

# 20 RESEARCH ON TEACHING READING COMPREHENSION

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## INTRODUCTION

The present chapter represents an update of an earlier attempt (Tierney & Cunningham, 1980) to address the "state of the art" relative to research on teaching reading comprehension. The reading researcher and practitioner will find the chapter a review of what we know about reading-comprehension instruction, and a framework for addressing the adequacy and promise of existing and forthcoming lines of inquiry. Two basic questions drive our discussion: With whom, in what situations, and in what ways does teaching improve reading comprehension? How should research in teaching reading comprehension proceed?

Our purpose is threefold: (1) describe the nature and distribution of research in teaching reading comprehension in the context of stated and/or implied instructional goals, (2) consider issues of methodological significance as they emerge, and (3) suggest some reasonable guidelines for future research in accord with rising research interests and alternative approaches to investigation. To these ends, we adopt two discussion headings which represent the nature and scope of this research in terms of two fundamental goals for instruction: increasing comprehension from text and increasing ability to comprehend from text. The former reviews the large array of studies which examine the efficacy of teacher intervention intended to improve students' ability to understand, recall, or integrate information from a specific text passage or passages. The latter addresses those studies whose goal is to improve general and specific reading-comprehension abilities which will transfer to students' reading of passages they later encounter on their own. The two discussions will then merge in the final section of the paper, which addresses considerations for future reading-comprehension instructional research.

During its inception we recognized that a review which exhausted the literature was neither realistic nor within the bounds of our goals. Instead we decided that studies cited in the context of our remarks should be selected largely for their representativeness, significance, or promise. And, with respect to research paradigms, an attempt was made to include descriptive studies dealing with theoretical issues of relevance to teaching reading comprehension, empirical studies involving such prototypical methodology as treatment-group comparison, and discussions relating aspects of pedagogical intuition. To these ends, we believe the present review is comprehensive.

## INCREASING COMPREHENSION AND LEARNING FROM TEXT/PROSE

It is the purpose of this section to highlight research which studies instructional intervention as a means to improve students' understanding, recall, and integration of information stated in or inferable from specific text passages. Our review of such interventions includes prereading activities, guided reading activities, and postreading activities. Note that we have drawn a distinction between activities or strategies based upon when intervention takes place. This distinction might be characterized in the following trichotomy: building background knowledge; activating readers' existing background knowledge and attention focusing *before* reading; guiding reader/text interactions *during* reading; and providing review, feedback, or cognitive stimulation *after* reading.

### Prereading Activities

Most reading lessons include a prereading activity which provides a bridge of sorts between a reader's knowledge base and the text. Most lesson frameworks used in conjunction with basals and content-area textbooks consider this step a preparatory one in which purpose setting and concept development are primary goals. In principle, most of these activities are directed at the reader's background knowledge; implicitly, they reflect at least tacit acceptance of the role of background knowledge and the importance of building and activating readers' knowledge before reading (see Anderson & Armbruster, this volume).

#### *Building Background Knowledge Prior to Reading*

When readers apparently lack the prior knowledge necessary to read, what can be done to compensate? Three suggestions appear most often in instructional literature: teach vocabulary as a prereading step; provide experiences, vicarious or otherwise, which fill in and expand upon students' existing knowledge; or introduce a conceptual framework analogous to that of the text which will enable students to build appropriate background for themselves.

*Preteaching vocabulary.* An enduring piece of conventional wisdom in reading education is the recommendation that students be taught crucial word meanings prior to encountering them in text. In most directed reading lessons

which accompany basals and content-area textbooks, introduction to new vocabulary is an integral first step. As Bridge (in press) suggests, introduction to new vocabulary is perceived as serving "the function of arousing previous conceptual associations and providing new associations . . . to help students to relate the unfamiliar concepts to familiar ones." In a similar vein, Pearson and Johnson (1978) describe such activities as providing anchors for new information. Or as Beck, McKeown, McCaslin, and Burkes (1979) have suggested, teaching vocabulary is a specialized aspect of developing background knowledge essential for comprehension and is widespread in most reading programs. In fact, one person (Becker, 1977) has recommended that disadvantaged students be taught 25 word meanings per week, starting in third grade and continuing through twelfth grade, in order to compensate for the students' lack of conceptual knowledge.

The fact that vocabulary development is such a widespread instructional focus may be partially a function of that research which alludes to the relationship between vocabulary and reading comprehension. Correlations between knowledge of word meanings and ability to comprehend passages containing those words, between knowledge of word meanings and verbal intelligence, as well as between word difficulty and passage difficulty are all high and well established. (For a review of this work, see Anderson & Freebody, 1981; Davis, 1971.) These relationships have been further demonstrated by studies which show that not only do good and poor readers appear to differ with respect to knowledge of word meanings (Belmont & Birch, 1966), but also replacing high-frequency words with low-frequency synonyms in texts decreases subjects' passage comprehension (Freebody & Anderson, 1981a, 1981b; Marks, Doctorow, & Wittrock, 1974; Wittrock, Marks, & Doctorow, 1975). A strong relationship between meaning vocabulary and comprehension still obtains, even when intelligence is held statistically constant (Johnston, 1981; Vineyard & Massey, 1957). Such evidence, of course, fails to establish knowledge of word meanings as a *cause* of comprehension. Direct support for a causal relationship must be sought in the several instructional studies which have investigated the effect of preteaching vocabulary on passage comprehension.

Comprehension studies employing prereading instruction in word meanings have been both successful and unsuccessful in accomplishing a significant effect. While any conclusions drawn from an analysis of only a few studies should be seen as tentative, several characteristics seem to distinguish effective from ineffective programs. Preteaching vocabulary in order to increase learning from text probably requires that the words to be taught must be key words in the target passages (Beck, Perfetti, & McKeown, 1982; Kameenui, Carnine, & Freschi, 1982), that words be taught in semantically and topically related sets so that word meanings and background knowledge improve concurrently (Beck, Perfetti, & McKeown, 1982; Stevens, 1982), that words be taught and learned thoroughly (Beck, Perfetti, & McKeown, 1982), and that only a few words be taught per lesson and per week (Beck, Perfetti, & McKeown, 1982; Kameenui et al., 1982; Stevens, 1982). Attempts to teach word meanings without determining that they are key to the target passages (Ahlfors, 1980; Pany & Jenkins, 1978), without teaching word meanings and background knowledge concurrently (Ahlfors, 1980; Evans, 1981; Jenkins, Pany, & Schreck, 1978; Pany & Jenkins, 1978), without teaching words thoroughly (Evans, 1981; Jenkins et al., 1978; Pany & Jenkins,

1978; Tuinman & Brady, 1974), or without teaching only a few words per lesson or per week (Evans, 1981; Jenkins et al., 1978; Pany & Jenkins, 1978; Tuinman & Brady, 1974) are probably doomed to failure.

These conclusions lead us to question the practice of cursorily introducing new word meanings before having students read. This practice is probably only justified when just one or two crucial words are taught at some depth. Rather, to be effective, an extensive and long-term vocabulary strand accompanying a parallel schemata or background-knowledge-development strand is probably called for. Instead of preteaching vocabulary for single passages, teachers should probably be preteaching vocabulary and background knowledge concurrently for sets of passages to be read at some later time. In effect, this recommendation would result in a type of "spiral curriculum" (Bruner, 1960) wherein knowledge and vocabulary taught about a topic would assume knowledge and vocabulary learned previously about that topic and provide knowledge and vocabulary on which later knowledge and vocabulary about that topic could be built.

Our conclusions must remain tentative, however, for what is lacking in the research on teaching vocabulary is a substantial data base which addresses the subtleties and various effects which arise from vocabulary instruction across a variety of classroom situations.

*Enriching background knowledge.* Intervention research has supported the existence of a causal relationship between background knowledge and comprehension. McWhorter (1935), cited in Smith (1963), provided enriching experiences to children lacking in background of information and noted significant improvement in reading. McDowell (1939), cited in Smith (1963), improved reading readiness for kindergarten students by providing them with an "enriched curriculum." Graves and his associates (Graves & Cooke, 1980; Graves & Palmer, 1981; Graves, Cooke, & La Berge, 1983) developed previews for short stories that had, as one component, the building of prior knowledge important to understanding the selection. These several experiments produced data documenting that reading the previews before reading the stories increased students' learning from stories by a significant and impressive amount. Stevens (1982) increased learning from text compared with a control group for tenth-grade students reading a history passage by teaching them relevant background information for that passage. Hayes and Tierney (1982) found that presenting background information related to the topic to be learned helped readers learn from text regardless of how that background information was presented or how specific or general it was.

Unfortunately, while these studies support the notion that background knowledge development *can* improve comprehension and learning from text, they do not together or separately give us very clear or very specific guidelines on how to build background knowledge prior to having students learn from text. It is not certain what steps should be taken in determining what background knowledge a written selection requires, what quantity or quality of that knowledge a set of learners has or lacks, or what particular approach to use in developing that background knowledge for those learners. Furthermore, a number of issues need to be resolved before effective practices for developing background knowledge to increase reading to learn can be established: direct versus symbolic experi-

ence, direct versus incidental instruction, explicit versus inductive instruction, and so on. Obviously, more instructional research employing background-knowledge development before reading to learn is called for.

*Analogy.* A specialized instance of enriching background is the use of analogy. Analogy might be defined as an expositional method for comparing sets of information which are similar enough in essential respects to permit transposition of attributes across sets, usually from familiar to unfamiliar information. The classroom being what it is, explanation must often suffice for experience. Teachers, therefore, have long operated under the assumption that while explanation via analogy is not a substitute for experience, it affords a practical means for introducing students to unfamiliar information in the context of a familiar framework. Many philosophers (Black, 1962; Campbell, 1920) and psychologists (Rumelhart & Ortony, 1977), especially those advocating a schema-theoretic point of view, concur on this point.

