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ABSTRACT
        Challenging educators and students to look at both
the importance of secondary reading and the vital differences between
secondary level and elementary level reading demands, strategies,
competencies, and attitudes, the papers in this monograph indicate
the broad range of theoretical issues in secondary reading that must
be examined as a prelude to organizing methods courses for secondary
teachers. Papers include "What Is Secondary Reading" (Carl B. Smith
and Larry Mikulecky); "A Critical Summary of Rumelhart's Interactive
Model of Reading" (William Diehl); "Instructional Implications of
Rumelhart's Model" (Jerome Harste); "Cognition and Comprehension"
(Carl B. Smith); "Questions and Advance Organizers as Adjunct Aids:
Implications for Reading Instruction in Secondary Schools" (Richard
T. Vacca); "The Relationships of Attitudes, Interests, Motivations,
and Habits to the Teaching of Reading" (Larry Mikulecky); "Secondary
Reading Programs: Factors that Bring Teachers and Students Together"
(James Mills); "A Competency Based Program for Subject Area Teachers"
(Charles T. Mangrum); and "In Perspective" (Leo Fay). After most
papers in this monograph, summaries of reactions and discussions are
provided. (RS)

MONOGRAPH in LANGUAGE and READING STUDIES

Secondary Reading: Theory and Application

Secondary Reading: Theory and Application

The 1978 Lilly Conference on Secondary Reading

William Diehl, Issue Editor
David Caverly, Associate Editor
Nancy Leavitt Shanklin, Associate Editor
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THE 1978 LILLY CONFERENCE ON SECONDARY READING

Interest in the reading competency of secondary students is reflected by the legislated requirement, now in effect in many states, of a course in reading for secondary teacher certification. In reaction to this interest and the need for teacher trainers to prepare themselves to teach such courses, the Lilly Endowment, Inc., commissioned Indiana University to sponsor a three-day conference designed to bring together independent and private college educators to learn about and discuss theoretical aspects of reading, as applied to secondary school students. This conference, April 6, 7 and 8, was attended by more than 60 faculty members who had some responsibility for teaching or planning secondary reading methods courses at various colleges and universities.

A variety of theoretical issues were presented by noted educators. Topics were discussed in-depth by participating faculty members. The Lilly Conference was, then, a vehicle for the exchange of viewpoints and ideas and for the presentation of recent theoretical and research advances in secondary reading.

We are especially grateful to the Lilly Endowment, Inc., for making the Conference, and this publication, possible.

Carl B. Smith, Conference Director
Larry Mikulecky, Associate Director

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Introduction

Papers published in this Monograph indicate the broad range of theoretical issues in secondary reading that must be examined as a prelude to organizing methods courses for secondary teachers. The intention of this book is to challenge educators and students to look at both the importance of secondary reading and the vital differences between secondary level and elementary level reading demands, strategies, competencies and attitudes. Because of such differences, the teaching of reading at the secondary level cannot be approached in the same manner as the teaching of reading at the elementary level.

The Lilly Conference on Secondary Reading was designed to be a working conference. The speakers were present for the entire conference and shared ideas on all topics presented. Many of the participating faculty members served as reactors to and discussion leaders for the presentations. When possible, papers were sent to these reactors before the conference and formal reactions were prepared. Three small groups provided reaction and discussion after most presentations. After most papers, summaries of reactions and discussions in each group are provided. The purpose of these reaction/discussions is to capture the flavor of the conference as various discussion groups examined implications of formal presentations and attempted to apply theoretical generalizations to specific teaching situations.

In its national survey on reading, the National Assessment of Educational Progress concluded that between 1971 and 1975, elementary students (9-year-olds) improved in competency, while middle school students' (13-year-olds) and high school students' (17-year-olds) competencies remained the same or dropped. Since the National Assessment indicates that teaching of elementary school reading is better than ever before, reading problems of secondary students cannot be attributed to poor elementary teaching. Instead, the reading declines in secondary schools may be due to the changed natures of the reading tasks, the students, and the teaching methods at the secondary level. An understanding of the important differences related to reading at the secondary level is necessary to plan successful curriculums and teacher-training programs. This volume is a step to that understanding.

William Diehl
Issue Editor

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WHAT IS SECONDARY READING?

Carl B. Smith and Larry Mikulecky

What does secondary reading mean? Why do we have more than 30 states that require secondary teachers to take a reading course? Is it simply so that they will know what the elementary teachers already know, or is there something different in secondary reading that makes it important for us to look at it as a separate area?

Perhaps these questions can be answered by comparing elementary level learning motives, subject content, and instructional materials, with those at the secondary level.

For instance, if abstraction is the great achievement of adolescence then the secondary student is different—cognitively different—from the child in elementary school. However, this does not mean the adolescents simply give up whatever they were thinking in the elementary grades. They only gradually free themselves from the present, the tangible, and the concrete, until they eventually are able to engage in a rather wide-sweeping, free-swinging kind of generality. Now they can say that all Democrats (or Republicans) are numbskulls, based on the evidence of seeing one that they did not like.

Also unlike the elementary child, they look at themselves in the future in a specific way and they see the future as having stages of development. So one might say, again in early adolescence, "When I get through college and make my first million, I'll pick you up in my Lear jet and we'll fly to Texas." Notice all the stages mentioned in the future: college, million, Lear jet, Texas. The elementary child does not do this.

Secondary students differ also in their motives. The preoccupying motives, according to psychologists, revolve around resolving such things as sexual adequacy, interpersonal power, autonomy of belief and action, autonomy from parents, and being accepted by peers. Those are the urgent concerns. Because they are urgent, they dominate the ability to think abstractly—except, of course, in a small percentage of cases. In a typical classroom, 10 to 20% of the students do appear to be motivated by and are constantly working with abstractions. Often we

as teachers forget these other, overriding motives, and we think that because some adolescents can do abstract thinking they all should use this ability.

In examining learners, there are several areas of concern. First what causes them to act the way they do, and what are the implications of this motivation for reading? Also, what do their actions or motives mean in terms of interest, attitude, power to attend, and power to carry out tasks that are often quite difficult?

There are other influences on motivation. The adolescent has some motivational conflicts with the expectation of teachers and parents that they will be interested in and succeed in school. A few students, it seems, decide that any semblance of power or status among their peers corrupts their character. Since excellence in school often brings prestige, these adolescents deliberately avoid that excellence. It somehow taints them, and they do not want to be tainted. There are other students who are selecting or rejecting school subjects for other reasons (e.g., the subjects are inconsistent with their sex-role integrity). The 12-year-old boy who is trying to quiet doubts about his maleness may view French as effeminate (this association has been indicated in surveys). So he does not take French classes for that reason. The same would be true of a plain girl who questions her attractiveness to boys and may view geometry (a "masculine" subject) as inappropriate for her since it places her in a situation with which she does not want to be associated. Such connotations definitely affect the way an adolescent acts and thinks.

DIFFERENCES IN SCHOOL SETTINGS

There may also be some institutional changes and influences during early adolescence. Secondary schools, for example, often contain many more individuals than elementary schools. High schools have more people, with more diverse views, than the child has experienced in elementary school, and these views concern drugs, sex, authority, the value of study, attitudes toward parents, and so on. With all of that diversity, children must make some kind of resolution for themselves. There are so many advocates of all these ideological positions that they are not sure how to deal with them. Some adolescents begin to believe that any view can be discredited, especially any view that is proposed by an adult, because adults come on with very strong advocacy positions of how adolescents ought to act. Again, the student may be overcome by these factors rather than adhering to what Bruner, Kagan, Piaget, and Vygotsky all say is the major achievement of adolescence—abstraction.

Try to imagine what it is like going from fifth or sixth grade into a middle school setting. What sorts of changes and differences, besides the social ones, have to be taken into account if learning, reading ability, and reading attitudes are to develop for adolescents?

Empirically, the pressure is on the secondary schools. The National Assessment of Reading has indicated that between 1971 and 1975, 9-year-olds improved their reading ability. Middle school students (13-year-olds) and high school students (17-year-olds) either stayed the same or dropped over that five year period. So the typical secondary teacher's castigation that "if the elementary school teachers were doing a decent job, we would not have this problem," does

not hold up. Elementary school teachers are doing a better job than ever. But something has been happening, or not happening, at the middle and high school levels. Perhaps the root of the problem of students not showing a similar improvement in their reading ability at the secondary level is that the important differences between elementary and secondary schooling are not dealt with by teachers.

CHANGES IN READING DEMANDS

There is a drastic change in reading demands in the middle school curriculum. Instead of reading narrative-type stories in basal readers, students are confronted with a host of other reading demands. Reading poetry involves very different strategies, involvement, and abilities than reading short stories. Reading chemistry requires still different approaches. The approaches are not qualitatively different, since in one sense reading is reading is reading. In each case, meaning is constructed from print, but the strategies employed to construct meaning vary according to the reading task—a poem vs. a chemistry lesson vs. an essay vs. a short story, etc.

An example will help recreate the problem for you. This passage is from a piece D. E. P. Smith put together called "Martian Mathematics." As you read this, pretend you are an eighth or ninth grade student. You know how to read—you read newspapers and stories—but try to use your reading skills to construct meaning from this:

> In this chapter, we will be concerned with a study of the Pexlomb. A Pexlomb is defined as any Zox with pictanamerals which flotate the Zox into five beta Zubs where each Zub is supramatilate to the Rosrey of the Ord. For example, consider the Zox which is defined as 3 beta Ooz. It is obvious that any pictanameral which is Blat must necessarily be Cort to the Ord. This follows from our knowledge of the relationship of a dentrex to its voom. . . p.81

The problem here goes beyond not recognizing the vocabulary. Strategies needed to read this passage require holding in one's mind certain concepts, relating these concepts to other concepts, and arriving at tentative, revisable abstractions. These are specific strategies that nobody's fifth grade teacher taught them how to use. However, such strategies are required in some secondary classes.

The brighter students, of course, work their way through the secondary material. They manage to understand somehow. But what about the host of other students—and it seems to be a growing host—who are not handling the material? What can be done to help them meet these new demands?

There are other differences to be considered. The format between elementary and secondary texts is frighteningly different. It seems that the people who put together elementary textbooks consciously try to make them interesting, colorful, and aimed at children. This is not necessarily true of secondary textbook authors. Many of these authors are professors, who sometimes are more concerned about what their colleagues think of the content's value and validity than about

the needs of the secondary students. Even identical topics receive substantially different treatment in secondary textbooks than in elementary ones. For example, a fourth-grade text about the Middle East might have Tommy and Susan flying in an airplane with their uncle, seeing an oasis, landing, and meeting a boy and girl their own ages who show them some of the cultural aspects of the country. It is a narrative story. When a student arrives at the secondary level he/she encounters a textbook arranged in an unfamiliar way with very different concept density. Additional political, social, and economic concepts are introduced or inferred. Researchers have found that the density of concepts and ideas per page often increases a great deal, even from one year to the next.

What is being demanded of secondary students in reading differs substantially from earlier demands and overwhelms some students. One begins to see a downhill spiral as more and more students give up reading. Even using readability formulas, which have many limitations, as indications of reading difficulty, there is a large jump between what is demanded at the elementary level and what is demanded at middle and high school levels. A number of readability studies have indicated that the average textbook of grade 9 probably has a readability of grade 11. Consequently, if one expects students to independently read the textbook more than half of an average class (and perhaps as much as 70% of that class) will fail to comprehend the material. These extreme difficulties are not usually true at the elementary level.

In secondary schools, adult logic is required for making connections and for dealing with questions asked by teachers. Usually, such logic is new to the high school students. Most students are fledglings at it, and only a few have developed their thinking to the point where they can meet these thinking demands. Even vocabulary takes on a different sort of importance when words have two or three meanings, or when the context of the word is not sufficient to clearly define it because the materials and concepts are unfamiliar.

INCREASE IN VARIETY OF ALIEN CONCEPTS
Along with the abstraction, one of the prime differences between secondary school and elementary school is the introduction, in secondary school, of more and more foreign concepts. At the elementary level, a teacher can build on shared experiences or even provide these experiences for students. But how many beginning secondary students share knowledge about an ionic bond, or an SAS postulate? Secondary students are asked to do very different things to get meaning from print. Schema theory, an area now being researched heavily, suggests that what the reader *brings* to the print is probably more important than what is actually on the page. The child who knows a great deal about gardening and farms can comprehend a passage about agriculture better than someone who has not had those experiences. That is why a technique like the language experience approach can work at the secondary level. But, how can one provide a schema for abstractions, e.g., ionic bonds, that take much longer to build?

The above differences in concept and content expectations are just a few of those not being dealt with in a thoughtful way. Good teachers, from Socrates onward, have been doing reasonable jobs in trying to slowly build the students' ability to

deal with foreign concepts. We are not, however, doing such a good job, and it likely is because we are not consciously recognizing these important differences.

Another important difference occurs when the elementary child, going through all those hormonal and identity changes, suddenly hits a departmental structure. Instead of one teacher, and perhaps two or three classroom bullies to accommodate, the student now has six or more bosses—six or more teachers—each of whom thinks his or her subject is the key one. All in one day, the student may hear, "If you are not physically fit you cannot handle the world;" "If you ، ا not understand literature, you will not be a well-rounded individual;" "We are going to constantly be making the same mistakes if we do not take a look at the historical developments;" "In this scientific and technologically emerging society, anyone who does not have at his fingertips mathematical understanding or scientific capabilities is not going to be able to handle life." And on and on, from six or seven teachers a day. How many adults stay in jobs very long where there are that many bosses? It is not that the teachers are wrong about the importance of their subject areas, rather, it is that the teachers' attitudes often cause the transition from elementary school to be even more difficult. During that transition, students must deal with texts that are different and often difficult for them; they are asked to do things that nobody has ever shown them how to do; and all sorts of other demands are made on these fledgling thinkers.

INCREASE IN RANGE OF ABILITIES

Even the differences within a classroom begin to mount at the secondary level. Even though there are differences among elementary children and teachers must individualize instruction, students are more alike then than when they get older. For example, in a first grade class, the slowest child probably has a mental age (if you trust IQ scores) of about 4, the average child has a mental age of 6, and the brightest child, the 150 IQ child, has a mental age of about 9. That is a five-year spread, and a large one for a first-grade teacher to deal with. By the tenth grade level, however, the lowest student has a mental age of about 11, with all the various implications in terms of abstraction, ability to deal with new ideas, and speed with which new ideas can be synthesized. The average tenth-grade student has a mental age of 16, and the brightest student in the class has a mental age of 24 and is, for all practical purposes, an adult. Of course, even the brightest students do not have the same experiences as the teachers, but their mental equipment, the facility with which they can deal with mental abstraction, and possibly their reading abilities and preferences, may be superior to those of the teachers.

This same spread applies to reading ability. In fourth grade, for example, the average child reads at a fourth grade level; the poorest readers may be at first grade level or even, in a few cases, at the readiness level; the best reader in the class could comprehend material at a seventh grade level. Such a difference in ability is familiar, and most elementary teachers deal with it by using supplementary materials. But at the middle school level, where each teacher is teaching his own subject, and the school board might have purchased one text per subject for the entire district, the spread is even larger and is harder to deal with. For instance, in eighth grade, the average student reads at an eighth grade level; the slowest student reads at a third grade level; and the best student can read the

equivalent of first-year college material. The differences in a class, then, increase with each grade in school. By eleventh grade, it becomes even more difficult to deal with the spread. The spread in eleventh grade is to the point where the lowest readers have not increased much in their reading abilities while the best readers can comprehend graduate texts. These lowest readers may be reading at about a fifth grade level, though some have not improved since eighth grade, because they have not dealt at all with print. These are the students who drop out of school or who are the topics of newspaper articles when they are graduated, unable to read.

A key point here is that good teaching causes the differences to grow even wider. In a reading program that meets everyone's needs, the brightest students learn much faster the slowest students. The average students also will increase, and overall, the differences within the class will increase even more. Dealing with this range of students' abilities is key at the secondary level, if we are going to provide high quality education for all students. In most cases, however, second-ary teachers are not prepared to cope with these differences among students. The attitude of teachers often seems to be, "I am a science teacher (or a history or a math or an English teacher), and I will teach my subject to the level that is required. If some students cannot make it, well, I do have some sympathy, but my job is to teach my subject."

There are also differences in health and absenteeism between elementary and secondary students. On any given day, the average high school in this country has from 17 to 25% of its students absent or truant, therefore not getting education. Those figures are not that high at the elementary level. For all the denigrating of education that is done, the fact is that time spent with a teacher, learning, does make an important difference, and many students simply are not spending enough time in school to make the difference.

Recently-reported studies at the secondary level of exemplary reading programs found that a key factor in their success is the amount of time spent in reading. The more time spent reading, the more successful students are in reading. Time spent with a teacher in reading does, in fact, help students' ability to read at the secondary level.

There are many changes, then, that students face when moving from elementary to secondary schools. Students are vastly different, the demands on the students are vastly different, and the social and pscyhological changes are vastly different. Education cannot work unless it takes those differences into account.

BOOKTHINKING AS AN APPROACH

Since all these differences occur, then it seems that we have to find some different approach to the teaching of reading at the secondary level. A term that we think is appropriate is not "teaching reading," but "teaching bookthinking." We prefer this term because it seems to better characterize what the secondary, or the adult, or mature reader must do in order to survive in his/her world.

What *must* the mature reader do? The student must read a passage, like the one presented above by Smith, in its entirety. Or he reads a chapter, in its entirety.

That's a typical assignment—"Take out your books, open to page 32, read the chapter, and I'm going to ask you some questions." So after the students have read the chapter or passage, they are asked questions. Initially, the questions deal with such things as details, like "What was a Zox?" But after a few detail questions, teachers ask about the themes, about comparisons and contrasts, whether they found the passage valuable, or how they would make use of it. Now the students are required to respond to a very broad range of ideas. They are required to answer questions that call for cutting across an enormous scope of bits of information, tied together by a communication that we call a message, a chapter, or a book. Not only that, but the student has to respond to the message as it is presented by an author who has a purpose, a language, and a style that may or may not coincide with the reader's style. The students are not word-by-word reading; they are not decoding. They are not simply looking at one sentence in order to satisfy the requirements of reading at a mature level. They are, in fact, required to take some whole entity, like a chapter, and deal with it in its wholeness. The best way, then, that we can summarize this task is to say that the students must bookthink.

In bookthinking, readers must interact with an author who has a purpose, a language, and an organization. They must be able to match, or at least stay with, that purpose and language. They must be able to decipher or interpret the organization. Those tasks may be quite different from what was demanded in the elementary school. Therefore, students can start to develop a new strategy, as teachers introduce instruction that does, in fact, help the student deal with a book as a whole thing.

Bookthinking, then, is both a concept we can think about and a way of developing an attitude on the part of the student. Whether it is in remedial reading or developmental reading, students are not being asked to engage in "reading," as the term is associated with the elementary school; rather students are asked to engage in mature interaction with an author. Attitudinally, the notion of "book-thinking" seems to be much more attractive to adolescents than the term "reading." Part of its appeal lies in its apparent escape from the authoritarian ideas of parents, elementary schools, and teachers. The students feel that they are doing something on their own. The author and the student are getting together and trying to accomplish something.

More importantly, perhaps, the teacher can begin to develop a pedagogy. The teacher can begin to think about what it takes to bring the student reader and the book together. He or she can think about what is involved in getting students to interact with print, not only in terms of vocabulary, but also in terms of attitude, stylistic devices, and mental schemata. How does the teacher organize all these? How does he or she bring together the student, the book, the author, the environment, and the arrangement of people within the environment? With a concept like bookthinking guiding the teaching of a subject area, we believe that the content teachers no longer feel as if they are being dragged into a morass called "reading," but bookthinking provides an opportunity to teach the subject and to engage in thinking with the textbook. This is, legitimately, what the teacher wants to accomplish.

The main point is that print is a vehicle for teaching any content, and if students are expected to learn that content using print, the teachers themselves had best know a little about this learning vehicle and how it operates most effectively. Considering print as a vehicle is an approach that one might find very useful both in working with secondary content teachers and as a way of organizing one's own thoughts about secondary reading. Print and texts differ depending on the particular content area, just as one vehicle can differ from another. Being aware of the idiosyncrasies of each vehicle (text) can help a teacher to enable students to bookthink through almost any text. Thus, understanding print as a vehicle can lead to a clearer understanding of a geometry problem or more enjoyment of poetry.

GOALS AND COMPETENCIES

A final issue in secondary reading, and one that is still emerging and promises to have a profound effect, is that of minimum competency. This issue is closely tied to the controversy about literacy—what a person should be able to do to be considered literate. Is reading simply a set of minimum competencies? Does minimum reading competency mean merely being able to fill out forms, read signs, figure out prices at the grocery store, and complete other *functional* tasks? Or, should reading prepare students for vocational training? A number of secondary schools have adopted a philosophy that their first and foremost task is vocational, and that students should be able to read well enough to meet job-related reading demands, to get and keep jobs, and to be functional in society. Or is reading the means of creating an enlightened citizenry? Most teachers probably subscribe to this view of creating an enlightened citizenry, meaning that a person finishing secondary school should be aware, well-rounded, conversant, and able to continue learning once the pressure is off.

These various ideas have implications for educational theory and practice. That is, one's concept of the purpose of education influences what one emphasizes and does in the classroom. There is much evidence that students' attitudes toward reading drop with each consecutive year in school from fourth grade on. If our goal is simply minimum competency, that drop need not concern us. On the other hand, if life-long learning is our goal, then a drop in attitude and habit must concern us. Such philosophical issues need to be considered by educators working in the secondary area. Our purposes for promoting reading have attitudinal and instructional implications; therefore, those purposes need to be clearly defined, especially as minimum competency and competency-based approaches emerge as forces in secondary reading.

This Monograph and the Lilly Conference on Secondary Reading have been more concerned with the reading process, that is, the act of reading, than with the pedagogy of reading. We hope, however, that educators will be able to formulate a definition of secondary reading that is truly applicable to that level and not merely an extension of some definition held for elementary reading. To meet this goal, we ask educators to examine the differences between elementary and secondary reading and to consider ideas presented in the following papers. Being aware of these differences, then, it is hoped that college and university faculty members can design secondary reading methods courses, with some

pedagogical structure that considers the differences and the issues relevant to secondary reading.

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Smith, D. E. P. *Learning to learn.* New York: Harcourt, Brace and World, 1961.

Carl B. Smith, Ph.D., is professor of education, Indiana University, Bloomington.

Larry Mikulecky, Ph.D., is assistant professor of education, Indiana University, Bloomington.
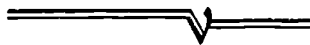
A CRITICAL SUMMARY OF RUMELHART'S INTERACTIVE MODEL OF READING

William Diehl

In "Toward an Interactive Model of Reading," Rumelhart (1976) outlines aspects of the reading procLss that proved problematic in many earlier reading models, and then proposes a model that can account for these aspects. Rumelhart suggests that earlier models were insufficient partly because they were based on formalisms (concepts, diagrams, and ideas of information flow) cf a linear stage computing model. Such a model characterizes a sequential, noninteractive flow of information. It is usually "bottom-up" in that information begins in one place, goes through transformations, and ends someplace else. (See Figure 1.)

Information ⟶ Transformation ⟶ Transformed Information ⟶ Transformation ⟶

Such a model can be made somewhat interactive by providing feedback loops:

Information ⟶ Transformation ⟶ Transformed Information ⟶ Transformation ⟶

Figure 1. Example of a "bottom-up" model.

Rumelhart proposes a different type of paradigm for viewing the reading process. He uses concepts originally developed in parallel processing in computer science to suggest what takes place when a mature reader interacts with print. In parallel computation, two or more types of processing are occurring simultaneously and interact with each other to arrive at conclusions. Rumelhart proposes, then, that reading involves the use of several types of information processing and that these "processing units" are highly interactive and are simultaneous. By using formalisms developed with computers, Rumelhart is able to adequately explain both the *interactive* and *parallel process* aspects of reading—aspects that have been suggested by other researchers and models, but not as clearly explained.

BACKGROUND

Reading involves a number of perceptual and cognitive processes to get meaning from print. A number of models have been proposed in efforts to illustrate these processes. Most models and theories, in their approximation of the reading process, have included the use of sensory (including graphophonemic), syntactic, semantic and pragmatic information. A major difference among models is the fashion in which these information banks are seen interacting on the print input. Rumelhart suggests that models have assumed either "a series of noninteracting steps of processing or (at best) a set of independent parallel processing units" (p. 1). This is certainly true of the Gough (1972) and LaBerge and Samuels (1974) models, which Rumelhart uses to make his point.

Gough proposes a sequential "bottom-up" model of reading (See Figure 2). In his model, information follows a definite, non-interactive flow. Graphemic information is taken in through the visual system and stored briefly in an *icon*. This image is scanned and operated on by a *pattern recognition device* that identifies the letters. These letters are next fed into a *character register* that holds the letters while the *decoder*, with the help of a *code book*, converts the series of letters into their phonemic representation. This representation is fed to the *librarian* which searches the *lexicon* and matches up these phonemic strings with entries already in the lexicon. The resulting lexical strings are fed into the *primary memory*. The primary memory holds up to five lexical items at once, and serves as an input to *Merlin*. Merlin magically applies its knowledge of the syntax and semantics to determine the deep structure, or perhaps the meaning, of the input. Finally, this deep structure or meaning representation is fed to The Place Where Sentences Go When They are Understood (*TPWSGWTAU*). Reading is completed, then, when all the inputs of the text have gone through this series of transformations and reached TPWSGWTAU.

LaBerge and Samuels (1974) propose a model (see Figure 3) that is likewise sequential and bottom-up. They do, however, provide some alternative routes for information flow, making this model more powerful than Gough's in explaining some aspects of reading.

The model consists of three memory systems: visual, phonological, and semantic. Graphemic information is first taken into the visual memory by *feature detectors* (f_1, f_2. . .). These feature detectors analyze the input in terms of lines, angles, spaces, etc. Most of this information is then fed to the *letter codes* (l_1, l_2. . .), which identify the letters. The letters in turn are fed into the *spelling pattern* codes (sp_1, sp_2. . .) which in turn go to the *visual word codes* ($v(w_1), v(w_2)$. . .). This route sometimes can be shortened. For example, f_1 bypasses the letter and spelling pattern codes and goes directly from feature detectors to the visual word codes. This would happen when one feature (e.g., the overall configuration of a word) is sufficient to identify the word.

Once the information passes through the visual memory, it may take one of several routes. It may be transformed directly into word meaning ($m(w_1)$); or it may pass through part of the phonological memory system—phonological spelling patterns ($p(sp_3)$, etc.), phonological word patterns ($p(w_2)$ etc.), or phonologi-
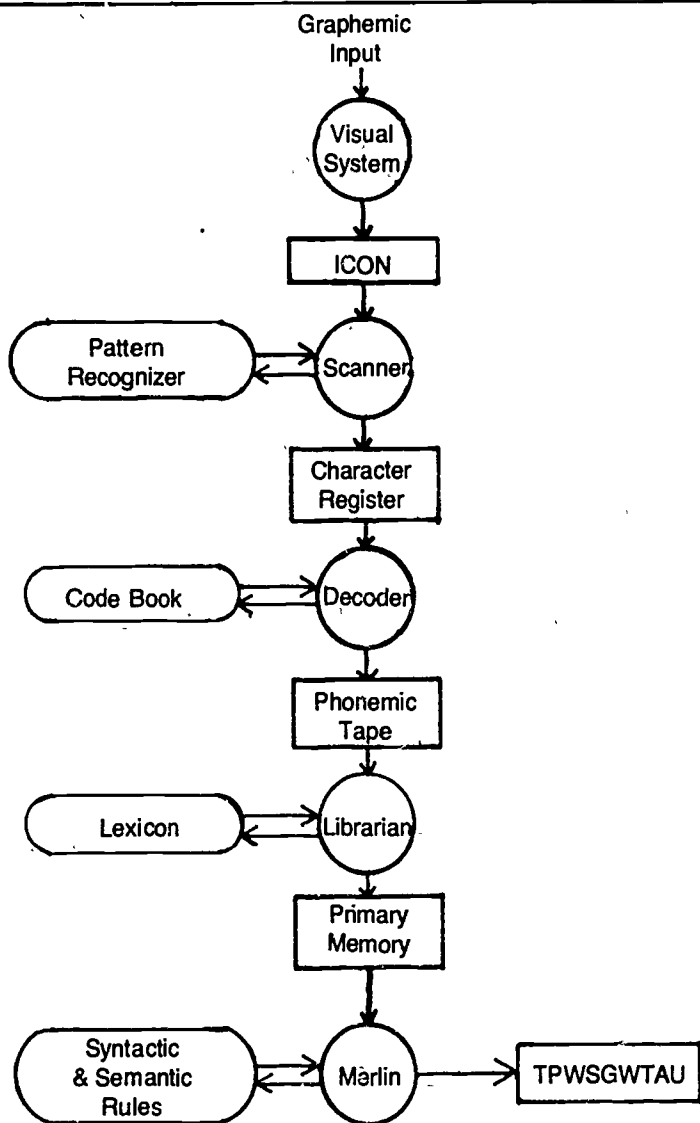
Figure 2. Gough's (1972) reading model.

cal word-group patterns ($p(wg_1)$, etc.). Lastly, information is transformed into word meaning or word group meaning ($m(wg_1)$).

