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AUTHOR Pehrsson, Robert S.; Denner, Peter R.
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ABSTRACT

A study assessed the reliability and some aspects related to the validity of an open sentence approach to assessing comprehension during silent reading. Subjects, 37 randomly selected seventh-grade students, read an "Opin" passage, prepared by deleting the second half of every other sentence. The blanks filled in by students were evaluated using a scale based on the response's resemblance to the author's intent. Responses were also divided into fragmented, projective, and interactive categories. Oral readings of a second, intact passage were used to determine the kinds of reading miscues made by students. The results confirm that the Opin sentence procedure has sufficient interrater reliability to be used for assessing a reader's ability to interact with text during silent reading. Both the percent score method and the category scoring method proved reliable for reading assessment purposes. The pattern of correlations with the miscue scores also indicates that readers who attempt to interact with the text while reading are more likely to make miscues that are consistent with their search for meaning. (Tables of data and a sample Opin passage are appended.) (HTH)

Assessing Silent Reading During the Process: An Investigation of the Opin Procedure

Robert S. Pehrsson

and

Peter R. Denner

Idaho State Univeristy

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Assessing Silent Reading During the Process: An Investigation of the Opin Procedure

Modern cognitive theorists (Rumelhart, 1981, Rumelhart & Ortony, 1977) have described reading comprehension as an active process which requires the application of prior knowledge. According to these theorists our knowledge is represented in abstract units called schemata. These schemes are thought to play a central role in the process of comprehension. During reading active schemes influence anticipatory and inferential thinking by providing the "empty slots" onto which the reader maps the elements of the text (Anderson, 1977). Goodman (1967/1976) describes this process as guessing (a psycholinguistic guessing game). The reader anticipates both the author's ideas and the language by which the author may convey those ideas symbolized in print. Thus, schemes enable the reader to set-up expectations based upon prior knowledge that are either confirmed modified, or disconfirmed as the reader encounters the actual details of the passage. It would seem that the "better" reader makes better guesses at both the ideas and the language of the author.

Based on this view of reading comprehension it would appear logical to differentiate good from poor comprehenders by examining the process of hypothesis generation and evaluation during the process of comprehension (Rumelhart, 1984). However,

there are very few assessment instruments now available which allow reading researchers, diagnosticians and teachers to view the reading process during the act of reading. The reading miscue inventory developed by Goodman and Burke (1972) and the cloze procedure developed are two such process oriented assessment devices. The miscue analysis identifies which clues the readers relied on most while reading and thus provides valuable information about the identification processes the reader uses as well as, some indirect evidence of the reader's comprehension activities. However, miscue analysis cannot be used to assess the silent reading process. The cloze procedure provides an assessment of the readers use of local contextual/linguistic clues in word identification and sentence comprehension but does not appear to adequately assess intersentence comprehension (Shanahan, Kamil, and Tobin, 1982). Thus it is apparent that neither one of these assessment procedures adequately captures the act of comprehending as it has been described by current theorists. Consequently, there is a need for tests which involve assessment of the comprehension process during the act of reading (Rumelhart, 1984).

In investigating reading comprehension, the interaction between the reader and writer would seem to be of paramount importance because it lies at the heart of the communication process. The reader brings to the page his or her organized emotional, conceptual, and linguistic experiences. Based on

experiences, the author represents his or her intended meanings, in the form of a written code. The reader is more likely to be successful in constructing meanings which are related to the author's if there is a commonality of experiences. This relationship between the author's and reader's experiences can be described as proximity (Pehrsson & Robinson, 1985). When there is a high degree of proximity between the author and reader, the reader will be more likely to make guesses based on their prior knowledge schemes that are confirmed by the passage. The less proximity, the more the reader and the author will diverge and thus, the greater the difficulty that the reader will have in comprehending the intended message of the writer (Pehrsson and Robinson, 1985).

If the reader is able to interact with the author successfully then the reader may even be able to predict the surface structure of the author's message. Surface structure is the observable sentence, written or spoken and the relationship among its words (Wardhaugh, 1975). Page (1974) suggested that the conceived surface structure is the author's internal concept of the sentence about to be written. Page also defined the perceived surface structure as the reader's internalized perception of the observable surface structure. Both perceived and conceived structure are unobservable. According to both the theories of Goodman (1967/1976) and Rumelhart (1984), when the reader and author interact the conceived surface structure of

the writer can be predicted by the reader.

