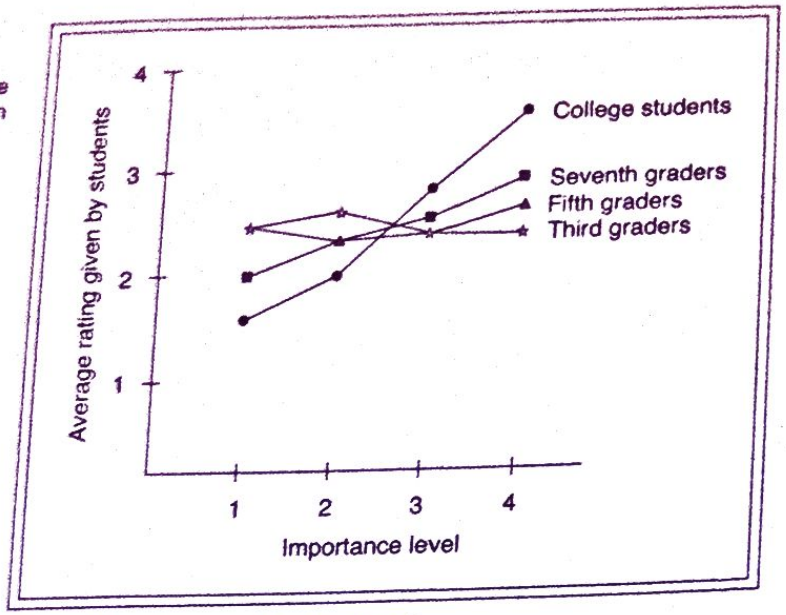
FIGURE 3–10

Average importance ratings for text given by students at four age levels



Adapted from Brown and Smiley (1977).

same as the least important ones. However, seventh graders, and to a greater extent college students, displayed an awareness of the relative importance of idea units; they tended to give high ratings to important idea units and low ratings to unimportant ones. In follow-up studies, older readers were better able to summarize text—such as identifying the important points—than were younger readers (Brown & Day, 1983).

As another example of age-related improvements in sensitivity to prose structure, let's focus on changes in students' skill in identifying the main idea in a passage. For example, consider a story about a boy named Jimmy who gets a paper route so he can save $100 in order to buy new bicycle. The story has approximately 40 sentences, but the main goal of the protagonist, Jimmy, is stated in one of them: "Jimmy wanted a 10-speed bike." To measure students' skill at identifying the main idea—in this case, Jimmy's main goal—we could ask them to select the best title for the story:

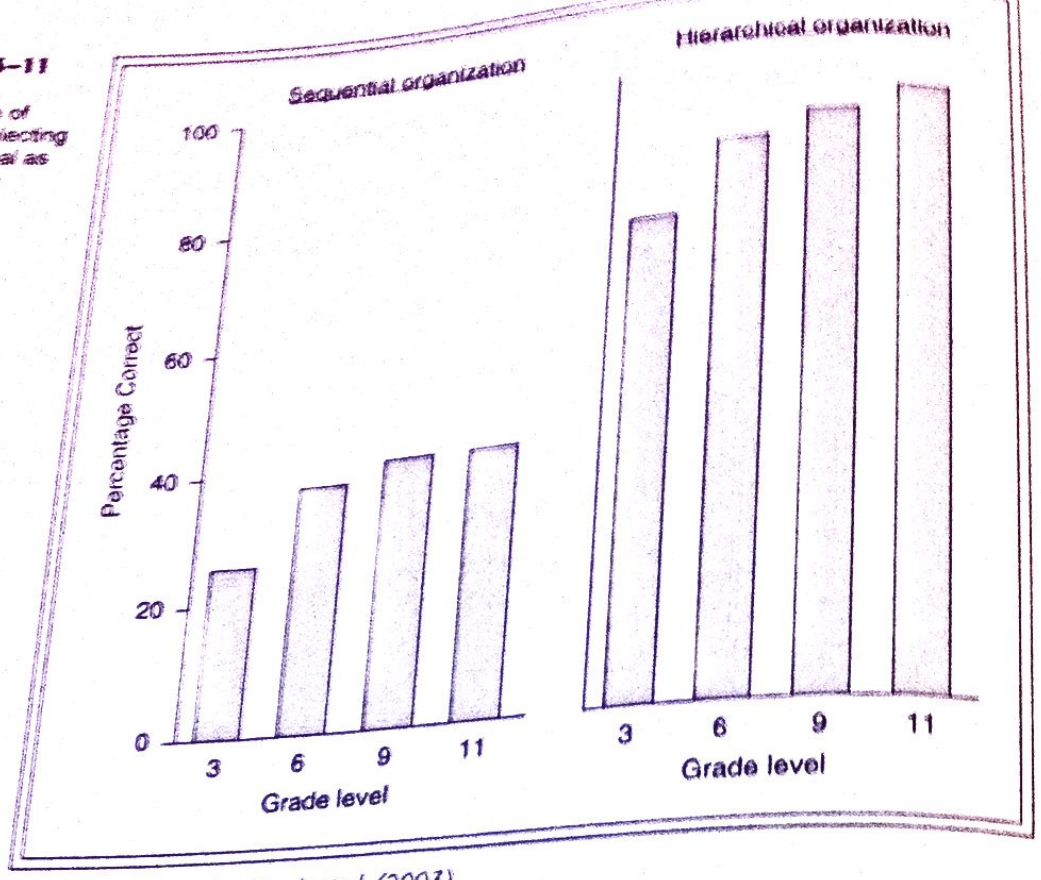
What is the best title for the story?