Despite the potential utility of analogy claimed by educators, philosophers and psychologists, research on its pedagogical efficacy has been examined by only a few studies and many of these studies have only indirectly explored analogy's use in reading comprehension. In a listening situation, Vosniadou and Ortony (in press) showed that analogies are effective mechanisms for acquiring new information but their worth varied in accordance with their "goodness of fit." In problem-solving situations, several researchers have examined the effect of reading analogous story problems (e.g., Gick & Holyoak, 1980, in press; Perfetti, Bransford, & Franks, 1983). They have shown that many individuals fail to access analogies unless prompted to do so or presented with more than a single analogical possibility. Several studies have dealt with analogy only indirectly and results from these studies are mixed and rather unrevealing. For example, Dowell (1968) and Drugge (1977) found no significant effects stemming from instructional use of analogy, whereas Mayer (1975) and Royer and Cable (1975, 1976) obtained results which favored the advance presentation of analogous material on readers' comprehension of other passages. Of most direct relevance to reading comprehension, the most positive evidence of the value of analogy comes from a study by Ausubel and Fitzgerald (1961) who found a superiority for readers given an advance expository passage on an analogous familiar topic and from a study by Hayes and Tierney (1982) who found that students given different modes of presenting or embedding analogous information had an advantage on certain transfer measures over students not given analogies. Hayes and Mateja (1981) replicated this latter finding for immediate and delayed posttest measures using different materials. Taken together, the results suggest that if analogy is to be used effectively to increase comprehension or background knowledge as a requisite for comprehension, care must be taken on several points: (a) one must alert students to the analogy or passages with analogies which could possibly prompt readers to notice the relationship or "fit" between two sets of information, (b) the presentation of the analogous information matters—it is likely that different modes will have different impacts, and (c) the methods used to assess effects may influence the conclusions one draws. In terms of our third point, we hold that any research attempting to improve background knowledge needs to consider that a complex interaction will exist among teaching methodology, texts,

topics, and readers. Also, the influence of changes in background knowledge of the familiar or unfamiliar information may be subtle and difficult to measure without on-line as well as posttest measures sensitive to such variations. Apart from providing students with analogies in the text they read, researchers might consider training students to create their own analogies. We are unaware of any research which has studied when and how readers might enlist their own analogies to improve their own reading comprehension.

### *Activating Background Knowledge and Attention Focusing*

If readers have the necessary background knowledge prior to reading to learn, what can or should be done to activate that knowledge or focus attention in order to expedite their learning from text? Many theorists and practitioners advocate strategies which encourage students actively to relate the new information they gain from reading to their prior knowledge. Such strategies are based on the assumption that learning is a constructive rather than a merely reproductive process. A number of suggestions for activating background knowledge have arisen. Many are directed to teachers, a very few are directed to students, and still fewer are directed to texts (or rather to text authors). For the purposes of discussion, we have selected the following as illustrative of teacher initiated/directed strategies for activating background knowledge: advance organizers, objectives, and pretests and prequestions. From among those strategies indicative of student generated/monitored activity, we will consider student-centered discussion and student generated questions and purposes. With respect to text adjuncts we will discuss prefatory statements, pictures, and titles.

*Advance organizers.* One of the most widely researched and controversial strategies designed to activate a reader's background knowledge is that of the advance organizer, proposed by Ausubel (1963, 1968). In Ausubel's (1968) words, the intent of the advance organizer is "to bridge the gap between what the reader already knows and what the reader needs to know before he/she can meaningfully learn the task at hand" (p. 148). Based upon Ausubel's theory of verbal learning, which posits the existence of hierarchically organized cognitive structures, the function of the organizer is to provide ideational scaffolding for the stable incorporation and retention of the more detailed and differentiated material that follows in the passage. In a practical sense, its purpose is to prepare readers to gain information from reading they could not have otherwise gained (Bransford, 1979).

Ausubel (1978) has suggested that for advance organizers to function effectively, they must be written at a higher level of abstraction or generality than the material to be learned, address the conditions of their specific use, account for both the reader's existing subsumers and the unfamiliar concepts presented within the text, and take into account those factors involved in posttesting. In the case of unfamiliar material, Ausubel prescribes the use of an expository organizer to provide "relevant proximate subsumers." With familiar material, he suggests a comparative organizer to facilitate the integration of new ideas and to increase discrimination between ideas.

There is some evidence that advance organizers affect the subsequent learn-

ing of some students some of the time with some texts when readers have some prerequisite knowledge (Ausubel, 1978; Bransford, 1979). However, despite the fact that several hundred research studies and any number of synthesis attempts have explored the differential worth of advance organizers, we still lack any "real" closure regarding their instructional value. Over the years researchers intent on synthesizing the bulk of advance organizer research have resorted to extensive literature reviews (Barnes & Clawson, 1975; Hartley & Davies, 1976; Lawton & Wanska, 1977; Mayer, 1979) and, most recently, meta-analysis, a statistical technique suggested by Glass (1978) to standardize and compare treatment effects (Luiten, Ames, & Ackerson, 1980; Moore & Readence, 1980). One such review of the research by Sledge (1978), which focused on the use of advance organizers with secondary students, reported that the majority of studies did not favor advance organizers and, in studies for which differences did favor advance organizers, less capable students benefited most. A more recent synthesis, a meta-analysis which examined trends across 135 advance organizer studies (Luiten et al., 1980), suggested the following: most advance organizer treatment groups tended to perform better than control groups; the effect of advance organizers had a variable impact across special education, elementary, secondary, and college students; the impact of aural and visual organizers varied with the age level of students; and the effect of advance organizers tended to increase rather than decay over time.

Two major problems have had the effect of diminishing the worth of most individual advance organizer research studies and synthesis attempts. The first problem, the lack of a clearly specified operational definition of advance organizers, has left advance organizer research largely nonreplicable. Theoretical position papers, research reviews, and research reports have virtually failed to provide either teachers or researchers with specific guidelines for developing advance organizers. Unfortunately, Ausubel (1978) suggests that "apart from describing organizers in general terms with an appropriate example, one cannot be more specific about the construction of an organizer. For this always depends on the nature of the learning material, the age of the learner, and his degree of prior familiarity with the learning passage" (p. 251). These "general terms" to which Ausubel refers are scattered throughout his writings and in what appears to us to be poorly articulated examples. The result is such that for any single text, a variety of advance organizers might be generated and the differential effect of any one might become a legitimate research question. Clark and Bean (1982), after arguing the seriousness of this problem, called for theorists and researchers to employ text analysis and free-recall measures of comprehension and learning to define operationally advance organizers.

The second problem relates to the global nature of those questions researchers tend to ask about advance organizers. Given Ausubel's warning with respect to the differential nature of learning material and varying needs of learners, it seems misguided for researchers and practitioners to continue to explore the efficacy of the advance organizer without regard for the different potential effects these variables may have. Questions should be pursued that go beyond the general issue of whether or not advance organizers work. Clearly, only in the context of examining a variety of data across a variety of specific texts and types of learners can researchers hope to develop descriptions which address the instruc-

tional and theoretical significance of the advance organizer in a useful manner. Literature reviews and meta-analyses already suggest that, while advance organizers tend to increase conceptual learning and problem solving, they decrease recall of technical information and specific details (Mayer, 1979, 1983) and that advance organizers are of more benefit to older and more able learners than they are to younger and less able ones (Luiten et al., 1980). More recently, research studies have found that advance organizers aid sixth graders who can selectively attend, but not those with selective attention deficits (Borer, 1981), and that EMR adolescents benefit more when reading to learn from an advance organizer than they do from a traditional introduction (Peleg & Moore, 1982). Clearly, more research in how advance organizers interact with text characteristics, learner characteristics, and type of learning desired is called for.

In content classes, such as social studies and science, there exists a hybrid of the advance organizer—the structured overview—whose widely advocated use deserves some comment. In theoretical papers, both Barron (1969) and Earle (1969b) proposed the development and use of a visual overview to introduce students to the concepts and relationships represented within a text or a unit within a course. They proposed that the overview incorporate the terms arranged in outline form effectively to highlight to students the content of a text or unit, including its logical structure. In so doing, it was believed that the overview assumed the properties of Ausubel's advance organizer, that is, it related "new content to relevant subsuming concepts that have previously been learned" (Barron, 1969, p. 33). Fortunately, structured overviews are operationally defined more clearly than traditional advance organizers. Unfortunately, to date the research dealing with the effectiveness of these graphic overviews suffers from one of the same major problems ailing advance organizer research—namely, the probes which have driven the research have failed to examine systematically the impact of the strategy beyond whether or not it works. Studies conducted so far have provided support that under certain conditions with certain students structured overviews have a positive effect on learning (Dean-Guilford, 1981; Kelleher, 1982; Moore & Readence, 1980); however, these investigations have provided little in the way of specific guidelines for developing, using, or evaluating structured overviews. In general, students with high verbal ability seem to benefit more from structured overviews and they seem to work better with expository passages (Moore & Readence, 1980), but there are exceptions. The issue of the *quality* of the structured overview in determining its effect on learning from text has yet to be adequately addressed.

Another hybrid of the advance organizer—the story preview—has been developed by Graves to be used with students before they read to learn stories in either literature or reading classes. In research conducted by Graves and his associates, story previews have been shown to increase learning from stories for high- and low-ability fifth- and sixth-grade students (Graves & Palmer, 1981); for low-ability seventh- and eighth-grade, inner-city students (Graves, Cooke, & LaBerge, 1983); for tenth-grade, rural students (Hood, 1981); and for eleventh-grade, suburban students (Graves & Cooke, 1980). In reviewing this work, Graves and Slater (1981) concluded that story previews generally have a moderate and positive effect on story comprehension and retention, especially when the stories being read are difficult for the students. They also concluded that story previews

can assist students in making inferences from their reading and that, in general, students like them. Story previews seem a promising intervention for activating background knowledge and attention focusing before having students read to learn from stories. The story preview is operationally defined, and initial investigations have attempted to determine how well story previews work for students of different ages and abilities.

