DOCUMENT RESUME

ED 240 526 CS 007 517

AUTHOR Snow, David
TITLE Instructional Implications of Inquiry in Reading Comprehension.
INSTITUTION Southwest Regional Laboratory for Educational Research and Development, Los Alamitos, Calif.
SPONS AGENCY National Inst. of Education (ED), Washington, DC.
REPORT NO SWRL-TN-2-82/26
PUB DATE 15 Sep 83
NOTE 50p.; Paper 2 is SWRL-TN-2-82/26 and was previously announced seperately as ED 223 987.
PUB TYPE Guides - Classroom Use - Guides (For Teachers) (052)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Decoding (Reading); Elementary Education; Guidelines; *Phrase Structure; *Reading Comprehension; *Reading Difficulties; *Reading Instruction; Reading Research; Reading Skills; Remedial Reading; *Sentence Structure; *Word Recognition
IDENTIFIERS Inference Skills; Parsing; *Text Structure

ABSTRACT

A contract deliverable on the NIE Communication Skills Project, this report consists of three separate documents describing the instructional implications of the analytic and empirical work carried out for the "Classroom Instruction in Reading Comprehension" part of the project: (1) Guidalines for Phrasal Segmentation; (2) Parsing Tasks in Reading Comprehension Research; (3) Reading Comprehension: Definitions and Instructional Methods. All three papers are designed to give practical guidelines to teachers or training personnel in the use of innovative instructional methods helpful for poor readers. The first paper presents guidelines for producing segmented text for students with moderate skills in single word recognition but problems in reading connected text. The guidelines, which give technical and syntactic criteria for locating appropriate phrasal units, are illustrated by a text sample used in an experimental study. The second paper deals with parsing tasks, which represent a second stage of training in phrase and clause boundary reading and are designed to show students how to use intuitive notions of sound and meaning to parse sentences and locate groups of words that "go together." The third paper describes some classroom techniques and methods that will help students develop inferential comprehension skills on higher levels of text structure. (HOD)

SWRL



DATE: September 15, 1982

TO: Dr. Bruce Cronnell

FROM: Devid Snow

SUBJECT: INSTRUCTIONAL IMPLICATIONS OF INQUIRY IN READING COMPREHENSION

COPIES TO:

Attached are three documents giving instructional implications of the enalytic end empirical work carried out for Classroom Instruction in Reading Comprehension. These materials are designed to give practical guidelines to teachers or training personnel in the use of innovative instructional methods which, in our experience, appear to be helpful for poor readers. These documents collectively constitute Deliverable No. 13 (Summary reports: instructional implications) for the "Classroom Instruction in Reading Comprehension" part of the NIE Communication Skills project.

The first two papers describe some classroom techniques suggested by our empirical studies of reading comprehension. In a series of experimental studies, staff investigated children's perception of instresentence units (phrases and clauses) in reading. The studies showed that some poor readers have difficulty recognizing and using these major syntactic units in printed text. This is reflected most cleerly in the students' oral reading, which may show miscues in intonation, stress, and pausas. Inappropriate strategies for "grouping words together in meaningful units" (parsing) also have adverse effects on reading comprehension.

A promising instructional aid for such readers is segmented text. Segmented (or parsed) text presents each meaningful phrase on a separate line. (An alternative method is to separate phrases with slashes.) The lines or slashes give explicit cues to the boundaries of functionally significant units in reading. These phrasally cued texts help to introduce the notion of grouping words together, and give children practice in recognizing meaningful phrase and clause units. This practice constitutes a first step in learning strategies that are conducive to good oral reading and comprehension.

Guidelines for producing segmented text are presented in the first paper. The guidelines, which give technical and syntactic criteria for locating appropriate phrasal units, are illustrated by a text

sample taken from the study's experimental materials. Using these procedures, teachers can prepare segmented text materials for use in the classroom with students who possess moderate skills for single word recognition but who still have difficulty in reading connected text.

The second paper deals with parsing tasks. These activities represent a second stage of training in phrase and clause boundary reading. This second stage helps children to recognize meaningful groups of words more independently. In parsing activities, students learn to locate the boundaries of phrasal units themselves, without the aid of line boundary cues. Instead of using syntactic criteria, which the children may find confusing, these activities show students how to use intuitive notions of sound and meaning to parse sentences and locate groups of words that "go together." After this practice, children are well on their way toward using efficient comprehension strategies in their everyday reading experiences.

One special comment about these activities should be emphasized. When using segmented texts or parsing activities, the teacher should use extensive oral modelling to convey the melodic and temporal cues (prosodic features) that are associated with phrase and clause boundaries in speech. Through simultaneous listening and reading, children can more easily relate the new reading materials and skills to the rich oral language knowledge they already possess.

The third paper in this series, entitled "Reading Comprehension: Definitions and Instructional Methods," describes some classroom techniques that are derived from analytic phases of the project. The activities described in this final paper represent an extension of instruction beyond the skills that were the focus of the preceding papers. The focus here is on methods that will help students with advanced comprehension skills on the discourse level of text organization. These skills entail comprehension of inferential text information that is given by more than one sentence or even by the text as a whole. Such information is logically implied by relationships between literal statements but is not directly stated in the text. Many teachers believe that these aspects of comprehension (sometimes called "interpretive skills"), represent the most important (and difficult) instructional goal for children in the middle and upper elementary grades.

These three papers, then, address a wide range of comprehension skills, beginning with a focus on literal comprehension at the phrase and sentence levels and extending to inferential comprehension skills on higher levels of text structure. Thus, one or another of these techniques can be used with students at different stages in the acquisition of reading skills. In spite of the diversity of approaches and instructional goals, these techniques share a common, unifying feature--all of them are designed to foster young readers' active, purposeful involvement in the creative task of "constructing" meaning from printed text.

vn
Attachments

# GUIDELINES FOR PHRASAL SEGMENTATION

David Snow

For studies of the effects of phrasal segmentation on text comprehension and oral reading (Coots & Snow, 1982: Snow, Coots, & Smith, 1982), materials were prepared with reading passages that had been divided into phrasal units. This paper summarizes the guidelines used for segmenting text into phrasal units and exemplifies the use of these guidelines in a phrasally segmented text.

The following guidelines were used to divide text into phrasal units. The guidelines are based on linguistic analysis, on psycholinguistic studies of sentence perception in listening and reading (Snow & Coots, 1981), and on intuition.

The first set of guidelines (a through e below) gives characteristics that apply to all phrasal segments.

a. Segmented units are generally 3-7 words in length.

b. Segmented units include integral syntactic units.

c. The words in segmented units are linked together by grammatical relationships.

d. Breaks are avoided that might introduce ambiguity. On the other hand, breaks that might clarify ambiguity are acceptable.

e. Some sentences may comprise whole segments.

The second series (1 through 11 below) gives syntactic criteria for the phrasal segmentation of text. The Appendix is an example of segmented text, that illustrates the use of these guidelines. Next to each phrasal segment is one or more numbers identifying the applicable syntactic guideline(s).

1. Main and subordinate clauses are usually separated.

2. Coordinate sentences are generally separated.

3. Coordinate verb phrases are generally separated.

4. Prepositional phrases (including infinitive phrases) are usually segmented. The notable exception occurs when the preposition constitutes part of an idiomatic expression, normally with a preceding verb.