(a) Jimmy wanted a paper route
(b) Jimmy wanted to save $100
(c) Jimmy wanted a 10-speed bike

This is a task studied by van den Broek, Lynch, Naslund, Ievers-Landis, & Verduin (2003). They asked students in Grades 3, 6, 9, and 11 to read the Jimmy story and then select the best title (and to do the same for a story about Sally who "wanted to do something special for show-and-tell"). Some students received the story in sequential form in which the main goal was toward the end of the story, whereas other students received the story in hierarchical form in which the main goal was stated near the beginning of the story.

FIGURE 3–11

Percentage of students selecting the main goal as the best title



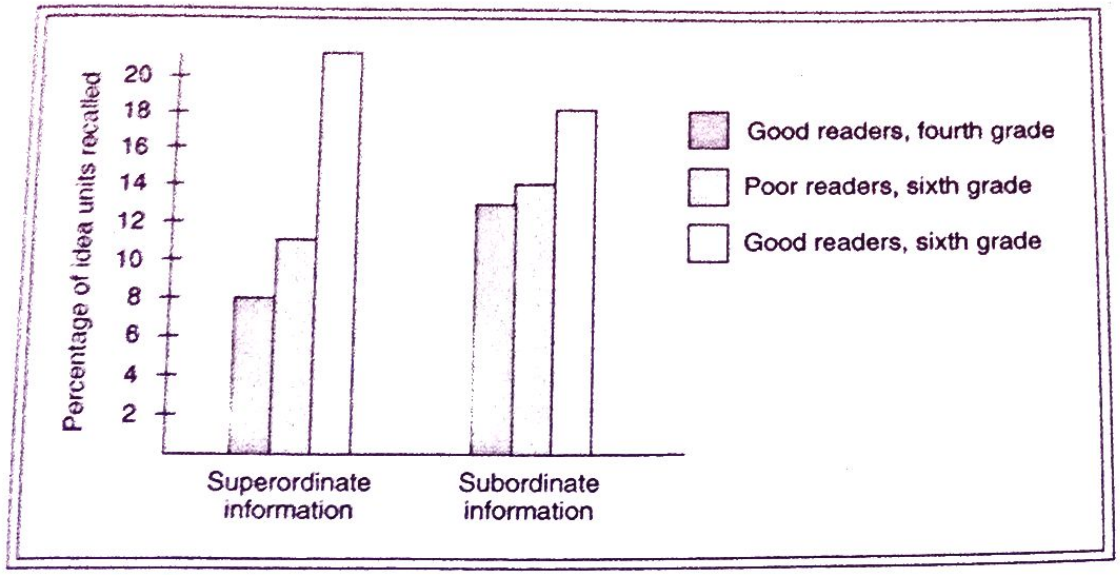
Adapted from van den Broek et al. (2003).