Both studies by Gough and LaBerge and Samuels, then, propose models in which the reading process occurs along definite, sequential lines. Various types of processes and information stores are used, but they do not interact; each information store acts only on input passed on to it by the previous information store. LaBerge and Samuels manage to adapt this information processing ap-
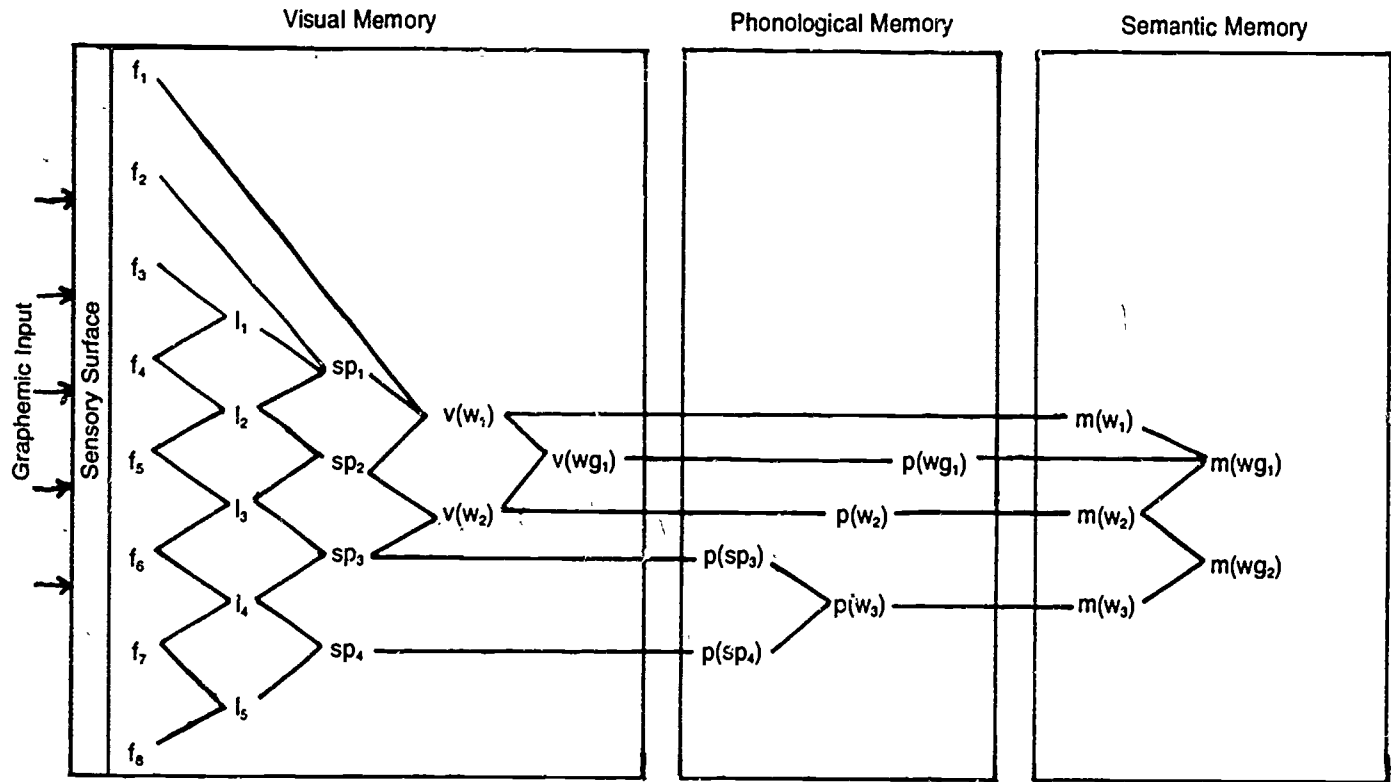
Figure 3. Reading in the LaBerge-Samuels' (1974) model.

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proach so that it can account for aspects of reading that Gough's model does not. For example, LaBerge and Samuels show how a reader can "recognize" a word and get its meaning, without analyzing spelling patterns or sounds. This would not be possible using Gough's model.

As a prelude to introducing his own model, Rumelhart introduces Gough's and LaBerge and Samuels' models and outlines their shortcomings. These models, and, in fact, all models based on an information processing paradigm, cannot account for a number of facts about reading. Such facts include:

1. The perception of letters often depends on the surrounding letters.

2. Perception of words depends on the syntactic environment in which the words are encountered.

3. Perception of words depends on the semantic environment in which the words are encountered.

4. Perception of syntax depends on the semantic context in which the word-string appears.

5. Interpretation of the meaning of what is read depends on the general context of the text.

There has been a great deal of research supporting these five aspects of mature reading (Bransford & Johnson, 1973; Kolers, 1970; Meyer & Schvaneveldt, 1971; Meyer, Schvaneveldt, & Ruddy, 1974; Rumelhart, 1976; Schank, 1973). It is clear, then, that the apprehension of information at one level often depends on the apprehension of information at other levels. Reading simply cannot be a serial, bottom-up process.

Other theories and models have attempted to deal with this fact, although Rumelhart does not mention it. Goodman (1967, 1970), in his psycholinguistic model of reading, certainly attempted to account for the interaction of various information banks. He proposed three decoding systems—graphophonemic, syntactic, and semantic. All three systems are viewed as acting simultaneously on the perceptual image from the page, as the reader attempts to hypothesize and confirm (or contradict) his or her decisions about the printed input. Goodman's model is serial in the sense that it begins with a perceptual image of the print and proceeds to a decision about meaning, but the intervening steps are highly interactive and are not sequential. Ruddell (1969) also proposed an interactive model of reading. Ruddell's model, like Goodman's, has serial-processing features; however, the various processing levels are viewed as dynamic and highly interactive.

Rumelhart's contribution, then, is not that he is the first theorist to attempt to explain interactive processes in reading. Both Goodman and Ruddell, in their models, were able to account for the five interactive elements mentioned above. Rather, Rumelhart's contribution is that he has applied a different paradigm— that of parallel computation, developed in computer work—that is better able to explain and illustrate the interactive aspects. Other models (including Good-

man's and Ruddell's) have followed, to varying degrees, the formalisms and flow charts of a linear stage model. By grouping various information banks, and by including feedback lines, Goodman and Ruddell tried to modify linear stage flow charts to account for interactions. The serial-processing features of their models stem to a large degree from the constraints imposed by a linear stage model. Rumelhart introduces a paradigm , at is more powerful in overcoming these constraints. His model is more able to show "that all these knowledge sources apply simultaneously and that our perceptions are the product of the simultaneous interactions among all of them" (p. 19).

RUMELHART'S INTERACTIVE MODEL

It is very difficult to represent a parallel-processing, interactive model in a two-dimensional diagram. Rumelhart begins by presenting a stage representation of his model (see Figure 4). In this model, the visual information store (VIS) registers the graphic information and, in turn, is acted upon by the feature extraction device. The features extracted are then used as input to the pattern synthesizer.

The pattern synthesizer is the crucial component of this model. It has available to it the incoming sensory information, information about syntactic possibilities, about the semantics of language, about lexical items, and about orthographic structures (including information about the probability of various strings of letters). Drawing from all of these information sources, the pattern synthesizer makes decisions and formulates a "most probable interpretation" of the information.

Clearly, such a model can show that various levels (graphic, semantic, etc.) do influence reading in interactive ways. What is not explained—and this is the problem encountered by theorists such as Goodman and Ruddell—is how these components interact. What has been lacking is "a representation for the operation of the pattern synthesizer itself. To represent that, we must develop a means of representing the operation of a set of parallel interacting processes" (Rumelhart, 1976, p. 21). The development of this representation is the crux of Rumelhart's model and his major contribution to models of reading.

Rumelhart suggests that formalisms developed by computer scientists to conceptualize the parallel computer provide the means for explaining the pattern synthesizer. These computer systems (including the "General Syntactic Processor," developed by Kaplan, and "HEARSAY II," developed by Lesser, Fennell, Erman and Reddy) are characterized by sets of totally independent processes that communicate "by means of a global, highly structured data storage device" (Rumelhart, 1976, p. 22). This device is analogous to Rumelhart's pattern synthesizer. Rumelhart names it "the message center," both to provide clarification and because of some differences between the message center and the proposed pattern synthesizer.

This message center formulates hypotheses, seeks confirmatory information, and decides whether to confirm or reject the hypotheses. To do this, the message center draws on any of the knowledge sources (similar to the ones in Figure 4). The sources contain specialized information about some aspect of the reading process.
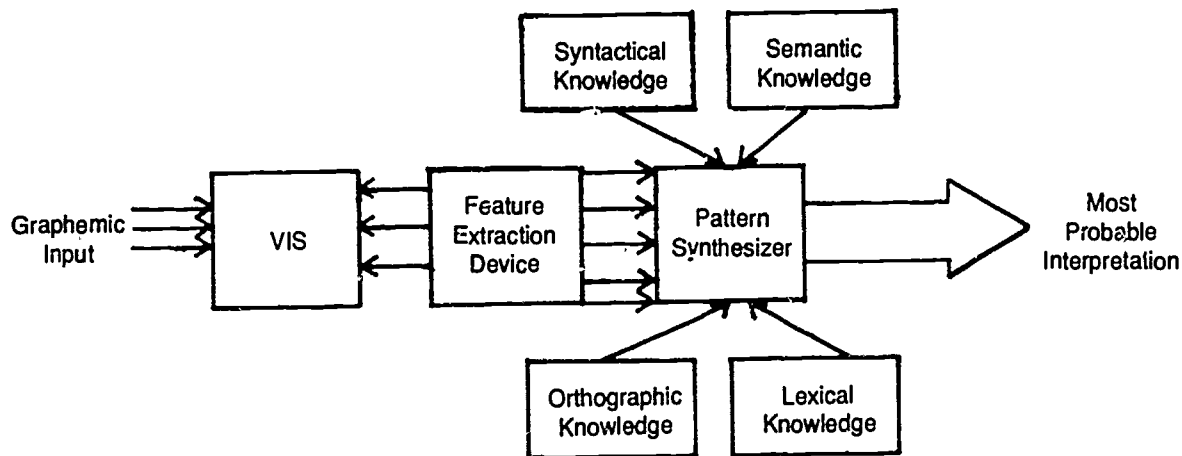
Figure 4. A stage representation of an interactive model of reading. (Rumelhart, 1976)

Based on available information from the text, these knowledge sources generate hypotheses that are entered in the message center. For example, a reader picks up a book and begins to read. Immediately, the syntactic knowledge source hypothesizes that the first meaning unit will be a noun phrase (since most sentences begin with a noun phrase). The lexical level knowledge source might hypothesize that the first word is "the." The feature level, detecting certain lines, might hypothesize that the first letter is *t*, and this hypothesis would be carried on to the letter-level knowledge source. All the various hypotheses generated— whether or not they are in agreement—are entered in the message center. Each of the knowledge sources continually scans this message center for hypotheses relevant to its own sphere of knowledge. (For example, once the letter-level source has hypothesized that the first letters are *t,h,e,* the lexical level knowledge source reviews the hypothesis to confirm that such letters do form a known word.)

> As a result of its analysis, the hypothesis may be confirmed, disconfirmed and removed from the message center, or a new hypothesis can be added to the message center. This process continues until some decision can be reached. At that point the most probable hypothesis is determined to be the corre :t one. To facilitate this process, the message center is highly structured so that the knowledge sources know exactly where to find relevant hypotheses and so that dependencies among hypotheses are easily determined. (Rumelhart, 1976, p. 22)

In Rumelhart's model, the message center is represented as a three-dimensional space. One dimension shows the position along the line of text, one shows the level of hypothesis, and one shows alternate hypotheses at the same level. Figure 5 is an illustration of this model. It is represented two-dimensionally, but can be seen as three—"cat" and "car" are actually alternate hypotheses at the lexical level. It is important to keep in mind that, although this diagram is a tree-like structure, it does not represent a bottom-up model; processing does not take place only from features to letters to letter clusters, etc. Rather, the hypotheses can be generated, confirmed, or rejected at any level.

Rumelhart goes one step further than many other theorists in his attempt to illustrate the reading process. He proposes a mathematical model of hypothesis evaluation. This both quantifies his model and provides indications of research that can come from it. He identifies four different types of dependency relationships among hypotheses in his model:

1. A hypothesis may have one or more *daughter* hypotheses. According to Rumelhart, "Each daughter is an alternative way in which the higher hypothesis can be realized" (p. 33). For example, the hypothesis that the first word is a noun determiner has two daughters: "a" and "the," either of which will provide direct evidence to confirm the hypothesis.

2. A hypothesis may have one or more *parent* hypotheses. "A parent hypothesis is one to which a hypothesis can lend direct support" (p. 33), Rumelhart states. Thus, in figure 5, DET is parent to both "a" and "the;"

3. & 4. A hypothesis can have *sisters*—left and right. "Sisters are hypothesis which either follow or precede a particular hypothesis at the same level. Sisters are not alternatives, but are consistent possibilities

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"Syntactic Level" "NP"

"DET" "Noun"

"Lexical Level"

"a" "car"

"Letter Cluster Level"   "the" "cat"

"Letter Level"   't' 'h' 'e'   'c' 'a' 'r' 't'

"Feature Level" F_1 F_2 F_3 F_1 F_2 F_3
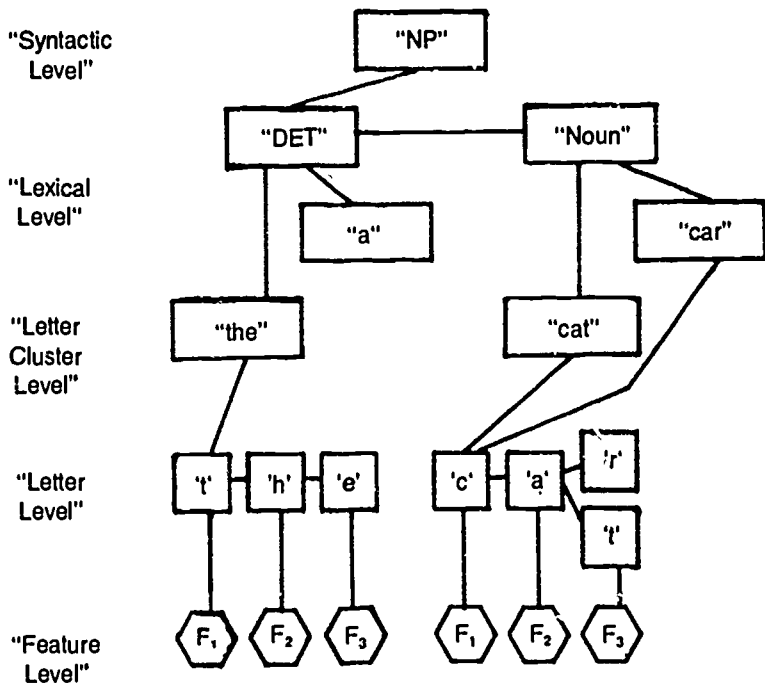
Figure 5. An illustration of the relations among the hypotheses in the message center. (Rumelhart, 1976)

of the same level" (p. 33), the researcher says. *Right sisters* follow a given hypothesis while *left sisters* precede a hypothesis. Therefore, in figure 5, NOUN is a right sister to DET (Since the reader hypothesizes a *noun* to follow a *determiner*). At the same time, DET is a left sister to NOUN.

Using these four dependency relationships, Rumelhart develops a strength measure for evaluating hypotheses, based on the Baysian probability that the hypothesis is true given the evidence at hand. Thus, he attempts to explain, mathematically, how the message center and information sources make optimal use of the information at hand to decide on a "most probable hypothesis." This allows his model to be quantified and to "generate specific predictions—in spite of the enormous complexity of a highly interactive system" (Rumelhart, 1976, p. 37).

CONCLUSION

Rumelhart presents a model of the reading process in which sensory, semantic, syntactic, and pragmatic information is processed in an *interactive* manner to reach an understanding of written language. Different types of information are fed into a message center; hypotheses are formulated and confirmed or rejected by appropriate information sources. New hypotheses are generated until a "most

probable hypothesis" is arrived at. This interaction of hypotheses and information sources—all of which are kept track of in the message center—can be character-ized mathematically in a probability model. Thus, reading is viewed as the formulation of hypotheses, testing of probabilities using a range of information sources, and finally decisions about the "best" hypotheses are made and ac-cepted as meaning.

While the notion of interaction is not new in reading models, Rumelhart, by using concepts drawn from parallel computation, has provided a more powerful expla-nation and description of how this interaction occurs. By presenting a simultane-ous and interactive model, Rumelhart is able to account for aspects of reading that serial models, such as Gough's (1972) and LaBerge and Samuels' (1974), could not. By moving from a linear stage to a parallel processing paradigm, Rumelhart is also able to characterize the interaction more exactly than Good-man (1967, 1970) and Ruddell (1969). For these reasons, Rumelhart's model is an important contribution to reading theory and models.

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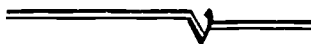
INSTRUCTIONAL IMPLICATIONS
OF RUMELHART'S MODEL

Jerome Harste

Rumelhart (1976) provides us with a model of reading that is sophisticated enough to cope with most of the complexities of language processing as evidenced in reading behavior. The essential features of this model explain how higher-level language processing (semantics and meaning) facilitate lower level language processing (letters, words) and how mastery of the former facilitates mastery of the latter.

The popularity of Rumelhart's model lies not in the fact that his ideas are new (see earlier writings by Goodman, 1970, and Smith, 1971), but rather in the unfortunate belief that things are not true until psychological research proves them.

Rumelhart's model is weak, however, in its explanation of how the context in which language is found, both linguistically and environmentally, can both facilitate and mitigate against proficient language processing. Rumelhart does frightfully little to explain the cultural constraints that operate in alternate language contexts and their effect upon the process of reading.

Good models of reading ought to organize perception, generate research, and suggest instruction. Despite obvious weaknesses, Rumelhart's model is probably the most powerful in terms of the first criterion. For this purpose, it adds to our knowledge of the reading process. The implications of Rumelhart's model for instruction and research are less clear and largely unaddressed by him.

Much of this applied work is yet to be done by other researchers. I hope each person who reads this paper will consider the instructional implications of Rumelhart's model. I have given Rumelhart's model some thought and wish to suggest some instructional techniques that seem consistent with one of the major tenets underlying his model.

Rumelhart's model suggests readers have copious information available to bring to the reading process. Instructionally, this notion suggests we can do much to assist readers by helping them become more flexible in their bringing this alternate information to their reading. Rather than focusing attention on the surface structure of language (words, exactness, letters, etc.), as now seems to be the

case with much instruction, we need to assist students to discover the predictability of print. One way of enhancing this discovery is by instructional strategies that give the students access to available language and pragmatic information they already process in speaking and listening. We need to develop strategies that encourage students to be as cognitively active as possible if they are ever to become proficient readers. Students have much information to bring to the process. Using this information does not make the reading task easier, rather, it is part of the reading process itself.

About all we can instructionally do as teachers is establish a conducive environment that encourages those reading behaviors which we see as being important. It is important to realize in this regard that it is not our presence in this environment, but the student's presence, which is important to learning how to read.

In practice, this notion suggests that we need to abandon several assumptions that seem to have governed instruction in the past. For example, rather than assume words are known or unknown, we might better approach students with the expectation that they do indeed have available information that can be brought to the reading process for reconstructing meaning from print. Such a shift in attitude would make readers reliant on their own linguistic and cognitive processing abilities rather than dependent on teachers or outside sources for solving their reading problems.

Rumelhart's model supports one intuitive notion we have had for years: that readers are better served when we provide readiness for the material. Procedures prior to reading, such as discussions, film strips, etc., assist readers to access background information and increase the likelihood of its availability for processing. The old, but still common, practice of giving students a reading assignment in preparation for a discussion is, unfortunately, backwards. Because what the reader brings to the process greatly influences what he/she gets out of the process, teachers can insure more successful processing of print through the reverse procedure—discussion first, reading second.

In summary, a good model of reading ought to allow us to reflect on what is being done currently and help us eliminate instructional strategies that do a disservice to ourselves and to our students, as well as build strategies and techniques that incorporate new understandings about the reading process. Rumelhart's model, I believe, has these possibilities. But frankly, he needs us as much as we need him.

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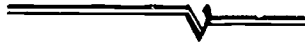
REACTION TO RUMELHART'S MODEL

GROUP ONE

Richard Ferry

After reading the paper on Rumelhart's model, one has the feeling, similar to that about the digestive process, that one of the worst things to do is reflect upon what we are doing, especially during the process itself. Similarly, we never ask a fish what water is, or how to describe water. But as reading people, we sometimes construct complicated models without taking into account how children feel and react when they are reading.

Assuming that there are different stages in the reading process, I cannot see the reason for differentiating between something happening sequentially, as Gough's model (1972) illustrates, or simultaneously, as in Rumelhart's model (1976). Gough's and LaBerge and Samuels' (1974) input—called graphemic input in their sequential models—can be viewed from Piaget's idea of assimilation. Assimilation indicates that existing structures are taking in new structures and accommodating to them. The reader, then, whether reading is viewed sequentially or simultaneously, brings much knowledge with him/her to print. The reader may bring more to print than has been realized, and he/she is changed by it.

LaBerge and Samuels have three memory systems in their model—visual, phonological, and semantic language. It's hard to see how these can be separate and discrete, indeed how they can be anything but interacting. I always think of Helen Keller when we talk about visual or phonic memory. She did not have clear access to such memory systems. This does make one cautious about accepting LaBerge and Samuels' bottom-up process—letters, then spelling patterns, the whole phonological system that constitutes synthetic phonics.

Rumelhart's model also makes one think of Piaget's stages of development. Piaget contends that we must think before we can read, and that the child must first understand the "cue." For example, if two or three cigarettes were lifted partially out of the package, the child would know that the rest of the cigarettes are there, inside the package. The child next needs to understand the concept of the "sign." Piaget suggests that the child begins to understand that a sign, or symbol, stands for something else. At this point, he/she is ready to begin decoding in reading, to understand that these arbitrary letters represent something.

There are some suggestions for instructional techniques that can be drawn from Rumelhart's model. We want to try to devise activities that would cause the student to make as much use as possible of what he already knows about reading and language. For example, why do we not, with the students, make our own cloze tests? Why do we not block out every fifth word, perhaps in a sports page (if sports are of particular interest), to see how w. 'he students use the language cues.

The way a proficient reader attacks words is generally through context. We "read around" the word. If we cannot get the word this way, we usually go to initial consonants. It seems, then, that if a student cannot read around an unfamiliar word, that is, if he/she has very little to bring to the word from the context, then a teacher could work with him/her on a bottom-up program of synthetic phonics or something similar. This would give the student tools with which to decode the words in some way. Also vocabulary could be developed through redundancy in context. An author of children's stories introduces a new word by presenting the unknown word in a sentence, then presenting the same sentence using a known word in its place.

Lastly, Rumelhart uses a computer-based parallel processing model. It is hard to think in terms of two or three dimensions of processing. However, the notion of parallel processing is more feasible. For instance, students can study with the television on, somehow assimilating two sets of information; or one can read the evening newspaper with the television on. This is a concrete way of visualizing the idea of parallel processing.

Gene Rich

There must be a connection and a sequence to print in order to be able to predict anything, like "horse" for "house." A reader not only relates some previous experience with the concept "horse" but also has to relate previous experience with letters and sounds. The letters and sounds have to be learned early. Part of the problem for secondary teachers is that they have students who "call" words that have no visual similarity to the printed words. The student, it seems, is unable to make predictions. He/she has not made the connection that letters are a type of schema, so predictions are unrealistic. He may call "it" for "mother." He is not relating at all, or using any cue systems. Now, if he calls "mom" for "mother," it seems that the prediction skill is there.

We are not sure how far Rumelhart's model is from Smith's (1971) theory of prediction of reading. Also, since Rumelhart's model begins with grapheme input, how much knowledge of graphemes does the child need for the process to continue?

Jerome Harste

That is a good research question. If a model generates good research, that is another salvation of it. I am currently looking at what young children know about visible language or print before coming to school. They know much m re than we think they know. There seems to be a feeling at the elementary level that a child needs to be taught the graphophonemic language system, and that such teach-

ing precedes application of other information. That notion is false. Children know a good deal about all the systems of language. They need to be taught much less graphophonemic information than many persons think. In his paper, Rumelhart emphasizes the need for graphophonemic information in initial reading instruction. However, Rumelhart is really a psycholinguist, that is, he talks about how we process language in terms of how language and cognitive structures interact. He does not discuss context very much. In contrast, a socio-psycholinguist believes that the context in which we think about and interact with language governs many of the behaviors that are going to be produced.

We learn to predict print from our encounters with print in the natural environment. If we open a social studies book, we start making all kinds of reading decisions because of previous encounters with that context. The same thing is true of the early stages of print processing. Children have encountered print many times in their environment before they start school, and they have discovered much about the systems of language and the regularities of print.

This fact suggests some instructional strategies. First, you might help students discover what makes a social studies text distinctive. Second, you might read aloud the first page of a selection that is assigned for the students to read. This procedure should familiarize them with the kind of language the author is going to use (thus bringing up the student's syntactic data bank), and it should make them mindful of the kinds of terms and concepts that are going to be presented, as well as elevating those terms and concepts to a point of accessibility. Third, you might have the students write an article like one typically found in a social studies book. It is likely that we underrate the relationship between reading and writing. For example, if the students read Michener's chapter on the dinosaur in *Centennial* and then they were asked to write in the same style but about a different animal, the students would learn a great deal about how an author proceeds in writing a passage. The more they know about this pattern, the better they are able to predict the structure the author employs. Such a prediction, in many cases, is very helpful.

DISCUSSION

The general context of reading and the students' ideas about it influence his or her interaction with print. For example, one student believed that he could not read above first grade level. As long as he was given books printed in the same format as a primer, the student read well, even if the text was really written at an eighth grade level. However, when given the same material in a different format, the student "could not" read it. Thus, format is seen as another apsect of the general context.

Based on their experiences in school, children develop their own models of reading. If they are taught to attend primarily to the graphophonemic system (in a decoding approach) or to words (in a sight-word approach), they do develop their orthographical or lexical data banks, but they also become dependent on them. Students instructed under these approaches seem to develop a dependency on certain types of language data and seem less flexible in their use of alternate available language information.

There are varying views on which particular language systems provide the most trouble for children. One opinion holds that semantic aspects are more difficult for children than the syntactic, lexical, or graphic aspects. However, in another view, semantics is not simply a language system—it is the very basis on which children grow and develop in language. Since children use language very meaningfully, the problem may be that they simply cannot use the "right" vocabulary and terminology required when speaking about a particular discipline. Therefore, this problem is seen as a semantic one. In many cases, however, the students do understand, they simply lack the proper vocabulary to express that understanding. Their problem is lexical, not semantic.

Another difficulty is that much early reading does not demand active cognitive processing and inference making. Because of this, students often may not be adequately prepared for the kinds of inferential and advanced reading they are expected to do when they begin work in specialized content areas.

In the area of teaching methods, Rumelhart's model (1976) is considered already to be incorporated in several successful teaching strategies. Various study systems, such as SQ3R, encourage the student to survey and question, to make predictions, and then to read to test hypotheses. A good model of reading should be able to explain the theory of successful approaches to reading and studying A good model should also provide insights into new instructional directions. Rumelhart's model appears to do both.

GROUP TWO

Judith Raybern

I agree with all the levels of cues of information in Rumelhart's model. Instruction in the elementary school appears to incorporate a tendency to drill separately on each level of cues. We teach the children ways to approach print by sequencing and drill aimed mostly at the goal of decoding." Even as we work with children in the early elementary grades, we do not show a healthy appreciation of those students ability to predict. One of the best examples of a young child's predictive ability is described by Smith (1971). He points out that a preliterate child (one who is not yet reading) is quite able to assume, from the environment, what various labels mean. Smith takes a child through a large department store and has the child speculate what the labels might be saying at each point in the store and tell what information is intended by the symbols. So, I do agree with the interrelated ness of the information being brought to the meaning in reading.

Additionally, Rumelhart s model is probably useful in secondary reading courses in acquainting prospective teachers with the complexity of reading. It may also encourage them to examine their own reading styles and strategies. The model could be implemented in content reading courses by helping preteachers or students at that level to actually diagnose student reading behaviors and attempt to speculate about how a particular student is functioning and what types of cues are being used.