*Objectives.* Providing students with objectives before they read is a practice that has long been advocated by reading educators under the heading "setting purposes for reading." Common sense would suggest that providing students with objectives before they read to learn will enhance that learning (Levin & Pressley, 1981) on the assumption that if students know what they are expected to learn, they will tend to pursue their learning more systematically. The few studies which have used objectives as a prereading intervention to increase learning from text have generally supported their use. Duell (1974) found that students receiving detailed purposes for reading in advance learned targeted, unimportant information better than students who were just told they would have to take a multiple-choice test after reading. There was no difference between groups in their learning of targeted, important information. Borer (1981) found that behavioral objectives help sixth-grade students who can attend selectively, but not those with selective attention deficits. Maier (1980) found that giving learning-disabled students purposes for reading increased their learning of two folk tales.

Objectives do appear to focus readers' attention on the information targeted by the objectives, as evidenced by the fact that they have a positive learning effect on targeted information (intentional learning) and a negative learning effect on untargeted information (incidental learning) (Petersen, Glover, & Ronning, 1980). If teachers know what they want students to learn from reading a specific text, using prereading objectives/purposes to focus students' attention seems a good idea; if teachers do not know what they want students to learn or if they want them to learn everything, using prereading objectives/purposes seems a bad idea. Beyond this rather general advice based on common sense and a few studies, little can be said. What kinds of objectives there are, how to formulate or match them to specific passages, and their effect on different types and ages of learners are questions without even tentative answers.

*Pretests and prequestions.* Two teacher-directed preinstructional strategies somewhat related to objectives are pretests and prequestions. In the context of the classroom, both pretests and prequestions tend to be used most frequently for purposes of assessment. But as Pressey (1926) points out, questions asked prior to reading a text can serve a learning producing function as well. Specifically, Pressey (1926) has claimed that pretests increase a student's sensitivity to learning by alerting him or her to the nature of the task and its relevance as well as providing a means to evaluate, categorize, or generalize.

The claim that pretests and prequestions have a beneficial effect upon learning continues to be supported empirically, although with qualification. There is a general pretest effect (Willson & Putnam, 1982). Moreover, as Anderson and Biddle (1975), Hartley and Davies (1976), Levin and Pressley (1981), and Rickards (1976) suggest, pretests (often in the form of adjunct prequestions) can have a

facilitative effect if the material to be read is difficult to comprehend (Hartley & Davies, 1976; Levin & Pressley, 1981) *and* if the goal of the pretest is intentional learning (to have students learn only the information from reading which is necessary to answer the pretest questions) (Anderson & Biddle, 1975) *and* if the information tested on the pretest is among the most important in the text (Rickards, 1976). If, on the other hand, the goal is to improve general understanding and retention of a passage, pretests and prequestions tend to have a restricting effect on incidental learning (Anderson & Biddle, 1975). One may suppose, therefore, that if students know something about the topic to be learned, if the material to be used is difficult for them to read, and if the teacher wants students to gain specific learnings from reading, then either a pretest or prequestions in advance of reading will likely facilitate subsequent learning from that text. When prequestions are given to students *again* after they read, as postquestions, their effect on intentional learning can increase (White, 1981).

Such a claim, however, falls short of addressing the issue of variability across texts, readers, and teachers in the following respects. First, whatever effects pretests may have, it is doubtful they can overcome the lack of prerequisite information necessary to process a text. Logically, a pretest can only be expected to facilitate activation of existing knowledge if a reader has such knowledge (Bransford, 1979). Second, pretests and prequestions interact with passages to produce differential effects (Richmond, 1976). The relationships which exist between questions and texts are obviously complex and cannot be considered realistically outside the purposes for which the questions are posed, as well as the purposes for which the answers to them are interpreted. Like research on advance organizers and objectives, research on prequestions and pretests awaits further elaboration.

*Student-centered reading activities.* The three previous subsections have discussed prereading instructional strategies which tend to be teacher directed in nature; for while they may address student-related issues, they are nonetheless generated and/or directed on behalf of students rather than by students. We wish to contrast this approach to activating students' background knowledge and attention focus with that of student-centered prequestions, predictions, and discussion of purposes for reading. As is the case with most prereading activities, student-centered prequestions, predictions, and discussion are principally directive in their effect. They differ, however, from teacher-directed preactivity, in that their intended function is to encourage and make use of spontaneous student response in terms of directing both the focus of activity and its outcome. And, characteristically, these procedures result in some degree of student-teacher and/or peer interaction, as opposed to simple exchanges limited to one-way question-response sequences. In the main, student-centered prereading activities are based on the notion that such activity has the potential to activate problem-solving behavior (i.e., inquisitiveness) as well as the ability and desire to examine ideas and generate alternatives.

Most basal reading lessons and a number of reading educators advise teachers to begin with either selected questions or a discussion of the story topic designed to facilitate student-teacher and peer interaction in the context of the reading lesson. Stauffer's (1959, 1969) Directed Reading-Thinking Activity

(DR-TA) is one such procedure where purpose setting together with interaction are integral. As Stauffer has described the approach:

... either the reader declares his own purposes or if he adopts the purposes of others, he makes certain how and why he is doing so. He also speculates about the nature and complexity of the answers he is seeking by using his fullest experience and knowledge relevant to circumstances. Then he reads to test his purposes and assumptions. (Stauffer, 1969, p. 40)

Another recommended strategy, Manzo's (1969) ReQuest Procedure, uses a simple questioning format whereby students are given the opportunity to generate as well as respond to questions based upon a text selection or a portion of it. The procedure is typically done in pairs, student-teacher or individual students, and as sections from a text are read silently, each participant, in turn, poses a number of questions based upon his or her reading.

Research examining the efficacy of procedures similar to those described above provides some support for student-generated questions and discussion, but little mention is made with regard to either the type of text and student for which specific procedures are most appropriate or the extent to which the rationale for each such procedure is justified. For example, Manzo (1970) and Manzo and Legenza (1975) found general support for the use of the ReQuest Procedure with kindergarten children and poor readers. Palincsar (1982) supported the use of a variation of this procedure with seventh graders. Similarly, Bissen, Hoskisson, and Modlin (1976) reached the general conclusion from their study that first- and third-grade Title I children learned considerably more from passages taught by the DR-TA than from listening to the stories without discussion. Davidson (1970) and Petre (1970) found a similar advantage for the DR-TA over other types of directed reading lessons for fourth-grade students of different ability groups.

Outside the context of research based on selected strategies, there has been little support for the student-centered approach until more recently. Using both immediate and delayed passage-dependent recall questions, Chodos, Gould, and Rusch (1977) found that having fourth-grade students generate four questions from a brief summary of a passage before they read the passage significantly improved the students' learning of that passage as well as their ability to maintain what they had learned. Using a paradigm suggested by Swaby (1977), Schachter (1978) used discussion to link "to be read text" with prior experience. Swaby (1977) had presented sixth-grade students, prior to their reading a passage, with a written statement designed to create a link to prior experience. The procedure did not facilitate comprehension, but Swaby speculated that a discussion of prior experiences may have had an effect—especially an effect on inferential comprehension. Schachter (1978) took Swaby's suggestion and examined the impact of linking with prior experience through discussion. As predicted, Schachter's procedure yielded results which reflected an enhancement of inferential comprehension.

In general, research on student-centered prereading activities leaves us with an overriding concern. Despite the fact that informal prequestioning and discussion are widespread classroom practices, we could find little research which

examined the effect of these activities as actually carried out in classrooms on students' learning from reading. Durkin (1978-1979) and Guszak (1967) describe teacher-questioning, but the effect of teacher-questioning behavior upon students is not clear.

*Pictures, prefatory statements, and titles.* To what extent do pictures, prefatory statements, and titles (text adjuncts described by Hartley and Davies [1976] as content clarifying) improve a reader's ability to learn information in a specific text? While it is clear that such adjuncts can provide relevant contextual information and thereby improve comprehension for ambiguous or unclear passages (Arnold & Brooks, 1976; Bransford & Johnson, 1972, 1973; Bransford & McCarrell, 1974), it is less clear whether they are effective aids when the adjunct reiterates information provided directly in the prose (Aulls, 1975). Certainly, no one argues that having students read titles, prefatory statements, or illustrations makes them better comprehenders in any general sense (Jenkins & Pany, 1981), but there does exist evidence both to support and disclaim their facilitative effect when students are reading to learn from text.

With respect to pictures, Samuels concluded in 1970 that there was "almost unanimous agreement that pictures, when used as adjunct to the printed text, do not facilitate comprehension" (p. 405). Since that time, Thomas (1978) investigated the effectiveness of pictorial illustrations as adjunct aids in science texts using fourth-grade students of three ability levels as subjects; he found the illustrations to have no facilitative effect. Marr's research (1979) led her to a similar conclusion, namely, that it is often the case that pictures fail to have a facilitative effect on learning.

In contrast, a growing number of studies have found evidence to the contrary. Specifically, pictures have been shown to increase the prose learning of: (a) young children when their effect is measured in terms of responses to short-answer questions (Guttmann, Levin, & Pressley, 1977; Lesgold, Levin, Shimron, & Guttmann, 1975; Levin, Bender, & Lesgold, 1976); (b) fourth-grade students, (Peeck, 1974); (c) sixth-grade students, as measured by main idea responses (Koenke & Otto, 1969); (d) undergraduates (Dwyer, 1968; Snowman & Cunningham, 1975); and (e) the retarded (Bender & Levin, 1978; Riding & Shore, 1974). These and other studies have led Ruch and Levin (1977) and Levin and Lesgold (1978) to argue strongly in support of the notion that pictures have a facilitative effect on children's learning from prose. This effect is said to be a special effect for pictures over and above an effect due to more repetition of ideas (Levin et al., 1976).

The picture becomes murky when one considers that Rasco, Tennyson, and Boutwell (1975) found a facilitative effect for pictures but suggested that true effects were confounded with subjects' use of strategies. Dwyer (1967, 1968, 1969, 1971, 1972) found that not only were some pictures more effective than others, but also suggested that even when pictures were effective, they caused learners to slow down. We might argue that since strategy utilization arose from picture use, the relationship between picture and strategy use may be worthwhile to pursue as a positive effect rather than as a confounded outcome. Several of these studies have used listening rather than reading modes and assumed results were generalizable. When Readence and Moore (1980) meta-analyzed those stud-

ies where pictures were used when subjects read to learn (as opposed to listening to learn), they found the effect size for those studies to be generally positive but nonetheless quite small. Clearly, pictures do not have an equally facilitative effect for all subjects (Levin, Divine-Hawkins, Kerst, & Guttman, 1974).

