Feature Article

Metaphor Comprehension and Performance on Metaphor-Related Language Tasks: A Comparison of Good and Poor Readers

Pearl L. Seidenberg and Deena K. Bernstein

The performance of third- and fifth-grade good and poor readers was compared in order to determine if (a) they differed in their ability to comprehend literal and metaphoric language, (b) they differed in their ability to perform metaphor-related language tasks, and (c) their ability to comprehend metaphoric language was related to their performance on the metaphor-related language tasks. Results of separate 2 x 2 (group by grade) ANOVAs indicated that while there was no difference in performance between the two groups on the literal comprehension task, there were significant differences in their performance on both the metaphor comprehension task and on the metaphor-related language tasks. The findings also indicated differences in the pattern of correlations among the good and poor reading groups' metaphor scores and their scores on the metaphor-related language tasks. The results are discussed from a metacognitive perspective with implications for reading instruction.

A recent focus in educational research has been on children's understanding of figurative language (Baldwin, Luce, & Readance, 1982; Pearson & Raphael, 1979). Reynolds and Ortony (1980) have proposed that metaphoric comprehension is a critical aspect of the total language process. It has also been suggested that one of the factors that may contribute to poor readers' comprehension difficulties is an inability to recognize or interpret the metaphoric meanings found in reading materials (Ortony, 1980; Wiig & Semel, 1984).

In a recent study, Seidenberg and Bernstein (1986) have investigated the comprehension of figurative language by good and poor readers in Grades 3 through 6. The findings of the study have provided empirical support for the contention that poor readers have problems recognizing and interpreting metaphoric language. That study did not, however, explore the reason behind the differences underlying the performance of good and poor readers in their comprehension of metaphoric language.

A number of cognitive and linguistic factors have been proposed as implicating the ability to interpret metaphor. Wiig and Semel (1984) have stated that the poor metaphoric understanding exhibited by some children is the result of semantic deficits, specifically the ability to classify, define, and redefine multiple-meaning words, an ability they perceive as basic to metaphoric comprehension. Ortony, Reynolds, and Arter (1978) have maintained that word knowledge, the ability to engage in comparison activities, and the ability to generate semantic attributes are all necessary for metaphoric comprehension. Similarly, Baldwin, Luce, and Readance (1982) have indicated that for elementary-age children, knowledge of the salient semantic attributes common to both the topic and the vehicle of the metaphor is a critical factor in the interpretation of metaphoric language. By contrast, Pearson and Johnson (1978) have suggested that the interpretation of metaphor is related to the recognition of meaning equivalencies in synonymous words. It has also been suggested that metaphoric interpretation is dependent upon the ability to monitor one's own comprehension (Ortony et al., 1978).

The present study was guided by our interest in finding support for the assumptions outlined in the literature...
regarding the cognitive and linguistic factors that appear to be related to the interpretation of metaphor. We were also interested in examining the performance differences between good and poor readers. The following questions guided our inquiry:

1. Do good and poor readers in Grades 3 and 5 differ in their ability to comprehend literal and metaphoric language?
2. Are there performance differences between good and poor readers on metaphor-related language tasks?
3. Is the metaphor comprehension ability of good and poor readers related to performance on metaphor-related language tasks?

**Method**

**Subjects**

Subjects were 40 white, middle class third- and fifth-grade students (20 in each grade) selected from six regular classes in an elementary school in a suburban school district in New York State. In each grade, subjects were selected for either a high or low reading ability group based on their scores on the Reading Comprehension subtest of the Stanford Reading Achievement Test (Gardner, Rudman, Karlson, & Merwin, 1982). The Stanford Achievement Test's reading comprehension subtests for Grades 3 and 5 basically measure the same skills (e.g., literal and inferential comprehension and rate of reading). The high ability group, which was composed of 10 subjects in each grade, scored at or above the 60th percentile on the Reading Comprehension subtest; the low ability group, also composed of 10 subjects in each grade, scored between the 20th and 40th percentiles. There were 11 females and 9 males in each group. The subjects had never been referred for suspected handicaps, had no record of placement in remedial reading or adaptive education programs, and had never been retained in a grade. The mean reading comprehension score for the high ability students was 9.17 (SD = 2.48). The mean reading comprehension score for the low ability students was 3.45 (SD = 2.57). The mean age for the high ability students was 120.8 months; the mean age for the low ability students was 121.3 months. There was no significant difference in age between the high and low ability groups.