The prediction by the reader could be analyzed in terms of the degree of match obtained with the author's conceived surface structure. One way to evaluate the reader's ability to guess the intended meaning of the author would be to have them attempt to finish the author's sentences for him. This could be achieved by deleting half of every other sentence in a short passage and asking the reader to complete the open sentences using their opinion (hypothesis) as to what the author might have written in the blank. Under this procedure, the reader is asked to guess the surface structure that the author has written based on his or her ability to activate relevant knowledge schemes similar to those intended by the author and based on clues from the remaining surface structure. We have chosen to call this technique the Opin procedure because of the open nature of the sentence deletions and the fact that the reader must develop his or her own opinion as to the conceived structure the writer intended.

The purpose of this study is to assess the reliability and some aspects related to the validity of an open sentence approach to assessing comprehension during the act of silent reading. It is expected that the procedure will display sufficient reliability to be useful for reading assessment purposes. It is predicted, however, that Opin procedure comprehension scores will show only moderate correlations with

standardized reading achievement test scores that emphasize "product" rather than "process". Finally, it is expected that performance on the Opin procedure will correlate with performance patterns based on a miscue analysis, which is another process measure. It is anticipated that students who are able to interact with the writer will demonstrate a greater propensity while reading to make miscue error that both make sense and preserve the author's intent than readers who show less ability to interact with the text.

METHODS

Subjects

A total of 37 seventh-grade junior high school students from Idaho participated in the study. The subjects were randomly selected from a group of 178 seventh-grade students in advanced, developmental and remedial reading classes.

Materials

The passage used for the Opin sentence procedure was titled "Moon May Change Way People Behave" (You and Your World. , Xerox, 1974). The article describes the possibility that the moon affects human behavior. The readability level of the passage as computed by the Dale-Chall (1954) and Fry (1976) formulas fell in the sixth-seventh grade range. This passage was prepared for use with the Opin procedure by deleting the second half of every other sentence, which resulted in 12 Opin deletions for the experimental passage. In place of the deleted

sentence ending a line was drawn approximately equal to the length of the page. The title of the passage was also deleted. As an illustration, a copy of the passage used in the study including the Opin sentence deletions is presented in Figure 1. The information written in the blanks is the actual words used by the author to complete the sentences.

A second passage at the same reading grade-level range was used to record a sample of the kinds of reading miscues made by the students. The passage was titled, "Earthquakes" (Brown & Kemper, 1982).

Scoring

For the Opin procedure, the blanks filled-in by the students were evaluated separately using the following five point scale:

4 = same or very similar to the author's intent.

3 = different, but contributed to the author's intent.

2 = different, failed to contribute to the author's intent, but related to a topic supplied by the reader which was used to make sense out of the passage.

1 = made sense only in the local context and failed to contribute to an intersentence topic.

Ø = Failed to make any sense or was left blank.

A total score was computed for each student by adding up the number of points they received for each of the Opin deletions. Because the number of Opin blanks will vary with the

length of the reading selection (or sample length), the Opin score was computed by dividing the total raw score by the number of Opin deletions. The result was a percentage score which reflected the ability of the reader to interact with the text. The higher the score, the closer the proximity between the reader and the author.

A second means of scoring the responses to the Opin procedure was to count the number of responses in each of three categories: (1) Fragmented, responses that make sense out of the passage only within the local context, if at all, and without reference to an integrating scheme, (2) Projective, responses that were integrated around an hypothesized scheme but without reference to the scheme intended by the author, and (3) Interactive, responses that accurately reflected the scheme intended by the author. Students were classified according to the above described category system whenever 50% or more of their responses fall within one of these categories.

For the miscue analysis, the rater used a copy of the earthquakes passage to record the miscues made by each student. The rater listened to a tape recording of the student's oral reading, and marked all variations between the expected responses and the student's actual responses. Counted miscues included all substitutions, omissions, insertions, reversals, and repetitions. Each miscue was coded according to the level of the clues the reader appeared to rely upon and the probable

source of the miscue. The classifications used to code the miscues were: (1) makes sense, (2) same meaning, (3) syntactic fit, (4) syntactic fit up to miscue, (5) visual alike, (6) auditory alike, (7) begins same, (8) real word, and (9) self-corrects. A percentage score for each student was then computed for the number of miscues falling within each category.