It is the differential effect of pictures in interaction with a host of variables that leads us to conclude again that certain students, when reading certain texts for certain purposes with certain adjunct aids, are helped dramatically by those aids; however, such facilitative effects are significantly reduced when no regard is given to the likelihood of interaction. Indeed, this conclusion seems quite compatible with one Schallert (1980) reached following a review of the role of illustrations in prose comprehension. She stated:

. . . where research has found pictures to be helpful, the illustrations have seemed to be related to the text in certain ways. A reasonable hypothesis is that pictures are likely to help readers learn from written material if they represent spatial information or information that is important to the total message. In addition, there may be differences in the effectiveness of illustrations between situations in which the information to be derived from a picture is explicitly repeated by the text and situations in which the text provides merely the framework for certain information left to be derived from appropriate illustrations (p. 519).

Accordingly, she suggests that three issues need to be addressed: How might the information represented in pictures be measured? What kind of information should be represented in pictures? How do students read or learn to read pictures? These and other questions about the effect of pictures on learning from text have yet to be answered (Brody, 1980; Duchastel, 1980).

Research findings are in a similar state with respect to titles and prefatory statements. With children and adults as subjects, neither titles nor prefatory statements (Christensen & Stordahl, 1955; Cole, 1977; Landry, 1966) were found to have a facilitative effect on comprehension. Conventionally written introductions did not increase learning from text for EMR adolescents (Peleg & Moore, 1982). In contrast, studies by Doctorow, Wittrock, and Marks (1978) as well as Memory (1979) suggest that the inclusion of titles and prefatory statements provide certain adolescent readers advantages in terms of their ability to recall and answer selected questions. Kosoff (1981) found that different types of prefatory statements failed to increase learning from text but that *scripturally implicit* introductions increased the integration of prior knowledge with textual information in subjects' recalls. Unfortunately, in all but a few studies, we are given only sparse descriptions of the adjunct aid and the teacher, text, and reader variables. Rarely were multiple measures employed to address systematically the impact of the adjunct aid upon strategy use during and comprehension after reading.

### Guiding Reader/Text Interactions during Reading

A variety of interventions have been used by teachers and researchers in an attempt to influence how readers process text in order to increase comprehension.

Among these interventions are those adjuncts and activities which accompany the presentation and processing of the to-be-read text. Essentially such adjuncts and exercises appear to have a twofold purpose: increasing the extent to which to-be-learned material is accessible to readers and improving students' ability to comprehend the text. We shall address briefly each of the following: inducing imagery, inserted questions, self-questioning, and oral reading, lesson frameworks, and study guides.

### *Inducing Imagery*

In a recent paper, Tierney and Pearson (1983) argued that as an aid to comprehension readers and writers might try to visualize a scenario from the vantage point of an eyewitness or character in a story. Unfortunately, direct evidence of the worth of their suggestion is restricted to examining the effects of such encouragement in rather constrained text situations. The attempts at so doing in experimental situations suggest that imaging may not facilitate learning from text for very young children (Dunham & Levin, 1979; Gambrell, 1982) or even for adolescent EMR students (Bender & Levin, 1978). It may be that these students cannot image on command or that they do not learn well from pictures (Levin et al., 1974). This seems quite likely since a number of studies demonstrate that careful instructions and/or training to image can improve prose learning of third-grade students (Gambrell, 1982; Lesgold, McCormick, & Golinkoff, 1975; Pressley, 1976, 1977); fourth-grade students (Lesgold, McCormick, & Golinkoff, 1975; Levin, 1973; Lin, 1982); and fifth- and sixth-grade students (Gambrell, Koskinen, & Cole, 1981; Kulhavy & Swenson, 1975; Lin, 1982; Linden & Wittrock, 1981; Mazur-Stewart, 1983; Pressley, 1977). Other studies have found a facilitative effect for readers imaging about prose with twelfth-grade students (Anderson & Kulhavy, 1972; Mazur-Stewart, 1983) and college students (Steingart & Glock, 1979). While it must be noted that there are imagery-inducing strategies which do not help learning from text (Tirre, Manelis, & Leicht, 1979), that with longer passages it is difficult to get readers to maintain an imaging strategy (Anderson & Kulhavy, 1972), and that students who do not learn well from pictures do not seem to benefit from imaging (Levin et al., 1974), it seems fair to conclude that inducing imagery is likely to increase learning from text for selected students in and above grade 3.

In 1971, Paivio expressed concern for the fact that imagery researchers could only speculate about the instructional effects of imagery. Now there is sufficient data for educators to be optimistic that imaging activity is effective. However, given that most increases in learning from prose due to inducing imagery are slight and given that some students apparently have difficulty imaging, more research needs to be conducted in which the two concerns are addressed: (a) a variety of effects are examined; (b) care is taken to determine and describe how well imagery is induced. At the same time researchers might begin to explore the nature and role of spontaneous imaging by students as well as other vicarious reading experiences (e.g., identification with characters, the sensation of being "on the page," and so on).

### *Inserted Questions*

Providing students with questions during reading is a common instructional practice. In an attempt to guide students' reading of a text selection, teachers frequently stop students who are in the process of reading to pose a number of text-related questions. These questions are often either retroactive in nature, requiring the reader to refer to something just read, or proactive, requiring the reader to read ahead in order to search out an answer or confirm a prediction.

Research seems to bear out teachers' intuitions concerning the facilitative effect of inserted questions. Hershberger's (1964) original study and Rothkopf's follow-up work (1966) have not only provided a great deal of research impetus in the area of questioning, but also have clarified the role of inserted questions in reading to learn. Hershberger's (1964) original investigation reported that students given self-evaluative review questions outperformed a control (i.e., no-question) group on a posttest based on those same questions. This issue has since been examined by Rothkopf (1966, 1971, 1972a), who initiated a number of studies addressing the direct influence of questions inserted in text. Rothkopf's line of research and methodology prompted a rash of investigations (Boyd, 1973; Frase, 1967, 1968; Frase, Patrick, & Schumer, 1970; McGaw & Grotelueschen, 1972; Rothkopf & Bisbicos, 1967; Rothkopf & Bloom, 1970; Snowman & Cunningham, 1975; Graves & Clark, 1981; White, 1981) which, with few exceptions, confirm that students responding to inserted factual questions perform better on those same questions given as a posttest than students who only read the text passage. Further, when the questions which are given involve applying information gleaned from text, students who respond to the questions both in the inserted and the posttest situations perform better not only on the application questions, but also on the others as well (Watts & Anderson, 1971).

Of interest to educators, however, is not just the fact that inserted questions have an effect. Since the strategy is used by a great many teachers on a day-to-day basis, it seems imperative that their use be examined more closely. The available research provides only partial information on the value of inserted questions across different texts and purposes for reading, especially if time on task is held constant (Carver, 1972). Only a limited number of studies have addressed the type of attention-focusing functions inserted questions prompt as well as the extent to which learning is tied to attention or vice versa (Britton, Westbrook, & Holdredge, 1978; Reynolds & Anderson, 1980; Reynolds, Standiford, & Anderson, 1979). Too few studies have examined the effectiveness of using questions within classroom settings—for example, their value with repeated use and the worth of questions tied to a rational model of the text or reader.

### *Self-Questioning*

In an earlier section, we addressed self-questioning and purpose-setting strategies as they occur in prereading situations. We shall now extend that discussion to include literature which deals with self-questioning *during* reading.

Research-based information on self-generated questions is not only conflicting, but also far from complete. Studies by Duell (1974) and Morse (1976) demon-

strated that college students induced to self-question had no advantage over other students not induced to question, while André and Anderson (1978-1979), Frase and Schwartz (1975), Schermerhorn, Goldschmid, and Shore (1975), and Weiner (1978) found reason to support their use. Darwazeh (1983) found self-generated questions inferior to teacher-generated ones. There are a number of reasons why a more comprehensive and rigorous research program is needed to investigate further the effects of self-questioning as a prose-learning strategy. First, very few studies to date have trained students to ask questions or given them the opportunity to practice that strategy. In those studies where training did take place, peer training procedures were most often used. Second, in some instances, the instructions which were given to students severely limited the types of questions students would tend to ask. This criticism would hold with respect to both the Frase and Schwartz (1975) study—where students were required to identify those lines from the text that contained answers to their questions—and the Weiner (1978) study—where students were asked to generate a singular set of question types across different texts—with little regard for the idiosyncratic purposes for which the students might be reading. Third, and typical of reading comprehension instructional studies, very few self-questioning studies have used more than a single achievement measure to assess the effectiveness of a self-questioning strategy. And no study used text-analysis methodology to indicate the different types of inferences students generated. Fourth, a majority of the studies failed to use a sufficient number of comparison groups to separate out the effects of different components of the question-generation process. In summary, as Weiner (1978) has suggested in the conclusion of her paper, analyzing training programs, comparing various types of strategies, and using multiple-comparison groups and different measures of effect across a variety of texts are essential if we are to make explicit what has only been implied about the strategy of self-questioning. A recent study on self-questioning and other strategies by Palincsar and Brown (1983), which is discussed later in this chapter, addresses some of these issues.

### *Oral Reading, Lesson Frameworks, and Study Guides*

While questioning strategies are undoubtedly the most widespread approach to guiding student-text interactions during reading to learn, with imagery-inducing strategies achieving a less frequent second place, there are countless other adjunct devices and practices suggested in the literature. We will comment briefly upon three which are frequently recommended for classroom use: oral reading, lesson frameworks, and study guides.