**Materials**

In order to examine the comprehension of literal and metaphorical language by good and poor readers, we used the research paradigm developed by Reynolds and Ortony (1980) and adapted by Iran-Nejad, Ortony, and Rittenshouse (1981). Eight context-setting, short, paragraph-length stories were used. For each story, there were two sets of alternative story completion sentences—a literal set and a metaphor set. Figure 1 presents an example of one of the stories and the two sets of sentence choices. Each subject was required to select the sentence that best completed the story for both the literal and the metaphor set.

The target alternative, the first member of each set in the example, was assumed to fit the story most appropriately. The three distractors contained elements closely associated with elements in the story or closely similar to the target. Accompanying each story was a hand-drawn picture illustrating the main idea of the story. One story appeared per page of a booklet, and each story was followed by one of the two sets of experimental sentences, first by the metaphor set and then by the literal set. The target alternative was randomly ordered in the metaphor and literal sets.

Four metaphor-related tasks, measuring factors identified in the literature as related to the interpretation of metaphor, were also administered. These included three subtests of the Word Test (Jorgenson, Barreh, Huising, & Zachman, 1981): Synonyms, Multiple-Definitions, and Absurdities. In addition, the ability of the subjects to name critical semantic attributes of the metaphorical vehicles in the metaphor task described above was also assessed.

The Synonym subtest of the word test examined the assumption that the ability to recognize the equivalence of meaning between a figurative and literal statement was related to the ability to recognize the equivalence of meaning between two words (Pearson & Johnson, 1978). The Synonym subtest contains 16 vocabulary items of increasing difficulty. The subject is required to respond with a word that has the same meaning as the target word. For example, for the stimulus item bashful, acceptable responses would be shy, timid, or meek.

The Multiple-Definitions subtest of the Word Test was used in order to examine the assumption that the ability to redefine multiple-meaning words was related to metaphor comprehension (Wiig & Semel, 1984). The Multiple-definitions subtest contains 14 items of increasing difficulty. The subject is required to respond with two appropriate alternate meanings for a target word. For example, for

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**Waiting for Mother**

David's mother went on a trip. David did not see her for two weeks. He wanted to see his mother very much. One afternoon, he was playing in the yard. A car stopped in front of their house. David saw his mother in the car. He was very happy. He ran to his mother.

**Literal Set:**

David was pleased to see his mother.
All the car windows were closed.
David came back from a trip.
The yard was covered with grass.

**Metaphor Set:**

The thirsty puppy found water.
The man went to the movies.
The cat was in the back yard.
The man was getting on the train.

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**Figure 1. Example of story and two sets of sentence choices.**
the target word bark, acceptable alternate meanings would be part of a tree and a sound.

The third language-related task, the Absurdities subtest of the Word Test, was used to examine the assumption that metaphor comprehension depends upon the ability to monitor one's own comprehension (Ortony et al., 1978). Interpreting absurdities is similar to interpreting metaphors in that both tasks require one to recognize that a literal understanding of a word, phrase, or sentence is irrelevant or inconsistent given the context. Therefore, for both tasks metacognitive awareness of the textual inconsistency is required for resolution of the comprehension failure. The Absurdities subtest contains 15 items of increasing difficulty. The subject is required to explain or correct sentences that are semantically absurd because of incorrectly used vocabulary words. The following is an example of a sentence that appears in the Absurdities subtest: The mother fed the lullaby to her baby.

Finally, the ability to name critical semantic attributes of the metaphorical vehicles in the metaphor task described earlier was also assessed, because prior research has indicated that this ability is related to metaphor comprehension (Baldwin et al., 1982). The Attribute test was a list of metaphorical vehicles based on the eight target alternative sentences used in the metaphor set described earlier (see Table 1). For each item, subjects were asked to tell "as many things (at least five) as you can about the words—things that tell what the words are like, what they do, or how they feel." Two examples were modeled for the subjects. The instructions were repeated when necessary and subjects were encouraged to respond.

### Procedures

For the literal and metaphor tasks, subjects participated in small groups ranging in size from 4 to 6 subjects. Response booklets were distributed to the subjects after they were seated in the experimental area. Each response booklet contained a cover sheet and page of instructions. The instructions, which were read aloud, directed the subjects to read each story silently as it was read aloud by the experimenter. Then the subjects were instructed to turn the page, and the picture representing the main idea (theme) of the story was shown. With the picture still visible, the subjects were told to read the set of four alternatives and circle the sentence that "best completes" or "fits with" the story they had just read. The subjects were then instructed to read the four alternatives silently, as they were read aloud by the examiner, before circling the sentences that best "fit with" the story.