Figure 3–11 shows the percentage of students selecting the main goal as the best title for the story for each of the four age levels (Grades 3, 6, 9, and 11) and the two ways of organizing the story (sequential and hierarchical). As you can see, there is an age-related increase in readers' sensitivity to prose structure as indicated by older readers outperforming younger readers on choosing the best title for the story. In addition, as you can see, readers are much more accurate in identifying the best title when the story is in hierarchical form than sequential form, indicating that readers have a particularly hard time identifying the main ideas in a story when it is not organized in a way that emphasizes the main ideas. This research by van den Broek et al. (2003) shows that students improve in their ability to identify main ideas over the course of their academic careers, but even by late high school have difficulty with poorly organized passages.

Ability-Related Differences in the Use of Prose Structure Meyer (1975) devised a technique for determining whether readers use the *top-level structure* of a passage, which is a sort of skeleton outline of the main topics. Use of this top-level structure would be indicated if students recall the main superordinate ideas before they recall the subordinate ideas. If more mature readers are more sensitive to top-level structure, their recall protocols should be organized around this structure and recall should be enhanced mainly for the superordinate rather than the subordinate information in a passage.

FIGURE 3–12

Recall of superordinate and subordinate information by three groups



Adapted from Taylor (1980).

Taylor (1980) asked good fourth-grade readers, poor sixth-grade readers, and good sixth-grade readers to read and recall a short passage. As expected, on delayed recall, 59% of the good sixth-grade readers used top-level structure in recalling the material compared to only 18% of the poor sixth-grade readers and 12% of the good fourth-grade readers. If skilled readers focus more on top-level structure, we would expect them to excel particularly in the recall of superordinate ideas. As expected, on delayed recall, the good readers in the sixth grade recalled about 75% more of the superordinate information than the poor readers in the sixth grade, but only 30% more of the subordinate information than the poor readers. These results are summarized in Figure 3–12.

Age-Related Differences in Sensitivity to Topic Shifts If skilled readers are more sensitive to prose structure, we would expect them to pay more attention to topic sentences. Gernsbacher (1990) showed how reading a text involves a process of structure building in which "the goal of comprehension is to build a coherent mental representation or structure of the information being comprehended" (p. 1). Gernsbacher argues that the first step in building a structure is to lay a foundation, a process that presumably takes time. To study this process, skilled readers were asked to read a passage that was presented one sentence at a time on a computer monitor. When readers finished reading a sentence, they pressed a button to see the next sentence. In a series of research studies, Gernsbacher found that skilled readers spent more time reading the initial sentence in a passage than subsequent sentences. According to Gernsbacher, "comprehenders slow down on the initial sentences of paragraphs because they use those initial sentences to lay a foundation for mental structures representing paragraphs" (p. 5).

For example, consider the story shown in the left portion of Table 3–1. According to a structural analysis by Haberlandt (1984), the story consists of a statement of the setting followed by two episodes and an ending. An episode consists of a beginning, reaction,

TABLE 3–1

How much time does it take to read each sentence in a story?

Sentence	Type	Reading Time (Seconds)
Mike and Dave Thompson lived in Florida.	Setting	
They lived across from an orange grove.		
There was a river between their house and the grove.		
One Saturday they had nothing to do.	Beginning	3.1
They were quite bored.	Reaction	2.3
They decided to get some oranges from the grove.	Goal	2.1
They took their canoe and paddled across the river.	Attempt	2.2
They picked a crate full of oranges.	Outcome	2.1
While they were padding home the canoe began to sink.	Beginning	2.6
Mike and Dave realized that they were in great trouble.	Reaction	2.1
They had to prevent the canoe from sinking further.	Goal	1.8
They threw the oranges out of the canoe.	Attempt	2.1
Finally the canoe stopped sinking.	Outcome	2.5
Now all the oranges were gone.		
Their adventure had failed after all.	End	2.4

Adapted from Haberlandt (1984).

goal, attempt, and outcome. These components are labeled in the second column in the table. If students use the first sentence of an episode to lay the foundation for representing the episode, we would expect their reading time to be longer for the first sentence than for the other sentences in the episode. The right-hand column of Table 3–1 shows the reading times by skilled readers for each sentence in the two episodes. Consistent with the predictions of structure-building theory, the first sentence took much more time to read than the other sentences.