5. Adverbial phrases are usually segmented. Exceptions tend to be cases in which the phrase is judged to be trivial or awkward when in isolation.

6. Preposed elements are generally segmented (e.g., This morning/ . . .).

7. The subject and the verb are usually separated if one of the following conditions is met:

   a. the subject noun phrase contains modifiers (e.g., noun + adjective);

   b. the subject noun phrase is complex (e.g., relative clauses);

   c. the subject noun phrase serves in some other way as a stage-setting event.

8. The verb and the complement are usually separated when the subject and verb remain conjoined and when one of the following conditions prevails:

   a. the complement is complex (e.g., People thought/ this information . . .), or contains modifying phrases.

   b. the complement is separated from the verb by an intervening, segmented phrase (e.g., The cause was,/ in the final analysis,/ unknown).

9. Lists of items within a single category are not usually divided (e.g., Borneo, Burma, Thailand, . . .). However, an elaborated item (usually at the end of the series) is separated (e.g., . . ./ that showed joy, love, anger,/ and other feelings).

10. Complex coordinate noun phrases are generally separated.

11. Head noun phrases are usually segmented with their sentential complements. Exceptions occur when

    a. the noun phrase is in postverbal position and the entire segment would exceed to constraints on word length.

    b. the complement is a nonrestrictive relative clause.

## References

Coots, J.H., & Snow, D.P. Effects of phrasal segmentation on text comprehension and oral reading (draft Technical Note). Los Alamitos, CA: SWRL Educational Research and Development, 1982.

Snow, D.P., & Coots, J.H. Sentence perception in listening and reading (Technical Note No. 2-81/15). Los Alamitos, CA: SWRL Educational Research and Development, 1981. (ERIC Document Reproduction Service No. ED 208 388)

Snow, D.P., Coots, J.H., & Smith, K. Speech prosody and children's perception of sentence organization (draft Technical Note). Los Alamitos, CA: SWRL Educational Research and Development, 1982.

APPENDIX

PHRASALLY SEGMENTED TEXT

THE MUFFIN MUNCHER

Many, many years ago 5, 6
in the far corner 4, 5
of a very poor country 5, 6
stood the poorest of poor castles.

The villagers of the castle 7a
did not have riches and valuables.
They were also poor in spirit.
They had done nothing 4, 11a
to be proud of.

The only way they had stayed alive at all 1, 7b
was by baking and selling 8a
the best muffins in the land.

Every morning 5, 6
the king, 11b
who was also the head baker, 7b
would bake a fresh batch.
When he had finished, 1, 5, 6
the people would load their carts 3
and set off 4
for the other villages 4
in the kingdom.

There was never any trouble 11a
selling the muffins.
They were the finest ever baked.
But because the people were so poor, 1, 5, 6
they had to use all the money they had earned 4
to buy wood for the fire 10
and flour to make more muffins.

So, 5, 6
day in and day out 5, 6
the head baker, 11b
who was also the king, 7b
would build up the giant fires in the ovens 3
and bake muffins.

He would slowly mix all the ingredients 4
in a big cracked bowl.
Then he would pour the mix into the tins 3
and put them in the ovens to bake.

The people were just barely getting along.
As if things were not bad enough, 1, 5, 6
there appeared at the castle one day 6, 7a
a great dragon.
Now this was not 8a
your everyday 9
run-of-the-mill dragon.
He was rather large.
He was a little heavy.
He was a muffin-munching dragon.

With crumbs still on his face 4
from the last muffins he'd eaten 1, 4, 6
he came down the hill 5
right up to the bridge.

Taking one look, 5, 6
the people ran over the bridge 4, 10
and into the castle.

The dragon took a great long smell.
He said, "I smell muffins!"
This castle, 1
he decided, 1
smelled like a nice place to stay.
So he moved in 4
right under the bridge.

He was very tired from his long journey.
He took his pillow 10
and the picture of his pony from his bag, 3
curled up, 3
and fell fast asleep.

The next morning 5, 6
the people looked out their castle windows 3
and thought that the dragon was gone.
Breathing a sigh, 5, 6
they began preparing for another day.

After loading their wagons 4
with fresh warm muffins 1, 5, 6
they set off across the bridge 4
over the soundly sleeping dragon.
With all the noise from the wagons 4, 6
he woke up right away.

He peeked up over the edge of the bridge 4
to see what was going on.
"So, that's it.
The people from the castle make muffins!
Those muffins look so good 2
and I am very hungry.
How can I get the people 4
to bring me fresh muffins?"

He thought and thought 3
and finally came up with a plan.
He jumped up on the bridge 4
right in front of the people, 3
tried to look very mean, 3
and roared.

"Stop, 2
or I shall burn up your bridge!"
Then he blew a little flame. 3
and puffed three smoke rings.

"From now on," he rumbled, 4, 6
"you shall each give me 8a
ten of your best muffins 5
as your price to cross my bridge."

"But this is our bridge!" they cried.

"Well if I burn it up 1, 5, 6
it won't be anybody's bridge," said the dragon.

The people thought 3
and talked awhile 3
and finally agreed 4, 8a
to give the dragon what he wanted.
They barely had enough money to buy wood, 5
let alone enough wood 4, 11a
to build a new bridge.

From then on 4, 6
every wagon that crossed the bridge 1, 7b
left ten muffins.

With crumbs all around him 4, 6
the dragon would sit there 5
stuffing those scrumptious muffins away.

This might have gone on to this day 4
except for one little thing.
The dragon was eating so many muffins 1
that the people did not have enough to sell.
Because of that, 5, 6
they didn't have enough money 4, 11a
to buy wood for the ovens 10
or even flour to bake more muffins.

They would return every day 4
with fewer and fewer goods.
One day 5, 6
they all came home with nothing.

The next morning 5, 6
the head baker, 11b
who was also the king, 7b
could not fire up the great ovens 1, 5
because there was no wood.
He could not use his big cracked bowl 1, 5
because he had no flour or goods 4, 11a
to put in it.

With a heavy heart 4, 6
and a tear in his eye 10, 3
the baker sat sadly 4
on a pile of empty flour sacks 3
and cried.
"We have no more goods to make muffins.
We have no more wood to light the fires.
We cannot bake any more muffins.

Our bridge will be burned down.
What are we ever to do?"

That same day 5, 6
the dragon woke up, 3
brushed his teeth, 3
combed his hair, 3
and prepared for another day of muffin munching.

He waited 3
and waited 3
and waited.
No wagons came.
His stomach began to rumble and roar.
He tried eating a few of the crumbs 1, 11a
that had dropped on the ground 5
the day before.
They were stale.
"No muffins!" he roared.

Finally 5, 6
he decided to enter the castle 3
and find out what had happened 4
to all his muffins.

The dragon walked through the castle 1, 5
until he reached the bakery.
Then he peeked inside.
"Where are my muffins?" he roared.
"I've been waiting 3
and waiting 3
and waiting!
Where are they?"

