

## Does orthography interact with instructional processes?

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This article presents an interesting observation noticed in a research project on the development of reading proficiency as related to children's metalinguistic awareness and cognitive processing skills. One hundred eighty Oriya (an Indian language belonging to Indo-Aryan group) children belonging to Grades 1, III and V were administered two tests of reading achievement (oral reading and reading comprehension) and Raven's colored Progressive Matrices. The results showed that the oral reading performance and reading comprehension did not develop simultaneously, though they were positively related to each other in all the grades. The children, in their literacy acquisition process, seemed to follow two successive stages: Phonemic (syllabic) decoding alone and phonemic decoding plus comprehension, which are otherwise not considered as two distinct stages of the acquisition process. As an explanation, a possible interaction between the nature of orthography and instructional process is hypothesized.

Key words: reading acquisition, orthography, teaching methods.

The relationship between the nature of orthography and instructional processes is not a general field of interest in pedagogy. Nevertheless, it is well acknowledged that in opting for a specific method one should examine the writing system to be taught. For instance, phonic method had to be abandoned in teaching Korean Hangul as it did not suit the Korean writing system (Taylor & Taylor, 1985). Similarly, one could assume that a combination of whole-word and phonic methods is the most suitable method for English as English contains both regular and irregular words. It is also established that whole-word method normally hinders the development of segmental awareness in children (Morais, 1991).

No findings have been reported, as yet, suggest-

ing any possibility of a particular instructional procedure, when practiced under specific orthographic conditions, resulting in a bizarre observation as recorded here. A small gap between reading achievement and writing; or even between decoding efficiency and comprehension, to a lesser degree, in normal children's literacy acquisition process is well accepted. But, this paper presents a distinct gap between children's oral reading proficiency and comprehension observed in a larger study (Prakash & Mohanty, in submission).

### METHOD

**Subjects:** One hundred eighty normal children from an Oriya medium school situated in Utkal University

campus, Bhubaneswar, India, served as subjects. 60 children each, 30 boys and 30 girls, from Grades I (6-7 year olds), III (8-9 year olds) and V (10-11 year olds) were randomly selected for the purpose.

**Procedure:** All the subjects were administered, individually, tests of reading achievement—Graded Oral Reading Test and Graded Reading Comprehension Test—and Raven's Colored Progressive Matrices (RCPM) as a measure of nonverbal intelligence.

(a) Graded Oral Reading Test: The test was developed by Mohanty, Sahoo and Sahoo (1985) for assessing oral reading proficiency of primary school children (Grades I through VII) in Oriya. It consists of eight sentences for each grade level originally selected from primary school text books and then subjected to item analysis. The test is in a booklet form and each sentence is printed on a separate page. The subjects were instructed to read the grade appropriate sentences clearly, loudly and carefully. The scoring involved noting down the number of errors committed under seven categories: Mispronunciation, Substitution, Insertion, Omission, Repetition, Reversal and Refusal to read. The total number of errors was used to calculate per cent of miscue as follows: Per cent of Miscue = (Number of errors/Number of words)×100.

(b) Graded Reading Comprehension Test: The test was developed by Mohanty, and Sahoo (1985) for assessing reading comprehension of primary school children. The test consisted of two passages (and certain number of questions on each in a different booklet) for each grade level. The subjects were instructed to read the passages starting from two grades below the actual grade of the subject (if the subject failed to answer the questions pertaining to that level, the test was administered from Grade I level). The subjects were told to read each of the passages attentively at their own pace (with no time restriction) and be prepared to answer the questions related to the passage they read. The test was stopped when the subject failed to answer any of the questions pertaining to two consecutive passages for a grade. Each correct answer was given a score of 1 and wrong answer a score of '0'. The total number of correct answers for each individual was recorded as subject's Reading Comprehension score. Maximum score =86.

(c) Raven's Colored Progressive Matrices: The test

was administered individually following the standard procedure described in the manual. Each correct response was credited with a score of 1. Maximum score =36.

## RESULTS

The results showed that oral reading performance and reading comprehension had moderate positive correlations in all the three grades ( $r = 0.49$ , for Gr. I;  $r = 0.38$ , for Gr. III and Gr. V); but the careful observation of the data indicated that they did not develop simultaneously. The Figures 1, 2 and 3 illustrate the discrepancy observed between the development of oral reading skills and reading comprehension.