One deficiency in the model, which we would have to overcome, is how the mediation is achieved between what the child brings from his/her environment

and what he/she matcnes with the author s intended meaning. As teachers, we may want to be careful about accepting the student s first response. we may need to devise ways to get to the student's actual meaning.

In using Rumelhart's model in a methods class, several activities should be included. Direct instruction techniques should be employed to teach students to use the different types of cuing, and students would work through materials they will use in teaching to identify points where they could bring out or emphasize these cues for their students. Also included should be instruction in designing questions to help students predict in their reading. We need to encourage teachers to get their students to talk about the processes used in their reading. Other things to include are getting the learner actively involved in explaining his own approach to pnnt and building readiness each time. The model has not taken us as far as we need to go, we also need to demonstrate how the student could use these cuing systems in reading.

Claudia Cornett

I may evoke an emotional response, as well as a different response to the content itself, by saying first of all that I am not impressed with Rumelhart's model. It presents only things that we already know. We know a teacher should use open-ended questions. We know the teacher has to prepare the student. We know the teacher should stimulate prediction, anticipation, classification, diver gent thinking, tying in. We know that it is important for the students to form analogies. to read and think, to use metaphors and similes, to make decisions, to hypothesize. We know all that—all the things this model suggests—already.

A positive way of viewing the model is that it does support many of the things we are doing. A good teacher does emphasize and provide time for a student to ponder what he has read and does not require a student to answer questions immediately after reading. A good teacher encourages construction of the whole and does not focus on the components. A good teacher emphasizes relaxation and feeling comfortable when reading so that the right side as well as the left side of the brain is used. A good teacher encourages picture formation in reading, and in so doing encourages what happens in the pattern synthesizer to take place.

Listening to the presentation, I found myself using certain words to associate the ideas presented with my experience. I thought of "maze" for example, I like the idea and I feel good thinking about myself and others as readers going through a maze, doing things like looking, searching, or discovenng. I also associated words like 'fun and scary.' Scary' made me think of Piaget and Kohlberg and the importance of dissonance, and the uncomfortable feeling that may come with a new experience. But that sensation is vital, for one does not grow without that feeling of struggling. It is important for students to encounter unknown structures and patterns in their reading so that when they encounter the unfamiliar they will not feel as if something is wrong with them because their expectations are not met.

DISCUSSION

Most participants agreed that what was presented about the idea of prediction was not new. One person suggested that it reinforced what we had believed and

taught. Many participants emphasized that the role of language acquisition or language development was enhanced by Rumelhart's model.

One participant suggested that the model does not include all of the prerequisites" to the language process. She stated that secondary content teachers must learn the prerequisities—such as, diagnosis, the skills, or phonics—because they facilitate learning the language process. The group debated whether colleges and universities should be preparing secondary reading teachers or secondary content teachers who teach reading. One argument was that these prerequisite skills should be taught to preservice teachers so that the skills become part of their repertoire. These participants also felt that intensive skill instruction can be handled by the content teacher. Other group members argued that knowledge of these skills would only interfere with teaching of the content area. Instead of stressing skills, the secondary content teacher should build on students' background knowledge, as emphasized by Rumelhart's model, help students understand their own reading behavior, and teach students strategies by which to be more efficient in content reading. These participants' main argument was that the secondary content teacher's role is to teach the content area—teaching reading is a lesser role. Therefore, secondary reading methods courses that emphasize skills and phonics would serve only to disenchant the preservice teacher with reading instruction.

One participant expressed concern for the student s attitude toward reading. She suggested that preservice teachers must be taught to identify and build on this attitude. After a good attitude or mental set is attained, the skills can be learned through the material.

In discussing methods of teaching this model to secondary content teachers, one participant suggested using a cloze activity within a scientific article. By doing this, the preservice teacher realizes the interrelatedness of all the cuing systems. The information brought to print by the reader was emphasized by several discussants.

Another participant suggested building background knowledge through readiness activities. The group members agreed that pre-organizers often are not suitable for distribution to entire classes, because they do not take into account differences in ability and need. The idea that all students in a single class should reach a certain level of thinking was challenged by one participant who recalled research suggesting that the majority of the world would never reach Piaget s abstract operational level of thinking—even though these persons function well in society.

GROUP THREE

Toby Herzog

A major problem with Rumelhart's model is that he does not discuss applications. Secondly, his model leaves out prereading all of those expectations that we set up before we come to the printed page. Rumelhart begins with the printed page and goes from there.

The differences between models are important. The bottom up models (Gough,

1972, LaBerge & Samuels, 1974) are sequential and linear. They call for process-ing letters or features, and proceeding to letters, clusters, sounds, words, and meaning. The method Rumelhart suggests allows us to begin at higher levels In other words, we might start directly with the meanings of the words rather than processing the letters, then go to the sounds, etc. He is saying that at these higher levels we have several data banks acting simultaneously. We have syntax, semantics, orthography and the lexicon all acting at the same time rather than in a sequential fashion.

The applications of this were not clear to me. The model itself seemed geared toward the secondary reader. Do elementary readers follow these same stages? I have trouble seeing how they would. Maybe the beginning reader starts with one model and, as he becomes more proficient, moves to another model. To say that Rumelhart's model is a scheme for the reading process (and therefore instruc-tion) at any age, certainly presents problems.

The idea of prereading expectations is too important to be ignored. A well-read student will set up certain expectations based on prior experiences, such as "I've read this author before" or "I've read issues of this newspaper before, and therefore I have some idea what to expect." The reader knows that material will be contained in a certain place or knows the type of language or sentence structure he or she will read. Such knowledge will help in reading a particular passage.

Diana Mayer

We would like to center our discussion more on "What does it all mean?" rather than present more information about models. Dr. Harste gave some implications in his presentation.

In one example, a student had read a passage that contained an unfamiliar word However, when given the same word in a more familiar context, she understood it. This demonstrates the point that children have available information to bring to the reading process, and when unknown words are encountered in a familiar context they become not only known but also predictable. After taking the time to make a schematic connection through using a more familiar passage, we should, perhaps go back to the original passage and see if the student now recognizes the word in an unfamiliar context. It is important that we make the connection between a student s own experience and an unfamiliar word. If the application is not made back to the original text, what have we accomplished?

DISCUSSION

Several participants thought Rumelhart's model lends support to the idea that reading can best be enhanced by providing many reading experiences It is important for students to read many materials so they will encounter words in a variety of contexts. A student must have a mental set for a passage before he or she is willing to read it. Sets result from doing a great deal of reading and being exposed to a broad vocabulary. Our job is to help students improve their reading by having them read.

Many research studies have demonstrated that mature, skilled readers tend to increase their vocabulary and comprehension skills simply through wide, extensive reading—without instruction. However, some research has been done using matched groups of good readers as measured by test scores, IQ, interest, and so on, in which one group does only extensive reading, while the other group receives instruction in prereading strategies, has discussions, and takes tests. The group that had received instruction far excelled the other group in developmental reading skills. This result indicates that while it is important to do a great deal of reading, reading alone, without instruction, will not ensure marked reading improvement.

Discussion also centered on the expectations that a child brings to the reading task One participant pointed out that some students bring an expectation of failure to reading, and that teachers have a responsibility to ascertain student expectations and point out the realistic or unrealistic aspects of them.

Another participant pointed out that reading models tend to assume that students are intrinsically motivated. Since schools emphasize the importance of reading, children learn early that it is socially unacceptable if they cannot read, then they lose their motivation and begin to reject reading. This rejection becomes stronger as the child progresses through school. A third participant related experences at a community college to support these ideas. The adults coming to the school often were convinced that they cannot learn. At the same time, they wanted to learn and often had unrealistic expectations of the amount of time and effort it would take for them to become good readers. In such a situation it is important to be candid with the student and make clear that the process of learning to read will take a long time Realistic expectations help the students feel successful along the way Just as a reader makes decisions about what he/she is going to read before even looking at the material, so students make decisions about what they expect before they even enter a place where they learn to read. These expectations need to be taken into account.

Reading teachers should also be aware of the importance of building on experences Students have many experiences in life upon which teachers can draw. If students look at the material before they read and anticipate, based on experences, what might be contained in the reading, then unknown words or ideas can be understood by using all the stored information. If a familiar word is used in an unusual sense (like "Compact" in Mayflower Compact), the teacher should point it out, because the student's background information needs to be supplemented. Prereading strategies should be used in addition to building on experences. Prereading strategies help provide motivation and desire to read, regardless of past experiences.

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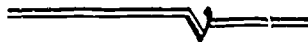
COGNITION AND COMPREHENSION

Carl B. Smith

It may be too simplistic to say that humankind's view of the earth parallels the intellectual growth of a child. But it is true that for a long time our view of the earth was confined by the limitations of our eyes. "The earth is flat," Columbus was warned. Our eyes told us that the sun rises and sets, and that the earth is flat. With the advent of the telescope and complex mathematics, we learned that there was more to the world than what meets our eyes.

Our solar system is part of a galaxy, and astronomers tell us that other galaxies exist beyond ours. Astrophysicists are predicting that untold sources of energy exist in the complex forces that hold a solar system and a galaxy together. There are, for example, "black holes" charged with tremendous energy, totally invisible to all save the laser beam, yet waiting for us to understand and to "mine" them. Thus we have grown in our view of the world—from relying totally on the limits of the eye to theorizing about exploiting a force that the eye cannot see.

A child's mind, in 12 or 13 years of growth, goes through a similar evolution. During the early years, the child constructs views of the world from the concrete images that are in his/her memory. By the time the child reaches adolescence, he/she is capable of leaping over the concrete barriers to discuss the principles of justice and order that govern concrete actions. The child may not carry on a sophisticated discussion at age 12 or 14, but according to Piaget (1926) and Vygotsky (1962) he/she has the capability to combine concepts and to understand the relationships among principles. The child can operate among abstractions. He/she can theorize about something that cannot be seen.

The purpose of this paper is to outline this remarkable intellectual growth and to explain possible consequences on reading comprehension.

WHAT IS COMPREHENSION?

Generally, we equate the term comprehension with meaning. After all, we read in order to get meaning. Comprehension (or its synonym, meaning) has a variety of definitions. To some persons it means a kind of sponge-like activity wherein the reader presses the words, with a message, into his mind. Then at some future date, when asked a question or when some other stimulus prompts him, the reader twists the sponge, hoping that what drips out will satisfy the questioner or respond appropriately to the stimulus.

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A similar notion is that comprehension is merely a kind of categorizing of information—of putting it into various slots or cubbyholes in one's mind Thus, whenever one seeks an answer to a question, he reaches into the right slot, like the mail sorter in the post office, and withdraws the appropriate envelope—all self-contained, sealed, and orderly.

A more dynamic view of comprehension calls for an operational definition That is, anyone who can answer typical questions about a message comprehends it Ordinarily, teachers in classrooms operate on this principle. They assign students to read a chapter, a paragraph, or a book; then they ask questions Typically, those questions ask for certain prominent details, for example, "Who did it?" "What happened?" "Where did it take place?" Or they ask for sequence information. "What happened first, second and third?" Other typical questions require the manipulation of information for some purpose. "What's the main idea?" "In what ways are the characters alike or dissimilar?" Other questions require judgments, that is, the selection of criteria to be applied to the message The typical questions here are. "Did you like it?" (It is assumed, of course, that everyone can answer the question, "Did you like it?") "Is it worthwhile?" and so on. Students are often asked to put the information to some kind of use, to extend the story, to provide a different ending, to draw their own conclusions, and so on

What is interesting about this whole routine of asking questions is that no one ever seems to worry about the student's sense of how to go about answering those questions. Teachers from kindergarten through graduate school continue to ask the same types of questions without ever explaining to or demonstrating for the student how a particular type of question can be answered Answering questions is a demonstration of comprehension. It seems that we think it is enough to ask the questions and assess the validity of the answers without ever determining whether the child s mind needs different questions at different ages, or whether anyone has shown him how to use his thinking capabilities to under stand what the question is aimed at and to sort out the information he has learned so that he can frame a suitable response. In this sense, the asking of questions simply provides an outline or a paradigm for interacting with students by testing their comprehension.

Basically, there s nothing wrong with asking questions, especially if a wide range of questions is asked so that the child's mind is, in fact, required to search for details, to manipulate information for a purpose, to establish criteria and make judgments, and try to extend the information beyond the point described in the reading. As a matter of fact, a consistent exposure to such a range of questions will more than likely make the learners aware that simply categorizing or "spong ing up" the information is not all there is to comprehension. They become aware that their minds can have many kinds of interactions with a message, and they are more likely to engage in a broader interaction with passages that they will read in the future.

Still a different definition of comprehension is that given by Gibson and Levin in their book, The Psychology of Reading (1975). They maintain that comprehen sion is extracting meaning from print." The difficulty with that definition is that it

sounds, again, as if there is some way to squeeze from print the same information, no matter who you are or what your background is.

It seems that it would be better to say that comprehension is constructing meaning from print. In his descriptions of thinking, Piaget uses the term "constructing" as a way of defining what the mind does when it thinks. Learning, thinking, and comprehension are activities in which learners have to build something for themselves. They build their own meaning, and that is not only in a relative or subjective sense.

An excellent example of this concept is when, not long ago, my wife gave me a column from the newspaper. It described the problem of a woman married to a 220-pound man who insists on holding on to her for dear life all night, every night. Furthermore, the woman complained that he smokes, loves salami and garlic and consequently has terrible breath; his toenails are long and as sharp as knives, and his chest is covered with bristly hair, making for long, sleepless nights. To top it all off, the woman complained, he thought he was the world s greatest lover, which, she insisted, he was not.

Now suppose you gave that passage to a 7-year-old, a 10-year-old, a 16-year-old, and yourself And suppose that you asked each one to tell you what it was about You are not allowed to prompt them with any specific questions. You are simply to have them tell you what the article was about. The 7-year-old, to begin with, might have difficulty in recognizing some of the words in such an article and will likely focus on the rather humorous images of the husband that are portrayed—like his bad breath, or his sharp toenails. The 7-year-old does not understand the nature of the complaint that is being rendered. The 10-year-old, on the other hand, gets the impression, from all that is written, that the woman does not like her husband because he is mean, smelly, and dirty. This child, too, laughs at some of the bizarre images used in the article. The 16-year-old says, "How gross! Why does she stay with a man like that?" And you, as you read this, may have laughed because you have a husband like that, or know one like that, or revel in the cleverness of the presentation, or you may have been indignant. You may have felt that it was unfortunate that this was published in the newspaper, and if it was, it was even more unfortunate that it was included in this paper. Well, let me tell you what meaning I get from it. The only time my wife gives me something to read is when she's trying to change my behavior.

Thus, each of us at our age and level of development comes up with a different meaning for the article about the man who hugs like a semitruck, because each of us has in fact constructed meaning. We have not simply soaked it up, or categorized it, or extracted it so that each of us has the same thing to retell when asked to tell about what we have read. Depending on our age and our purpose, each of us constructs a meaning that varies from a series of concrete images to generalizations about adult behavior.

By defining comprehension as the act of constructing meaning from print, we have not made it a simple concept. Rather, this definition should show us that in addition to an effective knowledge of the alphabet code for English spelling, both semantics and the organization of a message play an important role in the

meaning that anyone gets from the message. In other words, reading comprehension is intimately tied to semantics and to thinking.

From the example given, I hope that it is reasonably clear that we cannot discount the difference in comprehension from age 7 to the adult as simply a difference in experience. The 7-year-old or the 10-year-old child may indeed have been able to pronounce and to hold in his mind an image for every word or sequence of words that appeared in the letter. It is what the reader is able to do with that complex of concepts and words that makes the difference. Why is it that for the young child the article represents a series of funny or bizarre images, for the middle child a picture of an ugly man, and for the adult a lesson to be learned about his own behavior?

GROWTH IN THINKING

It is too simple to say that the learner's thinking moves from concrete to abstract. That is such a broad, vague sweep that it does not provide anything more than a general direction in helping us review what thinking and comprehension are. In education, we probably have let ourselves overlook the differences in thinking as the child moves from age 5 or 6 at the entrance of school to the age of 16 or 18 when he departs from compulsory schooling. Part of that problem probably stems from the fact that we tend to equate language production with thinking and then use gross overgeneralizations about children's language. Even though it is clear that a child moves from simple to complex ideas, or from concrete to abstract across the years, we seem to mask the difference between the way a 7-year-old thinks and the way a 16-year-old thinks by saying something like. "When the child enters school at age 5 or 6, he has all the basic language forms and can use and understand them." That statement, along with others about the size of the child's vocabulary, misleads us into thinking that the child not only has control over his/her language, but also has a huge set of concepts, both concrete and abstract, that he/she is working with. Quite the contrary, it is very clear from the work of Loban (1976), Menyuk (1971), and Chomsky (1970) that the child continues to grow in language up to and through grade 12 or age 18. And that growth is not simply an expansion of vocabulary. That growth constitutes the development of important language functions, that in turn enable the individual to express the thoughts that he/she has, thoughts that also become more and more complex and abstract as he/she grows older.

Loban conducted a monumental longitudinal study observing the language development of children from kindergarten through grade 12. To indicate the development of language during the elementary grades, we have selected in Table 1 some items reported by Loban as characteristic of language development from ages 7 through 12.

If language is one symbol system for manifesting thought, then we might conclude that the growth in language reported by these researchers is indicative of a constantly changing thinking structure as well. If we assume that psychologists like Piaget (1958) and Vygotsky (1962) are correct in saying that there are significant changes in the mind of the human organism as it reaches across the first 14 to 16 years of its existence, then it behooves us as educators to determine

Table 1

Language Development in Children

Ages 7 and 8	Children can now use relative pronouns as objects in subordinate adjectival clauses (I have a cat *which* I feed every day). Subordinate clauses beginning with *when, if,* and *because* appear frequently. The gerund phrase as an object of a verb appears (I like washing myself).
Ages 8, 9, and 10	Children begin to relate particular concepts to general ideas, using such connectors as *meanwhile, unless, even if.* About 50% of the children begin to use the subordinating connector *although* correctly. They begin to use the present participle active: *Sitting up in bed, I looked around.* The perfect participle appears: *Having read Tom Sawyer, I returned it to the library.*
	If twelfth grade is used as a base for the total growth of written adjective clause incidence, then fourth graders have achieved 46% of their total growth on this usage.
Ages 10, 11, and 12	At this age children frame hypotheses and envision their consequences. This involves using complex sentences with subordinate clauses of concession introduced by connectives like *provided that, nevertheless, in spite of, unless.* Auxiliary verbs such as *might, could,* and *should* will appear more frequently than at earlier stages of language development. They have difficulties in distinguishing and using the past, past perfect, and present perfect tenses of the verb, and almost none of them use the expanded forms of the past perfect or the future perfect.
	The stage of thinking *if this, then (probably) that* is emerging in speech, usually applied to temporal things rather than to nontemporal ideas and relations: *If* the cost of higher education escalates, *then (probably)* enrollment will falter.

how we can identify the significant changes and what those changes mean for us in our expectations for reading comprehension. Do we have any control over the changes? Are they automatic and inexorable? Let us take a look at how thinking develops and pay particular attention to the characteristics of the mental development of the junior and senior high school age mind. For the most part, we will rely on the data and the analysis provided by Piaget in his 50-year study of children's thinking and try to tie in some language and comprehension mani-festations of that thinking as we follow it across the years and across the stages

STAGES OF COGNITIVE GROWTH

Over the years, we educators have become tied to behavioristic concepts in which learning and thinking are pictured as growing mechanistically and quan-titatively, like some huge domino game in the mind. The behavioristic philosophy seems to have colored most of our thinking and to have governed the assump-tions that we made about the way children in school think. As a result, most of the exercises in which teachers engage and the curriculum they develop for their students have frequently followed the pattern of gradually increasing the number of items of knowledge that are presented. Those items are connected in rather complex ways and all sorts of differences among students emerge But we seem to associate those individual differences with quantity rather than with qualitative changes in cognitive development.

Another concept that governs our assumptions and therefore our actions is the notion of an intelligence quotient. Too frequently, we assume that intelligence is fixed, and we try to demonstrate that fact by measuring certain kinds of behavior and putting those measures into a normed test which we called an intelligence quotient test. Those who score low on the test are then expected to gain fewer units of instruction and to achieve them at a slower pace. Those who score high are expected to retain more units and to achieve them at a more rapid pace Our curriculum for different students has seemed to follow these assumptions by simply adding more units and increasing the words or the concepts in those units The way that we teach students, however, remains constant, that is, read and answer the typical questions of recall, analysis, evaluation, and extension

Contrary to the basic assumptions of quantitative growth and of fixed intelligence, most of us probably would agree intuitively that intelligence is dynamic, that it changes as it takes on new ideas and works them into a personal system Intuitively, we probably believe that our thinking processes are constructing schemes and systems in our minds. For example, the so-called wisdom achieved with age is not a mere chemical aging process like 12 year-old Scotch, mellowed in oaken casks. Wisdom is, in fact, the researcher in each of our minds—a researcher who has hypothesized, sorted through myriad trials, and has arrived at generalizations that guide actions. The difference between the 7 year-old's and my reaction to the newspaper column is not simply a difference in mental images and experience. Rather, the 7-year-old perceives from that column a few unique images of a funny (strange) man. On the other hand, I am able to abstract from that column some guidelines that will improve my social behavior and some guidelines about the relationship between men and women. In the sense that I can make that kind of generalization, my learning (or my thinking) is not simply quantitatively different from the 7-year-old's, it is substantively different from the

7-year-old's. It is in this sense that intelligence is dynamic. Across the years each new experience has not only added to the number of items in my mind, but each new experience has also expanded my previous experiences. So, rather than thinking of intelligence as a static condition or a static capability, it makes much more sense to think of intelligence as a dynamic process. In fact, it is probably better to call this growing and changing capability something different from intelligence simply because our concept of intelligence is lodged in the assumptions and unproductive concepts of the past.

Since we want to create a dynamic image of intelligence, we might do better to call this activity of the mind "thinking" or "knowing" instead of "intelligence." Then, if we use our language and our actions as manifestations of the way we are thinking, we also can measure or observe what is going on in the mind. That is what Piaget (1926) and Vygotsky (1962) did in their experiments. Their analyses of their results are revolutionary. They demonstrated scientifically that a child is not merely a shrunken adult. A child's thinking is substantively different from that of an adult. What is even more significant about the findings of these two psychologists is that they have determined that there is an inexorable pattern to the changes that occur in the child's mind. In other words, the substantive changes that occur in thinking and in our way of knowing, follow a pattern that does not change. Even though for sake of easy identification certain ages are placed on the different stages of development in a child's thinking, those are only generalized norms. Those ages could vary considerably from one individual to another, as is true in all age norms. But, according to Piaget and Vygotsky, a biological imperative moves the development of the mind and establishes its capability at any one period of time.

PRESCHOOL AND ELEMENTARY YEARS

In this paper we are not trying to list every possible change that occurs in the thinking process of the child, but only to give examples to highlight what happens for the youngster at the secondary school age level. So, let us start with the age before the child enters school, a type of thinking occurs during that period that is characterized by personal observation and very concrete labels. Vygotsky calls this type of thought *subjective coherence*, Piaget calls it *egocentric thought*. For children at this stage, a cow is an animal that has horns, and a calf is simply a smaller animal that has horns. They are different from a dog, which is smaller and has no horns. From the point of view of comprehension, children impose a coherence to what they listen to (or possibly read) but every detail that they can remember is important. At this stage in their development, they have no way of sorting out less important images. Whatever connecting or associating process they use to put the various images together is what they then recall. It has no relation to adult logic or to the process of abstracting themes, generalizations, and assumptions.

The age range covering kindergarten and the primary grades constitutes the establishment of what Piaget calls operational intelligence. It is the time when general concepts like men, animal, and dog are developed—a very important period, for these concepts are the stuff of general knowledge and form the base for thinking and acquiring knowledge beyond rote memory. During this stage of development the child operates on concepts and learns to categorize. He/she

develops internal schemes or structures for generalizing information, for abstracting it from the peculiar aspects of the concrete situation. This stage of development, called *concrete operations*, produces the invariant structures of classes, relations, and numbers. The child's environment can help or hinder the development of these structures, but it is not the cause of them. The dynamic relation between the child's mind and school activity, for example, is important, because the mind needs to use experiences which are assimilated into the internal structures that are developing. The mental structures also accommodate, that is, modify, as these experiences demonstrate the need. The child expands his concept of *dog*, for instance, when he/she learns that people are dogs—in a figurative sense, as in: "She's married to a dog."

The implications for comprehension at this stage of cognitive development suggest emphasis on determining sequence of events, on noting concrete cause and effect relationships, on getting the main idea, or on placing a story or a book in a category (e.g., mystery stories vs. biographies vs. comedies, etc.). The nuances of the child in perceiving cause and effect relationship and identifying the main idea are not those of the adult. Rather, the child is now able to see some concrete relationships and can express those concrete relationships in generalized terms (e.g., the quantity of water does not change when one pours it into a container with a shape different from the original container).

THE MIDDLE SCHOOL YEARS

It is during the middle school years (ages 10 to 13), when adolescence usually begins, that the child's thinking takes on the structures that enable the mind to operate like an adult s. This does not mean that he/she thinks in a more mature manner automatically, or that he/she achieves this level of thinking without the help of environment. Piaget and Vygotsky both agree that puberty marks a significant change in the structure of the intellect, therefore a significant change in what the organism can do intellectually. It is at this point that the adolescent has the capacity for propositional or hypothetical thinking. The onset of this capacity does not indicate that in every subject and at every moment the child now will produce propositions, starting with assumptions (e.g., if X is true, then Y must follow). But it does mean that the child-adult has the internal structures that enable generalizing, combining generalizations, predicting in an abstract sense, and arriving at conclusions in an abstract sense.

The child still may be inclined to tell all the details that he/she can remember after reading a passage, because each of us continues to operate at all stages of intellectual development. We never discard what Piaget calls our sensorimotor stage or our concrete operational stage. The structures that were developed during that period remain with us, and we can operate intellectually within those structures instead of at the formal operational stage that we are now describing. It is possible or convenient for us to operate at lower stages of development either because we do not have the experience or the concepts in a particular area to go beyond a lower stage, or because we simply choose to function at a lower stage. It is also conceivable that for lack of a prod by a teacher or by some other element in the environment a student may develop only a clumsy sense of how to operate at the level of informal operations. It is good to recall here what Piaget says about

intellectual functioning—it is goverened by internal structures, and these structures regulate the organism's functioning. But functioning works in two directions. assimilation of the environment into the existing mental structure, whatever its shape, and the accommodation of the structure to the particulars of the environment or the subject. In other words, a structure that has received very little growth or change as a result of accommodation will manifest a fairly low level of intellectual activity or assimilation.

As far as comprehension is concerned, it is during this middle school period when many students are able to find themes and main ideas in passages and provide supporting details to back up those themes. They also begin to appreciate the effect of language and the selection of examples or incidents in a writer's style to create mood or effect. During this period of development they frequently attach themselves to a particular author or type of book. They begin to see that there are intellectual personalities or generalizable experiences that they enjoy or can participate in happily and successfully. Those activities ought to be encouraged

The teacher's responsibility in the middle school years is to expand the use of propositional thinking and relate it to reading comprehension as an important activity. The nuances of language also take on significance, because not only does the notion of figurative language reveal the possibility for constructing relationships and for representing conditions that a bald description does not, but it also is through figurative language that the relativity of language forces itself upon the emerging adolescent. The teacher should constantly prod the student to determine what words mean within a given context. Thus, the student begins to generalize about context and to see how important the use of context is in gaining meaning as opposed to gaining the meaning of each word. The semantics or the meaning of language ought to form a significant part of his experience. It is during this time that the adolescent is able to see that abstraction is the main instrument for thought. The decisive role in this process is carefully using the individual words to advance concept formation.

Thus, the adolescent can achieve two extremely important components in adult comprehension. the function of words in context and the sense of the organization of the text. The middle school teacher and the junior high school teacher should take care to help youngsters understand the manner in which thoughts are organized in print. It is only within the organized context of a message that the words take on their full meaning. Vygotsky is especially insistent about the nature of this relationship at the formal operational level. He thinks that an important distinction must be made between the capacity to engage in formal operations and the use of that power. Its use, and therefore its observability, are dependent on words and on word meanings. An essential interaction takes place at this level of thinking that can be described only as a process, a verbal thought process, in which the structure of thought enables a word meaning to develop, which in turn alters the structure of thought, and so on. In this sense, reading comprehension is a constructive process and needs to be understood and explained as such to the student. A person's thought undergoes change as new words and new word meanings are introduced in a specific message. The same would be true as old words take on new meaning in a specific context.

Word meanings, therefore, are essential ingredients for thought change and also for measuring the development of thought change. Memorizing a fact or a statement is akin to memorizing a sound or a rhythmic beat unless the word meanings in the statement interact with some existing thought structure. All teachers, then, have a critical responsibility to explore words and their relation to the student's structure or framework in which they take on their real meaning.