The head baker, 11b
who was also the king, 1, 7b
walked up to the dragon 1, 5
as bravely as he could.
"Mr. Dragon," he said, 1
"we are poor people.
We live in a poor castle 1, 11b
which has very little.
Before you came. 1, 5, 6
the muffins we sold 1, 7b
barely paid for our firewood 10
and the goods we need 4, 11a
to mix muffins.
Now that we have to give you so many muffins, 1, 6
we can't buy enough wood.
Our ovens have no heat."

That poor dragon 7a
was so very confused.
He wanted some muffins 1, 5
because he was so hungry.
But at the same time 5, 6
he felt sorry for the baker 10
and the other people 1, 11a
who lived in the castle.

He thought 3
and thought.
Finally, 5, 6
a great big smile crossed his face.
"I have it!" he shouted.
He asked the head baker, 1, 11b
who was also the king, 1
to call all the people 4
to a castle meeting 1, 5
so that he could tell them 4
of his wonderful plan.

The people 7c
happily began to cheer and shout 1, S
as he finished telling his plan.
Surely S, 6
the dragon had solved the castle's problems 10
and his own.

Then and for always 5, 6
the dragon heated the ovens of the bakery 4
with his mighty flame.
With the extra money they saved 4, 6
by not having to buy wood 1, 4, 6
the people were able 4
to leave a stack of muffins 4
in reach of the muffin-munching dragon S
every single day.

SOUTHWEST REGIONAL LABORATORY
TECHNICAL NOTE

DATE: August 31, 1982
NO: TN 2-82/26

# PARSING TASKS IN READING COMPREHENSION RESEARCH

David Snow

## ABSTRACT

This paper reviews some techniques that have been used for eliciting children's judgments about functional parsing units in sentences. The review suggests that children understand the parsing task best when the instructions direct their attention to both the sound and meaning of intrasentence units. In pause acceptability judgments, for example, the children mark boundaries in the text where it is permissible to pause and the text still makes sense. Activities using pause acceptability judgments can be used to assess (and facilitate) children's acquisition of sentence perception skills in reading.

# PARSING TASKS IN READING COMPREHENSION RESEARCH

David Snow

The psychological process of segmenting sentences into meaningful units or "chunks" is believed to be an important aspect of text comprehension processes (Clark & Clark, 1977; Rode, 1974-1975). Parsing skills have been studied by reading researchers in an effort to determine the ways in which individual segment written sentences into processing units having psychological significance. This paper summarizes the procedures and findings of several studies focusing on text parsing skills, and discusses the implications of this research for instructional issues such as the use of parsed text in interventional training for poor readers.

The procedures discussed in this review all use elicited judgments from participants, rather than an analytic scheme, to determine meaningful word groupings in prose. In general, participants are asked to divide sentences into groups of words by placing slashes in the text. The approaches differ from one another in three areas: 1) the specific instructions given to participants as to how to identify groups of words having syntactic or prosodic integrity, 2) the format in which the text is presented, for example, whether or not it contains line breaks or punctuation, and 3) the amount of practice and/or modeling that is used to explain the task.

## SURVEY OF PROCEDURES

The most characteristic type of parsing task elicits perceptions of text structure indirectly by asking individuals to make judgments about pause placement in sentences. This technique was first used by Johnson (1970), who sought an objective method of specifying the linguistic subunits of prose. Johnson defined such units as places where speakers could pause. Boundaries where it was acceptable to pause were hypothesized to be an important locus of encoding and decoding processes. In order to locate these boundaries, adult judges were asked to divide a narrative passage into units bounded at junctures where one could pause in order to catch a breath, to give emphasis to the story, or to enhance meaning. These units were called "pause acceptability units" or "linguistic units." The validity of each unit was established when at least half of the judges marked it as acceptable for pausing.

Using a technique similar to Johnson's, Mason and Kendall (1973) studied children's ability to identify meaningful units in passages. Both adults and children (ages 9 to 11) were asked to identify pause locations in passages by marking their boundaries with slash marks. These "intrasentence pausal junctures" were described to participants as locations "where they would pause if they read the passage aloud." No other instructions, examples, or explanations of the task were apparently given. The passage format is unknown, except that it apparently contained standard punctuation.

Comparisons between the children's and adults' parsing of the texts showed little agreement. Nine year-olds tended to make idiosyncratic judgments, suggesting that the task had not been well understood. Older children were very cautious in marking pause junctures; many of them restricted their judgments to locations already marked by commas in the text. In general, the results were interpreted as showing that even upper elementary school children are not able to identify intrasentence units in passages.

In a second study, Mason and Kendall investigated the effect of text manipulations on children's reading comprehension. Fourth graders read paragraphs in Standard, Parsed, and Short Sentence formats. The Parsed version presented each meaningful unit on a separate indented line, with parsing apparently determined by the experimenters. The Short Sentence version did not control for line breaks, but presented the text in simple sentences. An example of the three formats is shown below.

Standard

Dick will be in Grade Five and though he enjoys math he likes art class best.

Parsed

Dick will be in Grade Five
and though he enjoys math
he likes art class best.

Short Sentence

Dick will be in Grade Five. He enjoys math. He enjoys art. He likes art class best.

The examples shown above give the only indication of what the actual text formats looked like. No punctuation other than periods was apparently used.

Multiple-choice comprehension testing showed that both experimental formats led to better comprehension and slower reading times than the Standard text format, but only for low-ability readers. It is interesting to note that these effects were strongest for the Short Sentence version. Thus, it appears that Parsed text may provide a good bridge for some readers between simple-sentence passages (which are easiest to understand) and the more structurally complex language that predominates in the reading materials of upper elementary school children. An additional conclusion of the study is worthy of note. The authors point out that middle- or high-ability students did not benefit from text organizations that segmented the text into meaningful word groups This implies that such readers are already proficient at the task of identifying intrasentence junctures as required for comprehension, even though children of the same age did not perform well in the earlier parsing task. Therefore, the children's inability to identify pausal boundaries in the context of this parsing task does not indicate an inability to tacitly identify and use intrasentence junctures as a part of the comprehension process itself. The results show that the task may simply fail to reveal the children's understanding of constituent structure in sentences.

Kleiman, Winograd, and Humphrey (1979) elicited judgments about intrasentence units by appealing more directly to children's intuitions of sentence structure. They used a parsing task in the context of testing the hypothesis that children's text parsing skills would be facilitated by the availability of prosodic information that is missing from written material.

The stimuli consisted of short, descriptive passages about fictional creatures. Each sentence was presented on a separate page. Line breaks were apparently determined by imposing a maximum line length. Except for periods, no punctuation seems to have been used. Participants were fourth grade children, evenly divided between above- and below-average readers. Judgments by adults on the same task provided a normative parsing of the text which was used to assess the children's accuracy on the task.

The children were asked to divide the sentences into "meaningful groups of words" by making slashes at word group boundaries. They were shown several examples of how sentences might be divided. The children were asked to read each sentence twice. On the first reading, they were to think about words that formed meaningful groups; on the second, they marked slashes at the boundaries of word groups.

The scoring focused on four types of structure which were candidates for designation as meaningful word groups:

1. Clause subordination marked by conjunctions like <u>because</u>, <u>when</u>, <u>if</u>.
2. Clause conjunction, that is, clauses conjoined by <u>and</u> or <u>but</u>, including coordinate predicate constructions.
3. Sentence-initial noun-phrases containing adjectives, conjunctions, or prepositional phrases.
4. Within-phrase conjunction, such as conjoined noun phrases and adjectives.