SRA (1979) achievement series test scores for vocabulary and comprehension were obtained from the students permanent school records.

Design

The interrater reliability of the scoring methods for the Opin procedure were evaluated by having independent raters score the students' initial responses to the moon passage. The independent raters also classified the students responses according to the category scoring method of the Opin procedure. The judgements in each case were then correlated using Pearson Product-Moment correlation procedures to assess the extent to which the scoring procedures are objective.

Test-retest reliablity of the scoring methods designed for the Opin procedure were assessed by having the students complete the Opin procedure for the moon passage twice. The stability of the scores determined by each of the scoring methods was examined by comparing the scores the students received on their first opin sentence compeletion with the ones they received on their second try two weeks later. The comparisons were made

using Pearson product-moment correlation procedures.

The same method of correlation was chosen to evaluate the relations between the Opin scores and standardized achievement test scores for vocabulary and comprehension. Pearson product-moment correlations were also used to ascertain the pattern of relationship between the scores on the Opin procedure and the miscue classification scores.

Procedures

All students selected to participate in the study were assembled in a common area within their school. The students were instructed to read the moon passage silently and complete the Opin sentence deletions. They were told that the purpose of the activity was to see whether or not students could figure out what the author might have written in each of the blanks. When the students completed the activity they were dismissed to return to their regular classroom. No information was given as to the actual details of the passage for any of the Opin deletions. All students finished the Opin procedure within 30 minutes.

During the next week, the same students were individually called to an office within the school and asked to read the earthquakes passage orally into a tape recorder. They were told to read the entire passage without asking for assistance, and to figure out words, if necessary, by themselves. No indication was given as to whether or not they would be tested for

comprehension after reading this text segment. When the students finished reading the earthquakes passage they were allowed to return to their regular classrooms. All students completed the oral reading within 10 minutes.

Two weeks from the time of the first session, all the students participating in the study were again assembled within a common area of their school. The students were presented with the moon passage for a second time and asked once more to finish the ends of the sentences that were left blank. Again they were told to try to figure out what the author might have said for each deletion. All students completed this activity within 30 minutes.

RESULTS

Reliabilty

In order to establish the interrater reliability of the Opin procedure, independent raters scored the responses of 37 subjects to the moon passage. These judgements were then correlated to assess the extent to which the scoring procedure was objective. Table 1 presents the means and standard deviations for the Opin percentage scores. The Pearson product-moment correlation for these judgements was $r = .93$ ($p < .01$). The interrater reliability was also assessed for the category scoring method. Table 2 presents the means and standard deviations for Opin classifications scores. Students were placed within one of the following classifications: (1)

fragmented, (2) projective, or (3) interactive, if 50% or more of their responses fell within one of the designated categories. The Pearson product-moment correlation comparing the category placement judgements of the two independent rater was found to be $r = .92$ ($p < .01$). These results provide evidence that the scoring methods for the Opin procedure show sufficient interrater reliability to be used for informal assessment purposes.

Test-retest reliabliity for the Opin procedure scoring method was assessed by comparing the performance of the 37 subjects on the moon passage with a second retake performance on the same passage two weeks later. Table 1 displays the mean and standard deviation for the scores on the Opin retake. The Pearson product-moment correlation between the initial performance and the retake performance on the moon passage was $r = .47$ ($p < .01$), demonstrating a moderate but significant relationship for the scores on the two testing occasions. This modest relationship is not completely surprising considering the interpretative nature of the Opin procedure.

Test-retest reliability was also calculated for the category scoring method. The results revealed a significant correlation of $r = .71$ ($p < .01$) for the category classification scores recorded for each of the two administrations of the moon passage. This test-retest relationship indicates that the category scoring method is relatively stable from one testing

session to the next. Taken together, these results suggest that the category scoring method is stable enough to allow for the diagnostic classification of students as Interactive, Projective, or Fragmented readers.