Four practice items (two literal stories followed by two metaphor stories) were also used. Subjects were given the correct responses to these practice items and were allowed to ask questions about the instructions and the task. When all subjects acknowledged that they understood the instructions and had completed the four practice items, the stories were presented without interruption.

The metaphor sets were presented first to all subjects, followed by the literal sets. This was done to avoid a possible literal response set, particularly since prior research had indicated that some students tend to interpret figurative expression literally (Wiig & Semel, 1984).

The metaphor-related tasks were administered individually to each subject. The subtests taken from the Word Test were administered in the sequence in which they were published. All direction and scoring methods used for administration of the subtests followed the published examiner's manual.

The Attribute test was also administered individually to all subjects and scored independently by the two investigators. A response was scored correct if it was a paraphrase of a standard interpretation that had previously been given by a majority of a group of 18 graduate students in an introductory special education course and if it would permit correct interpretation of the metaphor. For example, item 7 in Table 1, "A thirsty puppy finding water," was correct if the subject named a paraphrase indicating something about "feeling good" or "feeling happy."

### Results

#### Group and Grade Effects

A separate 2 x 2 (Group and Grade) analysis of variance was performed on the total number of correct responses selected and on each of the six tasks in order to examine the performance of the two groups at each grade level. Mean scores for the language tasks for the high ability group ranged between 3.4 and 11.8 at the third-grade level and between 4.3 and 13.7 at the fifth-grade level. For the low ability group, mean scores ranged between 2.2 and 7.5 at the third-grade level and between 2.8 and 9.1 at the fifth-grade level (see Table 2). There was no significant main effect for the literal task; however, significant main effects were found for each of the remaining language tasks (see Table 3).

An inspection of Table 3 reveals that for the metaphor, the multiple meaning, and the attribute tasks, significant main effects were due to significant differences between groups, while grade differences were not significant for either the high ability or low ability groups. For the synonym and absurdities tasks, both group and grade differences were significant.

### Table 1. Items of Attribute Test

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Attribute of Word</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Mice looking at a cat.</td>
</tr>
<tr>
<td>2.</td>
<td>Squirrel gathering nuts.</td>
</tr>
<tr>
<td>3.</td>
<td>Bird hurrying back to its nest.</td>
</tr>
<tr>
<td>4.</td>
<td>Chicks coming out of their eggs.</td>
</tr>
<tr>
<td>5.</td>
<td>Racing drivers turning off their engines.</td>
</tr>
<tr>
<td>6.</td>
<td>A dog burying a bone.</td>
</tr>
<tr>
<td>7.</td>
<td>A thirsty puppy finding water.</td>
</tr>
<tr>
<td>8.</td>
<td>Ants hurrying around their nest.</td>
</tr>
</tbody>
</table>
Table 2. Mean Performance by Group and Grade

<table>
<thead>
<tr>
<th></th>
<th>Grade 3</th>
<th></th>
<th>Grade 5</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High Group</td>
<td>Low Group</td>
<td>High Group</td>
<td>Low Group</td>
</tr>
<tr>
<td></td>
<td>(\bar{x})</td>
<td>(SD)</td>
<td>(\bar{x})</td>
<td>(SD)</td>
</tr>
<tr>
<td>Literal</td>
<td>7.8</td>
<td>.42</td>
<td>6.0</td>
<td>.52</td>
</tr>
<tr>
<td>Metaphor</td>
<td>6.0</td>
<td>2.54</td>
<td>3.2</td>
<td>2.44</td>
</tr>
<tr>
<td>Synonyms</td>
<td>10.0</td>
<td>1.83</td>
<td>5.5</td>
<td>3.06</td>
</tr>
<tr>
<td>Absurdities</td>
<td>7.6</td>
<td>2.46</td>
<td>5.8</td>
<td>2.30</td>
</tr>
<tr>
<td>Multiple</td>
<td>11.8</td>
<td>1.14</td>
<td>7.5</td>
<td>4.72</td>
</tr>
<tr>
<td>Meanings</td>
<td>3.4</td>
<td>1.65</td>
<td>2.2</td>
<td>1.03</td>
</tr>
<tr>
<td>Attributes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Relationship Between Metaphor and Language Scores