The average performances on Graded Oral Reading were at 66%, 92% and 95% accuracy levels respectively for Graders I, III and V while their corresponding performances on Graded Reading Comprehension were as low as 40% (below grade I level), 59% (below grade II level) and 63% (below grade IV level). The scores on RCPM was normal for all the grades, though it was relatively low for Gr. III. The mean scores for Grades I, III and V were 13.4, 15.2 and 22.8 respectively.

## DISCUSSION

The scatter diagrams (Figures 1, 2 and 3) suggest as if the children of the present study were pushed continuously, through grades, from left hand side (lower side) of the graphs rightward along the abscissa (GOR) to a 'take off' point of 90% plus level and then moved vertically on the RC plane. In other words, Oriya children in their reading acquisition process seemed to follow two successive stages, decoding alone and decoding plus comprehension, which are otherwise not considered as two distinct stages in the acquisition process. This unexpected observation, however, cannot be considered as an artefact for two reasons: (a) It is not unusual to find such children under certain situations where code emphasis at the cost of semantic skills is practiced in teaching reading. (b) Empirically too, in an ongoing comparative study on precocious readers and poor readers (with regard to both oral reading and reading comprehension) such cases of high oral

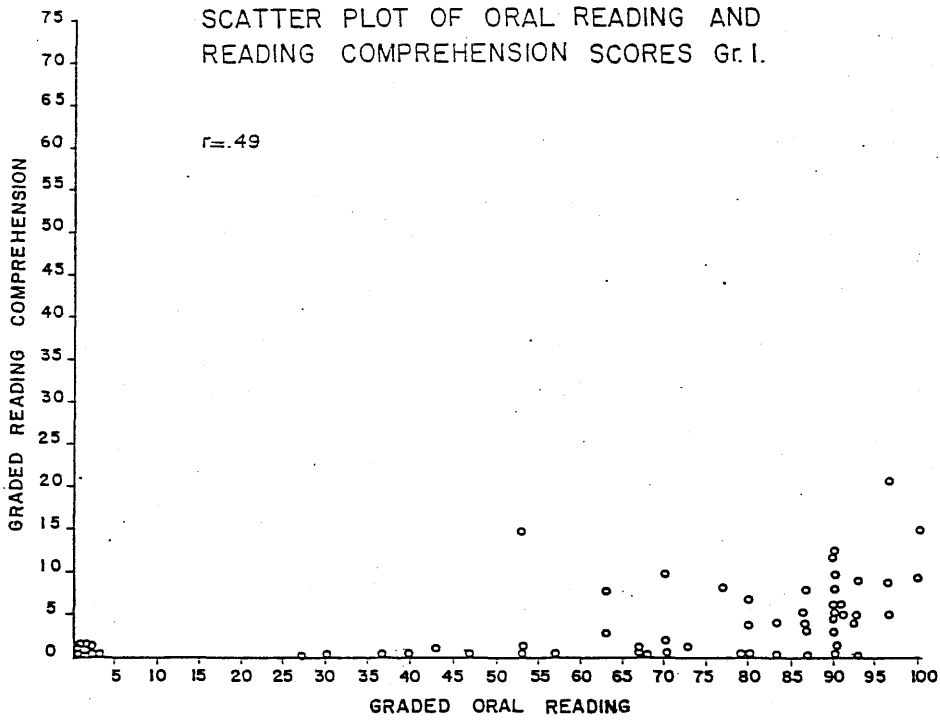


Fig. 1

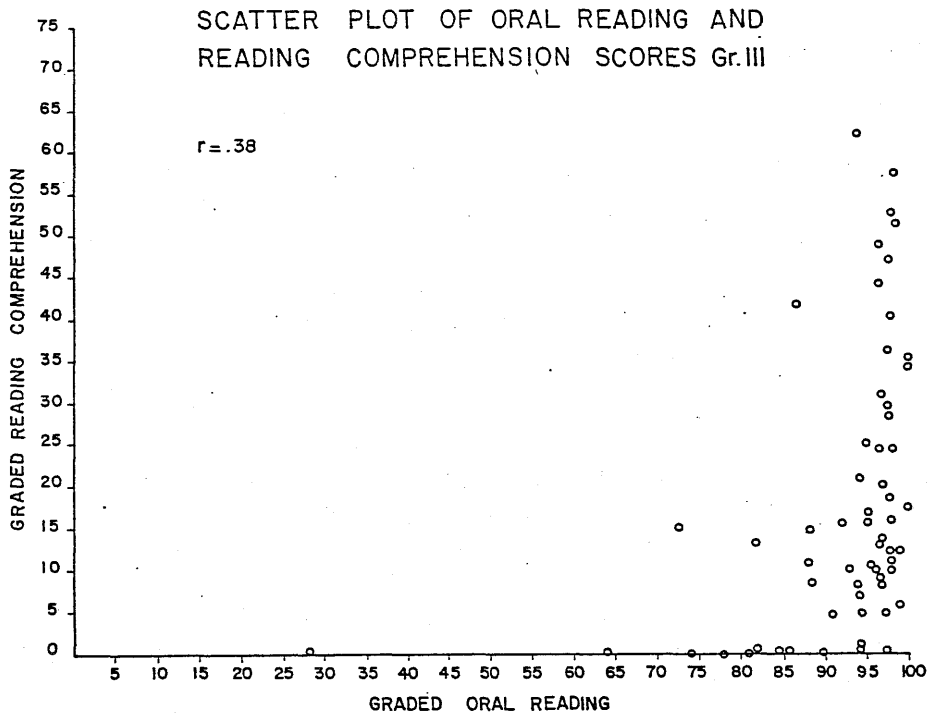


Fig. 2

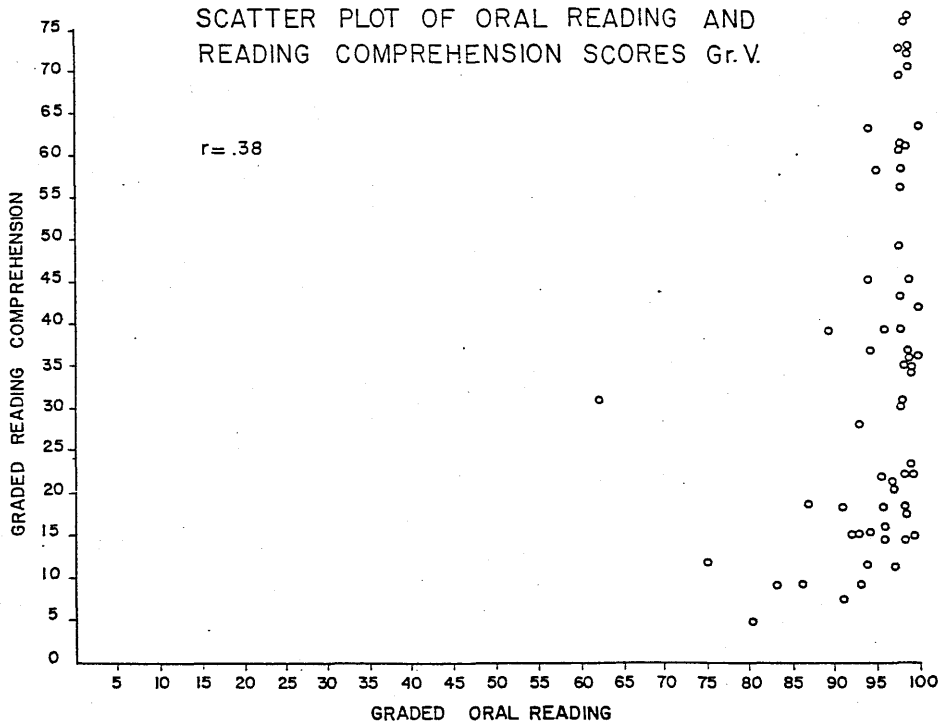


Fig. 3

reading performance and low reading comprehension were often observed (Sujata Pattanaik—personal communication).

In trying to account for the observed results, explanations were sought in terms of short-term-memory (STM) deficit hypothesis; hyperlexia; 'utterance' and 'text' language differences; script-specific features and teaching method that emphasize rote learning. Certainly more than a single factor from among the above might have contributed to the observed phenomenon.

The STM deficiency hypothesis of poor reading suggests that poor reading achievement is caused by STM impairment in efficient phonemic decoding and linguistic organization while reading. In the present study, however, children in all the grades performed very well in memory tasks such as Digit Span and Serial Recall (see Prakash & Mohanty, in submission, for details). Therefore it can be, confidently, ruled out as a contributor for the observed results.