Relationship to Standardized Achievement Measures

Table 3 presents the means and standard deviations for the standardized measures of reading achievement, SRA vocabulary scores, and SRA comprehension scores. The correlation between the Opin Scores and the SRA vocabluary scores was $r = .55$ ($p < .01$). For the SRA comprehension scores the correlation was found to be $r = .61$ ($p < .01$). These moderate correlations between process and product measures of reading achievement are at the level that one would anticipate. They indicate the ability to interact with the meaning intended by the writer is associated with higher general reading ability. It also suggests that readers of higher reading achievement in general experience less distance when reading materials selected for their grade level.

Relationship to Miscue Analysis

The Opin procedure scores were compared with each of the miscue scores to find out whether the reader's propensity to interact with the author influences the kinds of miscues he or she makes when reading. Table 4 presents the means and standard deviations for the students' performances on each of the miscue measures. Pearson-Product moment correlations were computed

betweeen the students' percentage scores on the Opin procedure and the 12 miscue measures. The intercorrelations are presented in table 5.

The highest significant correlations between the Opin percentage scores and the Miscue measures occurred for Making Sense (r = .51), having the Same Meaning (r = .41), and making Real Word substitutions (r = .56). More modest correlations were found for Syntactic Fit (r = .32), and Syntactic Fit Up To Miscue (r = .31). All other correlations between the Opin and miscue scores were small and nonsignificant. In line with the predictions, these data suggest that there is an association between performance on the Opin procedure and the kinds of miscues readers are likely to make. More specifically, the positive correlations suggest that the closer the proximity between the reader and the author as measure by the Opin procedure the more likely the reader is to make miscues that preserve the author's meaning and make sense.

The relations among the Opin Category Scores and the Miscues measures were also assessed using Pearson product-moment procedures. Table 5 presents the obtained intercorrelations. For category scores, significant although moderate correlations were found with Semantic Sense (r = .50), Syntactic Fit (r = .52), and Syntax Fit Up To Miscue (r = .39). There was also a significant correlation with the use of Visual Clues (r =.43). No other relations between the Opin scores and the Miscue scores

were significant. These results suggest that the classification of students as interactive, projective or fragmented readers is associated with the type of miscue they are likely to make while reading. It appears that the more readers attempt to interact with the material they read, the more likely they are to make miscues that make sense and fit the syntax of the sentence.

DISCUSSION

The results comfirm that the Opin sentence procedure has sufficient interrater reliability to be used as a means for assessing a reader's ability to interact with text during the act of silent reading. Both the percent score method and the category scoring method proved to have adequate reliability for reading assessment purposes. The more modest test-retest correlations for the percentage scoring method suggests that readers change their responses to the opin deletions from one response session to the next. This is not very surprising in light of the open-nature of the response format. Upon a second reading, some readers might show improvement in their ability to interact with the text, while others might experiment with different answers or give less attention to the activity due to the fact that they had completed the task once before. The category scoring method demonstrated greater test-retest stability. The correlation was sufficient to suggest that most readers maintain the same basic approach (interactive, projective, or fragmented) when interacting with the text,

eventhough they do not produce exactly the same responses each time. This suggests that the Opin procedure may be useful for diagnosing habitual reading strategies. Current research is underway to investigate this possibility.

The relations between the Opin procedure scores and traditional standardized measures of reading achievement suggest that proficient readers are more likely to attempt to interact with text when reading silently than less able readers. The pattern of correlations with the miscue scores also indicates that readers who attempt to interact with the text while reading are more likely to make miscues that are consistent with their search for meaning.

Taken together these results are consistent with theories of reading comprehension (Goodman, 1967/1976; Rumelhart, 1984) that suggest that proficient readers integrate their previous experiences with the experiences intended by the author through the development of presuppositions, and use the details of the text to confirm, modify, or disconfirm these expectations.

In summary, the Opin Procedure holds great promise for investigating how readers interact or fail to interact with authors. It appears that the Opin procedure assesses thinking process necessary to comprehension during silent reading. Moreover, the Opin procedure allows for the monitoring and assessment of comprehension during the act of reading with a minimal amount of interference. It is hoped that this study

will stimulate further investigation of the comprehension processes employed by readers during the act of silent reading.