Pearson's \(r\) was calculated for the pair-wise comparison of metaphor scores and each of the additional language test scores. All comparisons for the high ability and low ability samples pooled across grades resulted in a significant positive correlation only between metaphors and absurdities \((r = .51, p < .01)\) for the high ability group and only between metaphors and synonym \((r = .51, p < .01)\) for the low ability group. In order to further compare the relationship of the language scores to the metaphor scores for the two reading groups, a stepwise multiple regression analysis was performed on the data for each reading group using a .05 significance level for variable entry in order to determine the variable that best predicts metaphor scores. The variables considered were group and scores on each of the language tests, which were entered in the following order: synonyms, multiple meanings, absurdities, and attributes. For the high ability group, the only variable that entered at the .05 level was absurdities, \(F = 6.30, \beta = .51\); for the low ability group, the only variable that entered at the .05 level was synonyms, \(F = 6.25, \beta = .51\).

Attribute Knowledge and Metaphor Comprehension

For each reading group of 160 metaphor items (20 subjects x 8 stimulus stories), subjects in the high ability group properly interpreted 133 (83%) items and misinterpreted 27 (17%) items. Subjects in the low ability group correctly interpreted only 78 (49%) items and misinterpreted 82 (51%) items. Table 4 is a frequency tabulation that shows the total number of times subjects in the high and low reading groups indicated and failed to indicate the appropriate critical attribute when the metaphor stories were properly interpreted or misinterpreted (see Table 4).

Four scores, corresponding to a, b, c, and d in Table 4, were created for each subject. Correlated \(t\) tests were used to compare a with b and c with d. For the high ability group, the data indicated that the metaphors were not comprehended significantly more often when the critical attribute was named \((\bar{X} = 3.2, SD = 1.7)\) than when the critical attribute was not named \((\bar{X} = 3.5, SD = 1.6)\), ns. In the reverse case, metaphors were also not incorrectly interpreted significantly more often when the critical attribute was not named \((\bar{X} = 8.0, SD = 1.9)\) than when the critical attribute was named \((\bar{X} = 5.5, SD = .89)\), ns.

For the low ability group, the data indicated that metaphors were correctly interpreted significantly more often when the critical attribute was not named \((\bar{X} = 2.65, SD = 1.96)\) than when the critical attribute was named \((\bar{X} = 1.25, SD = 1.25)\), \(p < .004\). In the reverse case, metaphors

Table 3. The Effects of Group and Grade for Experimental Tasks

<table>
<thead>
<tr>
<th></th>
<th>Literal</th>
<th>Metaphors</th>
<th>Synonyms</th>
<th>Absurdities</th>
<th>Multiple Meanings</th>
<th>Attribute</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(F)</td>
<td>(p)</td>
<td>(F)</td>
<td>(p)</td>
<td>(F)</td>
<td>(p)</td>
</tr>
<tr>
<td>Main Effects</td>
<td>2.35</td>
<td>n.s.</td>
<td>9.38</td>
<td>&lt; .01</td>
<td>31.19</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>Group</td>
<td>4.25</td>
<td>n.s.</td>
<td>14.98</td>
<td>&lt; .01</td>
<td>39.20</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>Grade</td>
<td>.46</td>
<td>n.s.</td>
<td>3.74</td>
<td>n.s.</td>
<td>23.16</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>Group and Grade</td>
<td>.470</td>
<td>n.s.</td>
<td>0.00</td>
<td>n.s.</td>
<td>4.43</td>
<td>n.s.</td>
</tr>
</tbody>
</table>

Table 4. Contingency Table Showing Correspondence Between Metaphor Interpretation and Naming of Appropriate Matching Attribute for Good and Poor Readers

<table>
<thead>
<tr>
<th></th>
<th>High Ability Group ((N = 20))</th>
<th>Low Ability Group ((N = 20))</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Matching Attribute Present</td>
<td>Matching Attribute Absent</td>
</tr>
<tr>
<td>Matching Attribute Present</td>
<td>Matching Attribute Absent</td>
<td></td>
</tr>
<tr>
<td>Metaphor Correct</td>
<td>64(^{a})</td>
<td>69(^{b})</td>
</tr>
<tr>
<td>Metaphor Incorrect</td>
<td>11(^{c})</td>
<td>16(^{d})</td>
</tr>
<tr>
<td>Characteristics</td>
<td>25****(^{a})</td>
<td>53****(^{b})</td>
</tr>
<tr>
<td>Characteristics</td>
<td>28****(^{c})</td>
<td>56****(^{d})</td>
</tr>
</tbody>
</table>

\(^{a}\)Total Correct = 133; \(^{b}\)Total Incorrect = 27; \(^{c}\)Total Correct = 78; \(^{d}\)Total Incorrect = 82.
were incorrectly interpreted significantly more often when the critical attribute was not named ($\bar{X} = 2.8, SD = 2.06$) than when the critical attribute was named ($\bar{X} = 1.15, SD = 1.09$), $p < .001$.

