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Michael L. Walker
Eastern Michigan University

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Help for the "Fourth-Grade Slump"—SRQ2R Plus Instruction in Text Structure or Main Idea

Michael L. Walker

Elementary school students' ability to comprehend and study expository material begins to be a major concern primarily in the fourth grade. Chall's (1983) characterization of this period as the "fourth grade slump" (p. 67) remains a valid observation, because teachers still report that while children continue to show ability to read narrative material during this period they are unable to completely read and understand their content area textbooks.

The widespread introduction of expository material and the necessity to use reading as a tool for new learning in fourth- and fifth-grades have been identified by Chall (1983) as primary causes of the problems in reading comprehension and retention that are characteristic of this period. Readers of expository material at these early stages of development appear to suffer from an inability to use appropriate strategies and skills in a spontaneous manner for reading and studying. What, specifically, must emergent content area readers learn to do in order to be effective readers of expository text as opposed to narrative text? A wide array of competencies are involved, and of these, the necessity to establish goals and understand purposes for reading expository text, the requirement

to deal with a large vocabulary load, the ability to handle novel textual structures, and the need to develop long-term retention are of major importance.

In addition, there may be differences in the nature of schematic knowledge necessary for narrative and expository processing, and the macrostructures (higher-level semantic or conceptual organizations in text) in narrative and expository text may be quite different in many basic characteristics. Johnston (1983) asserts that emergent content readers may have an inability to find information readily because of lack of knowledge of the structural cues in expository material and a lack of knowledge of where inferences are required and what type these should be.

Studies with children as young as five and six years of age have found that while they usually do not spontaneously employ study strategies when faced with a learning task, these children are able to employ study strategies when directed to do so and shown how to do so by a teacher (Flavell, 1970; Flavell and Wellman, 1977). Flavell labels this a production difficulty as opposed to a deficit problem, because young children do possess the ability to integrate skills and strategies they have been taught to use into their cognitive functioning, and apply them appropriately .

Still, it is true that most young children often fail to use appropriate skills and strategies necessary for successful and efficient learning of various tasks, and fourth- and fifth-graders often lack knowledge about how to coordinate components of study systems needed for the complex demands of academic materials. Unfortunately, it is also true that for fourth- and fifth-graders, their production difficulties in study strategies and their problems in comprehension and retention of expository text are not always ameliorated by instruction.

Durkin's (1978-1979) quantification of the percentage of social studies instruction used to teach fifth- and sixth-grade students how to read and study expository material at no more than 1.3% of class time was an alarming finding that alerted many educators to the need for more instruction in this neglected area. The implementation, however, of thorough, comprehensive classroom study skills programs beginning in fourth- and fifth-grades has been slow, because many classroom teachers simply lack training in the area of study skills, and because the research findings in this area have been inconsistent and difficult to interpret. Although fourth- and fifth-graders could benefit from instruction in study skills and strategies, the acquisition of study strategies and skills by these students is left largely to chance (Adams, 1980; Herber, 1965).

A very promising development in improving the instruction of reading/study strategies has been the work initiated with fourth- and fifth-graders in the use of SQ3R (Survey, Question, Read, Recite, Review). (See Stahl, 1983, and Walker, 1991 for reviews of this research). Since Robinson (1946) began his research with college and secondary students in this system of surveying, questioning, reading, reciting, and reviewing expository material, researchers have extended its use to elementary students.

The results of SQ3R research have been inconsistent, however, primarily because there has been little investigation of these basic issues: the amount of instructional time necessary to teach SQ3R; which students benefit the most from using SQ3R; what type of pre-training is necessary; what type of expository material is best-suited for SQ3R use; what minimal levels, if any, of reading ability and prior knowledge are necessary for effective use of SQ3R; among others. The SQ3R studies of basic issues that do exist often differ radically from each other due to the failure of researchers to incorporate into

the design of their studies the significant findings of other SQ3R studies (Anderson and Armbruster, 1982; Caverly and Orlando, 1991; Stahl, 1983; Walker, 1991).

