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The Compensatory Role of Prior Knowledge: How Topic Knowledge Can Speed Up Reading Rate in Children with Reading Disability

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Prior Knowledge and Text Processing

Although the triangle model of word recognition (Plaut, McClelland, Seidenberg, & Patterson, 1996) incorporates semantics as well as phonological and orthographic units, most characterizations of reading disability (RD) focus only on deficits in the connections between orthographic and phonological units. Recently, however, deficits in semantic units have also been shown to underlie word identification difficulties in children with RD, in auditory as well as visual word identification (Keenan & Betjemann, 2007). In the present research, we ask whether it is possible to overcome the slowness with which the network of RD children settles in word recognition if they have topic knowledge. Specifically, if two children with RD are matched on out of context decoding ability, will they differ in reading rate in context if one has topic knowledge and the other does not? If semantics contributes to the constraint satisfaction process of word recognition, having prior topic knowledge should facilitate reading rate.

PK is known to help children with RD compensate for their deficits in reading comprehension (e.g., Recht & Leslie, 1988). However, it is unknown whether PK can help children with RD compensate for their slower reading rate.

Questions

- Does PK of the passage topic affect the rate at which a text is processed?
- Does PK differentially affect the reading rate of children with RD and Non-RD children?
- Can PK help children with RD compensate for the slower reading rate caused by their decoding deficit?

Method

Participants consisted of 104 children, age 9-17. Children read passages from the Qualitative Reading Inventory (QRI). Before each passage, their PK of the passage topic was assessed, and children were placed in a *No PK* group or a *PK* group based on this assessment. The two knowledge groups were matched on reading ability using an age-adjusted composite decoding z-score to ensure that

the children with PK were not better decoders than those without PK. Those whose decoding z-score fell below -1 were considered RD, and those with a z-score > 0 were considered Non-RD.

Results

One-way ANCOVAs (IQ covaried) revealed a main effect of PK in the children with RD ($F(1, 63) = 4.70, p < .05$), but no effect of PK in the Non-RD children ($F(1, 35) < 1$). (see figure 1).

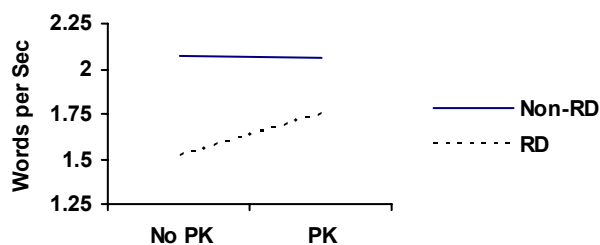


Figure 1. Effect of Prior Knowledge on Reading Rate in Children with RD and Non-RD children.

Conclusions

Even though children with and without PK read with the same accuracy when just reading words on a list, when reading words in context we found that PK significantly speeds the rate at which children with RD can read. Interestingly, it did not affect the reading rate of good readers. Because good readers read faster, one explanation could be that the connections between orthographic and phonological units in good readers settle before semantics has much time to contribute.

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