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Source: *Reading Research Quarterly*, Vol. 17, No. 4 (1982), pp. 462-481
Published by: [Wiley](#) on behalf of the [International Reading Association](#)
Stable URL: <http://www.jstor.org/stable/747566>
Accessed: 29-10-2015 02:21 UTC

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*An instructional redesign of reading lessons:
Effects on comprehension*

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TWO STORY lessons from a commercial basal reader were revised to highlight key story content and eliminate potential comprehension problems. The revisions were based on notions about the role of prior knowledge in comprehension and the establishment of important story content. The two lessons in their original and revised formats were administered to 24 children each. The effects on comprehension were measured by story recall and forced-choice questions. Children receiving the revised lessons recalled more of the stories and correctly answered more questions than children receiving the control lessons. Implications for reading instruction are discussed.

*Une nouvelle forme d'instruction en leçons de lecture:
Effets sur la compréhension*

ON A RÉVISÉ DEUX leçons de récit à partir d'un manuel commercial de base afin de mettre en évidence le contenu clé du récit et éliminer les problèmes potentiels de compréhension. Les révisions étaient basées sur des notions concernant le rôle que jouent des connaissances préalables pour la compréhension et l'établissement de contenu de récit important. On a administré les deux leçons dans leurs formats originaux et révisés à 24 étudiants par leçon. Les effets sur la compréhension ont été mesurés par le rappel du récit et par des questions de choix forcé. Les enfants exposés aux leçons révisées ont retenu plus des récits et ont répondu correctement à plus de questions que les enfants exposés aux leçons de contrôle. Les implications pour l'instruction de la lecture sont le sujet de discussions.

*Un rediseño de instrucción de lecciones de lectura: Efectos
sobre la comprensión*

DOS LECCIONES de cuentos de un texto comercial de lectura se revisaron para enfatizar el contenido principal del cuento y para eliminar posibles problemas de comprensión. Las revisiones se

basaron en la noción del lugar que conocimiento previo ocupa en la comprensión y en el establecimiento del contenido importante del cuento. Se administraron las dos lecciones, en sus formatos original y revisado, a dos grupos de 24 niños. Se midieron los efectos de comprensión por medio de la técnica de recordar el cuento y de la elección obligatoria de preguntas. Los niños que recibieron las lecciones revisadas, recordaron más de los cuentos y contestaron correctamente más preguntas que los niños del grupo de lecciones control. Se discuten inferencias para la enseñanza de lectura.

A large portion of the time spent on reading instruction in the elementary schools occurs around the directed reading lesson (a series of teacher guided activities surrounding a textual selection from the children's readers). In general, a directed reading lesson begins with a preparation component which presents vocabulary that will be encountered in reading and background information related to the story. Silent reading of the story then follows. In the primary grades the silent reading is divided into smaller segments, referred to as silent reading units (SRUs). Before each SRU there is usually a short discussion about the upcoming text and its illustrations. After each SRU there are questions about that unit. Finally, there is a period of questions and discussion about the entire story.

The implicit objective of a directed reading lesson is to provide students with meaningful encounters with text from which they can build comprehension skill. Recently, Beck, McKeown, McCaslin, and Burkes (1979) examined the suggestions for instructional practice provided in the teacher's manuals of a number of directed reading lessons in two widely used basal reading series. Such suggested practices have been shown to have a strong influence on classroom teaching behavior (Diederich, 1973). In their analysis of the two programs, Beck et al. identified practices that seemed problematic for comprehension. They found that lesson components sometimes contained information that was either misleading or irrelevant to the story. Beck and her colleagues hypothesized that lesson components that did not contain misleading or irrelevant content but instead provided relevant background knowledge and systematically highlighted content central to a story would be likely to result in better comprehension.

The present study examined the effect on comprehension of redesigning four lesson components: 1) pre-story preparation, 2) pre-SRU preparations, 3) illustrations accompanying the text, and 4) post-SRU questions. The redesigned components were based on two

theoretical notions. The first notion is that activation or establishment of relevant background knowledge prior to reading facilitates comprehension. Recent research has suggested that prior knowledge (Anderson, Reynolds, & Schallert, 1977; Chiesi, Spilich, & Voss, 1979) provides a framework into which a reader can assimilate new information. The facilitating effect of prior knowledge derives its pertinence to reading instruction from recent tendencies of reading programs to include stories in which knowledge beyond everyday experience is required for comprehension (Beck et al., 1979). Although such textual materials provide increased opportunities for adding to the child's pool of information, they also provide increased opportunities for comprehension to go awry if the unfamiliar concepts are not clarified during the reading lesson.