*Oral reading.* When students find a textbook difficult to read, teachers often ask that those students read the textbook aloud. This is not only an observed classroom practice, but also one to which teachers readily admit. Research on oral reading as a strategy is sparse and equivocal, although there exists a slight edge in favor of oral reading over silent reading for purposes of comprehension. Poulton and Brown (1967) and Rogers (1937) found no differences between learning from text after oral reading as compared with silent reading, while Collins (1961), Elgart (1978), Graham (1979), and Rowell (1976), all found comprehension

and retention to be superior after oral reading for students at several different age levels. We found no studies which examined the differential effects oral reading might have had upon recall of explicit and likely to-be-inferred information across texts read for different purposes by students of varying abilities. Nor did we find any students that addressed the long-term effects of oral reading versus silent reading in classrooms where boredom, inattention, and other factors might mediate the apparent superiority of oral reading.

*Lesson frameworks.* Cunningham (in press) and Cunningham, Moore, Cunningham, and Moore (1983) have suggested, based upon their analyses of lesson frameworks, that there are four steps essential for comprehension lessons to be effective:

- Step 1: Establish purpose(s) for comprehending.
- Step 2: Have students read or listen for the established purpose(s).
- Step 3: Have students perform some task which directly reflects and measures accomplishment of each established purpose for comprehending.
- Step 4: Provide direct informative feedback concerning students' comprehension based on their performance on that (those) task(s).

They also concluded that many, but not all, effective comprehension lesson frameworks have a readiness step preceding Step 1:

Readiness Step: Cue access to or develop background knowledge assumed by the text.

Similar steps are apparent in several widely used and highly recommended learning frameworks. For example, the Directed Reading Activity (Betts, 1946), the DR-TA (Stauffer, 1959, 1969), and the Guided Reading Procedure (Manzo, 1975), recommend lesson formats with similar phases to content teachers and publishers as strategies for aiding students in their efforts to learn from text as well as for guiding the development of teacher's editions for basals. While they may be designed to provide readers with a way to approach a text, they are as much an aid to teachers as to students.

Despite their widespread use and advocacy, there is a dearth of research based on these practices. In two experiments with seventh-grade poor readers in a geography class, Bean and Pardi (1979) found better learning from text when the Guided Reading Procedure was used in combination with prereading assessment and structured discussion. Biskin et al. (1976) found that first- and third-grade Title I students remembered story elements better after being engaged in a DR-TA than after listening to the stories without discussion. Also, Davidson (1970) and Petre (1970) examined student responses and found results which favored the DR-TA over the Directed Reading Activity (DRA) with fourth-grade students—especially higher-ability students. Lovelace and McKnight (1980) also found DR-TA to be effective.

Because the directed reading activity is essentially a set of prequestions given to students before they read and then given to the students again as post-questions after they read, the literature on prequestioning and postquestioning

can be said to evaluate indirectly the DRA. Anderson and Biddle (1975) concluded from their review that prequestions facilitate learning for the information sought by the questions and that postquestions facilitate learning for all textual information. Additional indirect support of the DRA comes from White (1981) who compared getting the same questions prereading *and* postreading with getting them just prereading or just postreading and found the before-and-after questioning superior to the other two approaches and a control condition. Sachs (1981) actually compared a version of the DRA with a worksheet activity and found the DRA superior.

Recently, several new lesson frameworks have appeared for teachers to use in aiding students to learn from reading. Stetson (1981) used Survey-Read-Recite-Record-Review (S4R) as a lesson framework in three pilot studies with different types of subjects and found that it increased learning from text dramatically. Hansen (1981) and Hansen and Pearson (in press) used a strategy method, a question method, and a combined method to increase inferential comprehension during reading to learn. Beck, Omanson, and McKeown (1982) reported that their redesigned DRA was superior to the DRA they found in a basal reading series.

While these lesson frameworks are supported both by tradition and the existing research, a multitude of questions remain. Not only is it not clear why or what part of each framework is causing learning from text to occur, but also little research exists to guide the users of these frameworks in matching frameworks with different learners or with different texts. Nor is it clear how teachers actually implement these frameworks in classrooms.

*Study guides.* Study guides are widely advocated adjuncts to textbook material. As described by Earle (1969a) and Herber (1970, 1978), study guides use various adjunct activities and questions to structure as well as guide students' reading of difficult subject matter prose. It is the purpose of a study guide to facilitate readers' understanding of text content while improving their ability to deal with patterns of ideas (cause and effect; comparison and contrast; sequence or time order; and simple listing) as well as levels of text presentation. While there is not an extensive body of research on the effectiveness of study guides at this time, several studies involving some permutations of this methodology have produced encouraging but differential results. Namely, for some subjects on some variables with selected texts, study guides have proven effective (Anthony, 1981; Berget, 1977; Carney, 1977; Estes, 1970, 1973; Maxon, 1979; Phelps, 1979; Riley, 1979; Vacca, 1977). With the growth of interest in cataloging text characteristics as well as describing readers' inferences with and without adjuncts, research should be forthcoming which will provide the differential information needed to examine those intuitions which prompted Herber's and Earle's original rationales for study guides. At the present, however, research does not show how different types of guides might and should be developed to facilitate prescribed reading outcomes.

### Teacher Interventions Following Reading

There undoubtedly exists as much variability within teacher interventions following reading (postreading activities) as between postreading activities and either

prereading or during-reading activities. This state of affairs seems reasonable since postreading activities have come to imply anything from recall exercises tied exclusively to explicit information represented by the text to long-term projects of an applied nature, which may be only tangentially related to what has been read. Under the assumption that such activities will provide for the retention, reinforcement, extension and/or application of previous learnings from text, teachers are frequently encouraged to consider postreading activity an integral part of reading to learn. A perusal of most basal reading material, content area texts, and lesson frameworks will confirm this observation. The notion of postreading activity raises the issue of whether interventions occurring after the fact have any influence upon student performance. Furthermore, do they do what they purport to do? We will attempt to pursue these issues as we address the effects of a select group of postreading strategies.

### *Postquestions*

Anyone who has visited public school classrooms very much will recognize this scenario: students are assigned to read a selection from a textbook, either in class or for homework; the teacher then asks a series of oral questions based on that selection which the students answer orally or assigns students a series of written questions to answer (generally with their books closed); at some later time, the students take a test which includes questions based on that selection.

Experimental results addressing the effect of postquestions upon student learning are quite conditional, as one would suspect. As in the case of inserted questions, students responding to postquestions perform better on those same questions given as a test than students who only read the passage. The facilitative effect of postquestions on "intentional learning" is reported by Anderson and Biddle (1975) to have occurred in 37 out of 40 such studies they examined. Nungestor and Duchastel (1982) found postquestions far superior to simple text review in producing intentional learning. Likewise, Ellis, Konoske, Wulfbeck, and Montague (1982) found postquestions superior to prereading instruction on intentional learning. Results in the context of "incidental" learning, however, are much more equivocal. While Anderson and Biddle (1975) reported that 26 out of 39 studies found a facilitative effect of postquestions on new questions appearing on a later test, they did demonstrate that the size of this effect was less than dramatic. In addition, others suggest that postquestions might under some circumstances have a restrictive effect on incidental learning (Fraser, 1975; Hiller, 1974; Rothkopf, 1972b; Sagaria & DiVesta, 1978; Wixson, 1981).

Another factor related to the issue of postquestioning is question focus/question type. Rickards (1976) found that postquestions derived from information with high structural importance in a selection facilitated intentional learning from text; however, questions based on information of low structural importance did not. Watts and Anderson (1971) and Rickards and Hatcher (1977-1978) suggest that application-type or meaningful learning questions facilitate intentional learning while rote-learning questions do not. Friedman (1977); Yost, Avila, and Vexler (1977); and Denner (1982) report that "higher-level" questions produce a greater learning effect than "lower-level" questions. Bislin et al. (1976) consider reflective questions, such as those used by the Great Books Foundation (1967), to enhance comprehension and retention of stories.

It is less clear what other factors might interact with the effect of postquestioning upon learning. Richmond (1976) found the effect differed across passages. Watts (1973) found the effect diminished as the time increased between postquestioning and testing. Shavelson, Berliner, Ravitch, and Loeding (1974) found better readers gained much less than poorer readers from postquestioning.

Based on what evidence we do have, however, it seems reasonable to conclude that if teachers use text materials which students find challenging, if teachers know specifically what they want students to learn from that material, and if what teachers want students to learn is information which the author also deems important, it is likely that teachers can facilitate learning by asking application-type or inference questions based on such text-derived information, assuming such facilitation is measured by a test which asks the same questions and assuming little time elapses between postquestioning and testing. Related to classroom practice, however, very few studies have examined the value of sets of related questions tied to either the pedagogical assumptions inherent within published reading programs or the discourse flow within texts, for example, networks of inferences and their prerequisite textual information.

### *Feedback*

When students answer questions or take posttests based on what they have read, teachers typically provide feedback, that is, let students know how well they have performed. In general, research supports this practice. Gagné (1978), Kulhavy (1977), and LaPorte and Voss (1975) all conclude that feedback which occurs subsequent to postquestions or posttests results in greater gains in learning than when feedback does not follow such activity. The timing of such feedback, however, does not appear to be a significant factor (Gagné, 1978; Kulhavy, 1977). Rather, it is the quality of feedback which most often results in its differential effects. While this may seem counterintuitive, Kulhavy (1977) and Barringer and Gholson (1979) note that it is feedback following wrong answers which has the most dramatic effect on learning. In fact, LaPorte and Voss (1975) found that feedback did not increase students' learning for questions correctly answered, but did for those questions which were incorrectly answered. Further, Barringer and Gholson (1979) have shown verbal feedback to be consistently superior to tangible feedback with respect to conceptual learning, but as Kulhavy (1977) has pointed out, if students can cheat (obtain feedback *before* answering the questions) or if material is too difficult, feedback will matter little if at all. These findings, as they stand, are quite interesting. It would be useful, however, to extend this research to address the questions of *how* learners use feedback following reading to learn and to what degree students need to understand and/or be convinced by feedback for it to have a facilitative effect on learning.