Interestingly, when the story shifts from the first episode to the second, the readers' reading time increases. This increase indicates that the readers are sensitive to the topic shift, presumably because skilled readers are aware of text structure. In a review, Hyona (1994) found consistent evidence for a "topic-shift effect" in which skilled readers devote "increased processing time for the sentence that introduces a new topic in the text" or in which "sentences located at episode boundaries are allocated more reading time than within-episode sentences" (p. ...).

Are skilled adult readers more sensitive than children to topic shifts? To examine this question, Hyona (1994) asked fifth graders and adults to read a story titled "Life at the Market Square" that was presented one sentence at a time on a computer monitor. The reader was to read each sentence, pressing a button to go on to the next, and to be prepared for a test on the passage. A portion of the story is presented in Figure 3–13, with the topic-shift sentences underlined. The results showed that both adults and children devoted more time to topic-shift sentences than to other sentences, but that adults showed a stronger topic-shift effect than children, especially when more difficult expository texts were used. Apparently, children are most able to build coherent structures when they are reading relatively easy stories.

FIGURE 3–13 Portion of "Life at the Market Square"

What is happening at the market square? You can join me to get a feeling of life at the square on a typical autumn day.

I buy an ice cream at a stand and go sit on a bench. Peach ice cream—yum, yum. I enjoy my ice cream while watching the people at the square. The square is full of life. There are shouting salesmen, crying kids, fighting drunkards, couples in love, grim-looking elderly ladies, and crazy pigeons.

There comes a strong smell of vomit from somewhere. Two drunkards have fallen asleep on the ground. One of them is surrounded by vomit. I begin to feel sick when watching them.

I go to a fish stand to look for some herring. The little stand is just in the middle of the square. The fish seller advertises his fish to me. I don't want to buy his fish, because they look old. On the ground, in front of the fish stand, there are scales of fish that stick to my shoes.

The pigeons seem to be having their meal. Beside me, there is a whole bunch of them rushing around. The pigeons are permanent customers of the market. In front of me, a pigeon couple fights for a herring that has fallen from the fish stand. Other pigeons join in the fight.

A man gets in front of a microphone. People at the square are clearly amazed. They start to gather around the man. The place is getting crowded.

[underlining added]

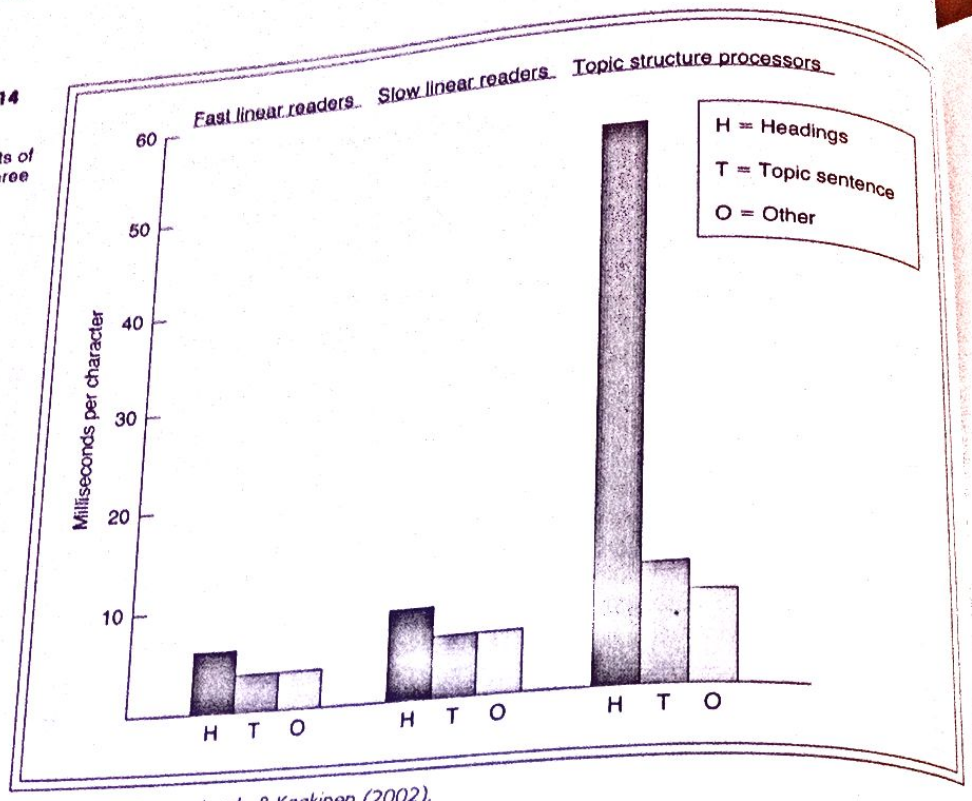
Source: Figure from Hyona, J. (1994, January). Processing of topic shifts by adults and children. Reading Research Quarterly, 29(1), 75–90. Reprinted with permission of the International Reading Association.