The second notion is that highlighting content that is central to the story facilitates comprehension. The notion of highlighting central content is based on the idea of a story map which is defined as a unified representation of a story's main stated and implied events and the causal relations that connect them (Beck et al., 1979). Beck and her colleagues argued that establishing a story map is critical to comprehension. In their analysis of current practices in reading instruction, they found that a lesson sometimes directs children to evaluate and interpret a story without first ensuring that they have a good grasp of what happened in the story. Prompting children to evaluate and interpret a story when they do not have the story map well in mind can result in fabrication rather than grappling with what is actually implied by the story. For this reason, Beck et al. argued that the child's construction of a story map is the first order of business in promoting comprehension as it is the base upon which the more interpretive and evaluative aspects of comprehension are built.

Two aspects of the story map notion are germane to this article. One is that an informally derived story map can serve to guide the teacher in preparing a story lesson. This aspect will be discussed with other instructional implications later in the article. The other aspect of the story map is that it is closely related to a more formal procedure, a narrative analysis developed by Omanson (in press), used in the study to analyze the story texts. Omanson's analysis identifies what is called the Central event sequence of a story. The Central event sequence of a story is the explicit story content that along with important Implied content comprises the "story map."

Four assumptions underlie the algorithms that determine which events and states are considered part of the Central event sequence. First, events and states that are causally or purposefully connected are more central than events and states that are not connected, or only temporally connected. Second, causally and purposefully connected events and states that form a sequence leading from the beginning to the end of the story are more central than causally and purposefully connected events and states that form “dead-end” sequences. Third, “component actions” (e.g., getting out cereal, pouring on milk, eating) are less central than a description of their superordinate action (e.g., eating breakfast). Fourth, events and states that introduce or involve main characters are more central than those that introduce or involve only minor characters.

Based upon these four assumptions, the Central and Noncentral content of a story is identified in the following manner. First, the story is divided into clauses that depict a single event or state (content units). Next, the relations that connect each unit are identified. In order to identify the connecting relations, the experimenter asks five questions about each unit:

1. *Componential Relation*: Is this event or state a component of a larger event?
2. *Purposeful Relation*: Was a prior action performed in order to bring about this event or state?
3. *Causal Relation*: Was this event or state caused by a prior event or state?
4. *Disrupted Purposeful Relation*: Does this event or state disrupt either a prior action or the goal of a prior action?
5. *Enabling Causal Relation*: Was this event or state enabled by a prior event or state?

After the connecting relations are identified in this manner, each unit is classified as Central or Noncentral. Central units depict events that are not components of other events, and that either introduce a main character or form a sequence of connected events and states that lead from the beginning to the end of the story.

Story content identified as Central has been shown to be the content most likely to be rated as important and included in summaries and recalls (Omanson, in press; Omanson & Malamut, Note 2). Thus, Central content corresponds both conceptually and empirically to Beck et al.’s informal notion of a story map.

Previous research on the effects of providing relevant background knowledge and highlighting central content has been sporadic. The notion that providing relevant background knowledge may enhance comprehension has been addressed by a number of studies. For example, Graves and Cooke (Note 1) and Langer and Nicholich (1980) examined the effects on comprehension of a careful structuring of pre-reading activities intended to build knowledge deemed important for understanding the upcoming text. Results of both studies suggest that greater prior knowledge allows enhanced comprehension. A study done by Pearson, Hansen, and Gordon (1979) carried similar implications. The investigators tested the comprehension of children with high and low prior knowledge of spiders on a story about spiders. Their results also suggested that the greater prior knowledge assisted comprehension.

In contrast, the notion of highlighting Central content, either with pictures or questions, has received relatively little attention. The bulk of the research on the effects of pictures on comprehension has been concerned with the presence or absence of pictures. Samuels's (1970) review of this area concluded that, overall, pictures did not seem to affect comprehension, although some studies found the presence of pictures to help while others found them a hindrance. Work by Peck (1974), however, has suggested that there is an issue beyond the presence or absence of pictures. Peck found that pictures in agreement with a text improve comprehension, while pictures that contradict the text inhibit comprehension.