### *Group and Whole-Class Discussions*

Beyond postquestioning and feedback, there are numerous other postreading strategies teachers use as a means of facilitating comprehension. Discussion bears specific mention as it surfaces in some form or another during a great many of them. From the initiation of group projects to the culmination of such individual

pursuits as book reviews, teachers frequently either schedule group discussion of some preread text or assign projects which will necessitate interaction to some degree. Support for the use of discussion as a strategy to increase learning from text emerges, but quite indirectly, through research related to group discussion.

A study which examined the use of guide material and small-group discussion with social studies text led Estes (1970, 1973) to suggest there were no direct benefits from small-group discussions. In contrast, a study by Vacca (1977) which incorporated the use of group discussion, claimed that group discussion together with the specific text material and study guide upon which it was based was both productive and beneficial in terms of the student's acquisition of content. Galda (1982) found discussion superior to drawing for primary-grade students. And Barron and Melnick (1973), in a longitudinal vocabulary study in the area of biology, alluded to the differential effectiveness of teacher-led full-class discussion and student-led small-group discussion. They suggested that both the full-class discussion and the small-group discussion were better than no discussion but that whole-class discussion tended to be easier to operationalize given specific guidelines and a purpose for the discussion.

Intuitively it would seem that the effects of discussion, when it occurs as part of some larger postreading activity, are confounded somewhat due to the likelihood that discussion facilitates some aspects of the activity and the activity, in turn, feeds into discussion. Further, the effects of discussion as a postreading activity in and of itself have yet to be fully addressed. Researchers should be encouraged to examine discussion's influence upon reading to learn, strategy acquisition, the nature of a reader's interpretation, and the reader's self-initiated pursuits. In so doing, they should remain cognizant of both the significance of discussion in the light of other classroom strategies and the nature of reader-text-teacher interactions. This implies measuring systematically the impact of the text before, during, and after discussion as well as the characteristics of the group—for example, cohesiveness, composition, goals, purposefulness, inquiry orientation, and nature of peer-teacher interactions.

### INCREASING ABILITY TO COMPREHEND AND LEARN FROM TEXT/PROSE

A principal question in research on comprehension and learning from text/prose is: What teacher interventions before, during, and/or after reading can increase what students learn from their reading beyond what they might learn when reading without such interventions? A principal question in research on improving students' ability to comprehend what they read is: What teacher interventions can increase students' ability to comprehend or learn from new passages (passages students must handle on their own) beyond the increase which might occur when students simply read independently? Clearly, the concern here is with transfer: Can students be taught knowledge, skills, or strategies that will transfer to their reading of passages with which teachers have not helped them?

In one sense, any study on reading can be viewed as a potential source for instructional implications, in which case the term instructional research on reading is synonymous with the term research in reading. If, however, it is worth-

while to distinguish between the two, then instructional research must be characterized as that which tends toward more direct and obvious implications for reading instruction than those studies whose only link to instruction is that subjects read text. Certainly, it is important to know what the characteristics of good and poor readers are and what the characteristics of comprehensible texts are. Further, it is important to know how classrooms function during reading instruction and the nature of practices presently in use. It seems, however, that such knowledge is only useful when it is examined in the context of what *causes* readers to comprehend better than they would under other circumstances.

Just four years ago, we suggested that there was a dearth of research which addressed the issue of improving students' independent comprehension abilities. Since that time the number of studies which have pursued this issue have multiplied. In our past review, we suggested that the studies with which we were familiar fell into two categories: (1) metacomprehension and inference training and (2) meeting the text-based needs of readers. At that time we felt that our categories were adequate to encompass what we believed was the domain of this research. Our present categorization represents a more specific breakdown of the nature of the pursuits which have emerged.

### Enhancing Comprehension Strategies of Readers

Comprehension strategies can be defined as those cognitive activities which good readers engage in to foster comprehension. Specifically, comprehension strategies might include: engaging background knowledge, goal setting, identifying task demands, allocating attention, evaluating content, self-appraisal, self-correction, predicting, self-questioning, and so on. While the pursuit of these strategies seems a rather obvious goal of any comprehension instructional program, our review of instructional research and programs has found only a few attempts to develop deliberate use of such strategies by readers.

#### *Engaging Prior Knowledge*

As we have discussed in previous sections of the present review, the notion of prior-knowledge engagement has been a recurring theme or activity for helping students prepare for a selection. In recent years, the research on metacomprehension has prompted researchers to consider ways they might encourage students to monitor their engagement of prior knowledge. With this as a goal, there have emerged a number of curriculum projects (e.g., Langer, 1982; Smith-Burke & Ringler, in press) in which teachers are directed to help students monitor what they know and to consider how this knowledge might be integrated with the text. Unfortunately, substantial research evidence to recommend these pursuits is lacking. For still unanswered from the research is whether students will spontaneously engage in such activities without teacher prompting, except in situations similar to those within which training has occurred. Consider the research evidence to this point.

A study by Hansen (1981) examined the effectiveness of instruction intended to make second-grade students more aware of how their prior knowledge might be enlisted in story comprehension. Based upon the work of schema theorists

(Anderson, Reynolds, Schallert, & Goetz, 1977) and others (Brown, 1977; Omanon, Warren, & Trabasso, 1978; Paris & Lindauer, 1976; Riley & Trabasso, 1974), Hansen set up three treatment groups. A control group received a mixture of literal and inferential questions. A question group received a "steady diet" of inferential questions. A strategy group focused on integrating text and background knowledge prior to reading. In this third condition, students received the traditional question diet but, prior to each story were asked to do the following: (1) relate what they would do in circumstances similar to those which would be upcoming in the story, (2) predict what the main character in the story would do, (3) write down on strips of paper (1) + (2) which would be then woven together. By weaving together the strips of paper, Hansen hoped to make students more conscious of the fact that reading involves weaving together what one knows with what is in the text. After ten stories across a 40-day period, Hansen's treatments were tested on a variety of measures, including passages intended to assess the transfer value of the training. In general, the results she obtained reflected a rather localized effect due to the treatment conditions and little, if any, effect as measured on transfer tasks. As rationalization of these results, Hansen questioned whether it was reasonable to expect students to apply spontaneously the training strategies.

In a follow-up study, Hansen and Pearson (in press) pursued a similar study with fourth-grade students whose teachers they trained to administer the treatments. Also the treatment in which teachers were trained represented a combination of the strategy-training and inference-question approach. Their results suggested an advantage of the treatment condition over the control condition, especially for the poor readers. On inference measures embedded within the instructional materials as well as on measures from three new passages, the poor readers exceeded their control counterparts. Together with the data from the earlier study, Hansen and Pearson suggested that the data supported the worth of strategy training for younger readers or poor older readers; other older readers, they suggested, may not need such instruction.

A study by Gordon (1979) looked into the effects of an even more explicit attempt to improve the readers' ability to engage prior knowledge. She compared the effects of two intervention strategies upon 42 fifth-grade students. One treatment focused on activating and fine tuning prior knowledge for instructional selections along with an awareness of text structure (helping students develop a sense of the framework for a story). The second treatment focused on providing students with strategies for inferring. A control group received the normal language-related curriculum. In general, Gordon's results were consistent with the findings of Hansen (1981) and Hansen and Pearson (in press). On inference items, including transfer items, the inference-treatment group fared best: on recall measures, the background-knowledge group fared best.

Carr (1983) tested a comprehension improvement program consisting of three procedures: a structured overview, cloze, and a self-monitoring checklist. These procedures were selected and combined to train subjects to activate background knowledge, find information in the text and relate it to background knowledge, and to organize new information in a hierarchical structure. This total strategy improved students' ability to infer on passages not taught in the treatment in both immediate and delayed testing.

### *Identifying Task Demands*

Metacomprehension research findings suggest that successful readers are more aware of the strategies they use during reading than less successful readers. On the basis of this finding an argument can be made for heightening the reader's awareness of task demands. With this as their rationale, a study by Raphael and Pearson (1982) examined instruction in the use of a strategy intended to make readers more aware of the task demands of questions accompanying story selections. During four 45-minute sessions, students from three grade levels (fourth, sixth, and eighth) were taught to differentiate questions which required them to locate the answer in the text (labeled "right there"), derive an answer from one's own background knowledge (labeled "on my own"), and derive answers that involved inferring relationships between text segments (labeled "think and search"). Over the duration of the treatment, trained students surpassed an "orientation only" group in the quality of their responses to questions (except textually implicit or "think and search" questions), performance on other measures, and their use of the question-answering strategy they were taught.

### *Allocating Attention: Summarizing*

A number of studies have pursued transfer training in conjunction with improving summarization skills. Because a summary of a text or text section is selective and abstractive, it is logical to assume that learning to summarize texts might actually cause readers to be able to allocate their attention better to important information when reading. Several attempts at improving summarization ability have been made.

One such study by Day (1980) was reported by Brown, Campione, and Day (1981). Working with low-ability community college students, Day studied the effectiveness of summarization training with and without explicit cueing intended to facilitate self-monitoring. Specifically, college students were given either: (a) encouragement to summarize and capture main ideas, (b) instructions for modeling certain rules, (c) instructions for modeling certain rules and encouragement, or (d) instruction for modeling certain rules and rules for using these rules. Across pretest and posttest measures, Day found that providing students rules for summarizing influenced the students' abilities to summarize, detect main ideas, and delete trivial information, but the influence of this training varied with the sophistication of the students. In other words, although all students profited from the training conditions, less sophisticated students (students with writing problems) needed more explicit training (i.e., training in the rules and their application). As Brown, Campione, and Day reported:

Training results in greater use of the rules, and improvement is effected with less explicit instruction with more advanced students. For those students with more severe learning problems, training results in less improvement and more explicit training is needed before we can get any effect of training. (1981, p. 16)

In a similar vein, Taylor (Taylor, 1982; Taylor & Beach, in press) conducted a series of studies in which intermediate grade-level students were instructed

to build summaries of expository text by relating the superordinate and the subordinate information. Across the various studies, a modest transfer effect was found within content area but not across content areas.