The last two categories refer to structures at the phrase or within-phrase level. Length of these units (number of words) was found to be

an important factor that determined whether they were marked as separate word groups. Thus, clause structures were more consistently marked by both children and adults than phrasal or within-phrase structures.

Candidate structures that were marked by half or more of the adult judges were considered to be word groups requiring breaks. The children's performance was compared to this consensual parsing of selected structures in the passages. Some example sentences are given below, showing the adults' judgments of meaningful word groups. A superscript above each boundary indexes the type of structure (1 to 4) as listed above. Line breaks are shown as they occurred in the text.

Glods are very large$^{2}$/and they are easy to see.

Because they have such long wings$^{1}$/they can fly very fast$^{4}$/and for a long time.

Glods sleep during the day$^{2}$/and eat at night.

The people on Orese$^{3}$/get scared$^{1}$/when they know glods are coming.

Glods are afraid of water$^{2}$/and they stay away from rivers$^{4}$/and large lakes.

Children performed the task in two conditions. In the "No Prosody" condition, there was only a written presentation of the text; in the Prosody condition, the children received a simultaneous written and spoken presentation of the sentences. The analysis focused on the frequency with which participants marked breaks at points required by the adult-normed version. As predicted, results showed that the parsing skills of below-average readers were significantly better in the Prosody condition. The authors concluded that the lack of prosodic information contributes to the difficulty some children have with parsing written text and hence with reading comprehension.

Cioffi (1980) used a parsing task as a means of addressing two major questions. 1) Do good and poor comprehenders differ in their ability to perceive and articulate sentence structure? 2) Is the comprehension of poor readers facilitated by articulating the structure of sentences as identified by their peers?

Children in the study were third and fourth graders representing Good Comprehenders and "Skilled Decoders" (Gibson & Levin, 1975), the latter group corresponding roughly to readers identified by Cromer (1970) as Difference readers. Children participated with the experimenter in the study, in small heterogeneous groups of from 6 to 15.

Each participant received either a narrative passage (about a science fiction incident) or an expository text (about volcanoes). The passage was typed in standard format, with double-spacing. Participants also received the same passage in a format in which each sentence was typed lengthwise on a separate line, with triple spacing between lines. Except for sentence-final periods, no punctuation was used in any of the experimental materials. Participants were first asked to read the story in the standard format (typed on one page) to find out what it was about. Next, participants were told they would be dividing sentences but would first practice the task. Practice materials were four sentences from "Jack and the Beanstalk."

A crucial aspect of Cioffi's procedures is the careful practice that was provided for the children to help them understand the task. Cioffi had found that simply asking students to mark places where it makes sense to pause sometimes confuses them. His explanation of the task and practice session are described below.

> The experimenter told the subjects that he was going to read the first sentence from "Jack and the Beanstalk," and he wanted them to tell him what he was doing wrong. The sentence was then read in a grossly exaggerated word-by-word fashion.
>
> Typically, students responded by suggesting that the sentence was being read too slowly or spaces were being left between all of the words.
>
> The experimenter probed, "Are there places where it is okay to pause, say to take a breath?"
>
> The students agreed there were.
>
> "Where are they?"
>
> Students invariably suggested periods or commas signalled places where one might pause.
>
> "And if there are no periods or commas, are some places better than others?"
>
> Students admitted that there were places without punctuation where it was permissible to pause.
>
> At this point their attention was directed to the first sentence, and they were asked to mark one place where they could pause and still have the sentence make sense. While they were deciding, the experimenter circulated among the students, encouraging them, apologizing that the task was sometimes hard, and praising any response. (Cioffi, 1980, pp. 107-108)

The experimenter continued in this manner until the children were able to practice the task of finding two and finally three pause locations within a sentence. After this practice session, subjects were then asked to find three pause locations within each sentence of the experimental passage they had read.

Pause acceptability locations that were chosen by at least 10 of 18 subjects in each group were selected as group judgments for sentence constituents. The analysis focused on differences between groups in pause acceptability judgments, and on the relationship between individual performance on the parsing task and other measures of reading skills such as auditory vocabulary and comprehension.

A sentence parsing index was computed for each child by tallying the number of pause acceptability judgments that agreed with the group norms. Correlations between this parsing index and other reading skills

such as comprehension ability were weak and nonsignificant, except for Skilled Decoders on the expository text. This finding indicates that the relationship between parsing abilities and other subskills of reading needs to be further explored.

Comparisons between the judgments of Good Comprehenders and Skilled Decoders showed quantitative but not qualitative differences in sensitivity to syntactic structure. Although the Good Comprehenders identified more constituent boundaries to criterion than did the Skilled Decoders, the two groups did not differ in the types of structure that were marked as acceptable for pausing. In general, both groups placed pausal boundaries at acceptable grammatical locations. The most frequent locations marked for pauses were within-clause junctures between noun phrases and verb phrases, as well as the boundaries of prepositional phrases. Some examples are shown below reflecting the group judgments of good comprehenders.

Simple sentences with prepositional phrases

(1) The Earth - looked blue and green - and fragile - through the window.

(2) In some volcanoes - big pieces of rock - are thrown from the crater - in giant explosions.

Coordinate constructions

(3) The cabin - lights flickered - and dimmed.

(4) Volcanoes are very different - and no two - have the same history.

Complex sentences

(5) The ship - was beginning - to tumble.

(6) There must - be a leak - she thought.

(7) She was one of the first - of the star children - as they were called.

(8) The Hawaiian Islands - were formed by lava - slowly flowing from the craters - of volcanoes on the ocean floor.

(9) At the top of the cone - where the lava leaves - the volcano - a crater forms.

(10) Active volcanoes - are the ones like Mount Saint Helens - that are erupting now.

The examples show that the children's marking of pause acceptability locations corresponds generally to constituent boundaries. However, as Cioffi points out, the parsing is sometimes agrammatical or reflects lower-level boundaries rather than larger constituent structures of the sentence. Examples include the split between cabin and lights (sentence 3) or the split between lava leaves and the volcano (9). Some of these instances of local constituent breaks may reflect the fact that the forced-choice task can encourage children to analyze sentences in more detail than is required for facilitating comprehension. This and related issues are further discussed in the following section.

This review has mentioned four studies that use a sentence parsing task. Some major characteristics of the methodology in each case are listed in Table 1.

## DISCUSSION

In the parsing tasks described in Table 1, individuals are asked to locate boundaries between groups of words on the basis of one of the following cues: 1) words that form meaningful groups, 2) locations where one would pause when reading out loud, 3) locations where it would be acceptable to pause. A major conclusion concerning these tasks generally is that any of these instructions are likely to be confusing to children. In order to be successful, the task procedures must include sufficient practice and training.