Similarly, the major concern of previous work on the effects of questions on comprehension has considered the properties of questions independent from story content (cf., Anderson & Biddle, 1975). For example, a number of investigators have argued that higher level inferential and evaluative questions are more effective in enhancing comprehension than lower level literal questions (e.g., Guszak, 1967, 1972; Hunkins, 1970; Ryan, 1973). Relatedly, several taxonomies of question types have been constructed to guide question-asking (e.g., Barrett, 1967; Herber, 1970; Ruddell & Bacon, 1972). An underlying assumption of this work on questions is that the effectiveness of questions can be evaluated independent of the text content being questioned. An important exception to this trend is the work of Pearson and Johnson (1978), who offer a taxonomy that takes into account the relationship between text content and questions. This latter view demonstrates an important point: The effectiveness of questions for promoting comprehension cannot be evaluated unless we know the role

of the information tapped by the question within the story framework. The work of Peeck and of Pearson and Johnson suggests that the relation of both pictures and questions to story content is critical to their effectiveness in enhancing comprehension and is consistent with the specific strategy of highlighting Central content.

In the present study, providing relevant prior knowledge and highlighting Central content to facilitate the construction of a story map were adopted as objectives for the four lesson elements within two directed reading lessons. The effects on comprehension of the revised lessons were then compared to that of the original lessons. In addition, the study aimed to determine if such revisions would differentially affect skilled and less-skilled readers, since the previous work of identifying instructional dimensions that affect comprehension was mainly targeted toward improving instructional practices for those children who have difficulty learning to read.

The two story lessons based on redesigned elements and the original lessons were administered to two groups of third-grade children. Free recall and forced choice questions drawn from Central, Noncentral, and Implied story information were used as measures of comprehension. The next section will describe the way in which the two lessons were altered in order to provide relevant background knowledge and to facilitate the construction of a story map.

Method

Materials

The materials for this study were two story lessons from the *Reading 720* series (Clymer, 1976), and the revised counterparts of these lessons. One story, "The Raccoon and Mrs. McGinnis," was taken from the second-grade materials (Level 7) and is 811 words in length. The other story, "The Donkey Egg," was taken from the third-grade materials (Level 8) and is 781 words in length. Both stories were analyzed by Omanson's analysis. The raccoon story was analyzed by two of the authors and an inter-rater reliability of .91 was obtained. This coefficient reflects the cumulative effect of disagreements on unit boundaries and relations on classifying each identified unit as Central or Noncentral. The raccoon story was found to contain 53 Central and 62 Noncentral units, and the donkey egg story had 22 Central and 99 Noncentral units.

The plot of "The Raccoon and Mrs. McGinnis" involves a woman who wishes on a star, a raccoon who comes nightly to her doorstep to look for

food, and some bandits. The raccoon's masked appearance happens to frighten the bandits into dropping a bag of money. The raccoon picks up the bag and eventually drops it on Mrs. McGinnis's doorstep while looking for food. Finding the money, Mrs. McGinnis attributes it to her wish on a star.

The second story, "The Donkey Egg," is an old Turkish tale about the Hodja, a gullible character. A sly friend gives the Hodja a pumpkin, telling him it is a donkey egg that will hatch a donkey. Weeks later, the "egg" softens and begins to smell, and the Hodja decides he must get rid of it. As he rolls the "egg" down a hillside, it hits a tree and bursts open, startling a rabbit. As the rabbit runs off, the Hodja mistakes it for a baby donkey, and sighs over his loss.

Examination of each lesson element surrounding these two stories revealed a number of potential problems. In the following sections, the revisions made to the lesson elements will be described and contrasted with the original lesson elements.

Pre-story preparation. The pre-story preparation component of each story lesson was altered in consideration of the knowledge needed to comprehend the story. First, key story concepts were identified and then activities were designed to activate or present these concepts. In "The Raccoon and Mrs. McGinnis," the major concepts around which the preparation was built were coincidence, since Mrs. McGinnis's wish comes true through a series of coincidences, and habit, since the raccoon's habitual behavior allows the coincidences to occur. The revised preparation component introduced the concept of coincidence and set up conditions to help children identify and interrelate story events that bring about coincidences. These conditions include the general idea that animals behave in a routine manner, and focus on seeking food and avoiding danger. More specific notions discussed were that raccoons tend to pick up objects found in their path, and that bandits and raccoons share the physical characteristic of a masked faced.