**Discussion**

Current educational research reflects an interest in the development of metaphoric language, and a number of factors have been identified as being important to metaphoric comprehension. There were three research questions raised by this study. The first asked if good and poor readers differed in their ability to understand literal and metaphoric language. The findings indicate that there was no difference between the two groups on a literal comprehension task. The high level of performance by all subjects on the literal comprehension task (see Table 2) indicates that the children in both groups were able to select the most appropriate literal response related to each story. The subjects' almost perfect performance at the two grade levels also indicates that the children in both groups understood both the story and the task. However, the findings also indicate that there is a significant difference between the two groups for the metaphor comprehension task. The poorer performance of the low ability group on the metaphor comprehension task indicates that these subjects are less proficient than subjects in the high ability group in processing metaphoric language even when the metaphoric statements are context embedded.

The second question raised by this study sought to discern whether good and poor readers differed in their performance on metaphor-related language tasks. The findings indicate that there are significant group differences in performance for the metaphor comprehension task and for the metaphor-related language tasks. These findings are consistent with a number of recent studies in reading research that demonstrate the importance of language-related factors for reading comprehension (Anderson & Friebody, 1982; Kleinman, 1982; O’Shea & Sindelar, 1983; Taylor, Wade, & Yakavich, 1985).

The overall poorer performance of the low ability group on the language tasks suggests that these subjects have less sufficient knowledge of similar word meanings and multiple meanings of words, and they pay less attention to the semantic content of sentences than high ability readers. It appears that the low ability readers not only have a less well developed vocabulary knowledge, but also have difficulty satisfactorily identifying word meanings and word interrelationships within a discourse context. The low ability readers’ performance on the absurdities task indicates that they are less able to monitor their own comprehension than the high ability readers. They appear to be less able to actually detect a contextually anomalous word or phrase and therefore less able to recognize and resolve a comprehension failure.

For three of the tasks (e.g., metaphor, multiple-definitions, and the attribute list), the children in the higher grade did not significantly outperform children in the lower grade. The strong ability effects but weak grade effects obtained here suggest that those aspects of language processing ability implicated in these tasks (such as using context to select appropriate metaphoric meanings, extending vocabulary knowledge to multiple meanings, and generating critical attributes for words) are probably neglected in elementary school programs.

The third question raised by this study asked if metaphor comprehension ability of good and poor readers was related to performance on metaphor-related language tasks. The findings indicate that the two reading groups also differ in the pattern of correlations among their metaphor scores and their scores on the language tasks. For the high ability group, only the correlation between scores for the metaphor task and scores for absurdities is significant. For the low ability group, only the correlation between scores for the metaphor task and scores for absurdities is significant. For the low ability group, only the correlation between scores for the metaphor task and scores for synonyms is significant. This finding suggests that the factors implicated in the high and low group’s interpretation of metaphor may differ. The finding also suggests that for the low reading group the underlying factor accounting for students’ performance on the metaphor task is similar to the factor underlying performance on a synonym task. Therefore, an awareness of the need to identify equivalence of meaning between two linguistic elements appears to be related among low ability readers to their performance on both a metaphor and synonym task. For the high ability group, the finding suggests that the metacognitive awareness needed to detect and resolve a comprehension failure is related to the performance of high ability readers in both a metaphor and absurdities task.

Support for this position may also be found in the results of a stepwise multiple regression analysis performed to determine the best variables to predict metaphor scores for the two groups. For the high ability group, the only predictor that entered at the .05 level is their score on absurdities and for the low ability group, the only predictor that entered at the .05 level is their score on synonyms.

It appears that while poor readers may be aware that cognitive processing has been affected by a failure in comprehension and that they need to identify equivalences in meaning, they do not have the metacognitive awareness or control strategies necessary for monitoring and repairing comprehension failures due to textual inconsistencies (e.g., anomalies, absurdities, etc.).