TABLE 1. SUMMARY OF STUDIES USING PARSING TASKS

| Task Descriptors | Johnson (1970) | Mason & Kendall (1978) | Kleiman et al. (1979) | Cioffi (1980) |
|---|---|---|---|---|
| Participants | adults | children (9-11 years) | children (Grade 4) | children (Grades 3 & 4) |
| Cue for defining units | pause acceptable | pause locations | meaningful groups | pause okay, still makes sense |
| Name of units | pausal units | intrasentence units | word groups | sentence constituents |
| Norms by | adults | adults | adults | participants |
| Findings for parsing skills | N/A | not successful | prosodic cues aided parsing skills | no substantial differences between reading groups |

As Cioffi points out, these tasks can be approached with one of two strategies. In one strategy, individuals will look for syntactic and semantic cues to guide their marking of intrasentence units. That is, they will use intuitions of structural units and mark boundaries that maintain the integrity of these units. An approach of this kind was encouraged by instructions asking children to look for "meaningful groups of words" (Kleiman et al., 1979). On the other hand, tasks in which children are asked to make pause acceptability judgments invite a strategy of using prosodic information or an auditory sense of "what sounds right."

Since the purpose of these tasks is to reveal children's sensitivity to constituent structure (which presumably corresponds to the encoding unit of comprehension), a task focusing on intuitions of syntactic structure would seem to be the most direct method of probing such abilities. However, this task is more difficult to explain to children than one based on prosodic cues. Cioffi's approach seems to be a good compromise. He asked children to look for locations where it was okay to pause and the sentence would still make sense. Since this procedure makes an appeal to both prosodic characteristics of sentences ("okay to pause") and syntactic-semantic structure (it still "makes sense"), the children may use either strategy or both. Anecdotal reports in Cioffi's study indicated that this was indeed what the children did. It may, in fact, be possible to combine possible instructions to children in even more explicit ways.

Validity of Parsing Tasks Based on Pausal Judgments

Because pausing phenomena are more accessible than syntactic intuitions and more easily defined in behavioral terms, pausal judgments

have been used as the basis for most parsing tasks. It would be worthwhile to consider the validity of pausal judgments as indicators of children's knowledge of structure in sentences. Clearly there are instances in which pause acceptability judgments fail to reveal the parsing skills that children must indeed possess. For example, in the Mason and Kendall (1978) study, neither good or poor readers performed well on the task. However, good readers must have a good (if tacit) knowledge of syntactic structure because parsing strategies are presumably a necessary adjunct to the text comprenension skills that these children demonstrate. This means that the parsing task failed to reveal their knowledge of sentence structure.

Some of the reasons for the poor results that are sometimes obtained in parsing tasks are procedural in nature. For example, the Mason and Kendall task did not seem to be supported with sufficient practice and explanation, which is an important issue, as mentioned above. Children cannot be expected to perform a task that they do not really understand.

A second problem relating to procedures is that participants were directed to mark places in the text where they would pause if they read the text out loud (not just where it would be acceptable). This is probably too stringent a requirement if pausal judgments are to be used as an indirect reflection of the perception of constituent boundaries in sentences. Although speakers do frequently pause at constituent boundaries within sentences (Goldman-Eisler, 1968), the relation between pausing and structure is not absolute but only a correlation that is not always reliable (Larkey, 1979; Cioffi, 1980). Perhaps one reason for this is that pausing may be used for other purposes than that of marking or

enhancing the packaging of sentences, functions such as emphasis and focus. In addition, information blocking (which may be marked by pauses and intonation changes) is dependent on the speaker's estimation of the density of new information being conveyed (Grimes, 1975). Thus, there are probably few instances in which the relation between pausing and structure is absolutely predictive.

Most studies of pausing phenomena as measures of structural units are based on the idea that pausing is at least acceptable at constituent boundaries. That is, when pauses occur in speech perceived to be fluent, they generally do not disrupt the temporal and prosodic integrity of constituent units (Clark & Clark, 1977). Tasks that attempt to elicit such judgments seem to be more reliable than those that focus on unstructured performance.

If pauses are acceptable at constituent units, what type of units are important? Are they clauses, phrases, or constituents within phrases? The following discussion addresses these questions and their relation to the purpose of parsing tasks. These questions are pursued by looking first at some brief examples of analytic or intuitive models of text parsing and then comparing these models with children's group judgments of pausal units in Cioffi's study.

## The Structure of Pausal Units

Sentences can be analytically divided into increasingly refined constituent units. Eventually each word is a constituent of some higher-level unit. The question addressed here is: At what point do constituents become sufficiently complex and integrated to become important as units in processing? In other words, what level of text parsing is important

and how does it relate to pausing judgments? As a starting point, it can be hypothesized that a "chunk" corresponds to a major syntactic unit. Such units might be defined as ones that are not contained within the boundaries of any other constituent except for the sentence as a whole. For example, a sentence used in the well-known click experiments of Fodor and Bever (1965) is shown below, with diagramming in labeled brackets to indicate the constituent structure.

(11) [ [ That [ [ he ] [ was happy ] ] ] ↓ [ was [ evident [ from
S1 NP1 S2 NP2 VP2 VP2 S2 NP1 VP1 ADJ PP

[ [ the way ] [ he smiled ] ] ] ] ] ]
NP3 S3 S3 NP3 PP ADJ VP1 S1

Fodor and Bever found that perceptions of sentence interruptions (locus of clicks) migrated to the major syntactic boundary, which is shown above by the arrow. This boundary occurs between the complex subject noun phrase and the verb phrase, units that are not embedded within any other intrasentence constituent. Other structures fitting this definition of major constituents would be sentence adverbials and subordinate clauses. Such examples seem to be the clearest cases of constituent boundaries that are also the most likely to be marked by pauses or by other prosodic phenomena.

However, other examples show that the parsing of sentences may result in units that do not correspond to major constituent boundaries in this sense. For example, a sentence used in the study conducted by Graf and Torrey (1966) is shown below. Graf and Torrey arranged sentences in meaningful phrases, an example of which is used here as a standard for comparison with responses given by children in the pausal judgment task.

(12) [ [ During World War II ]
S1 ADV ADV

(13) [ even fantastic schemes]
NP1 NP1

(14) [ received consideration ]
VP1 VP1

(15) [ if they [ gave promise
S2 VP2

(16) [ of shortening the conflict ] ] ] ]
S3 S3 VP2 S2 S1

The first three phrases correspond to the type of constituents discussed above; that is, they are major syntactic constituents. Lines (15) and (16), however, split the subordinate clause (a major constituent) into two smaller units. This parsing is determined primarily by length (the whole clause is too long). As a result, line (15) is not a whole constituent. It contains the subject, verb, and object head-noun. The embedded clause (16) is parsed as a separate constituent. Note also that the subject noun they is not separated from the verb phrase, again because of length considerations. In general, the parsing seems to be sensitive to three factors: 1) number of propositions expressed, 2) major constituent structure, and 3) subordination structure.

The judgments of pausing acceptability observed by Cioffi show a number of striking similarities to the parsing shown above. In the examples that follow, the sentence constituents identified by the Good Comprehenders in his study are written on separate lines.

(17) [ [ This morning ]
S ADV ADV

(18) [ Kim ] [ [ was sitting in the forward cabin ]
NP NP VP VP1 VP1

(19) [ and watching the Earth
VP2

(20) [ through the cabin window ] ] ] ]
PP PP VP2 VP S

The second verb phrase ("and watching the Earth through the cabin window") has been divided into two units, probably because it is too long (three propositions). These two units are not major constituents, but they maintain the integrity of the verb and object noun phrase (line 19) and the prepositional phrase (20). On the other hand, the subject noun phrase of the main clause ("Kim") is not separated from the verb phrase. Again, this seems to be because of length: The single noun is too short and does not express a proposition. In all cases, an interaction between word length (probably propositional density) and structure seems to guide the assignment of pausal boundaries.