The present study attempted to establish commonalities in goals with SQ3R research that addressed basic concerns in the use of this complex textbook-study system. SQ3R studies were categorized according to whether or not their research design permitted them to consider five basic implementation issues. The elucidation of these issues is important for a thorough understanding of SQ3R, and for extending the use of SQ3R to emergent content readers (Table 1). The wide variety of other issues also addressed in these SQ3R studies was ignored. (In this review, SQ3R research includes SQ3R and variations that maintain the steps of surveying, questioning, reading, reciting, and reviewing expository material).

The purpose of the present study was to investigate the issue of whether or not SRQ2R (a reordering of the questioning step results in Survey, Read, Question, Recite, Review) usage is facilitated by pre-training in text structures or main ideas understanding; the effect of these study strategy paradigms on higher level thinking was also assessed. An additional purpose of this study was to determine if complex textbook-study systems could be used by classroom teachers in the regular school environment. The study, therefore, employed the social studies text that was used in the school district, and the study was conducted during the regular social studies period by the regular classroom teachers.

The study was based on my belief that pre-training in main ideas would be fairly comparable to pre-training in structure of text, and that both of these in combination with SRQ2R would be effective for the development of higher-level thinking skills for fifth-grade students. I hoped that the

design of the study would enable educators to ascertain if either of the combination study paradigms constitutes effective textbook-study systems for elementary school students.

Table 1
Issues Addressed in SQ3R Research

<u>Issue</u>	<u>Studies</u>	<u>Results</u>
Secondary and post-secondary students do not consistently use SQ3R, whereas elementary students do.	Adams, 1980; Ferrante-Alexander, 1983; Donald, 1967; Fisher, 1986; Galloway, 1984; Lant, 1989; Loranger, 1988; Peck, 1986; Slade, 1985; Summerville, 1985; Walker, 1991; Zirkelbach, 1984.	11 studies: 8 showed totally (4) or partially (4) positive results.
Too little time spent in SQ3R	Adams, 1980; Beneke & Harris, 1972; Butler, J., 1982; Butler, T., 1984; Carter, 1985; Courtney, 1965; DeLong, 1949; Diggs, 1973; Donald, 1967; Driskell & Kelly, 1980; Eanet, 1978; Ferrante-Alexander, 1983; Fisher, 1986; Foreman, 1982; Galloway, 1984; Gudan, 1986; Harris & Ream, 1972; Lant, 1989; Loranger, 1988; Martin, 1983; McReynolds & Church, 1973; Niple, 1968; Okey, 1980; Orlando, 1979; Peck, 1986; Robinson, 1961; Slade, 1985; Stoodt & Balbo, 1979; Summerville, 1985; Walker, 1991; Wooster, 1953; Zirkelbach, 1984.	32 studies: 10 totally, 15 partially positive
Tests requiring constructed responses are compatible with SQ3R processing.	Adams, 1980; Ferrante-Alexander, 1983; Donald, 1967; Foreman, 1982; Hickey, 1989; Okey, 1980; Orlando, 1979; Rusch, 1985; Walker, 1991; Wooster, 1953; Zirkelbach, 1984.	11 studies: 10 showed (4) totally, (6) partially positive results.
The questioning step is inappropriately placed in SQ3R.	Okey, 1980; Walker, 1991.	2 studies: 1 totally, 1 partially positive.
Text structures or main idea pre-training improves SQ3R effectiveness.	Walker, 1991.	1 study: 1 totally positive.

The variation, SRQ2R, was selected for use in this study for two reasons. Since Robinson's (1946) promulgation of SQ3R, exciting research into adjunct questioning (Andre, 1979;

Hamaker, 1986; Hamilton, 1985; Rickards, 1979; Rothkopf, 1966) has revealed that pre-question (questions asked before a selection is read to guide the reading of the selection) have a facilitative effect on test performance for those test questions that were also pre-questions (repeated questions), but not on test questions which did not appear among the pre-questions (unrelated questions). Post-questions (questions asked after a selection is read to ascertain and enhance comprehension, and to highlight important information) have facilitative effects on test performance for both repeated and unrelated questions. Facilitative test effects were also found for self-constructed questions (Duell, 1978; Frase and Schwartz, 1975; Schmelzer, 1975).