At the beginning of the middle school years, students enjoy and often construct their own puns, riddles, and word puzzles. This kind of activity has considerable value in helping them understand the relativity of language, the structure of messages, as well as the surprise that is created as the result of providing the mind with something unexpected. One sixth grader told me her favorite joke (a pun) and it went like this. "What do you do when an elephant swallows you? (I don't know, what do you do when an elephant swallows you?) You run and run until you're all pooped out.' The significance of that story for the sixth-grader is that the sixth-grader understands the double entendre of the joke, whereas a person in the primary grades is more likely to laugh at what he/she considers to be a vulgar expression or to say, "I don't get it."

THE HIGH SCHOOL YEARS

At the senior high school level, that is, ages 13 and up, the main intellectual growth is one of assimilation and accommodation. According to Piaget (1958) and Vygotsky (1962), the biological development has taken place and the organism has the biological structures that are necessary to think like an adult, that is, to think logically, or to think through propositions. Through different subjects, through different environments, through different problem-solving situations created by life and by teachers, a youth *assimilates* these experiences into the formal operations or the mental structures that enable him/her to generalize and combine. Additionally, the quality of those experiences, the energy that is applied to those experiences, and the arrangement of those experiences help him/her to *accommodate,* that is, to alter and to adjust mental structures so that he/she can function in the real world more effectively.

Table 2 summarizes the stages of intellectual development according to Piaget. It is important for us to remember that, according to Piaget and Vygotsky, there is an inexorable biological development across the years of youth, and this intellectual development is characterized by the development of internal structures that underlie all intellectual functioning. These structures have certain self-regulatory principles that do, in fact, regulate the organism's function. That functioning involves both an assimilation of the environment into the general structures (knowledge) and also an accommodation of those structures or schemes to the particulars of the environment. Knowing, or thinking, then, is identified with mental outlines and organizational structures as well as the energy with which the organism operates on the environment to assimilate and accommodate that environment. Therefore, there is both a biological and a dynamic aspect to cognition and to the related application of reading comprehension.

It does indeed make a difference what the school and the teacher do for the child. The school and the teacher can hinder the child's development by asking him/her

Table 2
Piaget's Stages of Development

Stage	Onset	Typical Activities
Sensorimotor	Birth	Perception, recognition, means-end coordination
Preoperational	1-2	Comprehension of functional relaticns, symbolic play
Concrete operational	6-7	Invariant structures of classes, relations, numbers
Formal operational	11-13	Propositional and hypothetical thinking

to engage in unchallenging, rote memory activities that do not call for operating on the environment. Furthermore, the student can be hindered and frustrated by asking him or her to engage in comprehension-thinking that he/she is incapable of doing—incapable because he/she has not yet reached that stage of biological development, or not had sufficient experience with the concepts and the organi zational structures to enable operating on the concepts that are being presented by the environment.

COMPREHENSION DEVELOPMENT

The importance of this discussion related to cognitive development, that is, a stage-like growth toward mature or logical thinking, is that it shows the impor tance of what the teacher and the school can do for the youngster while in middle and secondary school. Not only is there a continuing structural growth in the mind (if you accept the conclusions of Piaget and Vygotsky), but there is also a need for careful attention to the assimilation of information and the accommodation of the mind's sturctures to the world's reality. It is that eventual accommodation of the structures of a person's mind that enables generalizations and observations about life that are not simply feelings, but are in fact true intellectual operations on reality.

One rather obvious implication for what teachers do in helping students com prehend what they read would be an increased emphasis on vocabulary development, but vocabulary development with a difference. It is not enough for a teacher to simply pass out a list of new or technical words with their denotative definitions. The teacher must constantly prod the student to examine other words, though they appear common, to see how these words have changed meanings based on the context. A student does not intuitively search for con notative meanings. He/she wants to hang onto concrete aspects in life and thought developed from past operations. He,she wants to believe that words, like other experiences in life, are fixed. He,she has to be reminded regularly that word meanings are not fixed and that experiences, too, are redefined as the mind develops.

Another major implication for improving comprehension relates to question-asking. Instead of the teacher or the textbook constantly asking the student to respond to questions (thus giving the student the impression that there is a specific answer, and that all the mind need do is memorize, hold, or recall the pertinent information), the student ought to learn how to develop his/her own questions for what he/she reads. Manzo's research (1969) indicates that considerable advantage on traditional comprehension tests might be obtained by changing the technique of questioning in the classroom from teacher-to-student, to student-to-teacher or student-to-student. The responsibility of constructing questions forces the student to engage in formal operations. That student must ask what is generalizable about what he has read, what are the structure or organization of the article, and what are the important aspects of the topic or the story.

In a similar fashion, because the student is now able to think in propositions and because he/she is now able to predict abstractly into the future, that student is in a better position to take responsibility for his/her own learning. Even the motivational value of personal responsibility is worth considering. Thus, a major comprehension aid is to have the student decide in advance what it is that he/she wants to get from a reading selection, or what he/she thinks is important to achieve in a reading selection in order to accomplish his/her goals. By setting up these purposes, for example, through advance questions, and by skimming over the article to pick out certain concepts that seem to be important to identify, students take on a responsibility for their own comprehension as well as outline what it is that they will get from the article. The work of Ausubel (1960), Earle (1971), and others, suggests that an advance self-regulatory activity proves beneficial to the student reader.

In addition to the use of some of the above techniques as well as other problem-solving arrangements that got the student involved in analyzing and using information, asking questions on the part of the teacher must remain an integral part of reading and learning in the classroom. It has too long a tradition and too successful a history to be ignored. What is important, however, is that the teacher understand that the asking of a question over and over again does not help the student learn to answer it I can ask the question about a passage, "What is the main idea? What is the main idea? What is the main idea?" going from student to student to student and stopping only when I get the answer that I think is appropriate. But repeating the same question to different students has in no observable way helped those students who do not answer it correctly to finally achieve the correct answer. So teachers must find ways of explaining or demonstrating to students how their minds must work when they deal with this verbal material. Such explanations allow students to understand how their minds work when they answer specific questions. Until teachers understand the relationship between the question that is asked and the functioning required by their minds on the material in the book, question asking and question answering will do little to improve the comprehension of secondary students.

CONCLUSION

At the secondary level, students have the capacity to engage in what Piaget calls formal operations, that is, to generalize and combine abstractions to form operat-

ing principles. But that is not achieved as an automatic function simply because the capacity exists. There is a difference between the capacity to do something and the understanding and use of that capacity to operate in the real world. It is the teacher's responsibility to help the student see and practice the major mental operations related to the typical questions asked in the classroom. Those major operations are identifying with the subject (association), searching for and selecting information, manipulating information for a purpose, selecting criteria and applying them to make a judgment, and extending or using information in a logical or emotional way.

As trainers of teachers, we must instill in our preservice teachers an awareness of the difference between the mental structures and intellectual functioning of the middle and secondary school students and that of the elementary and the preschool students. Beyond that, we must also help teacher trainees devise the techniques and the pedagogy that will enable them to explain to their secondary students how to think as they read, and thus gain two major benefits in the students—assimilating important content and improving ability to think.

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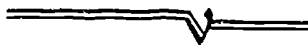
REACTION TO DR. SMITH'S PAPER

GROUP ONE

Rexel Brown

A question I would like to consider is how we are going to teach children to think at Piaget's different levels of cognition. There are some helpful techniques suggested in the literature. Particularly, I think of the structured lessons and study guides developed by Herber (1977).

In his paper Dr. Smith talks about the importance of context. I believe all secondary teachers need to learn how to teach the use of context clues. A convincing method of presenting the importance of context clues is by having teachers complete a cloze passage. By completing such an exercise, they begin to see the importance of encouraging students to think about context along the lines Dr. Smith suggests.

I assume Dr. Smith advocates helping students to pattern levels of thinking either by giving them questions or by leading them step-by-step through problems to appropriate answers. An alternative approach to reach these levels would be to design problems such that students must think at the desired level to complete the problem. Evaluating student responses, however, becomes a very difficult task. The only way to tell if students are thinking on the desired levels is for them to go through introspection, then explain to the teacher exactly how they went about reading and thinking. This is a very difficult activity unless in a one-to-one situation with the student.

Betty Skillman

One of my chief concerns is that if we are interested in changing the behaviors of preservice or inservice teachers, we must model the techniques in our courses. Too often, professors in education courses that I took failed to do this. I have found greater success in my own teaching by first using the prescribed techniques and later teaching the reasons for using them. Students are far more receptive to learning techniques that they have seen used successfully by their own teachers.

Finally, Piaget's developmental levels seem to support the idea that students can do the various types of thinking patterns teachers desire of them. But students often need a mentor or model to help them realize they have these thinking

abilities and to encourage their development. Clearly, teachers can and should provide this model in the classroom.

DISCUSSION

It was noted that a common complaint of secondary teachers is that if elementary teachers were doing their jobs, reading would not have to be taught in high school. Such an argument assumes that higher levels of thinking can be reached by elementary age children. However, according to Piaget, some levels of thinking do not even develop until students are beyond elementary school Piaget's theories can only strengthen the arguments for secondary reading courses. Consequently, Dr. Smith was asked whether other traditional taxonomies, like Bloom s (1956), could realistically be used with elementary children.

Dr. Smith said he did not see any problem in using such taxonomies for all levels of education. What is important is that the response expected by the teacher must be qualitatively different for a primary student than for a secondary student We still can say to the primary child, Did you like what you read?'' We can even help the student understand how to make judgmental responses. But, here the judgmental response has to be in terms of the student's feelings, whether he/she enjoyed the reading. Theoretically, at the first grade level, a child is not able to take external criteria, apply it to what he/she has read, then determine whether the passage was good, valuable, or worthwhile. We can ask teachers about something they have read and expect their answers to be qualitatively different from a first grade child's answer. For example, teachers might give the same response as a first grade child, but qualitatively it would be a lower level response. The same is true of asking for the main idea. For the primary child, the main idea is a category or a title for a story. The adult thinker is able to go beyond the story to express a much broader main idea.

Another participant questioned whether, when children grow into these more abstract levels of thinking, it gets harder for them to see specific ideas in the story Many sixth-, seventh-, and eighth-graders tend to do poorly on the areas of standardized tests that measure facts recalled from the passages read.

Dr. Smith agreed that it is possible that abstraction supersedes specifics How ever, one of the problems of hierarchial taxonomies is that they overlook qualitative changes in thinking. It is erroneous to ask students only lower level questions in primary grades and higher level questions in secondary grades. Taxonomies and stages of development should not be interpreted to mean that norms can be imposed on any age level. A level of thinking expected to appear at age 12 might appear anywhere from age 7 to 16. Teachers must be wary of correlating a strict age level with a developmental level of abstraction.

The comment was made that research by Evanechko and Maguire (1972) showed that both fourth-graders and eighth graders could think at the same level of abstraction. However, it was pointed out that teachers fail to capitalize on these elementary students' abstraction abilities.

Dr. Smith agreed and noted that one of his students several years ago did a study on teacher behavior and found one typical behavior among many. They uniformly assigned a chapter for reading and asked questions afterward. Teachers seldom considered whether students knew *how to* answer the questions. Every student is capable of answering questions on whether he/she liked a passage. What teachers need to do, however, is get students to think about the process of answering a question. Educators need to get away from thinking that emphasizing vocabulary improvement is the only way to achieve higher levels of thinking.

GROUP TWO

Lorraine Gerhart

In one of Emerson's essays, he makes a statement that summarizes my reaction to Dr. Smith's paper:

> Each creature is only a modification of the other, the likeness in them is more than the difference, and their radical law is one and the same. (Emerson, 1876)

I would like to begin by sharing two experiences that are directly related to that cognition discussed by Dr. Smith in his paper. When I was in the sixth grade, the class was rigorously taught, trained, and drilled in English grammar. I can still visualize specific examples of this particular training, but the concepts did not have meaning for me until eleventh grade when my English class was again taught grammar. Obviously, we had never absorbed any of the important con cepts.

In the second example, during high school I became aware of what I thought was a flaw in my thinking ability, an inability to form generalizations. It was very frustrating to sit through an entire class wondering what the teacher was proposing, only to have a classmate supply a generalized statement. When comparing that statement with the examples given by the teacher, I understood the gen eralization.

My problems with English grammar suggest a basic conflict between the theories of Piaget and Bruner. Piaget's theory, for example, points out the change in intellect during adolescent years, while Bruner's theory supports the notion that anyone can be taught anything at any level if it is taught properly. My inability to learn English grammar contradicts Bruner's ideas. As Piaget would indicate, I was not ready intellectually to assimilate what was being taught, since the teaching methods used at both levels were identical.

If one believes that Piaget is correct in saying that a child's mind is substantively different than an adolescent's mind, that person must question readiness for learning and the effectiveness of K 12 spiraling of skills. Is it logical to introduce a thinking-comprehension program K-12? I do not believe so!

A second major consideration to Dr. Smith s paper involves assumptive teaching as defined by Herber (1977). Dr. Smith suggests a premise that teachers con stantly question students but do not teach them about constructing answers. The same premise might be applied to writing. Students are exhorted to write, write,

write, but are given basically no instruction in how to accomplish this task Furthermore, little distinction is made between creative writing as an art form and expository writing for purposes of communication. This same premise is also applicable to language acquisition particularly by middle or secondary school students. Many questions arise if one accepts this premise. If students do not have the necessary knowledge of language structure to communicate thoughts effectively, do educators have a program of language development? Do our traditional English classes accomplish this development? If a student does not have the language to communicate his thoughts, can he think? If he can think, of what benefit is it?

Some practical answers given by Dr. Smith include Ausubel's (1960) advance organizers, Herber's (1977) reasoning guides, and Henry's (1974) spiral concept. These suggestions are valuable tools for the practical aspects of comprehension development.

An illustration of using Henry's spiral concept might be seen in the following example. Heidi, a seventh grader, has a comprehension problem that no one has been able to define. But everyone certainly knows what Heidi cannot do She cannot think logically, organize, classify. Teachers have exhorted Heidi to read for meaning, but she has not improved. Then, the spiraling concept approach was used to develop Heidi's reasoning ability. She had been exposed to classifying many times, but it had never made any sense to her. This time she started with a first-grade workbook, as part of a thinking program, even though her reading level is much higher than first grade. In working through the classifying exercises, Heidi had simple material in which to apprehend the concept The exercises were discussed not only in terms of correct answers but also how to achieve correct answers, as well as to set up classifying problems of her own. Within a week, Heidi had worked with her new understanding and was eager to learn more about reading.

In summary, we as teacher educators must question the need for study skills courses in learning. It is logical that adolescents could benefit from an under-standing of how the intellect is developed. It is logical that they must work through their own thinking process. If students knew of a way to improve their thinking, they would be interested in and motivated by monitoring their own development As Emerson, in *On Self-Reliance* (1876), says:

> There is no history. There is only biography. The attempt to perpetrate, to fix a thought or principle, fails continually. You can only live for yourself, your action is good only whilst it is alive—whilst it is in you. The awkward imitation of it by your child or your disciple is not a repetition of it, it is not the same thing, but another thing. The new individual must work out the whole problem of science, letters and theology for himself, can owe his fathers nothing There is no history; only biography.

Sister Cecella Marie Erpelding

There are four important areas of practical application that may be developed from Dr. Smith's presentation.

1. Readiness. Readiness is necessary at every level. Too often both teachers

and students begin reading before the necessary background information is presented. As teachers, we need to identify and build this necessary background. Rather than assume students can think and reason as adults, we need to think about the background information students need to possess in order to comprehend the particular content.

2. Vocabulary. In the elementary school vocabulary is frequently approached from the idea of one-word-one-meaning. Therefore, secondary school students are often surprised by the multiple meanings that exist for the same word. At the same time, there are many words that occur in several different content areas—same word, same spelling, but different meanings. If the content teacher does not emphasize that word has several meanings, the student tends to use the word in terms of the most common definition that he/she knows. In a school where I was principal, there was a 28% schoolwide reading gain in vocabulary and comprehension. This increase was achieved by stressing words and their multiple meanings in various content areas.

3. Attitude or comprehension problem. There are many students who have great difficulty with reading, but who have high interest in and a good attitude toward reading. It is important that we recognize that those same students might lose their interest if the material becomes overwhelming. An interesting question arises as to whether interest and attitude affect comprehension as much as intelligence does. Often, it seems students are branded as being unable to comprehend when interest or reading attitude is the major part of the problem. Teachers need to take into account the interplay of attitude and comprehension.

4. Questioning techniques. In the 1960's, learning packets were emphasized resulting in little, if any, classroom questioning. Interactions among students and with teachers help students learn how to think. The chance to verbalize reactions is important to the development of thinking. Clearly, such interaction is an important component of learning.

DISCUSSION

Group members discussed the extent to which schools foster and develop students' natural thinking processes. One person made the observation that educators frequently talk as though thinking takes place nowhere except in school. Obviously this is not true. The real issue is whether teachers complement the thinking students are already doing. The gap between the types of thinking students do outside of school and those used in school should be narrowed. The point was raised, however, that schooling may require a totally different type of thinking than used in the home environment. These different requirements must be taken into account.

Many teachers ask, "How are we going to get these students motivated? In view of Dr. Smith's presentation, the group decided this may be the wrong question. Instead, teachers ought to consider, 'What are these students motivated to do? What are they already doing? What do they come to school with? What interests do they have? What are their expectations? What do they want to do, and what do we want them to do? How can they interact? What is important for them to do?

It was suggested that college instructors need to help preservice and inservice teachers understand the concept of reading in its broadest sense Students use reading ' to interact with their universe and to get meaning or make sense out of things. "Reading," by such a definition, includes thinking, writing, questioning, and speaking. Reading print, then, is only one way of "reading."

Another point made was that studies of basic literacy (Cole, 1978) in countries where there is an illiterate population, indicate that reading itself affects the way people think. Reading itself then becomes a type of experience that affects thinking.

The last suggestion was for reconciliation between the ideas of Piaget and Bruner based on psychology of learning and readiness that has grown extensively since the views of those researchers became widely known in the early 1960's. Bruner implies that a teacher is able to teach anything but must do it intellectually and properly. In contrast, Piaget believes there are certain stages of logical development that must be considered when deciding when and if to teach a certain topic. It was suggested, for example, that there may be nothing that prevents the teaching of a story by Dickens to either twelfth graders or 12-year-olds, if the teaching is done intellectually. What Bruner means is teaching *to their intellect*. There is nothing wrong or objectionable about teaching grammar to seventh graders if it is done intellectually and properly, according to their learning styles and according to how ready they are to learn. This focus on learning and readiness may help reconcile the theories of Bruner and Piaget

GROUP THREE

John Bohan

Dr. Smith relates Piaget s cognitive stages to various comprehension stages in reading. His paper raises two questions.

First, what is the reason a student is not at the theoretical stage he should be according to Piaget? Dr. Smith suggested one possible answer The student may be lazy. It is easier to stay at a lower level of abstraction than to move to a higher level. There may be other answers we could explore For example, it might be important to examine the emotional reasons why students have not reached the expected level of abstraction.

Second, if cognition is related to reading comprehension, what can teachers do in reading that will help students to develop cognitively? Because teachers usually talk about reading in terms of main ideas, inferences, supporting details and so on, they often do not pay attention to the cognitive aspects of reading Perhaps teachers ignore these aspects because they are not as familiar with the levels of thinking as educational psychologists are.

It is possible to work directly with cognitive skills in a reading situation It seems, from analyzing IQ tests, that one component involved in cognition is the ability to see relationships. Therefore, one method of developing cognitive skills would be to work with students' ability to see relationships in what they read.

DISCUSSION

Dr Smith pointed out that teachers ought to have students pose their own questions rather than ask their students questions. One participant observed that this technique may seem to students to be a "cop out" on the part of the teacher. To avoid such student attitudes, college instructors need to show teachers ways to present such questioning strategies as legitimate learning activities. Teachers need to understand the value of letting students formulate their own questions and they should learn to pass this value on to students. Another person emphasized that by letting students make up their own questions, teachers are encouraging them to use their oral and written language abilities to manipulate ideas With secondary students, especially in content areas other than English, many teachers do not do enough with speech or writing. If teachers want students to operate on higher cognitive levels, they must help them to speak and write at those levels.

Teachers need to be able to pick out what is really important from reading selections They need to know more about the cognitive abilities of adolescents and they need to examine their own learning and views toward reading and teaching Only with this background, coupled with a good understanding of their content area, can teachers begin to make appropriate instructional decisions. Without this background, teachers may feel all the material in the reading selection is of equal importance—questions at the ends of chapters frequently make it seem so Unless teachers begin to make decisions about what to emphasize and what to de-emphasize, they place an unfair burden on students.

The point was made that much of what Dr. Smith said could also be related to material selection Based on text organization and the type of language and examples used, some materials are better written than others. Teachers can begin to make decisions about choosing a text that presents material in a way that enables students to understand what they read. Another aspect that should be considered is redundancy in text passage. A shorter text is not always easier, sometimes repetition of ideas using different language and examples can be helpful Dr Smith's remarks would suggest that the notion of readability be expanded beyond readability formulas to include other aspects present in the text.

Testing was the final issue discussed by the group. It was noted that neither standardized tests nor teacher-made tests can always give students credit for their cognitive processing That is, questions are marked wrong if students do not produce the exact answer expected by the teacher or standardized test designer. Secondary students, because they are exposed to several different teachers in a single day, must determine the response expected by each teacher. Frequently it becomes easier for the students just to memorize expected answers than to examine and think about a selection.

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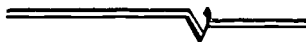
QUESTIONS AND ADVANCE ORGANIZERS AS ADJUNCT AIDS: IMPLICATIONS FOR READING INSTRUCTION IN SECONDARY SCHOOLS

Richard T. Vacca

> It seems that educators have accepted the notion that there must be a long lag between the formulation of theory and basic research, and the applications of that theory or research with students in classrooms. Such acceptance is manifest in the disdain of some theorists for teachers who "want recipes," and in the disdain of some teachers for theorists who "aren't practical." (Cunningham & Foster, 1978, p. 368)

As a translator of the body of research on questions and advance organizers, my purpose in this paper is straightforward enough. to help in some small way to reduce the lag between the research in these two important areas of prose learning and applications to secondary school classroom situations. The role of a research translator, Cunningham and Foster (1978) suggest, is to "explain the theory, model or research in terms the reading professor, director, supervisor or teacher can understand" (p. 369). It is really a matter of getting to the nub of the bone—of synthesizing seemingly broad areas of research activity so that connections, where appropriate, can be made to classroom practice.

This paper, then, will highlight the theory and research on adjunct questioning and advance organizers, to show how basic research has affected applied research in reading in content areas, and, lastly, to link the implications of prose learning research to promising classroom practices in secondary schools.

COGNITIVE AND BEHAVIORISTIC INFLUENCES

During the past 15 years instructional psychology has come into its own as a discipline probably because it has taken a giant step forward on the road to understanding how readers learn from written discourse. Two instructional psychologists in particular—Ausubel and Rothkopf—have contributed explanations of learning that have paved the way to substantial research on the processing activities of readers in prose learning situations. Oddly enough, Ausubel and Rothkopf approach the problem of learning from text from different psychological persuasions.

Ausubel (1963, 1968), for example, has advanced a cognitivist s view of mean ingful learning in which the reader (or listener) encounters an idea and relates it in a sensible fashion to ideas that he or she already possesses. Rothkopf (1963, 1965, 1970), on the other hand, has forwarded a behaviorist's view of mathemagenic activities in which the reader largely determines what stimuli will be nominal or effective. Therefore, the reader who encounters effective stimulation such as questions inserted in text will probably process the text information more thoroughly in order to be able to answer succeeding questions.

The theoretical musings of Ausubel and Rothkopf have resulted in the develop ment of two basic research paradigms that have pervaded experimental activity in learning from text. Each of these paradigms involves the manipulation of adjuncts to the prose material to be learned. The common denominator in both Ausubel s *advance organizer* paradigm and in Rothkopf's *adjunct questions* paradigm is that emphasis has been on *what the reader does* during learning. Faw and Waller (1976) assert that this experimental emphasis has led to a simple" methodology in the study of prose learning. ' Manipulate the students' activities during acquisition, . . . and observe what effects these variations have on learning and retention" (p. 692).

In what I believe is a significant attempt to reconcile the use of any form of verbal stimulation, whether it be organizing statements, questions, directions, objectiv es, or the like, Frase (1971) has proposed a heuristic model for prose learning research. In this model, he has delineated the role of *adjunct aids* to account for the utility of any class of verbal stimuli that disposes the reader to respond actively to certain aspects of text. If the reader, Frase contended, could be made to respond in certain ways to appropriate cues in a text, then learning could be brought under control.

Within the past 15 years, cognitive and behavioral educational researchers have run amuck with empirical frenzy attempting to verify or extend Ausubel's Theory of Meaningful Learning and Rothkopf's Concept of Mathemagenic Activities. At least 200 pieces of reported research have examined the effects of advance organizers, its many variations, and adjunct questions. Anderson and Biddle (1975) are quick to point out that knowledge about adjunct aids has obvious implications for what happens in the classroom. Furthermore they state that the research provides a valuable perspective on natural language understanding and human information processing. Researchers have approached the problem of prose learning from both behavioral and cognitive psychological accounts. Insights into the processing activities of readers, derived from various research on prose learning have influenced and will continue to influence methodological issues in secondary school reading instruction. So at this point, allow me to highlight some insights from the literature.

ADJUNCT QUESTIONING

Anderson and Biddle (1975), Rothkopf (1972) and Frase (1972, 1977), have contributed extensive integrated reviews of the research on adjunct questioning. An explanation will be given of the experimental paradigm, its theoretical under pinnings and some major insights associated with the research.

Rothkopf (1966) developed a prose learning research paradigm which consists of interspersing questions in a text selection contiguous to the material to which they relate. One or two questions may be positioned *before* a one- or two-page segment of text (pre-questions) or *after* the text segment (post-questions). The questions and the text segments are usually on separate sheets of paper. During the reading of the selection, subjects are not permitted to turn back to a page once it has been processed nor can they take notes while reading. Upon reading the selection, which may range from 1000 to 5000 words, the experimental readers are tested on the amount of questioned (intentional or direct) and nonquestioned (incidental or indirect) text material that they have retained.

The results of this type of experiment have been fairly predictable across studies. The pre-question group retains just about the same amount of material directly questioned as the post-question group. Moreover, both pre-questioning and post questioning yields greater retention of questioned material than a reading only control condition. Rothkopf (1966, 1972) has labeled this phenomena the "direct instructive effect" of questions. The most important phenomena as sociated with adjunct question research, however, is that a postquestion group produces greater recall of material not actually questioned than a pre-question group or a reading only group. This has been defined as the indirect instructive effect" and its explanation forms the basis of Rothkopf s Concept of Mathemagenic Activities.

Rothkopf (1970) defines mathemagenic (i.e., the birth of learning) activities as those student activities that are relevant to achieving specified instructional objectives in specified situations or places. Accordingly, under appropriate conditions, adjunct questions can have a controlling" or shaping' effect on the study activities of students that leads to general learning from text situations. As Rothkopf (1972) explains:

> The shaping through test-like events (questions) is thought to work in the following way. Subjects engage in a variety of activities while studying dis course. The consequence of some of these activities is to translate nominal stimuli of the instructional material into effective stimuli. The nature of the effective stimuli determines the substantive learning that results from expo sure to the text. Suppose a question is asked of the subject and he is able to answer it adequately. This would be a reinforcing event for the pattern of study activity (mathemagenic activity) that has preceded it and would tend to maintain the pattern of mathemagenic activities during subsequent study. If, on the other hand, the subject fails to answer the question, this would be like an extinction event for all (or some) of the mathemagenic activities that preceded that test failure. (p. 324)

Thus the implication of the mathemagenic hypothesis is that the reader s study activities will tend to adapt themselves to the questions asked.

Certainly, then, the type or nature of the question asked in a prose learning situation is of crucial concern. The earlier research, distinctly behavioristic in design, employed strictly factual, verbatim level adjunct questions that involved single-level cognitive processing. More recent research, however, reflects obvi ous cognitive influences. In these studies, researchers are concerned about ing higher order questions. They seek to vary the conceptual level of the

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adjunct aids in order to examine the precise nature of the multi processing activities of readers. Anderson and Biddle (1975) assert:

> Of practical interest is the fact that adjunct questions can do more than increase the accuracy with which people are able to repeat strings of words. Of both theoretical and practical interest is the indication that adjunct questions which entail paraphrase and application of principles and concepts to new situations may be especially facilitative, particularly when the criterion test makes similar demands. (p. 103)

Two recent studies illustrate Anderson and Biddle's contention. Rickards and DiVesta (1974) predicted that meaningful learning post-questions would facilitate retention more than rote learning post questions. The investigators also predicted that the frequency of the questions would be directly related to performance.