Another example shows some of the same features.

(21) [ [ The Hawaiian Islands ]
S1 NP1 NP1

(22) [ were formed by lava
VP1

(23) [ slowly flowing from the craters
S2

(24) [ of volcanoes [ on the ocean floor ] ] ] ] ]
PP PP PP PP S2 VP1 S1

This example contains a long, complex verb phrase whose pausal junctures divide it into units reflecting the subordinate structure of the sentence. This is shown particularly by units (22) and (23), each of which contains a verb and a head noun dominating the immediate lower level of structure.

The examples discussed above show that pausal judgments agree fairly well with some adult models of sentence parsing. The units do

not necessarily coincide with major constituent boundaries. Instead, parsing structure is sensitive to an interaction between (1) number of propositions expressed (1 to 3 propositions per chunk), (2) constituent structure, and (3) subordination.

On the sentence level, parsings tend to divide the sentence into clausal and adverbial units, giving main clauses, sentence adverbs, subordinate clauses, and coordinate sentences (e.g., "This morning/Kim was sitting in the forward cabin/and watching . . ."). As the number of propositions increases within clauses, subject noun phrases and prepositional phrases may become separable units ("Big pieces of rock/are thrown from the volcano/. . ."), but parsings usually retain the integrity of the relation between the verb and object noun phrase. Within phrases, complexity is built by post-nominal qualifiers such as prepositional phrases and relative clauses. The parsing structure usually separates the head noun from the subordinate qualifiers (" . . . were formed by lava/slowly flowing from the craters/or volcanoes. . .").

Although the units defined by children's pausal judgments seem to agree fairly well with adult intuitions of parsing structure, it is not clear that such units give a description of the optional "chunks" for processing by poor readers. Critical factors in the selection of an optimal unit appear to be (1) whether information is new or old, and (2) the number of propositions expressed (which is correlated with the number of words). Further research should be directed to the problem of specifying these characteristics more accurately.

SUMMARY

This paper examined methods of eliciting child judgments about the segmentation of sentences into meaningful units. The most effective methods relied on judgments of acceptable pause placement, but encouraged readers to attend to both prosodic and semantic cues. All parsing judgment tasks require considerable practice, probably in a setting with small groups of children. Judgments of pause placement do not show any substantial differences between 1) children and adults, and 2) good comprehenders and skilled decoders. The units identified by children's pausal judgments (or by adult models of text parsing) are not always major syntactic constituents such as noun phrases and verb phrases. Purely syntactic criteria are necessary but not adequate to account for the placement of pausal or phrasal junctures. A number of semantic factors interact with syntax as determinants of intrasentence units, including 1) number of propositions expressed, and 2) whether information is new or old. Specification of an optimal processing unit awaits further clarification of these and other factors affecting sentence perception.

References

Cioffi, G. L. The perception and use of sentence structure by good comprehenders and skilled decoders in contextually limited environments. Ph.D. dissertation, University of Minnesota, 1980.

Clark, H. H., & Clark, E. V. Psychology and language: An introduction to psycholinguistics. New York: Harcourt Brace & Jovanovich, 1977.

Cromer, W. The difference model: A new explanation for some reading difficulties. Journal of Educational Psychology, 1970, 61, 471-483.

Fodor, J. A., & Bever, T. G. The psychological reality of linguistic segments. Journal of Verbal Learning and Verbal Behavior, 1965, 4, 414-420.

Gibson, E., & Levin, H: The psychology of reading. Cambridge, Mass.: M.I.T. Press, 1975.

Goldman-Eisler, F. Psycholinguistics: Experiments in spontaneous speech. London: Academic Press, 1968.

Graf, R., & Torrey, J. W. Perception of phrase structure in written language. American Psychological Association Convention Proceedings, 1966, 83-84.

Grimes, J. E. The thread of discourse. The Hague, Holland: Mouton, 1975.

Johnson, R. E. Recall of prose as a function of the structural importance of the linguistic units. Journal of Verbal Learning and Verbal Behavior, 1970, 9, 12-20.

Kleiman, G. M., Winograd, P. N., & Humphrey, M. M. Prosody and children's parsing of sentences (Technical Report No. 123). Champaign, Ill.: Center for the Study of Reading, University of Illinois, 1979.

Larkey, L. S. Prosodic information in spoken English and its role in perception. Minneapolis: University of Minnesota, 1979.

Mason, J. M., & Kendall, J. R. Facilitating reading comprehension through text structure manipulation (Technical Report No. 92). Champaign, Ill.: Center for the Study of Reading, University of Illinois, 1978.

Rode, S. S. Development of phrase and clause boundary reading in children. Reading Research Quarterly, 1974-75. 10. 124-142.

SOUTHWEST REGIONAL LABORATORY
TECHNICAL NOTE

DATE: September 20, 1982

NO:

# READING COMPREHENSION: DEFINITIONS AND INSTRUCTIONAL METHODS

David Snow

## ABSTRACT

An examination of reading subskills shows that most comprehension skills reflect children's "verbal reasoning" abilities. Classroom techniques are presented for teaching these higher-level comprehension skills. The techniques feature comprehension guides and structured classroom interactions that show children how to understand implicit text information such as inferences, conclusions, or the main idea. The suggested activities, which can be adapted to instruction in content areas, involve a step-by-step sequence of exercises that permit students to experience reading as an active "thinking process."

# READING COMPREHENSION: DEFINITIONS AND INSTRUCTIONAL METHODS

David Snow

This paper summarizes the major ideas from two sources in the area of reading comprehension instruction. With a focus on classroom applications and methods, these two sources offer potential contributions to the improvement of reading comprehension. Part I summarizes the conclusions of Rosenshine (1977), who provides a good introduction to the study of classroom practices by examining the various skills that are widely believed to underlie successful reading comprehension. His review supports the conclusion that the skills that typically form the basis of instruction and assessment in reading comprehension (i.e., beyond word attack skills) are interrelated aspects of a single, global skill, which can be described as "verbal reasoning."

The description of reading comprehension as a reasoning activity is consistent with a recent cognitive trend in reading research in which reading is viewed as a type of inferential problem-solving task, requiring an active, purposeful, self-checking engagement of the reader's attention. In accordance with this view (with its emphasis on the cognitive orientation of the reader), researchers have ascribed poor reading comprehension to the reader's use of deficient strategies for deriving and constructing meaning from text (Golinkoff, 1975-1976; Meichenbaum, 1976; Ryan, 1979). Deficient strategies, for example, are often characterized as passive, excessively focused on details, and having the limited goal of "saying all the words right" (Myers & Paris, 1978; Ryan, 1979). The importance of effective cognitive strategies in reading has been expressed most

clearly in studies of children's "metacognitive" (Brown, 1977) and "metacomprehension" skills (Baker & Stein, 1978; Markman, 1977). These terms refer to readers' awareness of (and thereby control over) the goal-directed, cognitive processes used in reading, including the ability to monitor the comprehension process such that readers know whether or not they have understood the text. Metacognitive skills such as these are currently believed to be crucial prerequisites for the higher-level thinking activity implied by reading.