Ability-Related Differences in Sensitivity to Topic Shifts To further investigate reader's sensitivity to topic shifts, Hyona, Lorch, and Kaakinen (2002) asked adults in Finland to read 1,200-word passages on topics such as "Energy" or "Endangered Species." For example, the "Energy" passage consisted of a brief introduction, and two sections, each focusing on six topics. The six topics in the first section (on environmental damage resulting from use of conventional fuels) were air pollution, disruption of environmentally sensitive areas, oil spills, storage of radioactive waste, acid rain, and the greenhouse effect. The six topics in the second section (on alternative energy sources) were geothermal energy, ocean thermal power, solar energy, tidal power, wind power, and waste conversion. Each section consisted of a heading and two paragraphs. Hyona and colleagues recorded the readers' eye movements using a specially designed computer system, and in particular examined how much time they spent looking at the heading and topic sentence of the first paragraph—which indicate a sensitivity to topic shifts—as compared to other sentences in the passages.

As shown in Figure 3–14, they identified three major kinds of readers: fast linear readers who spend little time on each sentence, slow linear readers who spend equally more time on each sentence, and topic structure processors who spend relatively more time on headings and to a lesser extent on the first and last sentence in the first paragraph of each section. Importantly, the topic structure processors wrote better summaries of the passage than did other readers. However, only 20% of the readers were topic structure processors

FIGURE 3–14

Time spent rereading parts of passage for three groups



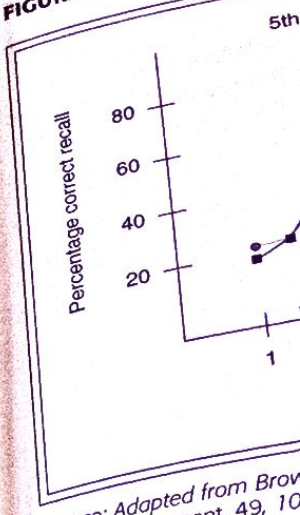
Adapted from Hyona, Lorch, & Kaakinen (2002).

This research shows that there are individual differences in adult readers' sensitivity to prose structure, and suggests that reading comprehension could be improved for the 80% of readers who show low sensitivity.

