool that has to be used with care, after testing for the effects of three dimensional print.

We concur with Helland and Asbjornsen (2003) who concluded that when assessing for dyslexia, visual-spatial skills should be considered as a separate indicator "along with an evaluation of language comprehension and mathematical skill" (p.218).

References

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