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Table 1

Means and Standard Deviations for the Opin Percentage Scores

	Mean	SD
Moon Passage (Rater 1)	52.9	17.4
Moon Passage (Rater 2)	53.3	17.3
Moon Passage Retake	50.5	21.5

Table 2

Means and Standard Deviations for the Opin Category Scores

	Mean	SD
Moon Passage (Rater 1)	2.24	.80
Moon Passage (Rater 2)	2.14	.86
Moon Passage Retake	2.14	.82

Table 3

Means and Standard Deviations for the Achievement Test Scores

	Mean	SD
SRA Vocabulary	6.7	3.4
SRA Comprehension	6.7	4.0

Table 4

Means and Standard Deviations for the Miscue Analysis Scores

	Mean	SD
Semantic Sense	63.8	15.8
Same Meaning	50.6	17.4
Syntactic Fit	66.1	16.6
Syntax to Miscue	87.2	12.3
Visual Similar	75.7	10.9
Auditory Alike	66.7	13.5
Begin Same	71.4	13.2
real Word	81.9	11.8
Self-Correct	20.3	12.5

Table 5

Presents the Intercorrelations of the Opin and Miscue Scores

		A	B	1	2	3	4	5	6	7	8	9
A	Opin	-	-	.51	.41	.32	.31	-.13	-.25	-.22	.56	.15
B	Opin Category		-	.50	-.07	.52	.39	.43	-.05	.03	-.27	-.15
1	Makes Sense			-	.79	.66	.45	-.21	-.05	-.28	.63	.12
2	Meaning Same				-	.50	.22	-.28	-.18	-.24	.49	.01
3	Syntactic Fit					-	.77	.01	.08	-.08	.39	.09
4	Fit up to Miscue						-	-.04	-.03	-.23	.33	.41
5	Visual Similar							-	.68	.72	-.09	.11
6	Auditory Similar								-	.55	-.05	-.01
7	Begins Same									-	-.23	-.19
8	Real Word										-	.03
9	Self-Correct											-

n = 37

* ($p < .05$)

Figure I

1. Everyone knows the story of the wolfman. When the moon was full, HE TURNED INTO A MONSTER. And he did terrible things.

Can the moon really make people mean and does the moon really have something to do
2. with the way people act? Two scientists here at Miami's School of MEDICINE HAVE MADE A NEW DISCOVERY. They found that the
3. moon does seem to affect the way people behave. Dr. Arnold Lieber and Dr. CAROLYN SHERIN DID A STUDY. They checked the dates of murders in the Miami area over a 15 year time period (1956-70). They found
4. that many more murders took place during the FULL MOON OR THE NEW MOON THAN AT OTHER TIMES.

Then they studied the murders in the Cleveland (Ohio) area for a 13 year period
5. (1956-70). Their findings were ABOUT THE SAME. More murders took place at the time of the new or full moon.

6. Why did the scientists CHOOSE TO MEASURE MURDERS? Murders are violent acts. If the changes of the moon have something to do with murders, they may have something to do with all violent acts. Does
7. this mean we're all A LITTLE MOON MAD? No. But it does suggest that the changes of the moon may have something to do with people's behavior.

8. Scientists have known for a long time that the MOON PULLS ON THE WATERS OF THE EARTH. The pull of the moon causes the
9. water of the world's oceans to rise. This is what is KNOWN AS TIDES. The pull of the moon is
10. strongest at the time of the new or full moon. This stronger pull CAUSES HIGHER TIDES. Scientists also know
11. that the human body is mostly water. And now this study MAKES SOME SCIENTISTS WONDER. Could the pull of the moon change the waters of the human body? And could such changes make certain people - or
12. ALL PEOPLE - MORE LIKELY TO BE VIOLENT?

ame _____

Op-In Category	Interactive		Projective	Fragmented	
Op-In Number	same or very similar to author's intent.	different but contributes to author's topic	different, fails to contribute to author's topic but relates to reader's topic	makes sense only in local context - fails to contribute to any topic	fails to make sense, far off topic, vague
Points	4	3	2	1	0
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
Totals					= _____ = %

Pattern (50% or more in a category)

Interactive _____

Projective _____

Fragmented _____

Total Raw Score _____ = %
Possible Total Score