IMPLICATIONS FOR INSTRUCTION: SUMMARIZATION TRAINING

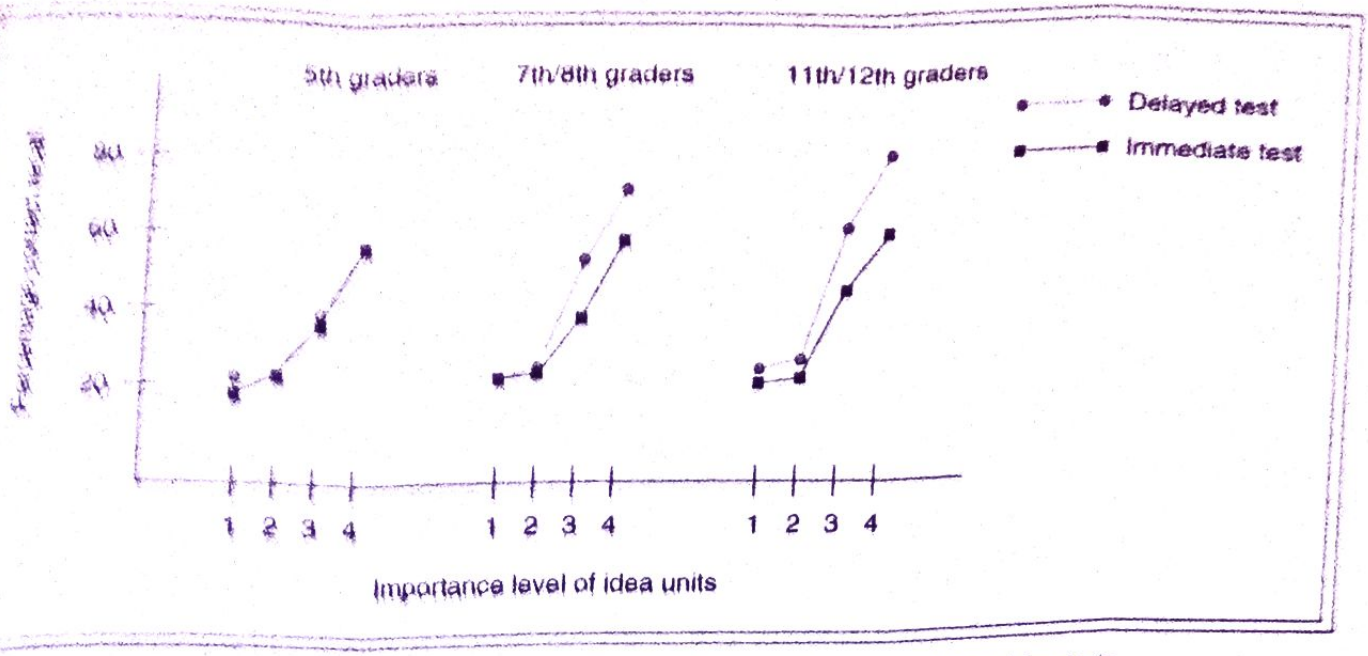
What can be done to help readers learn to pay attention to the top-level structure (or superordinate information) in a passage? Brown and Smiley (1978) provide some evidence concerning the potential trainability of structure-based reading strategies. For example, 5th, 7th/8th, and 11th/12th graders were asked to read along as the experimenter read a short story such as "The Dragon's Tears" or "How to Fool a Cat." Then students were asked to recall the passage, with the results summarized by the solid line in Figure 3–15. The results shown in Figure 3–15 indicate a levels effect for each age group in which students performed better on recall of more important idea units than on less important idea units. After the first recall test, students were given a 5-minute study period and told to undertake any activity that would improve recall. Paper, pens, and a copy of the passage (in primary type) were available. Then, a second recall test was

FIGURE 3–15 Percentage corr



Source: Adapted from Brow
Child Development, 49, 10

FIGURE 3–15 Percentage correct recall by importance level for three age groups

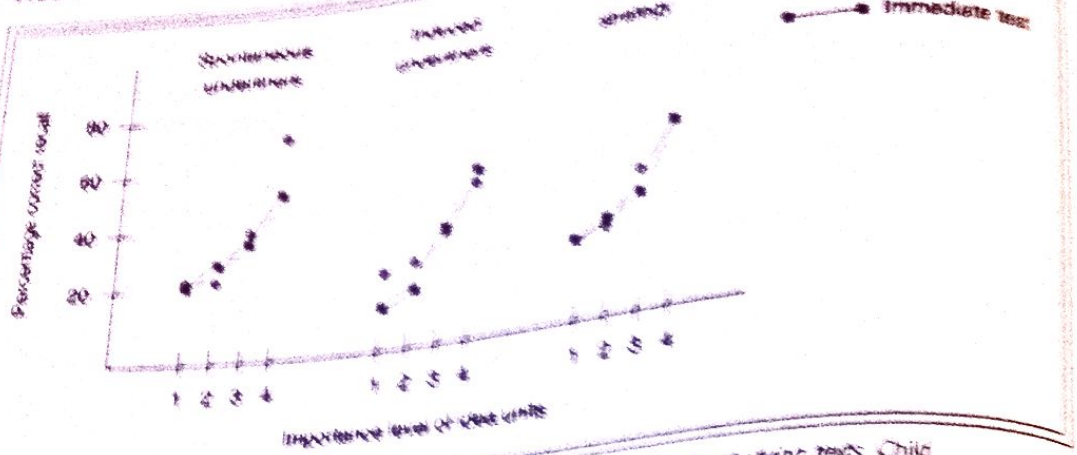


Source: Adapted from Brown, A. S., & Smiley, S. S. (1978). The development of strategies for studying texts. Child Development, 49, 1002. By permission of the Society for Research in Child Development.

administered, with the results summarized by the dotted line in Figure 3–15. The results show that the extra study time did not have much of an effect on the younger students but did improve the performance of the older students, particularly on recall of the more important idea units. Apparently, the older students knew to use the study time in order to focus on important information, whereas the younger students did not spontaneously use this strategy.

