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ABSTRACT

Besides phonological information, printed words also contain visual, semantic, orthographic and often also syntactic cues. Skilled readers have acquired the command of this variety of cues incidentally, as a consequence of language development. Two naming task experiments assessed the effect of congruent versus incongruent phonological or orthographic cues preceding the presentation of a target word or pseudo word. Subjects were 21 poor readers (mean age 11;1 years) and 21 reading matched controls (mean age 8;9 years). Cues were either congruent or incongruent with the final part (rime) of the target word (experiment 1) or with the initial part (onset plus vowel) of the target (experiment 2). Results indicated that (1) in the rime task, poor readers' performance was more affected by the cue congruence manipulation; and (2) poor readers' deficit primarily became manifest in decoding pseudo words. (Contains eight references. An appendix presents the sample items used in experiment 1 and 3 bar graphs.) (Author/RS)

Phonological and Orthographic Cues in Reading Disabled Children

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RUNNING HEAD: PHONOLOGICAL AND ORTHOGRAPHIC CUES

Abstract

Besides phonological information, printed words also contain visual, semantic, orthographic and often also syntactic cues. Skilled readers have acquired the command of this variety of cues incidentally, as a consequence of language development. Two naming task experiments assessed the effect of congruent versus incongruent *phonological* or *orthographic cues* preceding the presentation of a target word or pseudo word. Subjects were poor readers (11;1 yrs) and reading matched controls (8;9 yrs). Cues were either congruent or incongruent with the final part (rime) of the target word (Experiment 1) or with the initial part (onset plus vowel) of the target (Experiment 2). In the rime task poor readers' performance was more affected by the cue congruence manipulation.

Discussions in the reading research literature converge on the point that the ability to rapidly and automatically access individual word meanings on a graphophonemic basis is critically implicated in reading failure (Perfetti, 1992). However, there are still numerous unresolved questions. One of them is if poor readers, as compared with normals, differ in their use of orthographic representations in the process of word decoding. Besides phonological information, printed words also contain visual, semantic, orthographic and often also syntactic cues. Skilled readers have acquired the command of these variety of cues incidentally, as a consequence of language development. There are some studies of the relative importance of the various cues (Ehri & Wilce, 1986; Beverly & Perfetti, 1983; Rayner, 1988). The present study was aimed at assessing the relative cohesiveness between phonemic and orthographic information in disabled readers' mental representations. According to the developmental stage model proposed by Ehri (1991), skilled readers' representations have tightly connected spelling-sound relations. Skilled reading is characterized by the use of fully developed orthographic "images" in memory, amalgamating phonemic and graphemic information at the single and multiple unit or letter cluster level (Ehri, 1991). For poor readers this is assumed not to be the case. We wanted to find evidence for this hypothesis by assessing if poor readers' word identification is characterized by incomplete connections between letters in spellings and phonemes in pronunciations. Two naming task experiments assessed the effect of congruent and incongruent phonological or orthographic cues preceding the presentation of a target word or pseudo word.

Method

Subjects

Two matched groups of normal and poor readers participated in the experiments. The poor readers attended a school for children with learning problems to improve their reading skills. Poor readers were defined as subjects scoring at least 2 years below the age norm, as measured by a standard Dutch reading ability test (Brus & Voeten, 1972). These subjects (n=21; mean age 11;1 yrs) were matched on reading level on this test with a group of normal readers (n=21; mean age 8;9 yrs). Both groups had been taught reading with comparable instruction materials. There were no differences in teaching methods employed or differences in ethnic background.

Materials

Phonological cue presentation was realized by projecting digit symbols on a computer monitor screen. These cues were either congruent (e.g., cue: 4 target: store) or incongruent (e.g., cue: 5 target: house) with the following target. For orthographic cue presentation the equivalent digit names, fully spelled as printed words in lowercase letters were used (e.g., cue: four target: store). Targets were either real Dutch monosyllabic words or monosyllabic pseudo words, meaningless word-like letter strings. Sample pseudoword targets are plier, stacht, zerp. Sample items are presented in Appendix A.