The revisions contrast with the original pre-story preparation component provided by the commercial lesson, which focused on a discussion of raccoons as clever, playful animals. It did not include information about raccoons that we judged as most useful for story comprehension, such as raccoons' habitual behavior and masked appearance.

The framework selected to foster comprehension of "The Donkey Egg" was the notion of a practical joke. In the revised pre-story preparation component of the lesson, the idea of a practical joke was

discussed, and other conditions were set up to aid children in interpreting events in this light. These conditions included the impossibility of a donkey egg, and the Hodja's gullible nature. The preparation component also included a discussion of cultural characteristics of old Turkey. This was done so that children would have a schema for unfamiliar cultural characteristics mentioned in the text that might otherwise interfere with the flow of the story.

The commercial lesson preparation activity introduced the Hodja as a traditional Turkish story character, mentioned that donkeys do not lay eggs, and asked children to find out why the Hodja had been given a donkey egg. It can be noted that the concepts presented before this story are more helpful to comprehension than those prior to the raccoon story. However, the preparation still does not provide a framework that may help children relate events to the theme of the story.

Pre-SRU preparation. The redesign of the pre-SRU preparation had a two-fold purpose. First, the activities, which follow a break in reading between SRU's, were created to reorient the children to the story map by providing a focus on key upcoming events. Second, the activities were used to activate relevant knowledge by referring to concepts introduced in the pre-story preparation. The pre-SRU preparations in the original lessons were widely varied in their relationship to text events. Those that relate only tangentially to the text may distract the reader.

The orientation to the story map can be shown by comparing the preparations for the revised and original lessons that occur before one SRU in "The Donkey Egg." In this SRU, the Hodja dejectedly carries his "egg" to a remote hillside to dispense with it. As he passes through town, the villagers recognize it as a pumpkin, and chant "Donkey eggs grow on pumpkin vines." This is the *only* point in the story that reveals the identity of the donkey egg. The preparation provided in the original lesson is speculative and poorly focused: "What is going to happen to the soft egg? What will the Hodja and Fatima do with it? Do they still expect it to hatch? Do you expect it to hatch?" (Clymer, Level 8, 1976, p. 249, Teacher's Manual). The revised preparation provides an important focus: "On this page you'll find out what happens to the donkey egg. You'll also learn what the people in the village find out about the egg that the Hodja hasn't figured out." Thus, appropriate expectations may be activated.

A revised pre-SRU preparation for the raccoon story demonstrates the activation of prior knowledge. In the SRU, Mrs. McGinnis feeds her animals, leaves bread for the raccoon, and then

wishes upon a star. To reinstate the concept of habit, the following statement is made to the child: "You will find out some of the things Mrs. McGinnis always does—you know, her habits. . . ."

Pictures. As noted earlier, pictures that accompany story texts may inhibit comprehension if they conflict with story events or story theme in style or content (Beck et al., 1979; Peeck, 1974). The pictures accompanying the two stories were redrawn to depict Central content in a manner consistent with the overall plot of the story. The pictures for the original version of "The Raccoon and Mrs. McGinnis" are drawn in a fanciful style which contradicts the real-life nature of the plot. The characters look like fairy tale figures, with Mrs. McGinnis appearing as a homespun Mother Goose type, and the bandits as caricatures of evil-doers. The redesigned pictures have virtually the same content as the original pictures, but are realistic in style. Thus, they may promote the idea that the story is a plausible one.

Pictures for "The Donkey Egg" were revised in a less dramatic manner. In general, the revisions were aimed to eliminate caricaturish aspects of the art so that characters could be differentiated more clearly and the characters' style of dress and habitat could be recognized.

Questions. Questions asked after each SRU can best facilitate comprehension by assisting the reader to develop a story map. The use of Omanson's analysis (in press) to classify units of content as Central or Noncentral and to identify the relations that connect Central content units enabled a generalized procedure for devising questions that highlight the story map. On the basis of Central content and relations identified by Omanson's analysis as connecting Central content, questions were developed that enabled the children to reinstate the story map. Questions for the revised lessons were developed from the Central events and relations. The number of questions developed for the revised lessons was equal to that of the original lessons.

The questions in the original lessons did not seem to be derived from any such systematic procedure. While some of the questions aimed at eliciting important story content, others tapped information that was irrelevant to the story line. Questions considered irrelevant included those that tapped story details immaterial to the main events, and those that asked children to step out of the story and answer questions based on their own experiences or general knowledge. Questions such as these certainly have their place in instruction. However, because the questions of concern here occur between silent reading units, while children are still in the process of constructing text meaning, such questions seem potentially disruptive to comprehension.