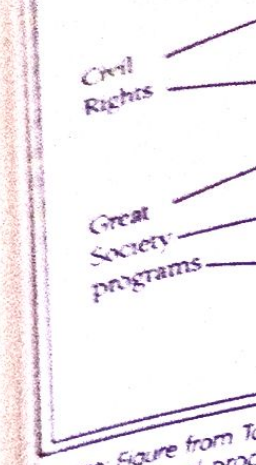
Can the younger students be induced to apply helpful study strategies even if they would not use them spontaneously? To investigate this question, Brown and Smiley (1978) continued the experiment for a second day. The procedure was identical except that during the 5-minute study interval students who did not show evidence of actively studying were prompted to engage in study activities such as underlining. Figure 3–16 shows the recall patterns for fifth graders who underlined spontaneously, fifth graders who were induced by the experimenter to underline, and fifth graders who could not be induced to underline during the 5-minute study period. Again, the solid line is the recall performance on the second test after the 5-minute study period. As can be seen, the students who spontaneously underline without having to be instructed to do so seem to have focused on important information, which is indicated by the improvement in recall of important idea units but not of other information. In contrast, inducing students to underline did not focus their attention on important information, as is indicated by the improvement in recall of unimportant information only. Similar results were obtained for the seventh and eighth graders. Apparently, younger readers need practice in effective techniques for recognizing and using the hierarchical organization of a passage.

FIGURE 3–16 Percentage correct recall in immediate test in three groups of the fifth graders



Source: From Brown, J. S. & Smiley, S. S. (1978). The development of strategies for studying texts. Child Development, 49, 1082. By permission of the Society for Research in Child Development.

FIGURE 3–17 A hierar



Source: Figure from T
prehension and proc
International Reading

In a direct training study, Taylor and Beach (1984) taught seventh graders to use a hie
archical summary procedure for reading social studies texts. For each training passage, t
student made a skeleton outline consisting of a thesis statement for the entire passage
the top of the page and a statement of the main idea of each section as indicated by hea
ings. Then the student generated two or three important supporting details for each ma
idea statement, and wrote superordinate topic headings in the left margin to connect
sections of the text. Figure 3–17 gives an example of a hierarchical summary of a thre
page social studies text containing one heading and six subheadings. The control studen
received no training. To test the effectiveness of the hierarchical summary procedure, st
dents in both groups were given pretests and posttests that involved reading passages an
then recalling and answering questions about them. As expected, the trained students
showed greater pretest-to-posttest gains in recall and in answering questions than the con
trol group.

What techniques do skilled readers use for summarizing a text, and can these skills b
taught to less skilled readers? To study these skilled reading processes, Brown and Da
(1983) identified the following principles of text summarization: deleting irrelevan
information, deleting redundant information, substituting a superordinate term for a lis
of items, substituting a subordinate term for a series of events, selecting a topic sen
tence, and inventing a topic sentence if none is given. Over the course of twel
30-minute sessions, Bean and Steenwyk (1984) taught sixth-grade students to use thes
principles to summarize a series of paragraphs. In contrast, a control group was told to fin
the main ideas but was given no explicit instruction. On a subsequent test of summarizin
a paragraph, the summarization-trained group obtained a much better score than the con
trol group (17.0 versus 11.0, respectively); importantly, on a subsequent test of readin

FIGURE 3–17 A hierarchical summary for a three-page social studies text

I. Johnson developed many programs to fight injustice and poverty.
  A. Lyndon Johnson became President of the U.S. after Kennedy was assassinated. Hard worker, tried to carry out some of Kennedy's programs.
  B. Johnson fought for civil rights law. (Civil Rights)
     purpose: to protect blacks from discrimination in hotels and restaurants.
     blacks had not been allowed in some hotels or restaurants in the South.
  C. Johnson persuaded Congress to pass a law ensuring all people the right to vote. (Civil Rights)
     protected black peoples right to vote. literacy tests now illegal.
  D. Johnson started a "war on poverty." (Great Society programs)
     job training, education for poor people. plans for a "Great Society"
  E. Johnson persuaded Congress to develop a Medicare program. (Great Society programs)
     for people at least 65 years old. hospital bills paid. doctor's bills paid in part.
  F. Johnson persuaded Congress to pass a law giving money to schools. (Great Society programs)
     purpose: to improve education of children from poor families. $1 billion in aid to schools.