Procedure

Subjects had to read aloud the target, which appeared 300 ms after the cue on the computer screen. A voice key registered reaction time. The experimenter registered incorrect responses by keyboard. Stimulus presentation and data registration were computer controlled, using the program MEL, the Micro Experimental Laboratory. Digit and letter cues overlapped either with the final part of

the word (rime, Experiment 1) or with the initial part (onset with following vowel, Experiment 2).

Results

Four 2 (group) x 2 cue (digit/letter) x 2 wordtype (word/pseudo) x 2 cue (congruent/incongruent) MANOVAs with repeated measures on conditional factors with error data and reaction times for correctly pronounced words as dependent variables were computed. Experiments 1 and 2 showed a largely similar pattern of results. As expected, the generally established poor reader effects were found: poor readers turned out to be overall slower and less accurate. Pseudo words elicited more errors and demanded more decision time. Poor readers made significantly more errors and needed more time to decode pseudo words. These effects may be regarded as the standard effects that can considered as a preliminary validation test for the experimental procedure employed in the experiments.

More informative were two additional interaction effects at the accuracy level that were found in Experiment 1 (rimes). There was a 1-st order congruence by cue interaction for cue-target congruent trials, letter cues were overall more efficient than digit cues, whereas the opposite was found for incongruent trials. There was an additional 2-nd order group by cue by congruence interaction. For the poor readers the described general congruence by cue interaction was significantly larger than for the normal readers. In Experiment 2 these interaction effects were not found.

Discussion

The general pattern of the results found in the studies reported here is largely consistent with the vast body of research data reported the reading research literature. Identifying pseudowords is more difficult and this is

in particular true for poor readers. Our experiments support the view that the poor readers' deficit primarily becomes manifests in decoding pseudo words (Rack, Snowling & Olson, 1992; Van IJzendoorn & Bus, 1994).

The most interesting result found in our experiments was the cue by congruence interaction at the accuracy level. In particular the outcome that poor readers were more affected by the digit/letter cue manipulation is informative. The 1-st order interaction might at first sight be interpreted in terms of relative higher overall effectiveness of orthographic cues. However, the fact that the effects of interest were largest for poor readers would then imply greater sensitivity for this group, a very unlikely interpretation. Therefore, we propose an alternative interpretation in terms of interconnections between phonological and orthographic information in the subjects' mental representations of words.

In skilled readers phonological and orthographic information is tightly connected, which makes them relatively insensitive or more robust to the manipulation of congruency. Conversely, in poor readers with relatively incompletely integrated phonological and orthographic information the effect of incongruent cuing can manifest itself much stronger. This account of our data is congruent with Ehri's (1991) model of the development of sightword reading. The poor readers participating in our study probably were still in the second stage of phonological cue reading, whereas the younger normals already had attained the third stage of sight word reading.

Two questions remain to be addressed. First, why were these effects only found in Experiment 1, manipulating the final (rime) part of the word? This result is in agreement with earlier conducted research. Experiments manipulating information in the final part of the word are more sensitive for detecting reading ability differences. The second question is why the reported effects

were only found at the accuracy level and not at the latency level. For the time being we do not have a satisfactory explanation for this. A correct interpretation must be based on a psychologically solid account of the interrelations of both dependent measures used. At this moment this account needs to be further worked out.

References

Beverly S.E. & Perfetti, C.A. (1983). Skill differences in phonological representation and developement of orthographic knowledge. Paper presented at the Biennial Meeting of the Society of Research in Child Development, Detroit, MI.

Brus, B.Th. & Voeten, M. (1972). Eén minuut test [One-minute test]. Nijmegen: Berkhout.

Ehri, L.C. (1991). Reconceptualizing sight word reading. In P.B. Gough, L.C. Ehri, L.C. & Treiman, R. (Eds.) Reading Acquisition. Hillsdale, NJ: Erlbaum.