An important practical implication of metacognitive studies is that student's reading comprehension skills can be improved by instruction designed to increase (1) their awareness of the goals, purpose, and nature of reading (e.g., that reading is more than a word-translation task), and (2) their ability to monitor their reading comprehension. Accordingly, the recent literature on reading comprehension reflects an interest in devising techniques for teaching metacognitive skills in an instructional setting (e.g., see Brown, 1978; Ryan, 1979). Perhaps the most typical instructional strategy involves cognitive behavior modification using self-instructional training (e.g., Meichenbaum & Asarnow, 1978). In this type of training, children are taught to use structured self-dialogues as a means of guiding their reading strategies and ensuring adequate comprehension monitoring.

An alternative approach to comprehension training is presented in Part II of this paper, which summarizes Herber's (1978) classroom technique using "comprehension guides." Although the techniques described by Herber are not derived from metacognitive studies, they share an important goal with the metacognitive approach: improving children's reading

comprehension by enhancing their awareness of reading as a "thinking process." Using a more intuitive and heuristic approach than self-instructional training, classroom instruction with comprehension guides seeks to improve children's metacognitive knowledge of reading by helping them to experience reading as an active, problem-solving activity. The comprehension guides constitute a facilitative technique for helping students gain experiences in successful reading comprehension--experiences that they will be able to generalize to post-training reading tasks. Since this technique does not rely on complex self-dialogues (which children may have difficulty using spontaneously), the effects of training may show better "transfer" than skills learned in self-instructional training.

Part I

## Reading Comprehension Skills

Reading specialists seem to agree that reading comprehension involves about seven basic skills:

- Understanding words in context
- Locating details in the text
- Recognizing the sequence of events
- Identifying cause and effect relationships
- Comparing and contrasting
- Recognizing the main idea
- Drawing inferences from the text

Rosenshine (1977) reviewed studies of these comprehension subskills and addressed the following questions: (1) Are these separate skills or aspects of a single skill? (2) Is there a hierarchical learning sequence associated with them? (3) Are these skills taught in a hierarchical manner in the standard basal reading series used most widely in the schools?

Correlational studies relevant to the first two questions (Davis, 1968, 1972; Spearritt, 1972; Thorndike, 1973) indicate that comprehension subskills are not generally identifiable as separate skills. Nor is there any evidence that they are learned in a hierarchical manner (i.e., with one prerequisite to another). An exception to this general finding is vocabulary (understanding words in context), which was best identified as a separate skill in all three studies cited above. The clearest distinction between the other skills is a generalized differentiation between (1) understanding explicit material in the text, and (2) making inferences. This

"explicit:implicit" dichotomy corresponds to Carver's (1973) useful distinction between reading and reasoning. "Reading" involves word recognition skills and understanding explicit sentence-level relations. "Reasoning" refers to the ability to combine meaning across sentences, including inferences and conclusions. Thus, most of the skills that are used to define reading comprehension measure verbal reasoning or "inferential comprehension" (Clymer, 1968).

Rosenshine (1977) also reviewed some of the most popular basal reading series and found that these various skills are not taught in a hierarchical manner. As a result of the findings of this review, some research questions are proposed concerning how the subskills of reading comprehension should be taught, including: (1) What are the instructional consequences, if any, of teaching comprehension skills in different sequences? and (2) Does instruction in one skill influence learning in other skills?

Further attention also needs to be given to the distinction between reading and verbal reasoning. Skills in these areas might require different approaches in both instruction and assessment.

Part II

## Classroom Instruction Using Comprehension Guides

Herber (1978) presents a strategy for teaching comprehension skills that is centered around the use of structured guides ("comprehension guides") to the target content of texts children are expected to read. Instruction using comprehension guides is intended for comprehension training in content-area classrooms, that is, where the focus is on comprehending (and learning from) written material in social studies, science, and math. This type of instruction is appropriate (or adaptable) for classroom settings ranging from the upper elementary grades through high school. In contrast to traditional methods of comprehension instruction (asking questions about the text), the purpose of comprehension guides is to initially simulate the comprehension experience by showing students (1) what comprehension entails, and (2) how to understand the written material they encounter. The overall goal is to provide children with experience and practice in reading comprehension as an activity in thinking.

Comprehension guides are prepared by the teacher, who determines what information (including inferences, conclusions, etc.) the children should understand and learn from a given text. This target information is written as a series of declarative statements that collectively constitute the comprehension guide. The children's task consists of finding evidence from the text to either support or reject the statements in the comprehension guide. The comprehension guide serves to simplify and structure the comprehension process in two ways. First, it establishes a purpose for reading: The children know exactly what kinds of information they will be looking for in the text. Second, the activity does not require

students initially to construct or reconstruct the content of the text. The task is only to locate evidence for or against the statements of target content that are provided in the guide. The experience of verifying or rejecting statements by locating evidence in the text serves in effect to simulate the comprehension experience. Once this experience is simulated in a structured and supportive type of instruction, it provides a pattern for children to follow in subsequent reading experiences (Herber & Nelson, 1975).

Levels of Comprehension

The statements in the comprehension guide are intended to address different levels of comprehension relative to the text. These refer to comprehension of information at different levels of the text structure. The three levels of comprehension discussed in Herber (1978) are as follows:

- Literal: information explicity stated in the text, that is, what the author said. This is essentially sentence-level information.
- Interpretive: information pertaining to what the author meant, as induced from connections across literal level statements. This information takes the form of inferences and conclusions.
- Applied: synthesis of the author's ideas with the reader's own ideas and experiences, giving rise to larger principles and generalizations.

The first of these levels (Literal) represents reading in the sense discussed by Rosenshine (1977) while the other two represent verbal reasoning. The comprehension guide begins with statements at the literal level and concludes with statements at the applied level.

Sequence of Instruction

The traditional method of teaching comprehension involves asking questions, either before or after reading. For example, comprehension instruction in elementary school reading texts consists almost entirely of questions (Rosenshine, 1977) with little or no explicit teaching about what comprehension entails. Herber (1978) points out, however, that questions presuppose that the learner already knows how to comprehend the material. Thus, questions are not effective as aids in teaching comprehension; they only reinforce comprehension skills that the reader has already acquired. Comprehension guides provide an alternative to the use of questions for students who can benefit by first learning how to comprehend the material they encounter. Exercises using questions are appropriate in later stages of the instructional sequence, which are intended to encourage generalization of skills and transfer.

As described above, the instruction sequence using comprehension guides begins by providing a simplified and supportive context for facilitating an experience of the comprehension process. The initial task is to recognize evidence from the text that supports statements presented in the comprehension guide. After considerable practice with this prerequisite recognition experience, students are ready for less structured activities that gradually shift the problem-solving initiative from the teacher to the learner. For example, using skills acquired in the initial recognition activities, students next respond to questions about the content of target text material and eventually practice formulating comprehension statements by themselves. This instructional sequence, which progresses from simpler to more demanding activities, permits students to

gradually transfer comprehension skills to new reading experiences in a manner that is ultimately independent from the initial comprehension guides. The instructional sequence is based on the idea that recognition is easier than production and therefore provides a more facilitative learning activity. Suggested steps in the overall program include practice using comprehension guides in the following sequence of forms:

1. Declarative statements, with references to locations in the text where supporting information can be found.
2. Declarative statements, without references.
3. Questions, with references to locations in the text where information supporting answers can be found.
4. Questions, without references.
5. Questions that students formulate, and answer.
6. Student-produced statements (e.g., a summary) of the content of material they have read.