In order to provide a sense of the differences between the questions in the revised lessons and those found in the original lessons, the questions from both versions for one SRU in the raccoon story will be compared. The actions depicted in this SRU occur after Mrs. McGinnis has made her wish and gone to bed. The raccoon comes to the doorstep to collect his slice of bread, carries the bread into the woods, and rinses it before eating. Still hungry, he begins to search for food. He is then startled by the appearance of two men and hides behind a tree. The men discuss plans for stealing Mrs. McGinnis's animals.

The revised questions for the unit are as follows: 1) Why did the raccoon come down from the tree? 2) After the raccoon ate the bread why did he look for more food? 3) What did the raccoon do when he saw the men coming? 4) Where were the men going? 5) Why were the men going to Mrs. McGinnis's house? As can be seen, these questions systematically pattern the flow of the story.

The six questions asked in the original version, however, wandered in and out of textual concepts. Only two of them touched upon key events, and one of those in an ambiguous way. The series of questions began by asking if Mrs. McGinnis got her wish (by default, the answer is no, since the wish is not mentioned in this SRU). The next question was: "What did the raccoon do?" Although this question seeks information that is important to the story flow, its phrasing is rather global, for the raccoon did many things in that SRU. Next, the question sequence sidetracked to inquire as to why the raccoon swished his bread in the water, and where one could find this information. Then returning to the story line, the next question was: "Why were the two men going to Mrs. McGinnis's house?" The final question then called on children to conjecture whether the men are correct in assuming that Mrs. McGinnis will not discover her animals are missing until morning. The lack of organization in the type and sequence of questions does little to promote a child's construction of the story.

To reiterate, four aspects of the story lessons—pre-story preparation, pre-SRU preparation, pictures, and after-SRU questions—were redesigned to introduce or establish prior knowledge judged essential to story comprehension and promote the establishment of a story map.

Subjects and Design

The subjects for this study were 48 third-grade children drawn from two urban schools near Pittsburgh. These children were from a lower SES background and approximately 75% were black. On the basis

of the Level I Reading subtest of the Wide Range Achievement Test (Jastak & Jastak, 1965), which was administered to all of the third-graders in the two schools, half of the children (skilled) had a mean grade equivalent score of 5.1 (range = 4.2 to 6.7), and the other half (less-skilled) had a mean grade equivalent score of 3.1 (range = 2.5 to 3.8)¹. Revised story lessons were given to 12 skilled and 12 less-skilled children and the remaining 12 skilled and 12 less-skilled children received the original story lessons.

Procedure

Both of the revised and control lessons were given to the children in the appropriate group during two 4-week periods. "The Raccoon and Mrs. McGinnis" was given in December and "The Donkey Egg" was given in February.

The story lessons were presented individually to each child. Each session began with the examiner telling the child that he or she would be asked to do a reading lesson similar to a classroom reading group experience. The lesson then began with the vocabulary introduction from the original lesson (this dealt mainly with decoding work, and thus was not altered in the revised lesson), followed by the story preparation component. For each SRU in the story, pre-SRU preparation was presented, the unit was read, and questions followed. The child read silently, but was told that the examiner would help with any words that were unfamiliar. After completing the story, children were asked to recall as much as they could of the story. Finally, a set of 35 forced-choice questions about the story was presented. The examiner presented a card with each question and the answer choices on it, and read it aloud while the child followed along and indicated his or her answer aloud.

Dependent Measures and Scoring

The dependent measures used in this study were story recall and two sets of 35 forced-choice questions. To elicit recall, examiners asked the children to tell the whole story from the beginning, as much as they could remember. Neutral probes, such as "What else happened?," were used as needed. Each recall was scored for the gist of each Central and Noncentral content unit.

The second dependent measure consisted of responses to a set of 35 questions, each with three choices, given after each recall. Of these

questions, 15 queried Central content, 10 queried Noncentral content, and 10 queried Implied content.