The subjects were 80 college sophomores who were given an 800-word prose passage to read. The passage consisted of eight text segments. Four types of experimental questions were constructed for each of the eight related paragraphs:

1. Rote-learning-of-facts questions,
2. Rote-learning-of-ideas questions,
3. Meaningful-learning questions, and
4. Task-irrelevant questions.

Each subject responded to one of the four types of questions. The frequency of the questions varied such that half of the subjects received one question after every two paragraphs of the text, while the other half received two questions after every four paragraphs of text.

When questions occurred more frequently, meaningful-learning questions resulted in recall of relevant and incidental information that was equal to or greater than rote-learning-of-ideas or task-irrelevant questions. Only meaningful-learning questions were adversely affected by less frequent pacing. In order to be effective, meaningful-learning questions must be spaced relatively close together, so as to minimize cognitive strain. The findings also suggest that meaningful learning questions induce processing behaviors that favorably influence the recall of both relevant and incidental material. Rickards and DiVesta concluded that since meaningful learning questions contribute to the acquisition of ideas as well as facts, the material is then learned in an organized manner.

In another study, Rickards (1976) investigated the 'position effect' of adjunct questions, which demanded deeper and more extensive text processing. Rickards theorized that conceptual pre questions would force the reader to interrelate text statements in the course of deriving generalizations from whole paragraphs of material. The same question placed in a post-reading position, however, may not have the same effect, since performance here would be largely dependent on what could be remembered and so would be subject to interference and other factors affecting memory.

Seventy-five college students read an 800-word passage which described a fictitious African nation called Mala. Conceptual or verbatim questions were placed either before or after the associated text segments. In addition, a control group received inserted questions drawn from common knowledge (totally unrelated to the passage). All learners were given a total of eight inserted questions and were tested both immediately after reading the passage and one week later. They were not allowed to take notes or to turn back to a page and reread. Thirty seconds were given to read each text segment and 10 seconds to read each accompanying question. Immediately after reading the passage and the questions, the learners were given a test that required them to recall as much as they could about the material. One week later the same learners returned and were asked to recall as much as they could about Mala. After the delayed free-recall test, the learners were asked to take a completion test over the same material. A 2 X 2 X 2 analysis of variance was conducted on the results obtained from the tests.

In general, conceptual pre-questions produced higher recall than conceptual post-questions, and verbatim pre-questions yielded less recall than verbatim post-questions. While verbatim post questions and conceptual pre questions were superior to control questions on the immediate recall test, only conceptual pre-questions exceeded the control questions on delayed recall. Correlational and clustering analysis support the view that conceptual pre questions produce more highly structured and organized memories than verbatim questions. Rickards concluded that by inducing readers to derive a relevant schema for the passage information, conceptual pre questions apparently resulted in topically related material becoming interrelated and organized around a superordinate structure of concepts and ideas, thereby aiding long term retention of passage information.

These research studies suggest that at least three characteristics of questions appear to have facilitative effects on text learning. (1) the position of the adjunct question in text, (2) the contiguity of questions to related content, and (3) the type of question asked. Rickards research implies that question type may be the determining factor in deciding the position of adjunct questions in text and the frequency in which they are asked. Implicit in Rickards work, also, is the notion that a pre-question that is conceptual in nature may assume the properties of an advance organizer.

With this point established, it is appropriate to highlight the research paradigm associated with advance organizers and then to discuss its theoretical base.

ADVANCE ORGANIZERS

For two decades experimenters have studied extensively the use of advance organizers as an aid to learning and retaining concepts (Baker, 1977, Barnes & Clawson, 1975). The research activity in this area of prose learning is based on Ausubel's belief that an individual's wealth of knowledge is organized hierarchically in terms of highly generalized concepts, less inclusive concepts and specific facts. Ausubel (1963, 1968) has theorized that advance organizers appear to maximize the cognitive readiness of learners prior to a new and unfamiliar task.

He maintains that cognitive structure organization, stability and clarity is a major factor in meaningful learning. Learning is facilitated to the degree that previous knowledge is clear, stable and organized.

To test this theory, Ausubel (1960) first established a basic research paradigm that incorporated the use of preparatory paragraphs that he labeled advance organizers." He predicted that learning and retention of "unfamiliar but meaning ful material" is enhanced "by the advance introduction of relevant subsuming concepts" (1960, p. 267). His experimental design thus involved the introduction of a 500-word passage (the advance organizer) written at "a higher level of inclusiveness, generality and abstraction" which the experimental group of col lege students read *prior* to reading a text selection (2500 words) on the metallur gical properties of steel. The control group, on the other hand, read an unrelated 500 word passage on the historical evolution of methods for processing iron and steel prior to reading the experimental selection. Three days later, the subjects were administered a 36-item multiple-choice test on the passage material. The advance organizer group performed significantly better than the control condi tion. As a result of the experiment, Ausubel (1960) proffered two reasons for the facilitative effects of advance organizers in general:

> First, they explicitly draw upon and mobilize whatever subsuming concepts
> are already established in the learner's cognitive structure and make them a
> part of the subsuming entity. Second, advance organizers at an appropriate
> level of inclusiveness provide optimal anchorage. (p. 270)

What Ausubel says to the practical educator, then, is this. Advance organizers, if constructed and used properly, will enhance learning and aid retention because they tend to clarify and organize a learner s cognitive structure prior to a learning task. Advance organizers presumably contain the necessary relevant subsum ing concepts" which enable the learner to fit and anchor new meaning into previous knowledge.

An advance organizer, therefore, is defined by Ausubel (1968) as preparatory paragraphs which provide:

> . . . relevant ideational scaffolding, enhance the discriminability of new learn
> ing material from previously learned related ideas, and otherwise effect
> integrative reconciliation at a level of abstraction, generality, and inclusive
> ness which is much higher than the learning material itself. To be maximally
> effective they must be formulated in terms of language, concepts, proposi
> tions already familiar to the learner, and use appropriate illustrations and
> analogies. (p. 214)

The heart of Ausubel's theory, then, asserts that meaningful learning demands *potentially meaningful* material and a meaningful learning set on the part of the individual. Accordingly, Ausubel states that for new material to have potential meaningfulness it must be *logically meaningful* and the learner must have, available in cognitive structure, ideas relevant to the new material. New material is logically meaningful if it can be related to one s prior knowledge in a substan tive" and nonarbitrary" manner. An idea, for example, has *substantive reliability* if it can be paraphrased by the learner in synonymous language. *Nonarbitrary relatability*, moreover, suggests that the relation ship between the new material to be learned and relevant ideas in cognitive structure are nonrandom.

The majority of experiments since Ausubel s investigative work has been non supportive of meaningful learning theory. One of the major limitations, however, has been the lack of a commonly agreed upon operational definition that permits replication. Baker (1977) reports that more than 20 different forms of advance organizers have been investigated. My feeling is that a certain degree of empirical frenzy, perhaps mindlessness, has characterized the research enterprise since Ausubel's initial work. A 'let's see if it works" syndrome appears to have dominated at least some of the research. Baker (1977) suggests future research may benefit from a careful analysis of Ausubel s theoretical base, rather than on his specific treatment—the advance organizer.

Rickards (1977) probably sums up best the present status of Ausubel s theory of meaningful learning:

> Perhaps, the best candidate for a cognitive constructivist theory of instruction is Ausubel's (1968) assimilation (meaningful learning) theory, but the vagueness and ambiguity of his terms would have to be eliminated, if success with this theory were ever to be achieved. (p. 50)

IMPLICATIONS FOR AND APPLICATIONS TO READING INSTRUCTION IN SECONDARY SCHOOLS

Since the 1960s, learning from prose has been studied from at least two major investigative perspectives—adjunct questions and advance organizers. As I have stated elsewhere (Vacca, 1977), Insights have emerged, promising instructional procedures have been introduced into the literature (p. 388). Before the implications of basic research efforts, such as those I have described above, filter directly into classrooms, there is the obligation on the part of educators to test, under ngorous and controlled conditions, teaching/learning strategies that are "true" to both the integrity of the basic research and the reality of the classroom. Baker's (1977) feedback loop illustrates the chain of activity involved in prose learning research. The loop begins with a consideration of theory and leads ultimately to classroom practice. (See Figure 1)

Research in reading in content areas, particularly the ten year ongoing enterprise that has taken place at Syracuse University (Vacca & Herber, 1977), began with a set of teaching/learning procedures that evolved out of prose learning theory, and research and educational practice. From a series of mini-studies, short-term investigations (Herber & Sanders, 1969), burgeoned more than 20 doctoral dissertations (Herber & Barron, 1973, Herber & Vacca, 1977). These efforts represent a consistent, ongoing, concentrated study of functional reading in the content areas in secondary schools.
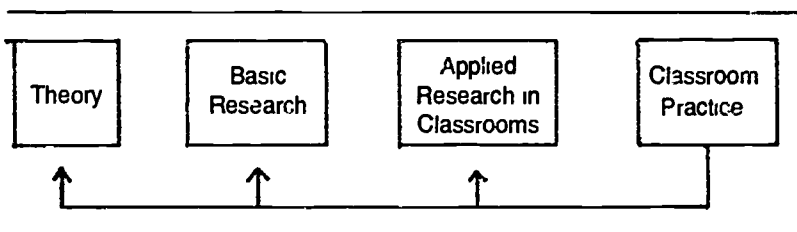

Figure 1. The progression of theory to practice.

This applied research effort has contributed to an understanding of innovative strategies for text instruction. In particular, the appropriate use of structured overviews (graphic organizers) and adjunct materials for reading guidance within the structure of planned lessons has supported the contention that it is necessary to equip students with a set for learning and a sense of the relevant aspects of a text passage.

Among the techniques deduced from the research on cognitive readiness is the structured overview. The structured overview facilitates a learning set by providing a visual diagram of the key vocabulary of a learning task. As such, the structured overview is a preparatory activity that has its roots in Ausubel's theory of meaningful learning. In a sense the structured overview provides a visual map, a vocabulary network, that permits students to see the concepts in an overall unit or a specific text passage in relation to what they know already.

Learning from text guidance is facilitated through the development of reading guides—adjunct materials that are developed to focus attention on relevant aspects of text material and to arouse active response in readers. Herber and Nelson (1975) suggest the use of a reading guide as an adjunct aid that provides simulation as well as stimulation. Students are presented a set of phrases or statements (adjunct material) which reflects the important aspects of the text material) as possible answers to be verified through reading. They discuss their responses in small and/or whole groups. In this way, Herber and Nelson maintain that students go through a simulation process.

Experiences of this type give students a feeling for processes that are part of reading comprehension. The principle operating in this guidance procedure is that it is easier to recognize information and ideas than it is to produce them. Herber and Nelson thus believe that by developing materials for simulation, content area teachers can establish an instructional sequence that moves students along a continuum of independence in which:

1. The teacher prepares statements for students reactions with reference as to page, column or paragraph.

2. The teacher prepares statements for students reactions with no reference as to page, column or paragraph.

3. The teacher prepares questions for students to answer with references added.

4. The teacher prepares questions for students to answer with no references.

5. Students survey the material, raise their own questions and answer them.

6. Students produce statements or meanings, concepts and ideas as they read.

CONCLUSION

Since the 1960s prose learning theory and research concerned with adjunct questions and advance organizers have introduced a number of insights related

to reading comprehension. Implications from the theory and research have resulted in applied research in classrooms as exemplified by the Syracuse University enterprise. These efforts have deduced a number of teaching/learning procedures that offer promising options to content area teachers in middle and secondary schools. Through the continuous reciprocity, then, that exists among theoretical constructs, basic research, applied research and educational practice, secondary school teachers are in a position to increase their instructional repertoires and to approach learning from written discourse from a broad, intellectual framework.

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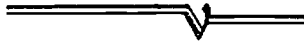
REACTION TO DR. VACCA'S PAPER

GROUP ONE

Phillp Rothman

Three questions in reaction to Dr. Vacca's paper on questions and advance organizers are: Is this approach new? Is it significant? Is it useful?

The paper seemed to treat advance organizers as being a new phenomenon. However, this is not true. In point of fact, the McGuffy Readers begin each relatively short reading selection with some preorganizers, including a list of vocabulary and some suggestions for reading. Therefore, advance organizers are not new.

However, by looking at organizers and seeing if we can somehow make them more effective, we can place them into a theoretical framework and that is certainly a worthwhile effort.

This ties into the question of significance. Perhaps this area is significant because of all the attention that has been paid to it. Dr. Vacca points out that in the last 10 years or so over 200 research articles have dealt with the use of organizers; that might indicate some importance. However, such a conclusion is suspect. Organizers seem to be one of those perfect areas of research for educational psychologists. For instance, psychologists often use their students as subjects, giving them a section to read. During this they give a pre- and post-test. Then, they give some organizers and do another pre- and post-test. As a result, they have a great article to be published. Hence, this area is one of those that fits easily into the life-style of educational psychologists, thus it generates a great deal of research. Most of the research, as pointed out in the paper, is relatively mindless. So, quantity is not the measure of significance. Rather, the measure of significance is whether there is development of a potent theory. The work of Ausubel and Rothkopf does promise some potency.

Last is the question of usefulness. The real test here is in terms of classroom use. First, can the secondary teachers of content areas use this information to make sure their students understand and remember their lessons? Yes. We can suggest some techniques that teachers can use to make learning more effective and efficient. Second, can we use this in helping our students

learn to read? This question has not been answered, however. What must be considered is not *giving* students organizers, but teaching them to use organizers that are present in the material. Students must learn to read on their own, because teachers will not always be there to prepare them. Teachers must, then, help students learn to use the organizers that are available in the material.

A final point is that once researchers establish the most effective ways to use pre-organizers and follow-ups, publishers can improve their textbooks accordingly. Indeed, such an improvement could be the most significant step taken toward helping students to learn to read.

Sister Karen Craig

I have only a few questions of Dr. Vacca. First of all, is this an ongoing process? After practice, can the length of the text selection be expanded between the organizers? As the children mature in this process, should they not be able to go further and further without organizers interspersed? Has this line of research not yet been attempted? The answers are not evident in his paper.

Also, a questionable assumption is made in the research. It is assumed that the student is internally motivated to answer these questions—or to do some bookthinking. But does this motivation actually exist in the child? If not, then the organizers will not serve their purpose as an aid to learning.

Evelyn Slavik

In his presentation, Dr. Vacca mentioned adjunct questions. I have a particu lar observation. Adjunct questions are supposed to be on a separate piece of paper, contiguous to the material to which they refer. What does a teacher do when giving this material to students to read? Does he or she tell the students to take out a pencil and put a Roman numeral one at the end of paragraph four on page two and then put Roman numeral two at the end of the third paragraph on page five? When they come to the first Roman numeral, then, do they take out the separate piece of paper and answer the questions that pertain to the Roman numeral? This sounds a little ridiculous. However, if the students are supposed to answer the questions silently, won t many students just ignore the questions and continue reading? If written an swers are required though, it has been my experience that if there is any thing students are loath to do it is to write answers to questions on some thing they have just read.

Another question I would like to ask is what is wrong with the "Let's see if it works" theory that Dr. Vacca mentioned? For instance, the point of an article that I recently read is that it is not possible to measure educational research experiments statistically. The author's conclusion was that all educational ex periments are successful when the researcher is enthusiastic, and results should not be analyzed with just statistics. This suggests that a "let's see" approach may be as effective as any other one.

Dr. Vacca .

Part of the meaningful learning theory of Ausubel was that a "set" does two things. (a) it provides a warm-up for the actual material, much like basketball players warming up before a game, and (b) it provides a "learning to learn" kind of set. Some very recent research has shown that students create their own organizers as they read, and that is what mature, sophisticated readers do. Mature readers constantly set up questions, probably at a subconscious level, that are answered as reading progresses.

In response to Sister Karen's question, Frase (1977) suggests that any kind of adjunct aid, whether a question or an advance organizer, can do several things. It can help prompt, but it can also be used as a training technique. That is, when the organizers are taken away, the desired study behavior has been internalized. In the applied research taking place, experimente have looked at ways that a teacher can move from guidance to nonguidance.

DISCUSSION

In addition to being a research focus, advance organizers have been put into use by teachers, including some of the members of this group. For example, one teacher has used organizers to the extent that students in her classes have been required to develop organizers. Using advance organizers improved her students abilities to discern the main topic, the subtopic, etc., which is in itself a high level ability. However, she emphasized, an assumption was being made that the teacher is going to be able to provide the organizer and that is not a valid assumption in many cases.

Researchers differ in their opinions about where to place organizers in the text. Should they be interspersed throughout, should they be put at the end, after each paragraph? What does the research state? Frase, who orginally did his work with telephone operators, suggested that a teacher put organizers at the end of a passage. Spache stated that it does not matter where you put them because he believes learning is not a sequential process.

Ausubel (1968) wanted organizers to come before the passage, to be highly complex and above the level of reading, so that the student would do in-depth thinking before reading the passage. Rothkopf (1972) said that they should be interspersed after about every 500 words throughout the passage. Therefore, research has shown advance organizers to be effective in various places. However, effectiveness often depends on the question. Rickards (1977) found that a concept question should come before the passage for the best benefit, while a factual question produced better results when placed after a passage In one group member s view, interspersed questions are better for meaningful learning.

Another participant stressed that advance organizers obviously are based on the concept of "set" and to have a set" it must come prior to the passage. Even interspersed questions are often placed pnor to the paragraphs to which they refer.

Yet another participant stated that the question itself, if it is worded properly and

placed properly, will be a review of what has just been read and a preview of what is to come. Interspersed questions can serve both pruposes at once.

A question was put to the group as to whether what they had been discussing is content, mind-sets, or skill oriented.

Rothman suggested that the discussion is about teaching by content teachers who are concerned that their students learn the material. Therefore, they may use this material as a mind-set for the content. He agreed with Dr. Vacca's suggestion that by doing this teachers help their students create organizers for themselves—and in the long run they develop skills as well. Rothman noted that the average content teacher is primarily concerned with teaching the content.

Mangrum supported this by stating that often more than one mind set is present. Even if the content area teacher is interested only in the content set, subliminally he/she is going to reach a skill set as well.

Sister Karen then asked, does the cognitive development of the students affect the types of questions they are able to handle? She could see how posing questions above the level of the students could easily discourage instead of motivate them.

Mangrum agreed that cognitive development often is not taken into account. The strategies that students need to answer the various kinds of questions is not taken into account at all by advance organizers.

A participant countered that statement by recalling the purpose of a three level study guide. By handling the text of those three levels of thinking, a teacher can work with a student who is proficient at the literal level to help him/her answer the higher-level interpretative questions. She thought the three-level guide is effective in its attempt to reach individual differences of students.

Mangrum asked whether SQ3R satisfies all the requirements of advance organizers. He questioned whether advance organizers are actually something new or just old wine in new bottles. He suggested that SQ3R and other study systems are actually more effective than advance organizers. He queried how independent the student will become if he/she is taught to survey, to generate his/her own questions—at the beginning, the end, or interspersed.

A participant countered by stating that advance organizers are a little more in-depth than a study technique like SQ3R.

Mangrum accepted that point. In addition, one of the things that organizers provide for a passage is a certain structure added through the connecting lines between the important points. However, just a series of questions might not add this structure to the passage. Another advantage of advance organizers is that they are visual stimuli, and teachers usually tend to deal with systems that are highly auditory. He emphasized that teachers need to make comprehension more of a visual process in an effort to ensure that students bring a visual memory or impression to what is being read.

GROUP TWO

Richard Graudin

Many things in Dr. Vacca's paper helped us verify as well as clarify the procedures one can use in a classroom when teaching content material. Basically, the scheme designed here is similar to many current methods used in elementary schools, including providing background information prior to reading experiences and setting purposes or goals for reading. From Dr. Vacca's paper, I learned techniques to use with children in terms of structuring the concept and developing the vocabulary as necessary. Dr. Vacca's concept of advance organizers is very adaptable to the content areas.

When you read Dr. Vacca's paper, you should note that he did not provide advance organizers. This fact brings up the old question of whether we should practice what we preach. We should devise strategies in the secondary reading preservice progra. .s in which we use in our instruction the techniques that the preservice teachers are told to use.

A possible fault lies in Dr. Vacca's research sample. It seems that he used mostly college students in his applied research. This raises the question of where applied classroom research might best be applied. Research questions that evolve from Dr. Vacca's investigation include not only the level of adjunct questioning (in terms of critical and creative understanding), but also the frequency of adjunct questions to enhance comprehension. So, if nothing else, areas have been identified where applied research might be used.

Mary Lorton

Dr. Vacca has done many positive things with an area of research characterized by nebulous attributes. First, he has taken some of the things Ausubel clouded over with his language and put them in a framework that is more basic and lends itself to the whole notion of applied classroom research. He has added his own aspects to this research, as well as drawn from the instructional framework of Herber (1977). He has also managed to collapse the various schema theories into one application that has much potential, especially for secondary reading.

However, one thing that seems to be missing from advance organizers is an allowance for convergent, or creative, thinking. In Dr. Vacca's approach, there are a number of possibilities from which students are to select a certain solution. However, not much reinforcement is provided for divergent (creative) thinking. What does this do for the student besides give a framework for reacting to the material in a sequential way? I believe that a component should be added to his method wherein the combination of convergent and divergent thinking are encouraged, resulting in more creative thinking and independent learning. It seems that by using Dr. Vacca s method the readers are somewhat restricted in using their own background experiences in the reading process.

DISCUSSION

One participant asked .n which content areas will divergent questions best enhance comprehension. It was decided by the group that history or theology is

the most applicable. Divergent questions can also apply to many areas of politics The ability of students to critically think about political statements or unctuous writing is another application of these types of questions.

I see asking divergent questions as a real problem in teacher education, Dr Vacca said. My approach is to present techniques of teaching, then present the theory. But I cannot neglect to deal with the theory. In our zeal to get teachers to use different techniques, we forget that those techniques have a theoretical base Teachers who can assimilate these theories are able to adapt and create their own techniques.

A participant asked Dr. Vacca whether a legitimate outgrowth of this method is to ask students to write their own problems and short stories and present their writing to other students. Then, the students could seek solutions from each other to problems they could not solve themselves.

Dr. Vacca commented that the method sounds legitimate, because writing has proven to increase thinking and reading ability.

Dr. Vacca said one way he has used to get students to write, read, and think divergently is, after reading a story about pygmies, to have students discuss the difference between how the pygmy might stalk an elephant in a stone-age setting versus how the pygmy stalks an elephant in a modern setting. By doing this exercise the students must deal with concepts beyond those given in the textbook. Unfortunately, my students' cognitive structures were such that they were not able to deal in the abstract. They were still looking for details about the pygmies rather than for abstract concepts. For example, when I suggested the pygmy was a coward they could not deal with it.

If we can help them to mold what they know into a schema prior to the reading and deal with their misconceptions, then we can build the readiness and the back ground needed for effective comprehension. By doing this, we can organize the student s approach to a reading passage. This is why it is so important that we deal with what Ausubel calls knowledge of the world.

The discussion continued when Dr. Vacca was asked how his theory might apply to areas such as chemistry or mathematics.

Research I am familiar with has gone mostly into the social sciences, the hard sciences, and literature, he replied. There has been very little reading research done with mathematics. I think the reason is that many reading people are not mathematically trained and are apprehensive of the context of math. However, one recent study was Earle s (1970) doctoral dissertation on the use of structural overviews in mathematics, which is in the first and second reports of *Research in Reading in Content Areas* (Herber & Sanders, 1969, Herber & Barron, 1973) He found structured overviews helped students to find the relationship among mathematical terms. Understanding terms is an important prerequisite for un derstanding mathematical concepts.

A monumental problem of math educators was suggested by yet another partici

pant. She recalled that one publisher of basal series of high school math texts advertised that their text had most of the reading removed. She suggested it is a content area in which much reading research needs to be done.

Dr. Vacca emphasized that reading in the secondary school has created an even greater gap between reading teachers and content teachers. In talking to both groups, the reading teachers recount an "us against them" sensibility. The content teachers, on the other hand, do not even acknowledge that reading teachers can help them. But to get back to reading and math, Riley's (1976) doctoral dissertation also revealed how to effectively facilitate the reading of word problems in math through the use of guide material such as structured overviews.

Dr. Vacca noted that having teachers, rather than publishers, create structured overviews, teachers will better understand how the information is organized. They can then control the process of comprehension in their students. Even though each will see different aspects of the material as being important, the common denominator sought is for the teacher to create a hierarchial ordering of the ideas in the material. If the teacher believes in his/her overview and gets the students involved in this hierarchy, it will have a facilitative effect for the student.

Moreover, Dr. Vacca stressed that the overview should mirror the author's writing and the coding of his thoughts. With an older group, cognitive structures may be stable enough that they would not need mobilization and subsuming concepts. However, eighth or ninth graders may need to deal with these concepts.

Someone asked when the best time is to use cognitive organizers, before, during, or after reading.

Dr. Vacca noted that research has supported their use at any time. There is no conclusive pattern to this research, however, because it deals with empirical questions rather than theoretical questions. All of the things suggested here make tremendous sense. He said, he did not know, however, if this kind of research will ever be stastically verified. When one can observe the dynamics of a classroom, all kinds of natural observations emerge to answer these theoretical questions in support of a teacher developing his/her own structured overviews. Dr. Vacca recalled that for a final exam in his course, he gives a random list of terms. He then asks his students to rearrange these terms into a structured overview. Even though he gets a variety of answers, each person has a logical explanation that evolves from his/her schema of what he/she has learned.

GROUP THREE

Robert Lucking

I think Dr. Vacca has clearly defined that we must do certain things to expedite learning through prose. It seems to me he has outlined clearly all that might be involved in prereading, in addition he gave strategies as examples. He also alluded to what might be done in a post reading situation. Unfortunately, I think most content teachers have emphasized all of their instruction only at the post reading level. Thus, he presented a number of ideas to us and we need to put them into perspective to help content teachers understand them. Using struc

tured overview is one option, providing cognitive organizers is another option, to help students comprehend better. Rothkopf, for example, supported these options with his work in the Bell Laboratories in an isolated situation. Although this was a somewhat ideal environment for pure theoretical research, much has been done in terms of the classroom.

It is dangerous for us to be too prescriptive in terms of what we recommend for different academic areas or situations. For instance, a strategy applicable to an English lesson may not be applicable to a chemistry lesson. Perhaps cognitive maps have greater validity in one setting than another. I hope our ongoing applied research deals with this question of validity.

One important point I would like to interject is that high school students seldom realize that structured overviews are already provided in their textbooks through the subtitles, etc. What I try to do is get students to realize this and thus become more independent in using overviews for themselves. I teach this by pointing out to them that subtitles, etc., can be used as an external outline of what the author is trying to convey. As a result, the students understand their reading better.

Lee Ann Rinsky

I might add that research has been done by Spache in the elementary and middle school grades that has shown any kind of organizer can actually interfere with reading. I agree with Spache that organizers might interfere if students do not know how to use them. I have found that organizers frequently are motivational in nature and while they often pertain to the selection, they do so in a rather ambiguous way. This ambiguity is something that teachers must understand before they can show the students how to use organizers. Teachers cannot just *tell* their students to use organizers, they must have their students apply them in their reading.

Robert Barr

I have only two questions I want to ask of the group. The first is simple but I doubt that anyone can answer it. How many of you emerged from your college training as a secondary teacher? How many of you have taught in public schools? I am sure that most of you in the process of your training were more teachers of content rather than teachers of reading. Secondary teachers are not convinced that they should be teaching reading.

DISCUSSION

A participant recounted her use of Dr. Vacca's techniques. When she had used structured overviews, she found those that were most successful were not the ones that had simply the direct lines showing a diagramatic flow of information. Rather, the successful ones were those that related the overview to the content. For example, teaching a story with a house in it, she suggested that one could put the overview in the form of a house and refer to the window or door to have the students remember the overview. She stressed that this technique is more motivational and interesting.

Another participant tried to analyze the deeper implications of Dr. Vacca's theory.

He emphasized the whole process of giving the students an organizer, such as a quick summary at a fairly abstract level of what the chapter was about, provided the students with more stuff to deal with in their reading. He stressed that the student s experience with the concepts about which they were reading is often more important than the print on the page. Thus, students read and rely more on the ideas in their experiences rather than attending to each individual letter or string of words. However, he mentioned that he had problems teaching the use of organizers to his students. One problem involves teaching teache s how to use organizers while another pertains to teaching students how to u, e them. With teachers, he found the best way to teach them how to use organizers is to have them analyze their textbooks. Because a reader has to analyze what is important in the text, they as teachers also have to make decisions as to what is important. He saw the role of content teachers in teaching reading as helping the student decide which concepts are really important and which are not. However, many teachers seem to want their students to know everything rather than being selective. The best way to get content teachers to use organizers is to make a strong case for relevance through the goals of the individual. However, when a teacher starts doing this he, she must be careful of confluent education. A teacher should understand and relate material to what the students already believe.

