

REACTION: EFFECTS OF REPRESENTATION AND ORGANIZATIONAL FEATURES OF TEXT

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Analyzing basic problem solving from perspectives normally associated with reading provides insights, both for students of reading and mathematical problem solving. Unquestionably, both theoretical and instructional theories of mathematics and reading share a great many commonalities. An opportunity to look at one of these commonalities, namely word problems, has been provided in the research of Blohm and Wiebe. As you have noted, the researchers sought to answer three questions in their preliminary investigation. First, could pictorially presented word problems with only minimal but pertinent contextual cues (a data diagram, i.e., the equivalent of a structured overview), enhance or facilitate correct solutions? Second, could extraneous pictorial and contextual information affect students' abilities to solve word problems? Third, given the four experimental conditions—(a) pictorial representation with pertinent-only organizational features; (b) pictorial representation with pertinent and extraneous organizational features; (c) verbal representation with pertinent-only organizational features; and (d) verbal representation with pertinent and extraneous organizational features—would there be a hierarchy of experimental conditions affecting students' abilities to solve percentage math problems?

Before commenting on the research, several compliments would seem in order. Blohm and Wiebe have presented a preliminary research study which is clear, concise, inventive and open. The quality of the presentation could serve as a model for others and future replication.

The research, as good preliminary research often does, raises more questions about the variables in the study than it answers. The answers are: (1) for the sample, one of the two types of percentage questions was easier (2) for the sample, non-pertinent math information when added to either pictorially or textual presentations, does not seem to help solve certain percentage problems. It would appear that these conclusions can be supported, given the data provided and answer partially three research aims of the study. Now, a few of the questions. What part does computational ability play in the scheme of things (e.g., why 80%)? Could age, grade or percentage computational ability have been used as an independent variable? (There was probably a pretty healthy age range between the youngest 10th grader and the oldest 12th grader. However, data on the sample was minimal.) If the study procedures are to be followed in replication, one should anticipate that only about one-third of a 10th-12th grade population in Algebra I and II could obtain 80% correct on a simple percentage test like the one used in the study. Furthermore, if the experimental conditions are introduced before the screening device, there is no way to ensure that only one form might have been used by those few who meet the 80% correct criterion. Also, it is apparent that one of the two types of the percentage problems is obviously more difficult and that "piloting" the forms and the items might avoid future problems.

In summary, the Blohm and Wiebe study provides some answers (and a great many questions) to the mysteries surrounding pictorially and textually presented information in math word problems. One does not have to look too far in the literature of reading to find just as many questions being asked about the mysteries surrounding the use of pictures in stories to enhance or facilitate comprehension.