Cunningham (1982) compared the (GIST) procedure to a placebo with regard to its effectiveness in improving fourth-grade students' ability to write one-sentence summaries of paragraphs. GIST differs from other instructional methods for teaching summarization, in that students are taught no explicit rules. Rather, they are led through a systematic procedure for developing summaries designed to enable them to induce whatever the rules for summarization are. In Cunningham's study, experimental subjects were better at composing one-sentence summaries than control subjects after nine days of treatment.

### *General Metacomprehension Training*

In recent years a number of developmental psychologists have examined the role of heightening the awareness of students in conjunction with comprehensive studies of reading-comprehension instruction. The two studies which we describe in this section are representative of the creativity with which such pursuits are being undertaken and their variations. Palincsar (1982) pursued the deliberate control of four comprehension strategies (summarizing, self-questioning, predicting, clarifying unclear text) with seventh-grade poor readers. Across three related studies, Palincsar enlisted a reciprocal teaching method where the teacher and students took turns assuming the role of teacher in a dialogue centered on pertinent features of texts. In Study 1 and Study 2, the investigator worked with students in pairs. In Study 3, four reading teachers worked with students in small groups in their classrooms. Across baseline, intervention, maintenance, and follow-up condition, students who received strategy training acquired a great deal of facility with the strategies. They typically achieved 70% accuracy by the fifteenth day of training and the effects of the training carried over to other measures including transfer measures and delayed posttests. For example, modest but reliable transfer gains were apparent on tasks similar to but distinct from, the training tasks and on regular classroom assignments.

On a different scale, Lipson (1982) and Paris (1982) developed a 20-week "course" designed to improve third- and fifth-grade students' understanding and control of comprehension strategies. At the heart of the course was the use of a variety of metaphors intended to make the various strategies more concrete for students. For example, they would develop bulletin board displays tied to metaphors, such as "Being a Reading Detective," "Reading Is Like a Puzzle," "Following Reading Maps." These metaphors would then be applied by the students in conjunction with sets of focal questions and other guidelines. The results of the study are quite encouraging. Those students who were involved in strategy training proved more capable at using the various strategies than control-group subjects and outperformed the control group on various measures, including various transfer measures and measures administered several months after instruction ceased.

### *Future Research on Enhancing Comprehension Strategies*

Although the results of the studies done so far are encouraging, much work in the area of instructional research on enhancing comprehension strategies of read-

ers remains. The strategies researched to date do not represent the universe of behaviors readers might employ across different texts. Also, it is not clear yet what is required for students to acquire self-initiated and flexible control over any or all strategies in transfer situations.

We have serious reservations about the degree to which many of the studies assume the worth of explicit teaching of strategies (Pearson & Gallagher, 1983). Teaching children our theories about how they think in order to get them to think better seems to us to be fraught with danger. It is true that we should be concerned with process, but to the extent that comprehension is like gardening, we must be more interested in the vegetables produced than the tools in the shed. Student understanding is more important than tacit or meta-understanding.

Likewise, we are concerned with the narrowness with which learning how to learn is currently defined. *Identifying task demands, allocating attention, and metacomprehension* have broad social dimensions that have to do with real-world requirements like completing homework and seatwork adequately and on time as well as taking turns, and not interrupting others when they are working; in short, behaving in a student-like manner.

Finally, we are uneasy with the linear and mechanical approach to presenting reading to students. However the brain functions, the experience of reading has all the components of art and experience. To date our comprehension instruction has tended to emphasize the systematic, sequential, and piecemeal at the expense of the aesthetic, experiential, vicarious, and the wonder of reading.

### Meeting Text-Based Needs of Readers

Given that certain readers have difficulty dealing with certain text features, there has been a tendency for researchers to subscribe to one of two approaches: either pursue instruction which will prepare students to process better texts with these features or develop text in such a way as to avoid such difficulties. Those studies adopting the former approach are a potential source of instructional implications for improving the ability of readers to comprehend or learn from passages not taught.

#### *Improving Sentence-Level Processing*

Several studies have attempted to increase comprehension and text-learning ability by treatments that seem primarily aimed at improving students' sentence-level processing. Such studies ranged from a study by Weaver (1979) that had subjects rearrange jumbled sets of words into sentences to having students pursue sentence combinations. Studies of the latter type have tended to predominate.

*Sentence combining/sentence reduction.* Disenchanted with the methodology associated with teaching writing via formal grammar, but nonetheless encouraged by the interrelationships shown to exist between syntax and reading, many have come to acclaim sentence combining as a potential means for improving both writing and reading comprehension (Combs, 1975; Mellon, 1969; O'Hare, 1973). In terms of improving reading comprehension, sentence combining and

its more recent counterpart, sentence reduction (Ney, 1976), is based upon the assumption that sensitizing students to the methods by which ideas are expressed and related in text will likely develop their ability to comprehend text structures. Unfortunately, attempts to validate these notions have produced limited results due to what we perceive to be a failure on the part of researchers to reflect upon those situations and measures which training in sentence combining would most likely influence. A study by Howie (1979) is an appropriate example. Howie attempted to examine the influence of sentence combining and sentence reduction upon the reading comprehension of ninth-grade students. Howie obtained no impact upon cloze reading performance nor any significant gains on the Gray Oral Reading Test. Howie attempted to rationalize these results by questioning whether the influence of sentence combining upon reading could be measured.

Three studies using fourth-grade students as subjects illustrate the same shortcoming and the equivocal nature of the findings so far on the effectiveness of sentence combining in increasing reading-comprehension ability. Crews (1971) compared an extended sentence-manipulation treatment with a traditional grammar program and found no difference in silent reading ability between the two treatment groups. Machie (1982), however, found that sentence-combining groups did better on the Gates-MacGinitie Primary Reading Test than did a traditional composition group. Straw and Schreiner (1982) reported that sentence combining affected growth on a transfer cloze test and on both writing and listening measures but not on the Nelson-Denny Reading Test when compared to instruction in a basal language arts series.

Apart from the failure of past research to enlist measures likely to be sensitive to sentence-combining training, we believe that these conflicting outcomes resulted from the fact that sentence combining/sentence reduction can only be expected to improve reading-comprehension ability for those students who have special problems with syntactic processing. If a study happens to include such students as subjects, the treatment will probably be effective; if a study happens not to include them, the treatment will probably not be effective.

### *Improving Text-Level Processing*

A number of instructional studies have evolved from recent developments in the area of text analysis. Two main lines of research have emerged, one primarily concerned with informational or expository text and one primarily concerned with stories.

*Structure of ideas.* Most text analysis procedures for use with exposition attempt to provide a diagrammatic representation for the patterns of ideas structured in text. Four such thrusts, networking (Dansereau, 1979), mapping (Anderson, 1978), flowcharting (Geva, 1980), and rhetorical structures (Meyer, 1975), have been adapted for use as instructional tools. Students use text cues to define the fundamental relationships as they manifest themselves in expository text. Networking, mapping and flowcharting require students to diagram how the ideas and their relationships are represented within text; rhetorical structuring requires students to label these patterns as well as identify the hierarchy of ideas. Apart from these four approaches, a more common classroom strategy

for schematically representing collected key ideas, their interrelationships, and subordinates is the structured overview (Barron, 1969; Earle, 1969b). Used as a prereading or postreading activity, the structured overview frequently serves as a device for presenting or organizing the key ideas from a textbook unit in a diagrammatic form.

Studies examining mapping (Armbruster & Anderson, 1980) and the creation of structured overviews (Baker, 1977; Barron, 1971; Berget, 1977; Earle, 1969c, 1973; Estes, Mills, & Barron, 1969; Vacca, 1977; Walker, 1979) have yet to address whether these strategies have any transfer value to passages which are not mapped or overviewed. Studies which have addressed the transfer value of other such strategies are few in number. Studies by Dansereau, Holley, and Collins (1980); Geva (1980); and Margolis (1982) have provided some data supporting the transfer value of training in the use and application of diagrammatic representations of text. Among the most encouraging sets of findings, however, are those offered by Bartlett (1978) and Mosenthal (1983) who coupled their instruction on texts with a consideration of author's purpose.

Bartlett, for example, examined the effects of teaching ninth-grade students to recognize commonly found rhetorical structures and their purpose on subjects' ability to identify and use these structures in their own recall protocols and on the amount of information they could remember. The instruction focused on how to identify and use four commonly found top-level structures in classroom text. Special aids for identifying the top-level structure were faded out over the week of instruction, while the passages studied became increasingly more complex. Students in the training group and control group read and recalled passages prior to training, one day after the training program and three weeks after the completion of the program. The instruction resulted in significantly increased use and identification of the top-level structure as well as almost a doubling in the amount of information recalled by the training group on the posttest measures.

Mosenthal (1983) examined the influence of teaching students procedures for analyzing an author's goals against the text itself. Experimental and control training methods were contrasted in two comparable sections of an eighth-grade course in physical science and in two comparable sections of a sixth-grade social studies course. Training occurred over a six-week period. Experimental and control conditions were identical, except for the inclusion of discussion and questioning related to discerning the writer's goals. Across the various baselines, training, posttest, and delayed posttests, experimental students maintained a consistent advantage, which was greatest for those texts identified as most difficult.

*Structure of stories.* Although Gates (1947) recognized the importance of a "story sense" in student comprehension of narratives, it was not until 30 years later that explicit teaching procedures were forthcoming to aid readers' development and use of a sense of story. In 1978, Cunningham and Foster reported a series of encounters between a classroom teacher and a reading education professor in which the teacher sought help from the professor in guiding her poorest readers' comprehension of the high-interest/low-vocabulary short stories they read each day in their reading group. The college professor suggested that the teacher use a simplified version of a story schema/grammar as a generic reading

guide with this group of students. The teacher reported that these bottom students liked reading stories in order to complete the slots in the generic reading guide and that she believed they were improving in their ability to understand the stories they were reading. Dreher and Singer (1980) criticized Cunningham and Foster on the ground that they did not formally evaluate the effectiveness of their classroom application before reporting it. Moreover, they suggested that, if such an evaluation had been conducted, the generic reading guide for stories would not have been an effective treatment. Their evidence for this assertion was the report of a study they conducted with a range of intermediate students using a different approach to story grammar instruction. In their study, students' comprehension did not improve as a result of their treatment. They concluded, based on their study, that there is little if any need for story grammar instruction with intermediate elementary students because they already have a well-developed sense of story.