He recalled the first couple of courses in which he taught structured overviews, as though they were panaceas. However, soon he realized that there are times when it is not reasonable to use structured overviews. Rather, something under the guise of a structured overview, but really approximating an outline, is more useful. He emphasized that for some reason an outline is somewhat on the "outs," probably for as many good reasons as bad.

Another participant asked how the student will survive when he,she gets to college, and the instructors do not give study guides. How are we to prepare them?

The former participant answered by stating that study guides or SQ3R can be taught in a sequence. The first step for SQ3R, for example, is to guide the students through the parts, showing them how to use each one. Then, he suggested previewing the study guides with the students so they understand the directions. By doing this, it is hoped that the students will realize rate, notetaking, underlining, etc., are all important processes in study type reading. These are the thinking processes inherent in any directions given in a study guide. Next, he suggested the students read a chapter using a study guide, starting with simple and going to the more complex directions.

A participant stated that the newest textbooks unfortunately do not have textual questioning interspersed. She recalled what Dr. Vacca had said regarding the basal readers. It took years for the publishers to change and to add a little blurb at the beginning of a chapter to help explain what follows. In addition, the questions at the end of the chapter are, according to research, 90% factual questions. She suggested it would be best if teachers encouraged students to ask questions about what they read rather than being dependent on the textbook. Again she indicated that research found that for every 100 questions asked by a classroom teacher, the student asks only fou. of the teacher, and these usually are on procedural matters.

Another participant noted the separation between the teacher's responsibility in the questioning process and the student's responsibility. He found that two concepts kept surfacing. One whether questions are useful for any type of reading. Often, he felt, students see application of questioning only for that immediate passage. It is necessary for the students to try questioning elsewhere. The second concept is the idea of perfection. No matter how many questioning techniques a student is taught, teachers should not expect students to use them perfectly the first time. However, using the techniques more than once will enhance this perfection. He emphasized that it is up to the teacher to determine how many times it need be tried before that student reaches his/her level of perfection.

Another participant suggested that questioning is an important concept. Often content teachers try a strategy with their students and if it does not work very well the first time or produce magic results, they give up. We often need to try new techniques several times until they become successful. A technique would not have been suggested in the first place if it is not theoretically sound.

A participant questioned this success. Any teacher has a given student only one-fifth of a day. If he/she is using structured overviews, and the other teachers are not, the amount of impact on the student is small. As preservice teachers go through college they have few courses in which overviews are used and thus have almost no models to follow. Even when they take a methods course that tries to teach them some techniques, how long will it take these same students to really believe in those techniques and to try them? While it is a distant goal to work toward, she accepted it as a worthwhile goal.

Another participant reinforced this idea of teachers trying a technique without success and giving up on it. An example of what she considered some of her best teaching was using a technique that failed and then analyzing the failure with the students. In addition, she found that a technique may work one year with one group but not with the next year's group. She emphasized that failure should not be looked upon as a disaster, but rather as a learning experience.

The old saying of ignorance begetting ignorance was suggested by yet another participant. When a teacher of a methods course introduces concepts (such as structured overviews or study guides) but does not use these concepts in his/her instruction, students often infer that these concepts are nice to talk about but are not worth using. She emphasized that if we are going to preach a given set of techniques, we must certainly model those techniques for students.

The discussion was then directed to the question of overkill. A participant recounted that we often teach prereading strategies, motivational introductions, structured overviews, or vocabulary presentations as being necessary before reading a given passage. As a result, preservice teachers are confused. They do not know when and how to apply the techniques. She argued that structured overviews cannot be applied to every passage.

One participant recalled a problem he had encountered in the last couple of years. The problem is a fundamental change in today's students— their attention spans are getting shorter and shorter. This has many implications for structuring

the reading situation and the prereading experiences. He suggested that perhaps we should focus our attention on helping the students concentrate more as well as helping them read for only one subplot rather than several.

Another participant closed the discussion with what she labeled a problem of believing in what one teaches. For example, she recalled one of her professors talking about SQ3R. He said that you can teach this method to students, but this often will not succeed, because there is one essential step missing. That step is believing in what one teaches. She remembered reviewing several experiments about SQ3R's theoretical basis. Through understanding the theory, she was able to accept the method in practice. She then stressed that few of the techniques presented to preservice teachers are relevant unless the theoretical foundations are understood.

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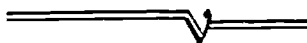
THE RELATIONSHIPS OF ATTITUDES, INTERESTS, MOTIVATIONS, AND HABITS TO THE TEACHING OF READING

Larry Mikulecky

Over the years, research in reading has tended to follow the cliche of the squeaky wheel gets the oil. Studies of poor readers, reluctant readers, remedial readers, deprived readers, culturally disadvantaged readers, inexperienced readers, and beginning readers far outnumber those of mature readers—individuals who read widely and well. Of the studies that deal with mature readers, the overwhelming majority are concerned with purely cognitive aspects of reading. Typical research questions focus on methods for improving comprehension, retention or study skills. Other studies of adolescent and adult age subjects confront the problem of how to teach basic literacy.

However, the secondary school reading problem most in need of emphasis is that of the uninvolved reader – the aliterate who is able to read but chooses not to. Anyone who has taught in secondary schools has met scores of students who have decent reading test scores but ignore reading assignments. Such students seem to comprehend little when they are coerced into reading and often offer the excuse that they cannot really understand reading unless they are interested in the subject matter—and apparently they are rarely interested.

These students range in intelligence from the dull to the quite bright and many are able to slide through high school with B s and C s simply by listening to teachers lecture. For such students reading is largely a passive undertaking involving little or no mental participation. These are not the remedial readers. They are, moreover, the 42.6% of entering college freshmen who claim a prime reason for going to college is to improve their reading abilities. Even though this vast number of students will form the core of our society and will face decades of continued job and life retraining, they may very well be unprepared by schools for such continued learning and retraining.

Therefore, the secondary school reading problem that needs emphasis and attention is that of students who are abandoning thoughtful reading as a means of learning—who are indeed learning habits of nonreading.

WHAT WE KNOW ALREADY

What we face in this area is not really a clear cut deficiency in reading skills. Many of the students who experience the difficulties enumerated above actually score above average on standardized reading tests. The problem is not necessarily one of strategy, either. Many of these students have, at one time or another, had the experience of reading, inferring, and comprehending pages of difficult reading material for which they had a high interest. The difficulty for many and perhaps most secondary students is related to reading interests, motivations, habits, and attitudes. Deficiencies in these key areas tend to interfere with efficient, active reading, detract from comprehension, and develop into poor reading habits that discourage continued learning.

Though research in reading attitudes is not overwhelming in volume, some interesting and potentially helpful findings are beginning to emerge. We know, for example, that high interest in an area does correlate with increased comprehension. Students who are interested in a topic are able to comprehend material a good deal more difficult than their usual level of ability (Estes & Vaughan, 1973, Schnayer, 1968).

Most research shows generalized attitude toward reading to be separate from reading ability. In numerous studies, ability and attitude have only about 10% shared variance (Mikulecky, 1976, Roby, Clock, & Lehman, 1974). Though slightly related, reading ability and reading attitude are two distinctly separate constructs. Capable readers may or may not like to read and may or may not read a great deal. On the other hand, less capable readers may actually enjoy and read certain materials. The separateness of these two constructs has some disturbing implications for schooling that emphasizes *only* competence. We could well be turning out waves of capable students who choose to abandon reading once away from the pressure of schools.

Other research on reading attitudes tends to add substance to the fear that we are developing nonreading readers. The attitude toward reading held by students, on the average, drops with each year spent in school from fourth grade through twelfth grade (Bullen, 1972, Mikulecky, 1976). It seems the longer most students spend in school, the less they like reading and the less they choose to read on their own.

Positive adult reading models are highly related to students success with reading. This is especially true for parental models (Dix, 1976, Hanson, 1969, Kes hian, 1963). but it is also true for teachers as positive reading models (El Hagrasy, 1962). Unfortunately, surveys of secondary school students suggest that it is rare for students to see either their parents or teachers actively and enjoyably reading (Lowe, 1974).

Work done in the field of social psychology suggests that changing behavior can change attitudes (McGuire, 1960). A host of other variables such as the prestige, dialect and style can affect attitudes (Dulin & Duran, 1977), but the process is complex and variables often counterbalance each other and are difficult to discern (Wyer, 1977). Free reading, Uninterupted Sustained Silent Reading, and

a variety of motivation programs have shown mixed success in changing attitudes toward reading. According to Alexander and Filler's 1976 review of the literature on reading attitudes, instructional methods and special programs can, but do not necessarily, help in improving attitudes. They also noted that attitudes toward reading may be affected by self concept, interests, and the attitudes of parents and teachers.

RELATIONSHIP OF ATTITUDE AND HABIT TO ABILITY

Generalized reading attitude has been found to be separate from reading ability among adolescents. The phenomena of attitude and ability are, however, related in a circular fashion that spans decades and even generations.

Perhaps the most concrete means for examining this relationship is to note the connections between reading habit and the new move to establish minimum standards and functional literacy. There are indications that while reading and writing abilities have generally been improving over the past 50 years, the demands in our society for sophisticated literacy have been increasing more rapidly than these improvements (Weber, 1975). During World War I, when nearly a quarter of the draftees could not read or write their own letters, such men could still anticipate being able to select from a variety of life and occupational choices. An illiterate or partial illiterate was hampered but could still function easily in society.

The percentage of individuals able to read and write their own letters has increased since W.W. I, but so too have the literary demands required to function in society. News stories about illiterate high school graduates have focused on a dramatic tip to an iceberg that also includes auto mechanics unable to comprehend repair manuals, bureaucrats unable to follow written policy changes, technicians unable to read and understand safety precautions for oil pipe lines or nuclear power plants, and anyone else who has found the literary demands of a job outstripping his or her abilities.

The term functional literacy denotes a standard that seems to be rising depending upon one's job or function and depending upon the changes and new complexities likely to occur within that job. Literary demands seem to have increased in most areas and are likely to continue increasing as individuals race to keep up with new occupational developments or to retrain for new occupations. In terms of our current situation, the term functionally illiterate can be applied to large segments of our population.

At the same time, the United States is experiencing another disturbing phenomenon—aliteracy. Increasing numbers of capable readers are regularly choosing not to read. For example, in countries like Canada, Great Britain, Australia, and Germany, the percentage of citizens reading books is from two to three times greater than the percentage of U.S. citizens reading books (Mann & Burgoyne, 1969). A 1969 Gallup poll reveals 58% of adult Americans claim to have never read, never finished a book. A typical response to these reports is that busy Americans don't have time for books and read magazines instead. A random survey of more than 5,000 American adults, however, shows only 26% to be reading magazines (Sharon, 1973). This same survey dispels the myth that

Americans read more on weekends than on weekdays. The clear majority of adult reading was shown to be done on the job (an average of one hour and 46 minutes daily) during the week.

The same sort of reading for the job phenomenon seems to be evident and perhaps even fostered in schools. Positive reading habits and attitudes seem to deteriorate with each successive year students spend in school (Bullen, 1972, Mikulecky, 1976). A recent survey of early adolescent reading during summer and during the school year revealed that almost no reading was done during the summer by early adolescents (Mikulecky, 1978). Of the 100 randomly surveyed students, 25% reported summer reading of less than 10 minutes a day. The mean reading time was only slightly above a half hour (36.9 minutes). During the school year the mean reading time jumped to slightly over an hour (66.9 minutes), but nearly 80% of that time was allotted to reading homework assignments. The American problem of reading mainly for the job seems to be starting early with reading mainly "for the teacher."

There are long range connections between aliteracy and the reading ability problems associated with the functional literacy movement. The standards and expectations of functional literacy are rising and the number of capable readers who regularly choose to read is decreasing. The political climate is such that legislatures and boards of education are ready to deal with the most dramatic symptom of the problems—illiterate high school graduates—by proposing minimum ability standards programs to guarantee reading ability upon graduation. This singular emphasis on ability while ignoring reading attitude and habit could, however, result in an even greater reading ability problem.

Programs that overemphasize minimum reading ability standards may place too much emphasis on treating apparent symptoms while ignoring some of the still operating causes of literacy difficulties. To teach basic skills while de emphasizing or even discouraging the development of positive life long reading habits and attitudes is likely to produce even more aliterates who choose not to read when the pressure is off. As functional literacy standards continue to rise, such nonreading individuals are unlikely to keep up and may even fall below their original high school levels. In addition, it seems clear that parental models do influence the reading ability and attitude of children. The phenomenon of more adults developing into nonreading models for their children can only serve to strengthen the vicious circle, as illustrated by the schematic in Figure 1 (Smith, Smith, & Mikulecky, 1978), of nonreading families generation after generation.

Reading attitude and reading ability are, then, related but separate, especially in the short run. Reading attitude and habit are, however, intertwined when reading, in its entirety, is considered from a perspective that spans several years. Minimum competency standards become meaningless if the methods for attaining those standards help create nonreading habits that prevent an individual from maintaining a reasonable standard of competency. This dilemma becomes even greater when one considers that literacy standards are rising and that occupational retraining is likely for most individuals. In addition, research on the effects of parental reading models on children s reading ability and attitudes suggests that ignoring aliteracy among adolescents and adults is tantamount to creating the

conditions for another generation of reading problems in the schools as the sons and daughters of nonreading parents complete the vicious circle.
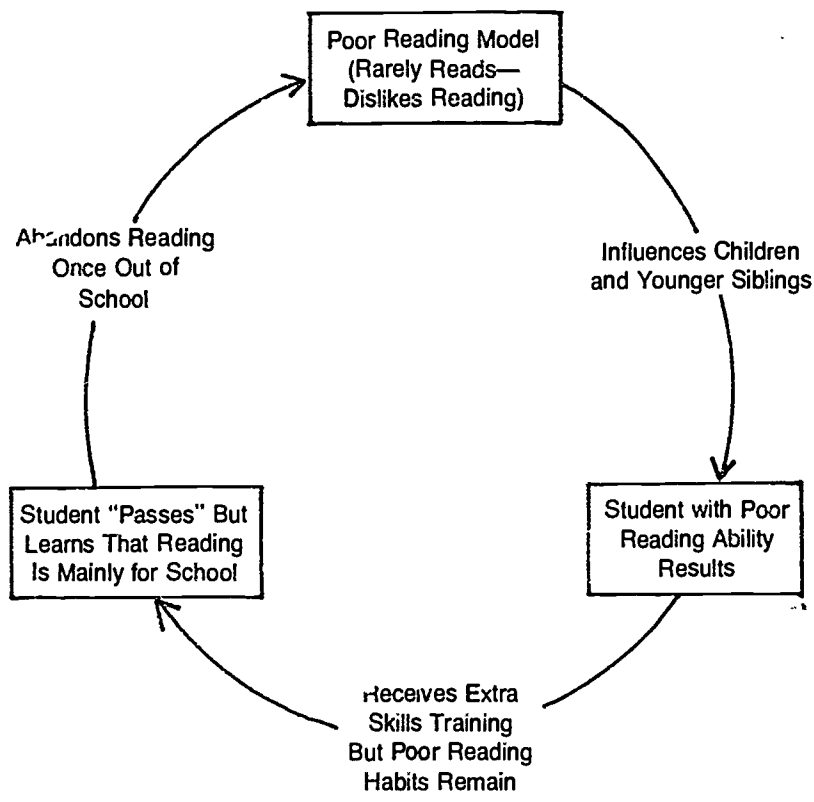

Figure 1. A vicious circle. Nonreaders produce nonreaders.

NEED FOR A BALANCED APPROACH

Attention must be directed to reading difficulties among secondary school students, but we must avoid the trap of treating only the most apparent symptoms while allowing underlying causes of reading problems to go unattended. Students who truly cannot read must be identified by minimum standards tests or by trained, aware teachers. We must realize, however, that marshaling all our efforts or even most of our efforts to improve the abilities of these students does not even approach a lasting solution to secondary school reading difficulties. We must break the vicious circle that begins with aliterate adolescents who grow to become poor parental reading models and perhaps less than competent adults in our increasingly demanding society.

One way to break that circle is to begin giving a balanced emphasis to the various aspects of mature reading. Tests and measures should chart a student's growth in reading competence, positive reading attitude and reading habit. A student

who demonstrates adequate reading competence but declining reading attitudes and habits should be clear cause for concern. Research indicates the children and perhaps even the younger siblings of that student are likely to become expensive new problems for the school and for society. Teachers in classrooms need to monitor their efforts to determine effectiveness in improving competence, attitude and habit Ignoring the effects of teaching methods on attitude and habit has grown to be a too expensive luxury. Administrators and boards of education need to demand a balanced sort of accountability. New curricula and new programs must be evaluated for their effects on reading ability, reading attitude and reading habit To ignore this balanced sort of accountability is, in the long run, educationally dangerous and economically wasteful. We may very well be causing many of our problems in education by ignorantly producing unwanted side effects.

It is alarming to consider the implications of a school district instituting a districtwide program based only on the initial successes of a pilot program in the area of reading competency Most new programs are instituted, however, in complete ignorance of the program's effects on reading attitude and habit. Such narrow vision is without excuse in a society in which the concept of environmental impact statements is discussed by elementary school children, and daily lunch time conversations debate the pros and cons of FDA studies of the side-effects of sugar substitutes.

Part of the solution to secondary school reading difficulties is to demand the same sort of sophisticated accountability for educational programs that we do of the producers of food additives. A narrow-vision and short-term emphasis on reading competence will no longer do Reading competence, attitude, and habit must be viewed as part of a total interrelated system and we must understand the implications and effects of this decade's teaching on the next decade s students. In short, we must demand the same sophistication in accountability for education that we do for soft drink production. We must at least as intelligently chart the effects of what we do to our children's minds as we chart the effects of what saccharine does to our bladders and tobacco to our lungs.

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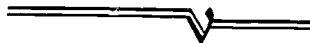
REACTION TO DR. MIKULECKY'S PAPER

GROUP ONE

Stuart Silvers

Before reacting to Dr. Mikulecky's paper, one should recall the reasons for reading as discussed by Burmeister (1974) in her book. The first reason is the Instrumental Effect—reading to solve a problem or to find out how to do something. The second is the Pretige Effect. Many students as well as many adults read for this reason; to keep up on "what's going on!" The third is for Reinforcement of an Attitude. We read simply to find more reasons to believe what we believe. Unfortunately reading for reinforcement usually does not happen in our schools. Students need to be able to read a variety of opinions to make up their own minds. A fourth reason is for Vicarious Aesthetic Experiences. For example, many persons are not able to travel much but can travel vicariously through reading and as a result can learn a great deal about a lot of places. The final reason is for Respite. Many people need to have this escape to get away from their problems for a while.

An important point from Smith, Smith, and Mikulecky's book and Mikulecky's paper is the idea of modeling. It is important that we as teachers think that reading is important. In Carmel schools, a district near Indianapolis, an hour a week is set aside just for everyone to read. As you read about Respite in Burmeister's book you see that the practice at Carmel is supported by her. This idea about Uninterrupted Sustained Silent Reading is good and should be tried by everyone.

Mahmood Butt

Most of what I do at Rockford College is in language instruction rather than reading specifically. So, when I come to the problems related to motivation and reading, I bring a perspective suggested by John Dewey around the turn of the century. Reading certainly can be looked at as a tool. There comes a time when you move from elementary to secondary learning that reading is used primarily as a tool to learn other things. One of the problems I find working with student teachers and others is that we often become victims of what Dr. Vacca called the dichotomy between the cognitive and the affective. Some researchers have done us a disservice by categorizing the brain's functions into these two separate areas when those areas are not really separate. One of the most important things teachers can do is to take the reader at whatever cognitive or affective level he or she might be and improve that level. In this process, we are trying to (a) foster the

kind of attitude in which receptivity or interaction occurs so that the students will read discriminately, (b) teach students to react in a discriminating fashion to the variety of information that is being presented to them yet to maintain a level of interest and a level of motivation, and (c) help them make this kind of behavior a habit—something that they do naturally without thinking about. Then, reading becomes a matter of looking for certain concepts and making some value judgment about them. This is basically what Dewey was talking about.

In addition, Dewey talked about a constellation of factors related to reading and intelligence. sex, achievement, self-concept, parents and home environment, the teacher, and the classroom environment. What I would emphasize is that teachers have no control over hereditary factors related to intelligence or the home environment They can, however, control what goes on in the classroom. As suggested by research studies, 12 things can be done in the classroom. The first is being aware of the student's attitude toward certain aspects of reading. In an average classroom we find a wide variety of student attitudes. Some students who can read but choose not to have been dismissed by the teacher as though they are never going to read.

What can we do for these students? We can become aware of their disinterestedness and provide them with reading material in which they might become interested Quite often we use material that, although it might teach the student something, is very uninteresting. For instance, in Illinois we have a good football player named Walter Payton Quite a few students who ordinarily choose to read nothing would read magazine and newspaper articles about him. One student even suggested we rename our stadium Payton Place. Whether there is any literary merit in it, I do not know. But there was a kind of connection--an awareness, an alertness.

Furthermore, we might provide situations in which reading is useful, for example, requiring certain reading to be able to complete or participate in a project. Thus, we are providing reading with some kind of context to give it practical meaning. In addition, the student's reading attitude can be greatly influenced by the teacher's regard for reading—that is, providing a positive example, or model, helps build positive student attitudes This suggestion goes along with the final, and one of the most important points that Kemper discussed. the importance of a positive reading model How positively do they present a model, how enthusiastic are they about it? The importance of the teacher as a model cannot be overemphasized If we are going to break this vicious circle that Dr. Mikulecky pointed out, we must be concerned not only with the models we provide for the students but also with the ways we build interest in the students.

Bonnie Thomas

Since I teach reading methods courses for the elementary level, I would like to find out how the reading program develops after the elementary years. However, I have a confession to make. I feel guilty about my reading habits. It seems I am very task oriented and during the school year I read only what my job requires. During the summer, though, when my family and I go to our cabin, I read for pleasure. Perhaps I too am part of the vicious circle.

I also remember an article that discussed positive reading models The school principal ordered that all personnel stop their jobs for a certain time period to read In the beginning, not many persons were happy with the edict, but after a while everyone began reading materials that were appropriate to their particular interests. Cooks were reading cookbooks, maintenance workers were reading how-to-fix-it books, and so on. The article suggested that this has a definite effect on students by providing several models of good reading behavior.

Dr. Mikulecky has offered two suggestions in his paper. One was that we need to change students attitudes toward pleasure reading (reading for fun), whether it be magazines or books, and two, we need to improve their attitude toward reading and that can improve performance on the job. While these are two different types of reading, they may mesh together. When it comes to attitude, I believe that improving their reading for pleasure is most important. I believe that students already are able to read so that they can perform competently on the job, and I do not feel that attitude enters in here.

DISCUSSION

In one opinion the shotgun approach to attitude was being suggested However, isn't just one teacher, not 10 to 20, enough to create positive attitude? For example, it is likely that one person provided the positive reading model for each member of this group.

A second participant agreed. He suggested that the change from narrative material in elementary to expository material in junior high school is what causes most readers to discontinue narrative reading on their own. He also emphasized that if our schools require certain competencies and the school board issues a plan of skill development, teachers will require even more expository material If they emphasize that type of reading, there will be even less time to do recreational reading.

Another participant brought up the issue of Uninterrupted Sustained Silent Reading. This participant stated that as a former principal he could not agree with that idea. Another emphasized the fact that if everyone in a school is reading, it becomes a priority and even a habit. He felt that aspect was very important. Still another participant reported that he disliked the regimentation suggested by the method. He believed that if each teacher modeled this behavior it would be more apparent to the student that reading can indeed be for pleasure A woman recalled some research evidence that suggested that it does not matter whether the entire school reads en masse, so long as at least one group does it

The discussion shifted back to the interest levels of expository versus narrative reading. A participant thought it sheer joy to read expository material and be able to solve a problem. Another viewpoint was that because expository material is associated with school, it does not allow one to develop habits for outside of school. Another participant suggested that expository material might be more than just textbooks. She recalled that over the past several years a number of paperback books that were strictly expository covered various topics, were well written, and were very interesting to read. She emphasized that it was not necessarily textbooks that were being discussed. Rather, the love of all reading

should be emphasized, whether it is in pleasure books, senous books, or anything else.

Another participant recalled that one of the oldest types of teaching is glossing. the teacher starts reading an assignment, bringing in his/her pertinent experiences in an effort to get students interested. Of course, this method cannot be used to build interest in all cases.

Another participant recalled an article discussing the sociological patterns of reading. At one time, only the "aristocracy" went to school. Persons born at the right time and place were automatically rich and intellectual. Thus, the motivation was built in. This notion gave way to the "meritocracy" who believed that if one worked hard, good things would come automatically. This "middle-class work ethic" is probably part of everyone present, he suggested. Individuals learned that if they do something now they will be rewarded later, and, again, motivation was no problem. Now, he warned, teachers are faced in the classrooms with "egalitarians" who believe in a free and equal society. The only way to stimulate students in this group is through their value systems. He suggests that rather than wasting time on having them reading what the teacher thinks is fun, they must be allowed to make their own choices. He also recalled Carlsen's (1972) development of stages. This theory states that children go through certain stages of interests that parallel reading development. At any given chronological age, the child has certain interests that are typical of that age. From his experience, the best success has come after giving students something he knew they would like and something he would personally recommend.

This participant then asked the group to recommend five books that would attract and hold teenagers at each grade level. He asked how many of the group had actually read the books recommended. His own suggestions were S. E. Hinton's Outsiders, or Go Ask Alice. Using these books he thought, would bring the teachers into the student's value system. For science class, he recommended using science fiction as a vehicle that motivates reading. Another participant recalled a successful bazaar at her school at which students and teachers buy, sell, or trade books.

One participant emphasized that one aspect not being discussed was sexism both in the books and in the reading models. In elementary school, the best readers are nearly always girls, and once students get to junior high school they seldom see a man read. Reading, she felt, is only something that Mom does in her spare time because Dad is too tired when he comes home from work. She stressed that coaches never read or even use a book in front of their players. Some of her students had said that they were going to be coaches and would never use a book. This, she believes is the attitude being instilled in children.

GROUP TWO

John J. Smith

Dr. Mikulecky's presentation added balance to the conference. Teachers need to work just as hard, perhaps even harder, on reading attitudes as they do on reading skills. But this admission broaches several questions.

1. How can we really go about working on secondary students' reading attitudes? Is modeling as effective as has been implied? Can we really spend very much time in front of students reading in secondary schools when we have them for only an hour a day?

2. How can we measure students' attitudes toward reading? Do attitude tests give accurate information or do students answer items the way they think they are expected?

3. Can we really work on attitudes by finding out students' interests and dovetailing them into our curriculum? I wonder if we can find out the interests of 100 to 150 students, and even if we do can we remember them? Maybe we should count on finding some common interests for a group of 30 students in a class. Adolescents are interested in themes relating to sex, peer relationships, and self-autonomy. But how much we can connect the schemata students bring to themes to our own subject areas?

4. Is it really possible to change attitudes even if we work at it? I agree that we can help, but I would not be surprised if we did not see a big change in students' attitudes. I believe attitudes change very slowly and the individual teacher probably will not see any effect he or she may have. Just as Dr. Mikulecky believes that working only with reading skills is a superficial approach and that working at reading attitudes is perhaps getting deeper into the problem, I feel that working only with reading attitudes is also superficial. The deeper problem may require work with students' attitudes in general. I believe there is too much apathy among secondary students—not just with their reading—and this is where we need to start.

Georgianna Simon

What factors may account for students negative attitudes toward reading? If a teacher is concerned about attitudes, what can he or she do? Dr. Mikulecky seemed to make three suggestions, but I wonder if they are sufficient. First, he said teachers need to focus on the uninvolved reader. Second, he believes students' negative reading attitudes grow from their being driven to abandon thoughtful reading as a means of learning. And third, he believes students' negative attitudes toward reading are related to either interest or motivation, not necessarily to lack of reading skills.

Another factor I think should be considered in relation to students' negative attitudes is reason for reading. Is reading just for school? Students also use reading outside of school to bake a cake or build a model airplane, for example. Some people read outside of school to improve their self-images or to gain prestige. Others read to reinforce their opinions or for the aesthetic value. I believe that an individual's reasons for reading grow out of his or her attitudes toward reading in general.

DISCUSSION

The group first considered the problem of collecting reliable information on students' attitudes. It was suggested that information may be collected orally, or if

one is uncertain that a high degree of trust has been established, students can be asked to respond in writing or on IBM cards without giving their names. Role playing interviews with an outsider, taped responses, or completion of open-ended statements were also suggested.

Two points of caution in relation to collecting information on student's attitudes were raised.

1. Reliable information about students' attitudes cannot be collected in a short period of time; a trusting relationship between the teacher and the students must be established first. While a teacher may seem to get off to a slower start by taking the time to assess student's attitudes, once the assessment is completed he/she can begin to group students according to their interests, perceptions, etc., and students will begin to progress quickly. Also, attitude measures themselves can lead to valuable class discussion making them a worthwhile use of class time.