Ehri, L.C. & Wilce, L.S. (1985). Movement into reading: Is the first stage of printed word learning visual or phonetic? Reading Research Quarterly, 20, 163-179.

Perfetti, C.A. (1992). The Representation Problem in Reading Acquisition. In P.B. Gough, L.C. Ehri, L.C. & Treiman, R. (Eds.) Reading Acquisition. Hillsdale, NJ: Erlbaum.

Rack, J.P., Snowling, M.J. & Olson, R.K. (1992). The nonword reading deficit in developmental dyslexia: a review. Reading Research Quarterly, 27, 28-53.

Rayner, K. (1988). Word recognition cues in children: The relative use of Graphemic Cues, Orthographic Cues, and Grapheme-Phoneme Correspondence Rules. Journal of Educational Psychology, 80, 473-479.

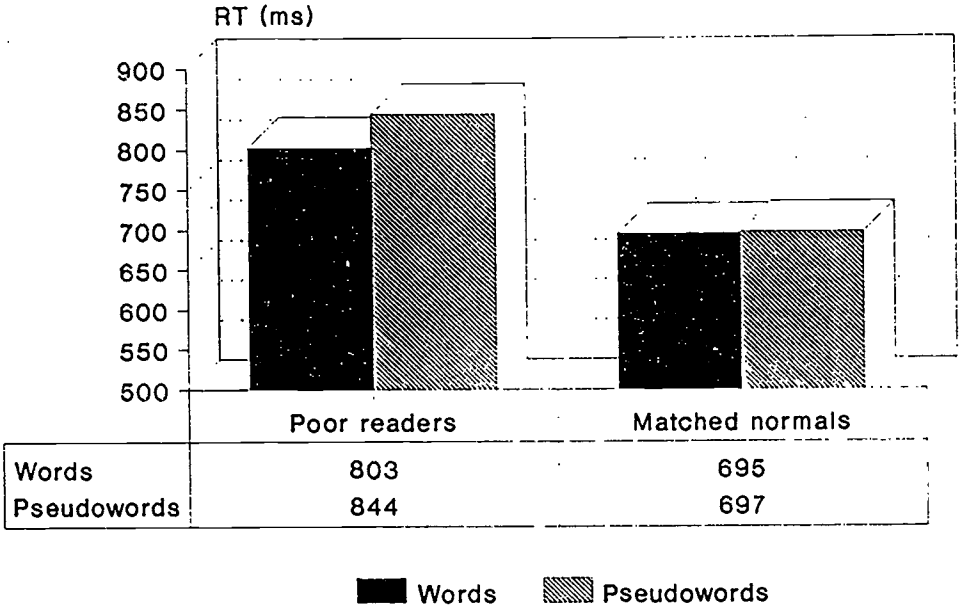
Van IJzendoorn, M.H. & Bus, A.G. (1994). Meta-analytic confirmation of the non-word reading deficit in developmental dyslexia. Reading Research Quarterly, 30, 3-12.