Several researchers (Okey, 1980; Spache and Spache, 1977; Walker, 1991) have called on investigators in SQ3R research to reorder the questioning step in light of the adjunct questioning findings cited above. Okey (1980) addressed the issue of the placement of the questioning stage by studying the performance of a group of college students taught to use SRQ2R. Walker (1991) extended this research by teaching elementary students to use SRQ2R, and by comparing these results to a group who used SQ3R. Both SRQ2R groups in the Okey and Walker studies performed significantly higher than others in the studies when they were assessed with experimenter-constructed short answer/essay exams.

The second reason for selecting SRQ2R for use in this study has to do with the issue of matching the criterion task with the processing that is characteristic of a study strategy or system. Several researchers previously found that criterion tasks that allow the students to construct responses (essay, short answer, cued verbal response) are more compatible with the cognitive processing characteristic of SQ3R use (Adams, 1980; Rusch, 1985; Stahl, 1984). Stahl went further and

speculated that SRQ2R would be more facilitative for higher-level thinking, and that SQ3R would aid factual recall. Since the encouragement and assessment of higher-level thinking was important in this study, and since the criterion task was performance on short answer/essay exams, SRQ2R's use might shed light on these issues.

Method

The subjects were 104 fifth-grade students drawn from six classrooms from two schools of a midwestern urban school district. Both schools are located in neighborhoods that are similar. Interspersed in these neighborhoods are areas characterized by high density apartment buildings, and single homes in deteriorating or poor condition.

Approximately 45 percent of the students enrolled in both schools receive either free or reduced lunches according to federal guidelines on income levels. In addition, about 25 percent of the student population is placed in categorical Special Education programs in these schools, and approximately 25 percent of the school population receives Chapter I instructional services. Minority representation in the student body is around 25 percent. Students of various reading ability levels were grouped heterogeneously in each classroom. There were 56 girls and 48 boys participating in the study ranging in age from 9.0 years to 10.9 years; 71 of the subjects were white, 29 were African American, and four were of other races. The six intact classes of students were randomly assigned to treatments of: I — SRQ2R Plus Structure of Text (19 students); II — SRQ2R (18 students); III — SRQ2R Plus Main Idea (20 students); IV — Main Idea (14 students); V — Control (16 students); VI — Structure of Text (17 students).

Passages from *America and Its Neighbors* (Cangemi, 1986), a fifth-grade social studies text, were used for instructing

and testing the six groups involved in the study (pages 150-176). The text passage used for the final test consisted of a 624-word passage (pages 178-180). All teachers and researchers believed that the Cangemi (1986) text was considerate, inasmuch as there were well-written introductions and summaries, explanations of terms, stated instructional objectives, and appropriately interspersed bold headings. The structure of the textual organization was descriptive, and the chapters and topics were arranged in chronological sequential order. A readability assessment of the textbook (Raygor, 1977) revealed a reading level of about 4.5.

The two SRQ2R groups which received pre-teaching in structure of text (Group I) and understanding main ideas (Group III) used passages from Unit 3, Chapter 7, pages 138-146 (Cangemi, 1986) for teaching; the other four groups also read and discussed these pages during the pre-teaching period (no instruction was offered to these groups).

The groups that received teaching in SRQ2R were introduced to the system by charts containing the steps, and modeling of the application of the steps of SRQ2R by the classroom teacher. In small groups, students practiced SRQ2R on text material that had been covered previously; each group discussed all aspects of the process until each was thoroughly familiar with all of the steps of the system. The whole class discussed any questions about the steps or the goals of SRQ2R that were raised by class members. Students were reminded daily to review SRQ2R with a buddy, and to repeat the steps before using the system.