Similar procedures can be used to help students be more aware of the logical structure of text, for example, how ideas are expressed by comparing and contrasting, by showing cause and effect relationships, etc.

Discussion

Procedures using comprehension guides have not been validated experimentally. Instead, they have evolved out of classroom experience which indicates, according to Herber, that they are very effective as a heuristic strategy for teaching comprehension skills. Although these procedures are not experimentally-based, a number of research results in reading comprehension appear to support the basic approach, including:

- Young readers appear to have difficulty with higher-level aspects of the text beyond the literal level, that is, drawing

inferences (e.g., Paris & Upton, 1976), summarizing (Otto, Barrett, & Koenke, 1969), or identifying the structural importance of ideas (Baker & Stein, 1978; Brown & Smiley, 1977; Smiley et al., 1977). Comprehension guides permit direct experience in comprehension at these levels.

- One of the most important prerequisites of good reading comprehension appears to be metacomprehension skills (Brown & Smiley, 1977; Markman 1977; Ryan, 1979) whereby readers know when they don't understand the text adequately. Practice with comprehension guides is aimed at improving students' ability to monitor comprehension by facilitating techniques that allow them to experience the comprehension process. By experiencing comprehension, students learn what to monitor.

- The facilitating techniques used in comprehension guides are based on the notion that recognition is easier than production. The claim that recognition practice provides a good learning context is supported by Brown (1975), who found that is was easier for children to recognize the sequence of stories than to reconstruct them from reordered sequences and that reconstruction in turn was easier than free recall.

- Comprehension skills for expository prose appear to develop later than those for narratives (Danner, 1976). This supports the focus on expository material, which is the target of comprehension training using the comprehension guide approach.

- The most fundamental problem in reading comprehension instruction is that of transfer (Brown & Campione, 1977; Meichenbaum & Asarnow, 1978; Ryan, 1979). That is, most poor comprehenders can usually learn to rehearse instructions, monitor their comprehension strategies, and apply other metacognitive "executive" skills in the context of specific training sessions, but they seldom adopt these strategies spontaneously in post-training reading experiences. The approach using comprehension guides addresses the problem of transfer by a sequence of instructional steps that makes a gradual step-by-step transition from initial, intuitive learning experiences to less-structured activities in which students apply their metacognitive knowledge about reading more independently.

## References


Baker, L., & Stein, N. The development of prose comprehension skills (Technical Report No. 102). Urbana-Champaign, Ill.: Center for the Study of Reading, University of Illinois, 1978.

Brown, A. L. Recognition, reconstruction and recall of narrative sequences by preoperational children. Child Development, 1975, 46, 156-166.

Brown, A. L. Knowing when, where, and how to remember: A problem of metacognition. In R. Glaser (Ed.), Advances in instructional psychology. Hillsdale, N.J.: Erlbaum, 1977.

Brown, A. L. Metacognitive development and reading. In R. J. Spiro, B. Bruce, & W. F. Brewer (Eds.), Theoretical issues in reading comprehension. Hillsdale, N.J.: Erlbaum, 1978.

Brown, A. L., & Campione, J. C. Memory strategies in learning: Training children to study strategically (Technical Report No. 22). Urbana-Champaign, Ill.: Center for the Study of Reading, University of Illinois, 1977.

Brown, A. L., & Smiley, S. S. Rating the importance of structural units of prose passages: A problem of metacognitive development. Child Development, 1977, 48, 1-8.

Carver, R. P. Reading as reasoning: Implications for measurement. In W. H. MacGintie (Ed.), Assessment problems in reading. Newark, Del.: International Reading Association, 1973.

Clymer, T. What is reading?: Some current concepts. In A. M. Robinson (Ed.), Innovation and change in reading instruction. Chicago: University of Chicago Press, 1966.

Danner, F. W. Children's understanding of intersentence organization in the recall of short descriptive passages. Journal of Educational Psychology, 1976, 68, 174-183.

Davis, F. B. Research in comprehension in reading. Reading Research Quarterly, 1968, 3, 499-545.

Davis, F. B. Psychometric research on comprehension in reading. Reading Research Quarterly, 1972, 7, 628-678.

Golinkoff, R. A comparison of reading comprehension processes in good and poor comprehenders. Reading Research Quarterly, 1975-1976, 11, 623-659.

Herber, H. L. Teaching reading in content areas. Englewood Cliffs, N.J.: Prentice-Hall, 1978.

Herber, H. L., & Nelson, J. Questioning is not the answer. Journal of Reading, 1975, 18, 512-517.

Markman, E. M. Realizing that you don't understand: A preliminary investigation. Child Development, 1977, 48, 986-992.

Meichenbaum, D. Cognitive factors as determinants of learning disabilities: A cognitive functional approach. In R. Knights & D. Bakker (Eds.), The neuropsychology of learning disorders: Theoretical approaches. Baltimore, Md.: University Park Press, 1976.

Meichenbaum, D., & Asarnow, J. Cognitive-behavior modification and metacognitive development: Implications for the classroom. In P. Kendall & S. Hollon (Eds.), Cognitive-behavioral interventions: Theory, research and procedures. New York: Academic Press, 1978.

Myers, M., & Paris, S. G. Children's metacognitive knowledge about reading. Journal of Educational Psychology, 1978, 70, 680-690.

Otto, W., Barrett, J. C., & Koenke, K. Assessment of children s statements of the main idea in reading. Proceedings of the International Reading Association, 1969, 13, 692-697.

Paris, S. G., & Upton, L. R. Children's memory for inferential relationships in prose. Child Development, 1976, 47, 660-668.

Rosenshine, B. V. Skill hierarchies in reading comprehension. In J. M. Mason, J. H. Osborn, & B. V. Rosenshine, A consideration of skill hierarchy approaches to the teaching of reading (Technical Report No. 42). Urbana-Champaign, Ill.: Center for the Study of Reading, University of Illinois, 1977.

Ryan, E. B. Identifying and remediating failures in reading comprehension: Toward an instructional approach for poor comprehenders. In T. G. Waller & G. E. MacKinnon (Eds.), Advances in reading research (Vol. 2). New York: Academic Press, 1979.

Smiley, S. S., Oakley, D. D., Worthen, D., Campione, J. C., & Brown, A. L. Recall of thematically relevant material by adolescent good and poor readers as a function of written vs. oral presentation. Journal of Educational Psychology, 1977, 69, 381-388.

Spearritt, D. Identification of subskills of reading comprehension by maximum likelihood factor analysis. Reading Research Quarterly, 1972, 8, 92-111.

Thorndike, R. L. Reading comprehension education in fifteen countries: International studies in evaluation III. New York: Halsted Press, 1973.