Appendix A

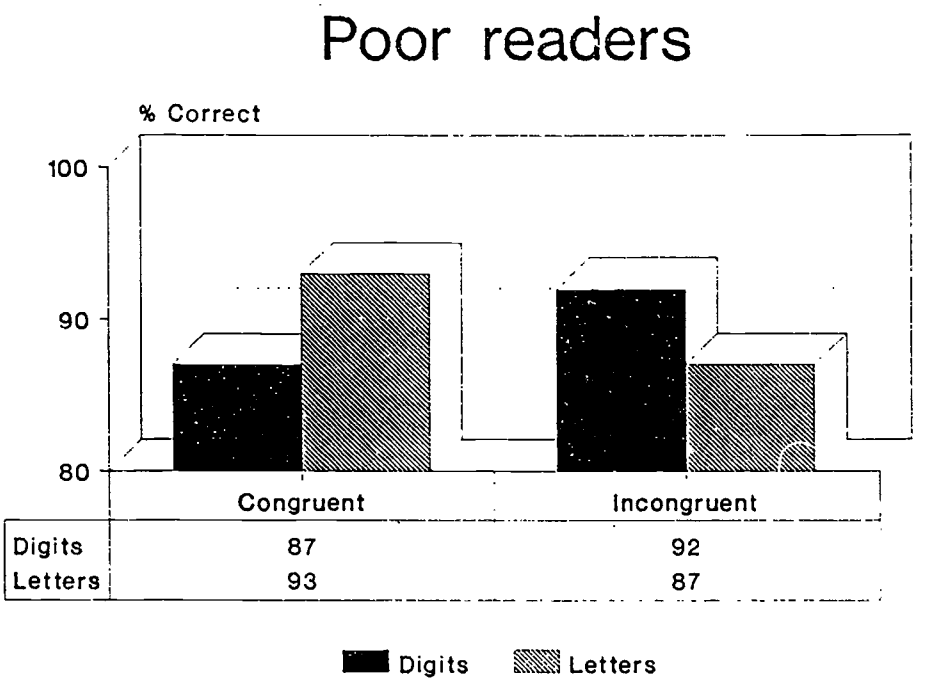
Sample items used in experiment 1 (Rimes)

Cue	Target	Comments
4	stier	word - congruent digit cue
vier	stier	word - congruent letter cue
5	vijm	pseudo word - congruent digit cue
vijf	stijf	word - congruent letter cue
8	stier	word - incongruent digit cue
acht	stier	word - incongruent letter cue
8	vijm	pseudo word - incongruent digit cue
acht	stijf	word - incongruent letter cue

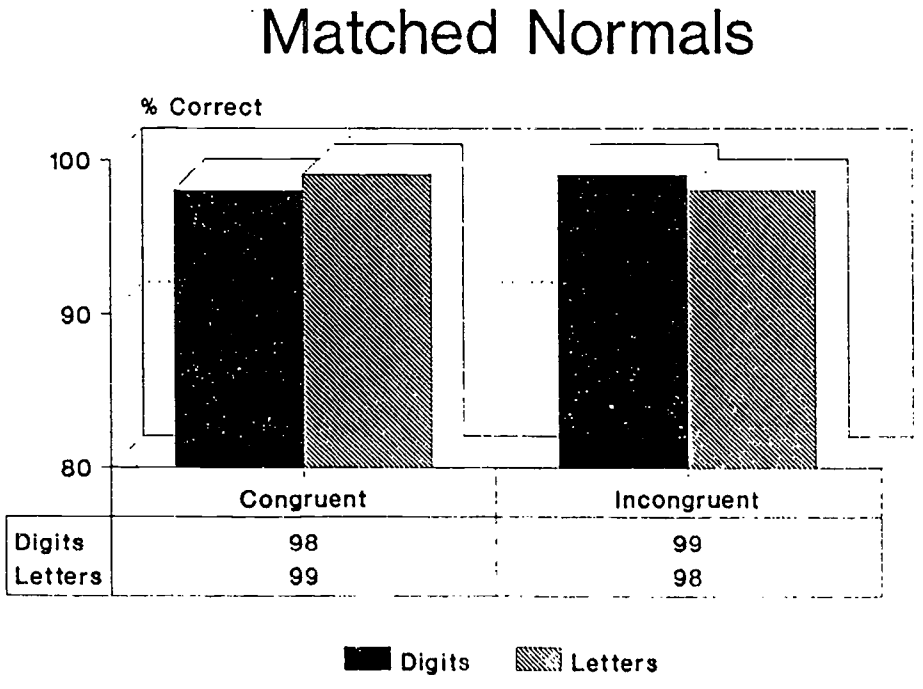
Group x Pseudoword effect



Rime data



Rime data



Rime data