Hyperlexia is defined as impaired comprehension in terms of failure to recognize propositions and the macrostructure of a discourse in otherwise

fluent readers. As the children tested in the present study were definitely poor in constructing meaning from the text, the hyperlexia hypothesis cannot be ruled out from being an underlying cause. May be a very small part of the variance observed in the results can be accounted for by this factor; but it cannot be a major factor operating in the present case considering the large sample size of children tested in each grade level. Besides, hyperlexia more often than not is associated with developmental disorders such as autism (Rispen & Breckelaer, 1991). The subjects of the present study were all normal children.

David Olson in several of his papers on cognitive consequences of schooling (e, g, Olson, 1975, 1980), differentiates between oral language and text language. He defines oral language (utterances) as language of everyday speech; as embodied in the mother-tongue which is universal possession of all humans. On the other hand, text language is defined as written language (but not just 'speech put down'); as a cultural invention which is tied to schooling. The oral language of speech is substantially diffe-

rent in both structure and function from the written language of text. All children experience this disparity in traversing from orality to literacy. For some children the transition may be more severe than for others, especially in the initial grades. However the hypothesis is too general (besides Olson's emphasis is more on philosophical, epistemological issues like development of scientific knowledge and conceptual intelligence) and it is unlikely that this could operate in higher grades like Gr. III and Gr.V.

Fourthly, it is about the orthographic factors. It seems perfectly logical to think that, all other things being equal, the type of orthography one is exposed to should have some specific influence on reading acquisition. Indian orthographic system is a mixture of syllabic and alphabetic principles. In that, the alphabetic segments are combined to form syllabic units which are spatially delimited; and, in principle, each syllable form can be analyzed into its consonant and vowel components. The syllabary system may initially pose problems in terms of the multiplicity of symbols, the mastery of which may take longer time. But, once all the symbols are learnt, the nearly perfect grapho-phoneme correspondence of Indian orthography (like in Hiragana and Katakana of Nihongo) should make oral reading easier to even a functionally poor reader. In the present study, though all the subjects scored well on oral reading, it is possible that they were still in the stage of mastering the various forms of symbols with out bothering much about the content (mispronunciation, it may be noted, constituted the largest proportion of reading errors). The poor intonations, poor parsings and inappropriate emphasis observed in children's reading might mean that they were employing a peripheral G-P-C route (such as one expressed in Morton's logogen model, 1980). Though, the children were asked to read silently, majority of them, irrespective of the grades, read the material aloud. Obviously, comprehension is much more than merely reading out.

It is a fact that Indians, from Vedic periods, have a very long oral tradition. In ancient education system, *vedas* were taught by the methods that emphasize orality and conceptual (epistemological) teachings were introduced only after the students perfected the oral recitation of the verses. Cultivation of memory was accorded utmost importance in

the educational practice. It is also known that till eighth century A.D. there was a strong resistance in Indian tradition of education for the use of script (Mookarji, 1947). Even in modern days, in many primary schools a lot of emphasis is laid on rote learning. Meaning extraction process of reading is not generally given any emphasis in teaching reading (Srivastava, 1979). Pattanaik (1981) reported an observation in which children were not making any differentiation between reading and memorization as indicated by one student's question whether he should read with his book open or closed! Besides, memorization is normally given maximum credits in examinations and evaluations by teachers. Informal queries with teachers of the school where the present study was carried out revealed that the methods employed in the school were not different. Their definitions of reading were confined to mechanical deciphering skills (of print) and memorization. But, comprehension is much more than mere memorization. There could be memories with out comprehension but not the other way. That the children were not performing meaningful reading was also supported by their poor reading awareness as measured by a reading awareness test.

Thus, with a tradition of orality and rote learning methods in the school, and with the fitness of phonemic strategy to Oriya script, it is not very strange that decoding strategy (sounding out) alone was emphasized and mastered first by the children. As a hypothesis, one may state that the kind of discrepancy between oral reading and reading comprehension observed in the present study can possibly never occur in teaching Kanji reading as Kanji inherently doesn't favour a phonemic method. By adopting the terminology of the prevailing models of literacy acquisition such as the one proposed by Frith (1985), the majority of children of the present study may be said to be in analytic, sequential phase of 'alphabetic stage' during which time children acquire Grapheme-Phoneme-Correspondence strategy of reading. Their comprehension would improve once 'orthographic stage' is reached when morphemes become the unit of processing. The observed pattern of reading, therefore, may be the result of an interesting case of an interaction between the orthographic features and specific instructional process.

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