Source: Figure from Taylor, B. M., & Beach, R. (1984, Winter). The effects of text structure instruction on middle-grade students' comprehension and production of expository text. *Reading Research Quarterly, 19*(2), 134–146. Reprinted with permission of the International Reading Association.

comprehension, the summarization-trained students scored 62% correct, whereas the control group scored 47% correct. These results provide additional evidence that summarization skills can be taught and that learning them improves students' reading comprehension.

A concentrated form of summarization is to be able to determine the theme of a passage. Let's begin by locating a group of junior high school students in special education classes who score below the third-grade level on reading comprehension tests. We ask them to read a story and state its theme (e.g., "We should be ourselves" or "We should be honest"). The students perform quite poorly on this task, indicating that they lack skill in theme identification. Can we help students improve their skill in determining the theme of a passage? This was the challenge faced by Walker and Williams (2001), who devised a 12-lesson instructional program to teach theme identification strategies.

Each lesson in the theme identification training involved a single story, and consisted of a prereading discussion of the topic of the story, reading of the story, discussion of the story, identification of the theme, and application of the theme to real-life experience. The prereading discussion included a *definition and discussion of the concept of theme*. The story was read aloud by the teacher while the students followed along in their texts, and at three points the teacher inserted questions for class discussion. Then, in the discussion after reading, students answered questions such as "Who is the main character?" "What is his/her problem?" "What did he/she do?" and "What happened at the end of the story?" In the theme identification phase, the teacher modeled three steps in generating the theme by saying, "[The main character] learned that he (she) should (not) _____." "We should (not) _____." "The theme of the story is _____." Finally, in the

application phase, students were prompted to describe real-world situations and experiences that corresponded to the theme.

In Walker and Williams's (2001) study some students (trained group) received theme identification training whereas others received traditional comprehension training (control group) involving the same 12 stories. On a subsequent transfer test, students read a new story and were asked to generate the theme. Figure 3–18 gives an example of a story and its theme. On the transfer test, students in the trained group generated more than twice as many correct themes as those in the control group. For example, the control group scored 14% correct compared to 35% correct for the trained group. As you can see, the theme identification program helped students learn a fundamental component in reading comprehension—identifying the theme of a passage—although of course there is room for improvement. The study shows that even students with severe learning disabilities can learn reading comprehension skills that transfer to new reading situations.

FIGURE 3–18 Examples of stories and their themes

STORY SYNOPSIS

Nick ignored Miguel, the new boy in his class, who had just moved to this country and couldn't speak English. Nick thought he was stupid. But one day when the teacher was ready to cancel a class trip because no one in the class could answer a math question, Miguel answered correctly and saved the day. Nick was very happy. He and Miguel became good friends.

"WHAT IS THE THEME OR LESSON OF THE STORY WE JUST READ?"

Acceptable: "Don't judge somebody by how they look or where they come from."
"Don't prejudge people if you don't know them that well."

Unacceptable: "When a new kid comes into the classroom you gotta make friends with him."
"That some people is bad, they don't want to be your friend."

STORY SYNOPSIS

Twin Lakes High School won the football game and the state championship. But when the photos that Gina had taken at the game were developed, she discovered there were 12, not 11, players on the field during the winning game. Gina told everyone what she had discovered, and they were all angry at her. But when the State Athletic Commission heard about what happened, they declared the situation an accident, and they said that no breaking of the rules is recognized if the referees don't identify it. Twin Lakes High School kept its championship.

"WHAT IS THE THEME OF THE STORY WE JUST READ?"

Acceptable: "We shouldn't lie."

Unacceptable: "The theme is about a girl named Gina, that they had an extra man on the field."
"About a girl that people was jealous of."

rce: From Walker and Williams (2001).