Finally, the two groups differed in their response patterns to the attribute test. For both the high and low group, the ability to name a critical attribute was unrelated to students’ ability to correctly interpret metaphors, and only for the low ability group was the ability to name a critical attribute related to incorrect metaphor interpretation.

Metaphoric interpretations, when the metaphors are context embedded, do not appear to be related to the ability to generate a critical corresponding attribute in the absence of contextual supports. For the low ability group, approximately 75% of the total of correctly interpreted metaphors were identified when the corresponding attribute was not named. Similarly, for the high ability group, approximately...
50% of the total of correctly interpreted metaphors were identified when the critical attribute was not named (see Table 4). This finding should not be interpreted to mean that the subjects did not know these attributes, but only that our procedure did not permit the opportunity to elicit them. It may well be that critical corresponding attributes are derived from the discourse context as well as directly from the lexicon.

The data also show that even when some of the children named the critical attribute, they were still unable to correctly interpret the metaphor (see Table 4). The children’s ability to name the critical attribute did not always predict their ability to comprehend a related metaphor. When the critical attribute was named, the low ability reading group was still unable to correctly interpret the metaphor 50% of the time, while the high ability group was unable to interpret the metaphor 15% of the time. These findings suggest that abilities other than word knowledge are implicated in metaphor comprehension. It appears that some poor readers may have the knowledge but lack the ability to match the critical attributes even when the metaphor is context embedded.

Summary

In this study, we found evidence for differences in performance among good and poor readers for metaphor comprehension and for metaphor-related language tasks. Good readers perform significantly better than poor readers in their knowledge of similar word meanings and multiple meanings of words and are better able to detect a contextually anomalous word or phrase. We also found that the pattern of correlations among the metaphor scores and scores on the language tasks differ for the two groups. For the high ability group, performance on absurdities is correlated with and is a better predictor of metaphor comprehension, while for the low ability group, performance on synonyms is correlated with and is a better predictor of metaphor comprehension. Finally, we found that the ability to name a critical corresponding attribute is not a sufficient condition for metaphor interpretation.

Practical Implications

There are several important implications for teachers in these findings. First, the findings appear to indicate that language processing abilities are related to reading comprehension. In addition, the finding that there is no difference in performance between the third and fifth graders in either the high and low ability groups on the metaphor task, the multiple word meaning task, and the attribute task underscores the need for teachers of elementary-age children to recognize the importance of teaching specific language-related skills and strategies at various grade levels. Thus, teaching children to use context in order to detect and resolve metaphorical meaning, extending vocabulary knowledge to multiple meaning words, and teaching children to generate and compare the critical attributes of words may yield better reading comprehension performance, especially when the reading comprehension task involves resolving anomalies or ambiguities and/or interpreting metaphorical language.

Second, it is important for teachers to recognize that the detection and resolution of comprehension failure is dependent upon the students’ acquisition and use of metacognitive strategies. However, teachers must also realize that the metacognitive strategies used for monitoring and repairing comprehension failures for literal meanings are different from those needed for metaphorical meanings.

Researchers have identified the metacognitive strategies that impact on comprehension failure for literal statements. The strategies that have received the most attention are knowledge of text structure (e.g., recognition of the logical organization of text and use of advance organizers, embedded headings, etc.) and repair strategies such as “lookbacks,” that is, looking back at or rereading relevant sections of previously read texts (Alessi, Anderson, & Goetz, 1979; Brown, Smiley, & Lawton, 1978; Owings, Peterson, Bransford, Harris, & Stein, 1980).

These strategies are necessary but insufficient conditions for resolving comprehension failures for metaphoric meanings. What is also necessary is knowing what to do to remedy the comprehension failure. This knowledge is metacognition about strategies. Students need to recognize text features and be able to use repair strategies, but they also need to control task variables. Thus, they need to be able to recognize and actively monitor inconsistencies (e.g., matching equivalencies of meaning between linguistic elements, generating and matching critical semantic attributes, etc.) in order to resolve comprehension failure.

Therefore, in order to resolve comprehension failure for metaphoric language, students need to acquire not only the knowledge of factors and the strategies related to the processing of literal meaning, but also metacognitive strategies for using this knowledge in order to control the task variables implicated in metaphorical language comprehension. They need to acquire not only an awareness of the importance of assuming an active role in regulating their own comprehension but also the task-specific control strategies needed for monitoring and repairing the comprehension failures that occur when they are processing metaphoric language.

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