More recently, Bowman (1981) found that a story structure questioning strategy improved the reading-comprehension ability of sixth-grade students when reading folktales as compared to a control group who received traditional questions at three levels. Fitzgerald and Spiegel (1983) identified 20 average and below-average fourth-grade students lacking a keen sense of narrative structure and randomly assigned them to experimental and placebo treatments. The experimental group developed enhanced story structure knowledge and were superior to the control group on transfer measures of reading comprehension.

Based on the few studies done so far, it seems safe to conclude that story grammar instruction (loosely defined) can, but does not necessarily, improve reading-comprehension ability. We see the current controversy in this area as centered on two questions:

- (1) Are there students beyond first grade who still lack a keen sense of story?
- (2) Is the availability of story schemata sufficient for comprehension of stories?

Regarding the first question, Dreher and Singer (1980) conclude that there are few if any, while Fitzgerald and Spiegel (1983) report having found that at least 20 percent of their fourth-grade students lacked such a sense. Regarding the second question, Dreher and Singer (1980) conclude that since intermediate students have an internal sense of story structure, story grammar instruction is unjustified, while Hoover (1982) has concluded that:

. . . improvement in the ability to deal with story information does not appear to be attributable to the developmental acquisition of schemata but rather to its increased accessibility, engagement, and efficiency as a processing and production mechanism. [abstract]

It would appear that some readers have a keen sense of the structure of stories and can use this sense; other readers appear to lack such a sense of story or fail to use it effectively. We hope future instructional research will delineate more carefully the characteristics of subjects with regard to their knowledge and use of the structure of stories.

*Future Research on Meeting Text-Based Needs*

Research which addresses the domain of meeting text-based needs of readers is in its infancy. While research has provided some clarification of those text characteristics which influence comprehension and results from training studies seem encouraging, we contend that scholars interested in the area of "text" have just begun to move into research which addresses the question:

Can students be taught knowledge, skills, or strategies which will meet their text-based needs and transfer to their reading of unfamiliar passages?

Researchers need to undertake concurrent analyses of: (a) the discourse features evident in the texts which students encounter, (b) an examination of the type of situation within which these features either enhance or detract from learning, (c) the strategies successful readers might enlist to maximize their comprehension of texts with certain discourse features in certain types of situations. It would seem that systematic research programs could begin on several fronts: engineering texts for purposes of improving their quality; providing students with problem-solving strategies to monitor and "debug" comprehension problems; increasing students' awarenesses of text features; including adjuncts intended to meet readers' text-based needs; and improving reader-based strategies to enhance the readers' use of the text or to override text-based problems.

## METAMETHODOLOGICAL FACTORS

Whether it is directed primarily at enhancing readers' comprehension strategies or meeting their text-based needs, reading-comprehension instruction functions within the context of general instructional principles. In recent years, researchers have formulated what some of these principles might be. In each case, a formulated principle represents a conclusion based on a literature review too extensive to reproduce here. Some of these principles are:

Students achieve less in classrooms in which there is a strong emphasis on students working alone. (Stevens & Rosenshine, 1981; Rosenshine, this volume)

Teachers should have students read easy materials and perform comprehension tasks they can complete with high success. (Cunningham, in press)

The more time students are engaged with academic materials or activities [that yield a high success rate], the greater their achievement. (Berliner, 1981)

For each particular group of students reading a particular set of materials in a particular allocated time, there is a pace of content coverage that will maximize student achievement in reading. (Barr, 1982)

The support for these general instructional principles is strong but problems remain. General instructional principles regarding the *quality* of instruction are lacking. How these principles and others interact is not completely clear. Why

principles like Berliner's and Barr's are often corrupted during implementation to mean "increase time on task" and "increase pacing" is frustratingly unclear!

It seems reasonable to expect that those who would attempt to apply the limited findings of reading instructional research on increasing ability to comprehend and learn from text would conduct these applications with these general instructional principles in mind. Moreover, future instructional research in reading comprehension should describe carefully the nature of the methodological factors of student isolation, material and task difficulty, academic engaged time, and pacing of content coverage. In addition, we hope that the questions that we and others have raised about these factors will be addressed by future reading comprehension instructional research.

In 1980, when our first review of research on teaching reading comprehension appeared, we expressed a great deal of concern for an apparent lack of commitment among reading educators to pursue instructional research. Since that time, numerous researchers have ventured willingly into this area. The emergence of such studies is testimony to a commitment to classrooms; we predict that the eventual outcomes will see the advancement of our understanding not only of the basic processes of reading, but also reading pedagogy. Still many challenges remain.

### FUTURE CHALLENGES AND THE NEED TO REEXAMINE OUR GOALS

In 1980, the following guidelines for conducting research on teaching reading comprehension were discussed:

1. Apply a greatest likelihood principle to experimental research.
2. Design studies where the complexities of texts, teaching, and context are addressed and can reveal their impact.
3. Design studies where the complexities of classroom learning can be addressed.
4. Design and implement research which can be coherently interpreted in the light of literature from all the relevant disciplines.

Nowadays, researchers seem more sensitive to research paradigms and data which consider the influence of a variety of variables whether they may be manipulated or allowed to emerge. While we are encouraged by these advances we simultaneously fear them. Our fear is that researchers have adopted an overly analytic approach to comprehension and research on teaching reading comprehension at the expense of vision. Most breakdowns of comprehension, including what was used in the present paper, tend to establish a catalogue of differentiated strategies and denies that the process is unitary, multifaceted and dynamic. Similarly, most research guidelines inflate the researcher's technical qualifications rather than the need for intuition and for vision. It is the need for vision that concerns us most.

#### *The Need for a Vision*

When we say that someone has "vision," we generally mean two things. We mean that the person has the ability to see what is possible to achieve or accom-

plish, given the strongest concerted effort. We also mean that the person has the ability to see how all the parts of a complex operation can fit together and work together dynamically. We generally speak of leaders having vision, but specialists need vision too. A maker of custom cabinets with vision will design them so that they are more useful and attractive than ordinary cabinets would be because he will anticipate how the customer can use them and how they can fit into their location. A person who does reading comprehension instructional research is a specialist who needs vision. A piece of reading-comprehension instructional research will be of more value to our field if the researcher has a vision of what is being researched as well as how the instruction being researched can fit and work together with the other parts of a possible "best" program to improve reading-comprehension ability or comprehension and learning from text. We believe that those who conduct the most important reading-comprehension instructional research will invariably have such a vision.

A vision will probably have at least four components or "levels of vision." They are a vision of readers, learning groups, and teachers as well as teacher support and change.

*A vision of readers.* There are various ways we might develop a vision of readers and their characteristics. For example, we might take a schema-theoretic view and adopt goals for readers which emphasize the role of a reader's background knowledge as well as the strategies used to refine or negotiate meaning. We might take the view offered by some developmental psychologists that successful readers have or need metacognitive control and awarenesses. Accordingly, we might adopt goals which emphasize the readers' ability to determine what they are trying to do and how they might go about doing it. In contrast to either a schema-theoretic or developmental position, we might take the view that reading is an interpersonal experience either between readers and authors, involving different types of collaboration between the two, or between readers and "the world of the text." Consequently, we might emphasize a sense of readership, authorship, different modes of criticism and the vicarious nature of a reader's experience. Alternatively, we might adopt a more functional view of readers and develop goals based upon literacy demands across school, home, and the workplace. There are countless views which might be held, one must recognize the potential that each alternative offers. They can force us to rethink just what our goals for readers have been and should be. They might prompt us to invest our energies in research on other strategies and concerns and, thus, extend our reading-comprehension research and practices beyond the categories into which most studies to date can be so easily arranged.

*A vision of learning groups.* As we consider the individual reader, we should not forget that learning is a social event usually occurring among individuals within a learning community, whether that group be a classroom, reading group, or a network of independent workers. The nature of this community cannot be disregarded. Indeed, the characteristics of one's community interface with and affect the goals being pursued for individual students or research subjects. For example, our vision of possible optional learning groups might consider the group's metacognitive abilities (recognizing the group's goals and different

strategies for achieving such goals), the group's independence (self-initiating goals or procedures for the accomplishment of such pursuits), the nature of the group's participation (teacher dependence or teacher independence; haphazard or rule governed) and the quality of the group's learning experiences (interpersonal, critical, ideational, aesthetic). Obviously, intertwined with such visions or goals for groups is a sense of the teacher's role.

*A vision of teachers.* Throughout the present chapter, we have made incidental references to the teacher's role. We shortchange our endeavors when we fail to appreciate their role, take advantage of them as collaborator, or disregard their multifaceted character. Our sense is that to develop a vision or visions of teachers, demands a willingness to begin pursuing instruction and instructional ideas within classrooms with teachers as collaborators in a research endeavor wherein we appreciate their role, take advantage of their insights, and consider the demands of their positions. In classrooms, with teachers, we can begin to understand the different concerns (management, curriculum, social, mental hygiene), behaviors (questioning, information giving, directing, responding), and realities (interruptions, time restraints, and materials) that should condition and shape our research and the implications we can draw from it.

*A vision of teacher support and change.* Our last component, or level of vision, relates to implementation and dissemination. Often our research may appear carefully planned and implemented, but its worth is diminished by its lack of potential value to teachers. Often our research is directed at studying the effects of a new strategy, but our findings fall short because we become bogged down with hostile subjects as teachers. As researchers, we must recognize that we are in the business of change involving a marketplace in which ideas may be bought, sold, discredited or nurtured. Whatever the nature of our research, we must recognize that we need to consider how to effect change, whether we are at the point of research dissemination, follow-up, or implementation. Having a vision of a support system forces us to consider how to put our research to use and compels us to recognize that to leave this critical step to the whims and follies of chance is to guarantee that the gap between research and practice will remain wide.

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