Results and Discussion

The recalls and answers to the comprehension questions were analyzed in separate analyses. For recall, an analysis of variance with lesson and reading skill as between-subject factors and story and content centrality as within-subject factors was used. For answers to the comprehension questions, an analysis of variance with lesson and reading skill as between-subject factors and story and question type (Central, Noncentral, and Implied) as within-subject factors was used. Both analyses revealed a number of reliable effects that are commonplace in comprehension studies. First, skilled readers performed better than less-skilled readers on both recall (.21 vs. .17), $F(1, 43) = 4.04, p < .05$, and questions (.73 vs. .60), $F(1, 43) = 20.93, p < .01$. Second, Central content was better recalled than Noncentral content (.32 vs. .06), $F(1, 43) = 340.62, p < .01$. Similarly, performance on the Central explicit questions (.79) was better than performance on Noncentral explicit questions (.66), both of which were better than performance on Implied questions (.54), $F(1, 43) = 92.55, p < .01$, where the specific pairwise comparisons are reliably different $p < .01$ (Newman-Keuls test).

The primary question posed by this study, however, was whether the revised lessons produce better comprehension as measured by recall and answers to questions. As shown in Table 1, children receiving the revised lessons did recall more of the stories (.22 vs. .17), and correctly answer more questions (.70 vs. .62), than did children with the control lessons. In the question analysis of variance there was no interaction with question type (Central, Noncentral, and Implied), indicating that the revised lessons reliably enhanced performance on all three types of questions. In the recall analysis of variance, there was an interaction between lesson and Centrality, $F(1, 43) = 10.31, p < .01$, with the advantage for the revised lessons appearing only in Central content, $p < .01$ (Newman-Keuls test). The lack of enhancement of Noncentral content in recall may simply reflect different task demands between recalling stories and answering questions. In recall there seems to be a general bias against producing Noncentral content by children of this age. Lesson did not interact with any of the remaining factors in either analysis.

Table 1 Proportion of content recalled and questions correctly answered by children in the revised and control conditions

Type of Score	Lesson	
	Revised	Control
Recall		
Central	.37	.27
Noncentral	.07	.06
Questions		
Central	.83	.74
Noncentral	.70	.62
Implicit	.58	.49

The second question of this study concerned the effect of the revised lesson on skilled and less-skilled readers. As shown in Table 2, the performance of both skilled and less-skilled readers was enhanced by the revised lesson on both recall and questions. For both measures the magnitude of the effect is sufficiently large that the performance of less-skilled readers in the revised lessons did not differ reliably from that of the skilled readers in the control lessons in regard to Central content.

Table 2 Proportion of content recalled and questions correctly answered by skilled and less-skilled readers in the revised and control conditions

Type of Score	Skilled		Less-Skilled	
	Revised	Control	Revised	Control
Recall				
Central	.40	.29	.33	.24
Noncentral	.08	.07	.06	.05
Questions				
Central	.86	.81	.80	.68
Noncentral	.82	.68	.58	.56
Implied	.65	.56	.52	.43

It can also be seen in Table 2 that performance on questions revealed different patterns for skilled and less-skilled readers. For less-skilled readers, the revised lessons enhanced the ability to answer Central

questions, while skilled readers were helped in their ability to answer Noncentral questions. This interaction in the question analysis of variance among Centrality, lesson, and reading skill was only marginally reliable $F(1, 43) = 3.81, p = .055$, and did not occur with recall—perhaps because of the differences in task demands between questions and recall. Yet the finding suggests an interesting interpretation. Less-skilled readers apparently have difficulty establishing a story map, as the less-skilled readers who received the control lessons performed poorly on Central questions. Consequently, the lessons helped less-skilled readers to better establish the story map. This is indicated by their superior performance on Central questions relative to the children receiving the control lessons (.80 vs. .68).

In contrast, skilled readers apparently have little difficulty establishing a story map as the skilled readers receiving the control lesson performed very well (.81) on Central questions. As a result, the benefit of the revised lessons for skilled readers was in elaborating, rather than establishing, the story map. This is indicated by the superior performance by skilled readers in the revised lesson on Noncentral questions relative to the skilled readers in the control lesson (.82 vs. .68).

The remaining reliable effects that emerged from this study concern differences between the two stories. It is not unexpected in a study such as this to find effects due to story differences, particularly since the stories were shown to be so different in structure according to Omanson's analysis. In "The Donkey Egg," 82% of the content units were Noncentral, compared to 54% of the content units in "The Raccoon and Mrs. McGinnis." Before describing the story effects, it is important to re-emphasize that despite the difference in story structure, the revised lessons enhanced performance on both stories.