2. A second caution raised related to being prepared to receive some gross or vulgar responses if one really encourages students to respond honestly to attitude measures. Many responses of this type are the students' way of testing whether a teacher means what he/she says, i.e., are they really free to write what they think and not just what is expected of them? It is best not to get upset or judgmental at such responses.

A concern was raised that college instructors should not be too idealistic when talking with preservice or inservice teachers about changing reading attitudes. Reading attitudes, it was agreed, do not change quickly. It may be deceptive for college instructors to leave teachers thinking they need to work on reading attitudes and drastic change can occur. If this perception prevails, teachers may try to work on reading attitudes, but if improvement is not quickly forthcoming, they may abandon work on attitudes altogether.

Taking students' interests into account to improve their motivations and reading attitudes also implies individualization. Many secondary teachers, however, get the impression that they must individualize everything all year long and accomplish it immediately. No wonder many get discouraged. Instead, it was suggested that preservice or inservice teachers need to be encouraged to try individualizing gradually. Also the point was made that some people are confused about individualized instruction in that they think it means every student must have a separate worksheet, etc. Grouping is individualized; sometimes working with a whole class is a form of individualization.

In summary, the point was made that if we are to get secondary teachers to begin working with students' reading attitudes, we must build a philosophical, attitudinal, or conceptual basis, and that the time spent to do so is well worth it.

GROUP THREE

R. Scott Maricle

I was amazed earlier in the conference to hear that on any given day, 25% of

students in secondary schools may not be in school. This may be indicative of the fact that teachers have been guilty of ignoring attitude, at least attitudes toward study and reading. They have been so geared to performance that they lost students. Dr. Mikulecky suggested, in fact, that students are being *driven* to abandon thoughtful reading. What kinds of things do teachers do in school that drive students from thoughtful reading? If we can identify some of the things teachers do that negatively affect attitude, maybe we can propose some ways to stop that. What ways can we generate?

DISCUSSION

Several participants felt that required book reports produced negative attitudes. Book reports can appear to be punishment rather than an opportunity to share. Students, then, may feel punished for reading books. They can even be driven away from pleasureable, recreational reading.

Television was seen as having an effect on attitude toward reading. Viewers do not have to "work at" getting the story or meaning the way readers have to. On the other hand, television can provide a motivating force in reading. Many students read books based on television programs, such as the *Man from U.N.C.L.E.* series. Several school districts have made excellent use of special programs. The Chicago *Sun-Times,* for example, released the scripts of two specials—one about the seaman who tried to escape from a Soviet vessel, and one about the Holocaust—to all the schools in Chicago. The *Sun-Times* provided the scripts free, to be used as reading material. The Philadelphia school system built excellent reading lessons around the scripts from the *Missiles of August* and the *Franklin and Eleanor* series. Television and print were intertwined; apparently the students were more enthusiastic about reading the script than viewing the program. This was a good indication of positive attitude. In addition, Philadelphia schools reported gains of up to two years on standardized tests after using these lessons.

One participant stressed the need to change students' attitudes toward school in general. If we change the attitude toward school and what education can do, the other attitudes, such as those toward reading, will automatically improve.

Also stressed was the usefulness of oral reading in bettering student attitudes. One participant described the success he had in getting students enthusiastic about reading by reading orally and then letting the students read orally, as an earned privilege. Reading was seen as something special, as a reward. Another participant cautioned against the misuse of oral reading. Too often, oral reading is a round-robin situation where students are handed something cold and expected to read, to perform. That kind of abuse does not do any good. Students should be given time to prepare for oral reading, so they are at ease with the material. Then they have a reason for reading and reading well.

Another participant felt that students had a poor attitude toward the work ethic and this is reflected in their schoolwork. It was pointed out, however, that a number of secondary students are running gas stations and grocery stores after school. They have lots of responsibility there, but when they get to school, they

are often treated like nine-year-olds. It was suggested that students be encouraged to earn the right to carry out much of the responsibility in the secondary classroom. By building responsibility, teachers build attitude.

Marjorie Loory

Given the nature of our society, I think we would have a very difficult time doing anything about attitude. It is an extremely difficult problem, given the biological changes of our young people, and the way society is structured. So many things are happening—the students are becoming aware beings, they are concerned about themselves and their abilities and relationships. Unless there is a concerted effort, I do not think we will see much change in attitudes.

What can we do? What are ways that we can motivate teachers and teacher-trainers to become motivators of students in reading? To be good role models?

DISCUSSION

Participants generated a number of suggestions:

1. Model in your methods classes what you would have your preservice teachers model for their own students.

2. Talk about what you are reading. For example, "By the way, it was an excellent book. . . " "I couldn't put it down. . . "

3. Assign students to do pleasureable, outside reading. Although assigning pleasureable reading seems like a contradiction, there are many students who are motivated by grades, so if using grades will get them to read more widely, and discover things they like, it is worth doing.

4. Have students keep a "reading journal" for five consecutive days. In the journal, they list the time of day they read, whether the material was content or recreational, plus the page numbers and title, if they want. This motivates some students to become more conscious of their reading and to read more.

5. Have book exchanges. Bring in old books and really play them up. ("This book is great. . . .") One participant who did this found that students soon brought in books on their own to share with her. Real enthusiasm was generated.

6. Make a real effort to show positive attitudes. One participant likened much of teaching to selling—selling ideas, strategies, etc. Your attitude toward what you are selling directly affects whether it is received enthusiastically.

Participants also discussed how the purpose of some aspects of schooling may run counter to the building of positive attitude. Teaching too often involves teaching for a test and using short-term learning. The attitude often is "We're doing this so you can get a good score or passing grade and can get out of here." We do not say "You can get this good score and then go on to things that really

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interest you." Unfortunately, we are in a system now that requires *results*. Results mean good test scores. But what are the tests really measuring? Are they measuring the things the students need? Dr. Mikulecky summarized this by saying that curriculum by itself is not key. What is key is curriculum, or competencies, and attitude.

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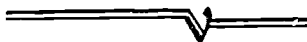
SECONDARY READING PROGRAMS THAT WORK: FACTORS THAT BRING TEACHERS AND STUDENTS TOGETHER

James Mills

How can secondary schools help students acquire the reading skills they will need in high school and beyond? Staff members in the Cleveland schools have been wrestling with this question for some time now and have developed a number of programs which, we believe, effectively meet the needs of our students. Two of these programs will be discussed in some detail later in this paper. First, however, some background information will be helpful.

CRITERIA FOR PROGRAMS

A variety of approaches to secondary reading have been tried in Cleveland over the past 13 years. In addition programs being used in other systems, particularly in large urban centers were reviewed. Many reading programs that are now conducted in secondary schools across the country were rejected as wasteful and counter-productive. Among our rejections are:

1. Tradtional remedial reading classes—taught as separate entities— usually focusing on word attack and providing no coordination of effort with subject area teachers.

2. Every teacher a teacher of reading programs where subject area teachers waste valuable time overstressing and frequently misteaching reading skills that have little or no relevance to what is being studied.

3. Packaged programs that do not take into account individual learning styles.

4. Assignment of elementary or English teachers to remedial reading classes—thereby confirming in the minds of content teachers the folklore that they have no responsibility for reading.

In our judgment, effective secondary reading programs must be individualized, interest oriented, and closely tied to subject area instruction. They must be

comprehensive with reinforcement coming from all members of the teaching staff. The programs must complement—not intrude upon—subject area instruction. Clearly such programs must have strong administrative support and will function most effectively if they are built on a firm foundation. Among other things, that foundation should include:

1. Setting forth of specific goals for reading on a school-wide or system-wide basis;

2. Assignment of reading consultants to help content teachers effectively fuse reading with content;

3. Assignment of reading personnel to textbook adoption committees as consultants on readability;

4. Providing funds to purchase multi-level reading materials; and

5. Coordination of specially funded programs with the ongoing curriculum.

COMMUNICATION SKILLS IMPROVEMENT PROJECT

The Communication Skills Improvement Project began in Cleveland during the 1971-72 school year. The program grew from the grass-roots, being initiated by a school-wide reading council in one of Cleveland's largest senior high schools. In six years it has expanded to 13 schools, and staff members in several other schools are now seeking an extension of the program to their buildings.

Basic Operation

Reading laboratories have been established in 13 inner city secondary schools—six senior highs and seven junior highs. Approximately 3,000 students in grades 7 through 12 receive corrective and developmental reading instruction in these reading labs. Participation is on a nongraded basis. Many students who receive instruction are selected on the basis of reading test scores and referrals made by teachers and guidance counselors. Others request to participate in the program.

The reading labs are operated under the full time supervision of a reading resource teacher in each school. These teachers use equipment and materials designed to allow for individualization and to permit a variety of instructional approaches. Individual needs are determined through diagnostic testing. Teacher assistants provide reinforcement and individual tutoring for students in the lab to increase the impact of the instruction provided there. In several schools an additional teacher provided by the Cleveland Public Schools works with the reading resource teacher to increase the number of reading services provided in the school.

There is some variation among the project schools in the operation of the reading centers, reflecting the educational priorities identified by the staff and administration. Some schools focus primarily on improving general reading comprehension. Others emphasize improving motivation for reading through the use of high interest, ability level materials, reinforced with individualized instruction. Games

are frequently used to build student interest. Students are required to assume some responsibility for planing their program of learning experiences and evaluating their performance.

The labs operate full-time with students scheduled in groups of 15 to 20 for two to five days a week depending on need. Students receive reading lab service for six weeks to one year, depending on their progress. All schools conduct inservice and follow-up activities with subject area teachers to coordinate students' work in the reading lab with their work in other classes. Files containing diagnostic information, work samples, and records of progress are kept for each student served.

Evaluation

Annual evaluations of the Communication Skills Improvement Program have been positive. Pre- and post-test scores show that gains made by students in the program are consistently greater than those of norm groups with which they are compared. Attitudes also improve as evidenced from pre- and post-pupil ratings on the Estes Reading Attitude scale (Estes, 1971).

PROJECT CONTENT-COGNITION: READING

Another Cleveland secondary reading program that has been particularly well received is Project Content-Cognition: Reading. With the generous support of the Martha Holden Jennings Foundation, the Cleveland Public Schools recently designed and implemented a comprehensive inservice program combining instruction in reading with instruction in subject matter in grades 7 through 9. The main characteristics of this project are:

1. Emphasis on cognitive skill development;

2. Focus on reading in specific subject matter areas;

3. Use of subject matter teachers in the development of learning packets;

4. Emphasis on not-seriously-handicapped readers;

5. Empahsis on designing individualized exemplary subject-content reading lessons that can be easily used by teachers;

6. Incorporation of evaluatory field-test procedures to obtain highly reliable and practical instructional materials; and

7. Use of videotapes to demonstrate classroom implementation of suggested instructional techniques.

Lesson Preparation

Working together, teachers and reading consultants develop instructional units based on textbook reading assignments. Emphasis is placed on developing subject matter concepts. Reading skills that students will use in developing these concepts are woven into the fabric of the lesson. Difficult words are taught prior to

reading so that when they are encountered in the text, they are seen as old friends—not unwanted intruders.

Studies conducted by the Division of Research and Development in the Cleveland Public Schools show that Cleveland students have particular difficulty with certain comprehension skills. Units are planned so that on given days each of these skills will receive particular emphasis. Thus, students are receiving help in reading skill development at the same time that they are learning subject matter.

Each unit developed includes a pre- and post-tests designed to measure students' progress. When units are completed, teachers try them with their classes. Test scores are carefully monitored and provide evidence of lesson effectiveness. Adjustments in instructional plans are made as needed.

Next comes the large-scale testing. Instructional plans are distributed to a new group of teachers who were not involved in the planning. Inservice training in the use of these plans is also provided. Teachers then try the lessons with their classes in what is called the large-scale testing. Following this phase a feedback session provides time when large-scale testers report strengths and weaknesses of instructional plans to unit writers. Final revisions are then made.

Completed instructional units contain a pre-test; an instructional overview listing concepts to be developed, lesson objectives, reading skills to be emphasized and materials to be used; an instructional plan that includes day-by-day instructions to the teacher together with transparencies and worksheets that are needed; and, finally, a post-test. Videotapes are made of segments of units being taught and become part of the complete package.

Inservice Follow-Up

After units are completed, they are disseminated to content teachers throughout the city. Initially, junior high chairpersons meet and materials are distributed and explained. There are follow-up meetings within each building and inservice training is provided for classroom teachers.

Care is taken to show how reading skills are fused with content materials. The Directed Reading Activity, a teacher-directed approach to instruction, is introduced and explained. Teachers are shown how completed instructional units parallel the design of the Directed Reading Activity. Videotaped segments of completed lessons demonstrate the usefulness of this approach in a classroom setting. In subsequent meetings, teachers are helped to build plans for teaching additional lessons using the structure of the Directed Reading Activity.

Evaluation

Results of a one-year evaluation of the project are highly encouraging. Tests developed and administered by the school system show a 40% gain in teacher proficiency in using reading-thinking skill techniques. At the same time, teachers show a high degree of satisfaction with their opportunities to participate in the program. Tests of students using the materials show that with two exceptions, classes achieved the goal of an increase of at least 20% in their comprehension of subject materials.

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CONCLUSION

The role of the classroom teacher is to create a learning environment in which each student can grow according to his ability, his maturation level, and his interest.

Both programs described above contain critical ingredients designed to bring teachers and students together for a positive reading-learning experience. Close ties are established between reading and content instruction; reading instruction is fused with concept development, and reading materials are correlated with the maturation level of students. Students become involved in an active, receptive process and learn to comprehend, interpret, and react to what they read.

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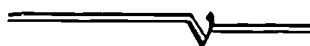
A COMPETENCY BASED PROGRAM FOR SUBJECT AREA TEACHERS

Charles T. Mangrum

There are 10 generic competencies that I believe most subject area teachers should have to improve their instruction when they are using reading materials as a medium for developing subject area objectives. This paper will explain how these 10 competencies were identified and how they are developed in undergraduate subject area education majors at the University of Miami.

BACKGROUND

Between 1970 and 1973, members of the Education Committee from the Florida State Legislature were systematically examining the reading achievement test scores of junior and senior high school students currently enrolled in high schools throughout Florida. They were alarmed by the number of students scoring below the national mean achievement. Their concern was communicated to their fellow legislators and during the 1973 session of the Legislature, legislation was passed that required all subject area teacher candidates seeking initial certification in Florida after September 31, 1974, to have a component in the teaching of reading as it relates to their subject area. The legislation was interpreted to mean that those seeking initial certification must acquire competencies, not mere credits, in the teaching of reading as it relates to their subject area. The competencies, however, were not clearly specified.

The legislation created considerable distress in the schools of education in Florida's colleges and universities. It meant that schools of education had to immediately require a competency based reading course for their subject area education majors. Initially, many of Florida's colleges and universities tried to satisfy the law by requiring subject area education majors to enroll in existing courses that focused on secondary and adult reading practices. Until the time of the new requirement, such courses were taken primarily by students who were majoring in reading or English education. These courses were inappropriate for the large number of students who were enrolling from such specialties as science, math, foreign languages, speech and hea..., sciences, physical education, art, business education, library science, and so on. The students' resentment toward the new requirement was transferred to the instructors and, combined with their questions about the relevancy of the course content, made teaching during these times very difficult.

The first round of training sessions to meet the certification needs of preservice subject area specialists fell short of expectations. At the University of Miami we recognized that if we were going to live up to the spirit of the legislation we had to find a new way to develop reading instruction competencies in subject area specialists. The search for a new way to help preservice teachers meet the certification requirements began with examination of textbooks, monographs, and journal articles that dealt with teaching content area reading skills to junior and senior high school students and young adults. We visited a number of secondary school reading programs and examined course syllabi from others. We also interviewed reading teachers and subject area teachers to determine just what reading competencies would be helpful to subject area teachers.

The textual material provided a rather extensive list of competencies, many of which were the same as those required of the elementary school teacher. For the most part we found that the reading teachers felt subject area teachers should know everything the reading teachers had learned in their master's level training programs. The subject area teachers who were interviewed rejected a number of competencies identified by reading teachers. In general, the subject area teachers believed that they needed fewer competencies than reading teachers.

As a result of our review of the literature, examination of reading programs and interviews with reading and subject area teachers, we identified 10 basic generic competencies that our preservice subject area teachers must acquire. We believe that when the preservice subject area teachers are able to perform these competencies, they are able to help students read better in content area materials.

TEN GENERIC COMPETENCIES

These statements contain the generic competencies preservice subject area teachers at the University of Miami must acquire.

1. Junior and senior high school students cannot be expected to read materials that are written above their functional reading levels. To avoid frustrating junior and senior high school students with reading requirements they cannot handle, subject area teachers must be able to determine the readability of their subject area materials.

2. Subject area teachers frequently prepare written materials for their students. To avoid creating materials with functional reading requirements beyond their students' abilities, subject area teachers must be able to write materials to specified readability levels.

3. Often a variety of reading materials are used to teach basic concepts in subject area courses. When a variety of reading materials are used, a subject area teacher must be able to match materials with the reading levels of students. To ensure the proper match, the subject area teacher must know how to rapidly determine whether the reading materials are suitable for the students' capabilities.

4. Many reading skills are required for reading subject area materials.

Subject area teachers must be aware of these reading skills and be able to determine which skills students have or have not acquired. To do this they must be able to prepare, administer, and score reading skills tests.

5. Each subject area has its own specialized vocabulary and one of the major responsibilities of teachers is to help students develop and expand understanding of word meaning in their subject areas. To do this, subject area teachers must follow a set of guidelines for developing understanding of word meaning and use appropriate activities for teaching specialized vocabularies.

6. Often, students need help to comprehend subject area materials. The subject area teacher must know the specific comprehension skills for his subject area and how to assess and teach these skills.

7. Subject area materials are written in a variety of styles and with different formats. To help their students read these materials, subject area teachers must teach students how to use the appropriate study strategies for their subject areas.

8. A large number of multisyllable words is one of the characteristics of reading materials. While the teachers are not expected to teach the beginning word recognition skills, they must be able to help their students develop a strategy for pronouncing multisyllable words.

9. Subject area teachers are often confronted with students who know how to read but who are reluctant to read. The teachers need to incorporate into their teaching those techniques that will increase the motivation of reluctant readers.

10. From time to time all subject area teachers will have students in their classes who are underachieving in reading and need special assistance which is beyond the teacher's competency. Teachers must know how to identify these problem readers and where to refer students for the specialized help they need.

INSTRUCTIONAL COMPETENCY MODULES

Once the 10 competencies were identified, we needed a means by which the competencies could be developed. We examined traditional textual materials and decided while they were good for providing basic information, for the most part they did not provide the learner with opportunities for using new knowledge and skills. Consequently, we prepared materials that would provide students with the background information they needed and opportunities to practice using their knowledge and skills. The resultant instructional competency modules are self-instructional packages designed to assist the user in accomplishing certain objectives. An objective consists of what the learner is able to do, know, and/or feel after instruction which he may not have done, known, and/or felt before instruction. Each of the instructional competency modules (see Figure 1) includes the following components:

Prospectus. This section of the module explains to the subject area teacher why it is important to accomplish the objectives of the module. The terminal and specific behavioral objectives the learner is to accomplish are also included in this section. It ends with a description of the resources and a statement on the time required to complete the module.

Pretest. After the subject area teacher has read the prospectus, he turns to the pretest to determine just what objectives he needs to master. There is one pre'est item for each specific objective in the module. If the learner feels he can perform the behavior asked for in a pretest item, he indicates such by choosing YES. If he has any doubt in his mind, he chooses NO. The pretest requires only yes or no responses.

Branching program alternatives for pretest responses. This section is included to provide for the flexible use of the instructional competency module. In this section the subject area teacher learns what he must do to accomplish the specific objectives he has identified for himself. He is directed away from those activities for which he already has competency. In this way the instructional competency module takes into account individual differences found among learners.

Enabling elements. Enabling elements are the training components of the module. Each enabling element contains a list of activities that are designed to help the learner accomplish one specific objective. The first activity always requires the learner to read a *Study Guide* that includes the basic information the student needs to know, relevant to the objective he is working toward. In addition to providing information, the Study Guides also include practicum exercises so that the learner can put his new knowledge or skills to work. The remaining activities in the enabling element are deisgned to develop competency with an individual, small group, or classroom of children.

Post-test. When the learner has completed the activities in a module, he tests his competency using the post-test. The post-test items require some type of performance relative to the module objective. The learner uses the post-test to assess his new competency.

Selected bibliography. Selected references are provided for the student who wants more information or who would like to consult another source for different ideas. The flow chart graphically illustrates the process the student goes through when he uses instructional competency modules

FIELD TESTING OF THE INSTRUCTIONAL COMPETENCY MODULES

Before the instructional competency modules were used, they were field tested to determine their effectiveness. First, individual preservice and inservice teachers were given the modules and were directed to complete a field trial evaluation form which we provided. Second, the modules were used for directed instruction with groups of preservice and inservice teachers under the direction of a resource person.

At the end of each module, each participant completed a field trial evaluation form. These forms were collected and used as guidelines for evaluating the effectiveness of the modules and for making revisions. The modules were evaluated by 1,140 teachers from these subject areas: mathematics, English, physical education, business education, vocational education, art, social studies, music education, chemistry, and economics. The modules also were reviewed by
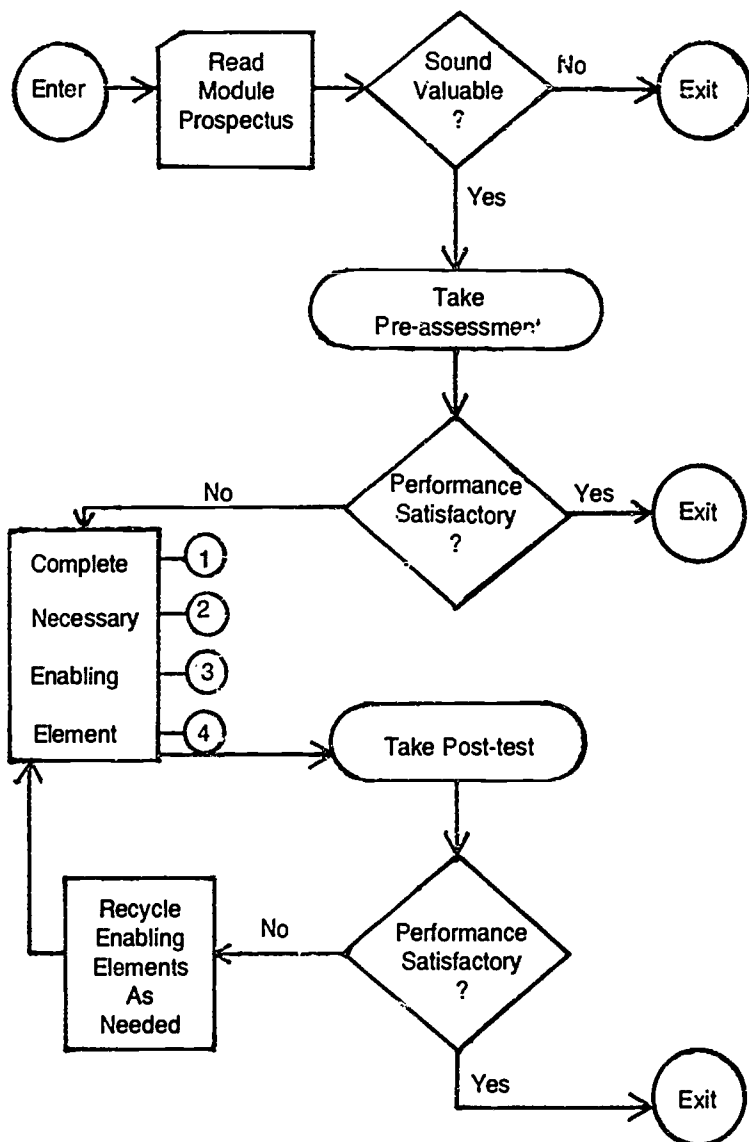

Figure 1. Flowchart of Instructional Competency Modules.

leaming disability specialists, reading specialists, directors of federal programs, principals, special educators, department chairmen, a director of a training program for practical nurses, and selected college and university professors. Two national authorities in secondary reading also were asked to evaluate each module.

The field evaluation revealed that the instructional competency modules were useful for developing competencies individually and in groups. The preservice teachers were much less successful than the inservice teachers in acquiring the competencies when they had to use the modules to direct their own learning. Evidently inservice teachers were able to use their own experiences, whereas preservice teachers needed the experiences of a resource person to bring meaning to the activities in the modules.

After the field trial was completed, the modules were revised and used to develop the 10 generic reading competencies in our preservice training program for subject area teachers. The 10 generic competencies in the modules now form the backbone of a course titled Teaching Reading in the Content Area. The modules are used to develop initial competency and in-school practicum experiences to develop proficiency. Each preservice subject area teacher spends two and a half hours beyond initial competency working with junior or senior high school students to develop proficiency with each competency. Our university students are placed in junior and senior high schools where they work under the direction of a reading specialist and a university professor. Approximately 8 to 10 students are assigned to each reading specialist who is a practicing reading teacher in the Dade County Public Schools. The university students are supervised and evaluated by the reading specialist and university professor.

ASSESSING THE COMPETENCIES OF PRESERVICE TEACHERS

We currently assess preservice teachers' competencies in four ways. After they complete the assigned activities in each instructional competency module, they first complete a post-test. Next, competency is evaluated by observation as they work with junior or senior high school students. Third, at the end of the semester, each student has a 30-minute individual oral examination with the professor. At this time the preservice teacher's knowledge and competencies are evaluated. Finally, the student's knowledge, and to some degree his competencies, are evaluated through the use of a comprehensive multiple choice final examination.

Grades are assigned on the total number of points accumulated from the four evaluations. A total of 50 points can be achieved for the 10 post-tests which are taken individually after each instructional competency module is completed. Another 20 points can be added for demonstrating competency with children and 10 points for demonstrating competencies during the individual oral examination. Finally, 20 points can be achieved for performance on a comprehensive multiple choice final examination. Final grades are assigned on the basis of total number of accumulated points. Competency must be demonstrated in all 10 areas or the student is given an incomplete grade regardless of the accumulated points at the end of the course.

LIMITATIONS OF THE COMPETENCY-BASED
TEACHER EDUCATION PROGRAM

While we believe the University of Miami reading course for subject area teachers is effective in accomplishing our program objectives, we feel it has some of the same limitations one can expect to find in any competency-based teacher education program. First, it is difficult to specify the teaching behaviors when we know so little about reading and teaching. We have not listed an infinite number of teaching behaviors, but, rather, have chosen to specify broad behaviors needed by teachers. What we have tried to do is to teach subject area teachers to behave in ways that are consistent with generalizations we have obtained from research and practical experience.

Second, there is a danger that preestablished standards will encourage minimal rather than maximum academic performance from students. In some performance-based programs the competencies are set so low that they are attainable by everyone in the program. As a result, the median performance is lowered and the range of performances reduced. We tried to avoid this problem by establishing competencies based on a task analysis of the subject area teacher's role in reading instruction. We have also incorporated a grading system, part of which relies upon curved test scores, to encourage maximum performance from our students.

Third, it is very difficult to obtain agreement on what level of performance constitutes competency. Competency is often in the eye of the beholder and the criteria are as varied as the number of persons who are judging competency. At present we use a percentage criterion for judging competency.

Fourth, competencies are difficult to measure. The knowledge competencies are less difficult to measure because they are easier to specify and can be measured with paper and pencil devices. Performance competencies are more difficult to measure because they require a description of more complex behaviors. Product competencies (how the students perform after treatment) are the most difficult to measure. Presently we are measuring competencies with paper and pencil tests and observations that allow us to get at the knowledge and performance competencies built into our objectives.

The program I have described is a modified performance-based teacher education program. For this program, generic competencies are written in behavioral terms, learners have prior knowledge of the competencies they must achieve, and class instruction is preceded by self-instruction with competency modules and followed by field experiences. The competencies of students are determined by performance. The program does maintain many of the aspects of traditional teacher education such as the three-credit-hour course, semester time limit, and competitive grading system. The marriage of ideas from performance-based teacher education and the traditional model allows us to meet the competency requirements for teacher certification with a manageable program.