The first of these story effects, presented in Table 3, is that in the recall analysis of variance, the two stories differed in the total amount of content recalled, $F(1,43) = 44.78, p < .01$, with the recall of the donkey egg story (.17) superior to that of the raccoon story (.12). A reliable interaction between story and Centrality, $F(1,43) = 49.79, p < .01$, revealed that the two stories differed only in recall of Central content (.39 vs. .25), $p < .01$ (Newman-Keuls test). However, in the question analysis of variance, the two stories differed on Noncentral content, $F(1,43) = 8.32, p < .01$, and in this case the Noncentral content of the raccoon story (.72) is superior to that of the donkey egg story (.61), $p < .01$ (Newman-Keuls test).

Table 3 Proportion of content recalled and questions correctly answered for raccoon and donkey egg stories

Type of Score	Story	
	Raccoon	Donkey Egg
Recall		
Central	.25	.39
Noncentral	.06	.07
Questions		
Central	.78	.79
Noncentral	.72	.61
Implied	.52	.55

The difference in the Central-Noncentral composition of the two stories described above suggests that an increase in the proportion of supportive Noncentral content enhanced the recall of Central content. This enhancing effect of additional supportive Noncentral content on the recall of Central content has been reported by a number of investigators (e.g., Black & Bower, 1979; Voss, Vesonder, & Spilich, 1980; Omanson & Malamut, Note 2). However, an increase in the proportion of Noncentral content decreased the likelihood of a specific Noncentral unit being brought to mind during questions. Presumably this is because Noncentral content is connected to Central content rather than to other Noncentral content during processing.

An interesting parallel between the lesson effect and the story effect described above can be drawn. Just as lesson components can enhance the recall of Central content, a story containing a large amount of elaborative Noncentral content can likewise enhance the recall of Central content. Thus, comprehension can be enhanced both from outside the text by lesson elements and from within the story itself by elaborative Noncentral content.

The second story effect involved an interaction among story, Centrality, and reading skill in the recall analysis of variance, $F(1,43) = 5.02, p < .01$, in which the recall of Central content by skilled readers (.44) was enhanced more by the additional Noncentral content of the donkey egg story than was the recall of Central content by less-skilled readers (.34), $p < .01$ (Newman-Keuls test). These results are presented in Table 4. This interaction among story, Centrality, and reading skill suggests that skilled readers are better able to benefit from the presence of large amounts of the supportive Noncentral content that appeared in the donkey egg story.

Table 4 Proportion of content recalled and questions correctly answered for raccoon and donkey egg stories by skilled and less-skilled readers

Type of Score	Reading Ability			
	Skilled		Less-Skilled	
	Raccoon	Donkey Egg	Raccoon	Donkey Egg
Recall				
Central	.26	.44	.23	.34
Noncentral	.07	.07	.05	.06
Questions				
Central	.82	.85	.75	.74
Noncentral	.78	.71	.65	.50
Implied	.56	.64	.48	.45

Conclusions and Implications

The present study set out to determine whether one can enhance the comprehension of basal narratives by careful structuring of lesson elements to highlight central story content. This work followed the identification of problematic aspects of basal reading lessons associated with comprehension instruction. Both the analytic and experimental efforts have focused on poor prognosis readers: those children who have difficulty learning to read.

As the results of the study indicate, the lesson revisions enhanced children's ability to recall story information and answer questions about the stories. Regarding the effects on skilled versus less-skilled readers, three statements can be made: (1) The lesson revisions helped both skilled and less-skilled readers. (2) Less-skilled children in the revised group performed at the level of skilled children in the control group. (3) A different pattern of results was evident for skilled and less-skilled children in the questions correctly answered. The larger advantage for skilled children was on Noncentral questions, while for less-skilled children it was on Central questions.

Several issues of concern to the general direction of the research reported here remain to be discussed. The first is the relationship between specific cases of enhanced performance on story recall and question responses, and general comprehension improvement. The approach chosen for this study, that of redesigning reading lessons, stems from a notion that daily encounters with reading lessons that consistently facilitate text comprehension may lead to the development of general comprehension skill. Any attempt to test the validity of such a global

notion must begin with a demonstration that comprehension of single texts can be enhanced by a careful structuring of the lesson elements surrounding the story text. Now that this has been demonstrated on individual stories, the notion that the lesson elements surrounding a text can be “engineered” to enhance comprehension of specific materials has some empirical basis, and recommendations and procedures for doing so can be utilized. However, evidence of the enhancement of comprehension of specific texts is necessary, but not sufficient, to allow the claim that general comprehension will thus be affected. An attempt to measure the validity of the notion concerning general comprehension would require large-scale instructional manipulation and longitudinal assessment. Yet it is intuitively compelling to think that cumulative reading experience designed to maximize conditions for comprehension to occur will better prepare children to comprehend subsequent texts than will lessons that fail to facilitate story comprehension. Thus, the research reported here represents an important step toward the eventual goal of improving instructional practices associated with reading comprehension.