COMPETENCY MODULES SUGGESTED BY MANGRUM

I. Outline of Instructional Competency Modules
  A. Prospectus
    1. Rationale
    2. Objective
    3. Resources and time required
  B. Pretest
  C. Branching Program Alternatives
  D. Enabling Elements
    1. Study Guides
    2. Practicum Activities
    3. Field Activities
  E. Post-test
  F. Selected Bibliography

II. Modules for Developing Content Teacher Competencies
  A. Determine readability levels of content area materials.
    1. Use Fry's graph for estimating readability
    2. Textbooks
    3. Articles
    4. Selections with less than 100 words
    5. Others
      a. Syllabus
      b. Tests
      c. Handouts
  B. Prepare Materials at Specified Readability Levels
    1. Alter a selection to a lower readability level
    2. Alter a selection to a higher readability level
    3. Write at specified readability levels
      a. A selection about you
      b. A course syllabus
      c. Test questions
        1. Essay
        2. True/False
        3. Short answer
  C. Determine if content area materials are suitable for a student to read
    1. Select materials
    2. Identify selection(s)
    3. Write questions like you ask
    4. Have student read selection silently—answer questions
    5. Have student read selection orally
    6. Make a decision on suitability
  D. Determine reading skill needs
    1. Identify reading skills in your subject area
    2. Construct reading skills tests
    3. Administer, score, and use to plan instruction

E. Teach Word Meanings
  1. Selecting words
  2. Acquiring guidelines for teaching
  3. Selecting activities
  4. Developing word meanings
F. Helping students comprehend
  1. Types of questions
  2. Preparing questions
  3. Answering questions
  4. Developing question answering strategies
G. Help students use study strategies
  1. Improve understanding and prolong retention
  2. SQ3R
  3. PQRST
  4. SQRQCQ
H. Pronouncing multisyllable words
  1. Identify potentially difficult words
  2. Acquire a strategy for pronouncing words
  3. Teach when and how to use the strategy
I. Motivating Reluctant Readers
  1. Intrinsic and extrinsic learners
  2. Affective and cognitive factors that influence motivation
  3. Incorporating motivation factors into teaching plan
J. Identifying and helping problem readers
  1. Characteristics
  2. Correlates of reading failure
  3. Identifying problem readers
  4. Referring and helping problem readers
K. Characteristics of an effective K-12 reading program
L. Evaluating student achievement in the K-12 reading program
M. Identifying teachers' inservice needs
N. Coordinating special services for the reading program
O. Selecting and purchasing reading materials
P. Financing and developing reading programs

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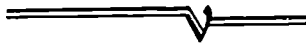
REACTION TO DR. MANGRUM'S PAPER

Editor's note:

At the close of his presentation, Dr. Mangrum asked the three discussion groups to consider two questions: "What reading-related competencies are necessary and are reasonable, given the time constraints of one course, for preservice content teachers?" and "What is the most effective way of developing these competencies?" The designated reactors in the groups—Vivian Ashby; Nora Lee Hoover; M. G. Lee; Donna Patterson; Connie Redick; Jo Ann Schall; Vernon Schertz; and Gwendolyn Trotter—served primarily as discussion leaders. With the exception of Hoover, the reactions were intertwined with the group discussion. For that reason, and with the exception of Hoover's reaction, only summaries of discussions are given here

Nora Hoover

In Indiana, in the fall of 1978, reading in the content area will be required of all our secondary students. A number of times I have taught a course in reading in the content areas and will describe a few aspects of this course which may be beneficial. Mangrum's book has been used in this course. An important point, however, not adequately covered in that book, entails motivating the preservice teacher from the first day onward. I have developed two techniques to provide this motivation. First I ask the students to specify the behavior of teachers they have had whom they found the most effective. Behavior is specified, as opposed to qualities (e.g., "sensitive"). The students identify the behaviors on index cards, which I collect. I then show them a model (Figure 2).

In their undergraduate major of 30 or 40 hours, the students have first developed knowledge about their subject: facts, concepts, and generalizations. Next, they developed skills, enabling them to think of themselves as artists, historians or scientists—but not teachers. To become a teacher, they must acquire knowledge about the teaching/learning process: theories, research, and so on. Lastly, just as they developed skills in their subject area, they must develop teaching skills: assessment, instructional techniques, and so on. My students and I generate a list of the various skills of a teacher. We then review the cards on which they have written effective teacher behaviors, and we chart each behavior in the appropriate square.

In four years, I have never had any behaviors that describe the teacher as knowledgeable or skilled in a particular content area. I have never had a behavior

that could be characterized as "knowledge about teaching/learning." The behaviors always fall in the last square of th model—"teaching skills." These effective teachers knew how to communicate, how to motivate, how to assess where a student was and how to help him get to where he wanted to be. This activity makes the point clear. My students realize that they are in the class to develop competencies in teaching skills. The course becomes meaningful.
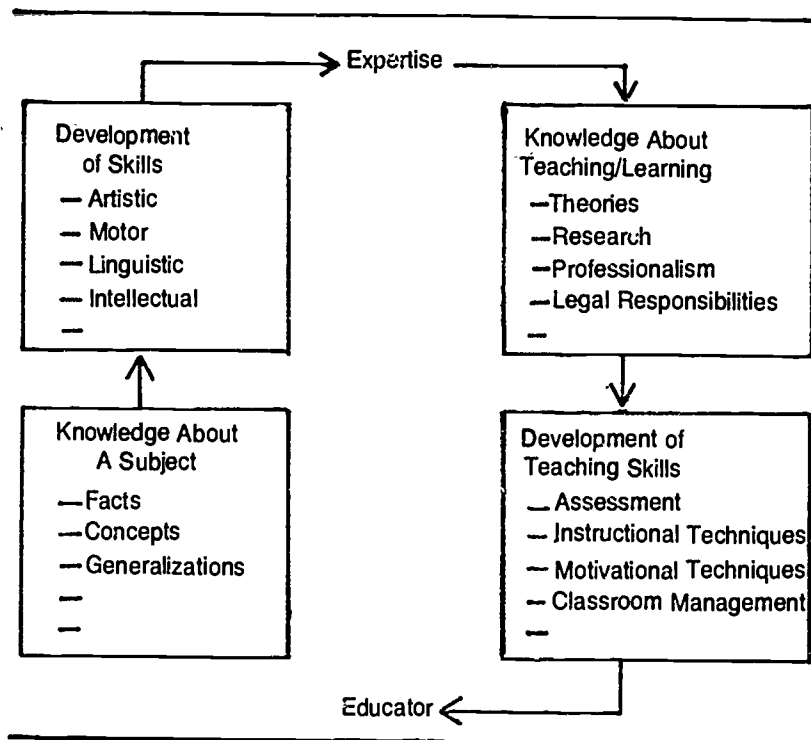

Figure 2. Model of Teacher Behavior.

From that point, I present to the students the range of abilities they can expect to encounter in a class. The students then work in small groups to generate the concepts and skills they think they need to know as content teachers. By doing this, they list the objectives of the course. Objectives generated by the students usually include how to test reading ability, how to assess the difficulty of textbooks, and how to rewrite passages. They generate, in effect, the competencies suggested by Mangrum.

GROUP ONE DISCUSSION

The group generated a list of competencies including motivational skills, assessment skills, vocabulary development skills, questioning skills, ability to adapt material for differing ability levels, ability to apply the subject area to life, and ability to individualize instruction. The group then addressed the question of the most effective ways to develop such skills and competencies.

Laboratory situations and practicums were stressed as ways of joining lecture with practice. One participant cautioned that field experience could be counter-productive when the cooperating teacher refuses to try the techniques advocated by the student teacher. Another participant, who had encountered the same problem, had success with preservice and inservice teachers in the same class.

One participant had her students prepare "suitability surveys," and vocabulary and comprehension learning packets for various lessons and texts. She encouraged her students to keep these and take them along when they interviewed for teaching positions. The students were generally hesitant to do this, but once they shared the packets with interviewing superintendents, the tone of the interview improved. "It is like an artist bringing his portfolio; it is a demonstrated competency. Rather than tell an interviewer what you can do, you can show him," one person commented.

It was suggested that the last of Mangrum's list of competencies—causes of reading difficulties—be presented first. One participant found it most effective to have students read in the areas of psycholinguistics and psychology because the students gain respect for the area of reading (which often does not happen when beginning with an area like word attack skills).

The group agreed that it is important for all content teachers to have a base level of competencies. After this base level is achieved, differences among content areas could be addressed with other competencies.

It was suggested that a "reading committee" composed of teachers from all the different subject areas could be set up in a school. Mangrum recalled his experience in Illinois in which such a reading committee actually developed the competencies for each content area and even trained the new first-year teachers in these competencies.

A participant asked for advice about how to teach a course when some of the preservice teachers themselves could not adequately read the text for it. Mikulecky suggested that an introspective approach might best be applied in which "the purpose of the course is to make the preservice teachers the best readers that they can be and thus able to apply the same techniques to their students."

GROUP TWO DISCUSSION

The participants were asked to generate a list of competencies for reading at the secondary level. In the 10 minutes available this list was produced:

1. Ability to determine the readability of material, and to match material to the range of students in the class.

2. Ability to define personal belief about the role of the teacher and the role of the student.

3. Ability to deal with subskills of comprehension, especially paragraph meaning and structural analysis of text material.

4. Ability to help students see and understand the purpose for what they are learning.

5. Ability to teach study skills.

6. Knowledge of reasons for having students read, and being able to set goals as a teacher.

7. Knowledge of how to help students develop reading on their own in various subject areas.

8. Knowledge of the organizational structure of printed material in the content area.

9. Ability to make decisions about which concepts are most important; ability to teach and develop those concepts.

10. Ability to identify where a student is on each of five levels—the personal, social, intellectual, psychological, and spiritual levels.

11. Knowledge of both what the students think about reading and what reading specialists think is involved in the reading process.

12. Ability to build a classroom atmosphere where readers/learners may explore and practice reading while learning about themselves in their universe.

The point was made that some of the competencies suggested were actually philosophical in nature; some participants were interjecting philosophy into the approach. The group debated whether it is possible to draw up competencies without first defining the philosophy. It was questioned whether, in 10 minutes or so, the group could establish a philosophical basis on which to build a core of competencies. "A lot of competency people push you into this kind of thinking. I believe, however, in a balance between theory and practice. I don't think you can move into the practice until you have your theory straight," one person commented.

Participants expressed other concerns about competency-based methods. One participant stated,

It seems he [Mangrum] was looking at the issue very narrowly. He seems to be directing his students to begin to do some things before they really know, "What do I believe? What do I think about what I should be doing? What do I think about myself? and What do I think about what my students should be doing?" They need to know something about themselves first. I think that is much more important than a list of competencies.

Another participant pointed out that Mangrum's competency-based approach was, in a large part, in response to a Florida state mandate. As such, it perhaps had to be defined narrowly. It was also pointed out that it would be impossible to draw up competencies for every inclination and philosophical base given by the teachers of a state. The exchange on this point follows:

"You tell me what you will be receptive to. I am going to package it in a very nice package, and I am going to give it back to you."

"That is exactly what has happened to students all the way from kindergarten through high school. People buy a thing [materials or a program] 'to do at' children."

"I think it's a question of whether we want people who know how to do things or whether we want people who know how to think. The stress on doing is why some of the competencies bother me."

"What we are looking for is a person who can look at the world and make decisions, create an environment. I don't know that that can be put on a list of competencies."

The discussion then turned to how one could build a course in secondary reading for content teachers, unless one preestablished a list of competencies to teach. One participant suggested the teacher "combine what they think their needs are with some of the things you think they need. You lead them into forming objectives, then, that you have arrived at together." Another participant suggested drawing up a pretest based on minimal competencies the teacher has identified. Explain to the students that these things have been identified as minimal competencies, discuss them after the pre-test, and design the course around the results of the pre-test. A third participant pointed out that the problem with such mutual approaches was that many preservice content teachers have little background and less interest in reading. A teacher might spend several weeks trying to draw out the preservice teacher, when all the preservice teacher wants is to be taught the competencies, and get out of the course. The specialist in reading would do more good by defining the competencies beforehand and making sure the preservice teachers left the course with at least minimal competencies to deal with reading. Other participants agreed. One participant said:

> Lots of prospective content teachers come into reading classes with nebulous notions about the reading process and reading problems. That is why I see the need for some kind of structure for the competencies we want them to know. Saying that we are just going to let them come in and say what their needs are is unrealistic; I don't think many have thought out what reading in the content areas is. We're going to see more and more students like that, now that reading courses are mandated for secondary teachers. The students take the class because they have to, not because they have special interest in or knowledge about reading.

GROUP THREE DISCUSSION

Initially, the group identified four competencies for content teachers: ability to use readability formulas; knowledge of materials available and how to use them; knowledge of methods available, and knowledge of methods of matching students with materials.

Discussion centered on readability formulas. One participant found that teaching such formulas sets a positive attitude; because of the concrete nature of the task and the results, students enjoy using readability formulas, and find them benefi-

cial in their teaching. Several participants felt it is important to point out to students the fallibility of such formulas. Readability gives only an estimate of reading difficulty. Problems with readability formulas should be pointed out early. One participant had his students do readabilities on a variety of materials. They found Bradbury's *Martian Chronicles* read at a fourth-grade level, while the philosopher Vygotsky was at fifth or sixth-grade level. Unless the students are aware of other influences on reading difficulty, they may totally discount readability instead of viewing it as one method of examining texts. It was pointed out that readability can account for 60% to 70% of text difficulty. There was still a high degree of variance unaccounted for by sentence length, word difficulty, abstraction, concept load, etc.

Student attitude was seen as a problem in developing many of the competencies. One participant said:

> Students start balking when you tell them what they have to do to analyze texts, to count concepts or look for key vocabulary, or to try to determine what elements they want to stress through study guides or organizers. They see themselves as content teachers, and this is just so much more work.

Another participant suggested that it is important to stress that the preservice teachers will not have to incorporate reading skills all the first year; these are competencies, rather, that can be incorporated as the teachers become comfortable with their positions and other responsibilities. Other participants felt that competencies needed to be identified that could and would be used from the first year of teaching. If preservice teachers are discouraged from incorporating reading skills the first year, they might never use them. Universities and colleges need to identify necessary and possible areas of competency to cover in a three-hour course. Also, universities and colleges need to decide whether merely information is being given out or if usable competencies are being developed.

Participants were generally agreed that, in addition to competencies, positive attitudes had to be developed. As one person commented:

> No matter what we teach in a preservice setting, it won't make sense until they have taught a few years. I would go after less competencies and try to engender a positive attitude for how reading relates to learning.

James Mills, director of English for Cleveland Public Schools, stressed the idea of good planning as a way to engender good attitude. He said:

> Positive attitude comes from success. Success comes from planning well. I am not sure "vocabulary development" is a competency. It is if it is taught well. If it is not taught well, it may be an incompetency. Something is a competency when it is done in a meaningful, creative fashion.

Another participant suggested finding ways of gaining the cooperation of the content-area professors. He had found great success with the literature department of his university by stressing the similarities to reading skills in what its faculty members were trying to do. The literature faculty, for example, taught "methods of analysis of prose" which included finding inferences, identifying organizational patterns, and other skills that often are labeled "reading skills." Also, there is an area of literary criticism—the transactional approach—that is similar to many of the current views of reading. In the transactional ap-

proach, the reader makes the work. The work is simply inkblots on a page until the reader organizes it and does something with it. Literature involves the individual experience of every reader with the work. This participant found he received much help from the literature department by stressing these areas of similarity.

Other participants emphasized the use of field experience in secondary reading methods courses. "It gives a sense of reality. . . .The students see that the information really is useful and usable," one person said. "It is a learning experience for the supervising teachers as well as for the preservice teachers. I have had several teachers adopt ideas presented by the preservice teachers," another noted.

Suggestions for involving preservice teachers from areas such as art, physical education, and music were discussed. One professor had asked teachers in those content areas to send him copies of reading materials they use in class and had received a large amount of material. When preservice teachers in those areas express doubts about the usefulness of reading in the areas, the professor shows them the reading materials actually being used. This was quite successful in convincing the preservice teachers of the importance of reading in the total curriculum.
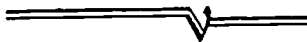
IN PERSPECTIVE

Leo Fay

Perspectives is an unusual topic for a paper. In fact, when Carl Smith gave me this topic, I was caught short until I remembered his Jesuit training. If you remember Philosophy 101, you may recall that perspectivism is a concept in philosophy in which the world forms a complex of interacting, interpretative processes in which every entity views every other entity and event from an orientation peculiar to itself. In short, perspectivism is to view events with a systematic bias and hence here I am as a practicing perspectivist, admittedly biased, as soon will become apparent.

As stated elsewhere, the primary purpose of this Monograph and the Lilly Conference was to provide an opportunity to study the reading process and how it develops, so that colleges and universities can meet the new state certification requirements for all secondary teachers to be prepared to teach reading. I suspect that there are those on each of our campuses who would say, "What a sorry state of affairs that colleges now need to be concerned with preparing secondary teachers to teach such an elementary and basic skill as reading." Such statements imply that reading is only an elementary and basic skill and that there was a golden age of literacy somewhere in our past. The papers herein are concerned with achieving higher levels of literacy, and I will attempt to presuade you that the golden age is yet to come.

The truth is that the new certification requirement reflects progress toward the goal of achieving universal functional literacy in our society. Furthermore, as our society continues to become more complex, even higher levels of literacy and a higher rate of participation in post-secondary education will become necessary. This, in turn, will open opportunities for people who have been economically and educationally disadvantaged in the past. Contrary to what we would like to believe, the record of higher education generally in meeting emerging needs of people, whether in education or in other areas, is not particularly good. As is often the case, this change in teacher education was forced upon colleges and universities by outside agencies.

Rather than discussing the dynamics (or lack of it) of change within our institutions of higher education, it would be more profitable to review literacy develop-

ment in this country and to consider in a broader perspective why the secondary schools need to be concerned with the teaching of reading.

Recently Ralph Tyler commented that, according to the best estimates available, the level of literacy in this nation at the time of its independence was a mere 15%. This figure surprises many persons who read the eloquent documents and speeches of the political leaders of that day. But the tradesmen, farmers, and frontiersmen had little need to read and did not. By the time of the War Between the States, this percentage of literacy had grown to a mere 28%. One factor we often ignore in the literacy arena is that a sizable proportion of our population was not permitted the privilege of literacy because they were not free people. And the obvious truth is that we still have not totally overcome the effects of this factor and of the systematic bias that was imposed when these people finally did receive schooling. This is one, the greatest no doubt, but only one of many factors that caused depressed school achievement.

It was not until the first decade of the twentieth century that literacy became an issue in this country. The turn of the century was a period of heavy immigration and the new immigrants were met with suspicion and disdain. People wondered, "Who are these hordes of people with their strange clothes, language, and manners?" Groups such as the Immigration Restriction League were formed and among other things, proposed literacy tests to restrict immigration, especially that from eastern and southern Europe and Asia. Henry Cabot Lodge, a leader in this movement, proposed a bill in Congress in 1896, which was passed but vetoed by President Cleveland, which would allow admission of only those who could read and write their own or some other language. Lodge was frank to say that such testing would "bear most heavily upon the Italians, Russians, Poles, Hungarians, Greeks, and Asiatics, and very lightly, or not at all, upon English speaking immigrants or Germans, Scandinavians, and French." According to Lodge, "The mental and moral qualities which make what we call our race" could be preserved only by excluding "the wholesale infusion of races whose traditions and inheritances, whose thoughts and beliefs are wholly alien to ours and with whom we have never assimilated or even been associated in the past." Similar bills were passed by Congress in 1901 and 1915 and also were vetoed This was a period when there was no real enforcement of school attendance laws (in those days you did not *compel* an American to do anything), and the idea of intervention programs to do something about illiteracy had little or no support The public generally was unconcerned.

The Census of 1900 asked the question for each person age 10 and over, "Can this person read and write?" On the basis of a "yes" or "no" response to this question the country was officially listed as 89.3% literate. The records show that 6% of the 17-year-olds in the nation went on to complete high school in 1900 This 6% was a 100% improvement over the 1890 figure.

The next decade (1910-1920) witnessed the first World War and continued strong feelings against the foreign born. The 1910 census reported a 92.3% level of literacy for the country based on the same standard that was applied in the 1900 report. By then 8.8% of the 17-year-olds completed high school. Although some concern appeared for the native born illiterate, no state passed legislation

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related to adult literacy. The military draft brought a shock to the nation by revealing that of all men tested for the draft 25% were unable to read a newspaper or write a simple sentence. The 1917 Army draft tested a select group of people—the young with the most recent opportunity for schooling. Obviously the functional literacy level of the total adult population was much lower than the 75% level of the draftees. For the first time a functional definition was applied, and statistics were based on actual performance.

The war ended, but not the interest in literacy. The Census of 1920, using the same definition used previously, reported the nation was 94% literate. That year 16.8% of the 17-year-olds completed high school. The Army experience led to the establishment of illiteracy commissions in several states. In 1921 Maine and North Dakota passed legislation and organized programs to abolish illiteracy. In 1922, 10 additional states passed such legislation. In 1924 there was a National Illiteracy Conference in Washington and a National Illiteracy Crusade was conducted. In the same year the Sterling-Reed Bill was introduced in Congress. This bill sought to establish a Department of Education which, among other things, was to research illiteracy. Section 7 of the Bill read: "In order to encourage the States to remove illiteracy $7,500,000, or so much thereof as may be necessary, is authorized to be appropriated annually for the instruction of illiterates fourteen years of age and older." Section 8 provided an additional $7,500,000 for Americanization programs to teach immigrants to read and speak English. The bill did not pass, but, interestingly, proposed a larger budget than the Right to Read effort received when it was funded 45 years later. The concern for literacy continued and in 1929 President Hoover appointed an Advisory Committee on National Illiteracy. The idea was a good one but the timing was poor. The stock market crash and the subsequent depression drove illiteracy from its priority position.

The 1930's was the age of the New Deal in America. The census that year reported that the nation was 95.7% literate using the same definition of literacy that applied previously. That year the percent of 17-year-olds who completed high school increased to 29. This census did report additional literacy data. The illiteracy rate over the 1920-1930 period for whites had dropped from 4.0 to 2.7%; for blacks, from 22.9 to 16.3%; and for foreign born, from 13.1 to 9.9%. During this decade studies of illiteracy were undertaken, including its relationship to crime. WPA writing projects developed new instructional materials, and special experimental programs were undertaken. However, the national effort that was emerging in the mid-1920's did not reappear.

The 1940's brought a new crisis situation. The Census of 1940 did not report literacy data. However, it was estimated that the level of literacy, using the previous definition, was 97.1%. For the first time more than half (51%) of the 17-year-olds completed high school. In 1947 the census collected specific literacy information using as the definition of "literate," all people 14 years of age and older who had completed five or more years of schooling. Three million persons past the age of 14 had no schooling at all (3.0% of the population) and 11.5 million (11.5%) had less than five years or none at all. To grasp the significance of these figures and using 1940 as the base year, the number of functionally illiterate adults in this country was greater than the then combined adult populations of fornia, Oregon, Washington, Idaho, Montana, Nevada, Utah, Arizona, New ico, Wyoming, Colorado, North and South Dakota, and Nebraska.

Once more the Army draft revealed the low level of functional literacy in the country. In May, 1941, an Army directive was issued to reject all men who could not pass a test of fourth-grade reading difficulty. In only six weeks 50,000 men were rejected. By September of that year 144,000 and by March, 1942, 433,000 men—the equivalent of 29 infantry divisions—were refused induction. After that the rule was changed. Late in 1943 illiterates were drafted and assigned to Specialized Training Units (STU's) that had been organized by Paul Witty of Northwestern University to provide literacy training together with the Army's basic training. The Army screened its ranks for rural school teachers who were then assigned to Witty's units. In the World War II draft, 38 out of 1,000 white and 112 of 1,000 black draftees were rejected as illiterate. I had my first experience with the literacy problem when assigned to the Psychological Testing Unit at Fort Snelling, Minnesota in 1943. Illiterate recruits coming through that center were primarily from rural areas. It was also in the early forties that the first books concerned with reading in high school appeared: *Developmental Reading in High School* (1941) by Bond and Bond, and *Diagnosis and Remedial Teaching in Secondary Schools* (1946) by Blair.

The Census of 1950 broadened the definition of literacy for all those over age 14 to include the completion of five years of schooling and the ability to read and write. On this basis the nation's literacy level was listed at 96.8%. By 1950, 59% of 17-year-olds completed high school. But once again history repeated itself. In the Korean War draft 300,000 men were rejected the first year for what was called "educational reasons." The proportions of rejectees varied widely from one region of the country to another. The national rejection rate was 19.2% ranging from 58% of the men from South Carolina to a low of 5 to 7% from Minnesota, the Dakotas, and Montana. The manpower resources of the nation were so low that not only the Army but the Navy as well had to accept illiterate recruits and provide special training for them. Indiana University received a contract from the Navy to assist with the development and evaluation of its literacy programs. During the 1952-53 academic year I had my second encounter with the nation's literacy problem by serving as a consultant with the Navy working at its three basic training centers—San Diego, Bainbridge, and Great Lakes. The navy selection process took men with potential (average non-verbal IQ 101), and its special training programs enjoyed a high degree of success. The criterion was fourth-grade reading level. The draft experience of the Korean War, which resulted in uneven proportions of men being drafted from high achievement states, brought changes in the draft for the Vietnam War including deferments for educational purposes.

The Census of 1960 did not contain direct literacy data. If the schooling definition were used it is estimated that the population over 14 years of age was 98.1% literate. Of greater concern was the matter of functional literacy and how it was to be defined. By 1960, 65% of 17-year-olds completed high school, and the percent of functionally literate people was increasing. At the same time population growth was such that the actual number of functional illiterates increased somewhat. The movement of people from rural to urban areas also had significant impact on both statistics and programs. The new draft laws kept the military in the business of literacy training. In 1966 the military undertook Project 100,000 with the goal of training 100,000 functional illiterates annually.

The Census Bureau conducted a special study in 1969 and reported that 99% of the population 14 years of age and older could read and write a simple message in English or another language. This data became th ^ficial statistic of the 1970's. In 1970, 76% of 17-year-olds completed high school and 31% of the 1972 high school graduates completed a bachelor's degree in 1976. About an equal percentage continued their education in some other form beyond the high school level. If the age group is expanded to from 16 to 22, 84% completed high school. The decade of the seventies is the period when the Right to Read effort was dedicated to elimination of illiteracy. The Adult Education Act of 1969, Public Law 89-10, and the Education Amendment of 1974 all gave reading skill statuatory recognition. Title VII of the 1974 amendment outlined a National Reading Improvement Program to be administered by the National Right to Read Office. Finally, in 1978, President Carter proposed a massive effort in the area of the basic skills.

And now to put all of this into a perspective—what do we conclude?

First, our society has made steady progress toward a totally literate society. The mere goal is significant for it reflects a people who care, and that goal is now more reasonable than at any point in our history.

Second, as our social, economic, and political development continues, the goal is not only that all persons achieve a basic level of literacy but also that a growing proportion of them achieve higher levels of performance. The increased percentages of persons completing high school and continuing to more advanced levels of education is one evidence that this is happening. In this connection, serious consideration needs to be given to the question, "Are we becoming too successful?" Higher levels of literacy for the mass of the population can no longer be justified on the basis of society's occupational needs. We are over-credentialed at all levels. The case for continued literacy development must be made on the basis of citizenship and personal development values—reasons enough in a free society.

Third, it makes good sense to be concerned about reading at the secondary school level. It is at this level that the basic skills of reading are applied as a means of learning in the different content areas. It is at this level that to read is to think, and it is at this level that the base is provided for effective learning at higher levels.

Is the present state of reading achievement a disaster that now calls for correction at the secondary level? Hardly. In truth the record is a proud one, and with the attention that will now be given to reading at the secondary level it will become even more so. The Golden Age of literacy is yet to come.

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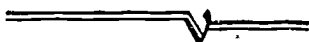
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Publications and Materials in Reading

Even though the process of reading is centuries old, educators are continuing to learn more about this comprehension mode and to pass understanding on to other educators.

In an effort to learn more about the reading process, the Indiana University Reading Education Program is active in research, and endeavors to communicate its findings in this area. Publications and materials available from the Program include Occasional Papers on such topics as:

1. Evaluation of materials, methods, techniques of reading;

2. Testing and measurement;

3. Critical and creative reading;

4. Teacher training and preservice education;

5. Literacy;

6. Reading in the content areas;

7. Cognitive and language development and reading;

8. Reading-thinking skills.

Teacher educators as well as preservice and inservice teachers may find these papers useful to expand their knowledge in reading or as a base for further research of their own.

In addition, two videotape series, *The Affective Dimension of Reading* and *The Language Base for Reading,* can be used in inservice and preservice teacher education programs, conferences, workshops, or college and university courses. The 12 programs in *The Affective Dimension of Reading* are designed to present concepts, strategies, and activities that have proven useful in motivating children to read. In *The Language Base for Reading,* the six presentations emphasize the teaching of reading. Presentations are made by many noted educators, including Bill Martin Jr., H. Alan Robinson, Jeanette Veatch, Carolyn Burke, Martha King, Richard Bamberger, Daniel Fader, and Kenneth Dulin. Each videotape series is accompanied by program guides and is available on a rental basis.

Another videotape training series (Lit-TV) for literacy instructors is available through the Audio-Visual Center at Indiana University.

Specific titles, costs, and other information are available from the Reading Education Program, Education 211, Indiana University, Bloomington, Indiana 47401, (812)337-7167.

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