The second issue concerns the goals of reading lessons vis-à-vis comprehension. The goal in redesigning these reading lessons was to enhance children’s comprehension of the stories contained in each reading lesson. Enhancing comprehension is not to be confused with making the reading process easier for a child. Rather, it makes the effort children put into reading more fruitful in that they will have a better grasp of what was stated and implied by the story. A good lesson would allow children to comprehend difficult stories nearly as well as they comprehend less difficult stories. This implies, of course, that if the effort a child puts into each reading lesson remains constant, the lesson surrounding a difficult story will have to contribute more than one surrounding a less difficult story.

A third issue concerns the goals of a single reading lesson. Enhancing children’s comprehension of story content is not the only immediate goal one needs for designing a lesson. Lesson elements that prompt the child to go beyond the story, to apply concepts learned in the story to his or her own experience, or to reflect about the literary forms used are likewise essential. However, ensuring that the child has the best grasp possible of the actual and implied story content is the first order goal on which the goals of extending, interpreting, and applying story content are built. Without the foundation of the story map, activities aimed at interpretation or evaluation have no basis, and thus are of questionable value for developing comprehension ability.

The delineation of story map development as a first order goal points out a major problem of comprehension instruction as identified in basal readers. That is, the basals often attempt to meet a variety of objectives within each lesson, thereby evidencing conflicting goals. When attempts to extend text ideas or draw attention to issues such as artistic or literary style intervene before a story map can be established, this first order goal may never be met.

Finally, having presented evidence for enhanced comprehension and a rationale for viewing the establishment of a story map as a first order goal of reading lessons, it is appropriate to discuss the utility of our lesson procedures for teachers and program developers. The following considerations can be used to guide the preparation of a story lesson: (1) selection of a framework for pre-story preparation activities that will ready children to recognize and interrelate critical story concepts; (2) use of pictures to complement textual concepts so that pictures are not at cross purposes with the text theme or content. (Of course, a teacher has no control over pictures used. Here she or he can only try to prevent any potential problems of pictures through additional discussion during the lesson.); (3) creation of pre-SRU preparation to reorient children to the story following the post-SRU break, and to highlight upcoming critical information; and (4) design of after-SRU questions to recapitulate the main story events and relations.

A teacher may find it useful to construct a story map to guide development of lesson elements. To create a map, a decision is first made, based on one's intuition as a mature reader, as to what the premise or starting point for the story is. Then one lists the major events and ideas that constitute the plot or gist of the story, being sure to include implied ideas that are part of the story though not part of the text, and the links between events and ideas that unify the story (Beck & McKeown, 1981). In preparing a story lesson, a teacher can then check to see that concepts needed to enable a child to establish a story map are highlighted before and during reading and that after-reading questions follow in logical sequence to elicit information required to construct the map.

The adoption of these considerations in preparing a lesson should help accomplish what has been discussed as the first order goal of comprehension instruction. However, these procedures are not meant to be viewed as some instant instructional panacea. Comprehension fluency develops slowly. Improvements in instructional practice must be matched to this gradual evolution. A refinement of strategies, aimed at the careful crafting of each daily lesson, seems an appropriate course to follow.

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TEST REFERENCE

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Reference Notes

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Footnotes

The preparation of this paper was supported by the Learning Research and Development Center, supported in part as a research and development center by funds from the National Institute of Education (NIE), United States Department of Education.

The authors gratefully acknowledge the assistance provided to this project by Cynthia Beebe, who helped with the design of dependent measures and scoring of recall data, to Laura Ritchey, John Abbruzzese, Carol Hughes, and Cathy Rosner who collected the data, to Alan Lesgold, Charles Perfetti, and James Voss who read an earlier version of this manuscript, and to Jay Ritter who typed the manuscript.

¹Three subjects moved during the study. Replacement was possible for two subjects only, and they had to be drawn from a third school in the district. This left the control group with one less subject than the experimental group.