Structure of text instructional materials consisted primarily of a series of semantic maps, discussion, and modeling by the teachers detailing the characteristics, use, and key words found in the various text structures (cause/effect,

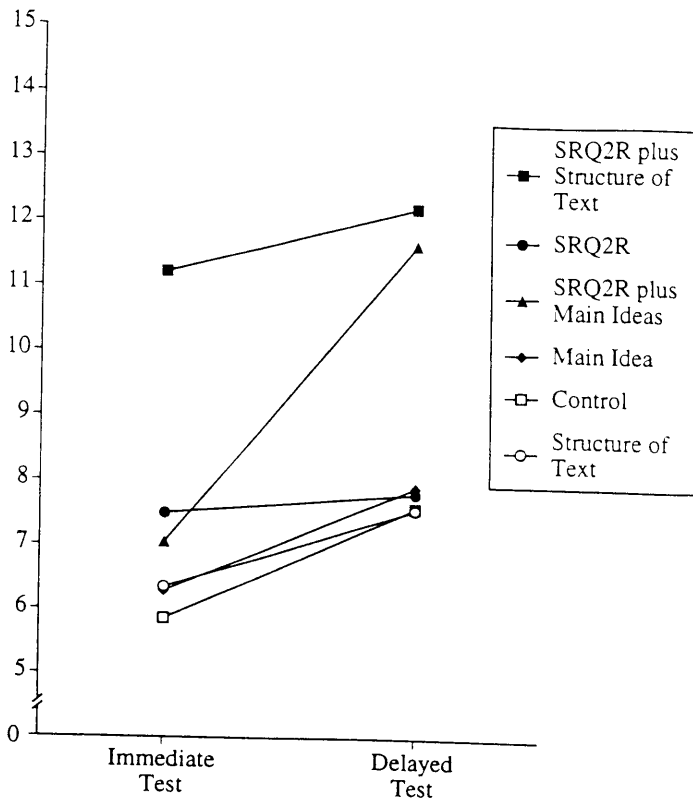
problem/solution, description, chronological sequence, comparison/contrast). Emphasis was placed upon the students' understanding the description text structure in combination with a superordinate chronological sequence organization, because that combination of text structures was employed in *America and Its Neighbors* (Cangemi, 1986). Main ideas instructional materials consisted of a series of semantic maps modeled after the procedures described in the article by Hennings (1991) for main ideas instruction. The teachers used and displayed semantic maps of the anticipated main ideas, details and ideas that help track the main idea and the ultimate main idea.

The two groups which were assigned to training in Main Ideas (IV) and Structure of Text (VI) alone, received the same type of instruction that the two groups receiving combination study paradigms had received initially in the pre-training period. Groups I and III were reminded daily in the main phase of the instructional period to continue to recognize and use structure of text and main ideas understanding, respectively, as they learned and used SRQ2R. The control group received no experimental instruction in study strategies and skills. This group was given conventional instruction consisting of pre-reading discussion of the topic; discussion of important vocabulary; reading the practice chapters; discussion of the important information and the end-of-chapter questions. Control subjects were then administered the same instructional tests that were administered to the experimental groups after each practice passage.

The *Gates-MacGinitie Reading Tests, Level 5/6, Form K* (MacGinitie and MacGinitie, 1989) was administered to subjects in the six groups to determine the comparability of reading ability among the groups. Results indicated that there were no significant differences in reading ability among the

six groups. A short answer/comparison prior knowledge test on the settling of Oregon and Utah was administered to all students. Analysis of test results revealed that all of the students were "low prior knowledge" subjects (no student scored above 50 percent) and there were no significant differences among the groups.

Figure 1
Group Means of Immediate
and Delayed Test Performance



A short-answer/essay test, Comprehension Test I, was administered to all subjects one day after they read the 624-word test passage from Cangemi (1986), and a parallel form, Comprehension Test II, was administered three weeks later to assess long-term retention. Correlational data between the two forms revealed that $r=.80$. Both Comprehension Test I and II observed the principles of comprehension assessment stressed by Anderson (1972): each test avoided the language of the text and instruction; each was a short-answer/essay exam that required the reader to construct responses. In addition, each test contained equal numbers of textual explicit items (answers can be found on the pages of the passage under study), textual implicit items (answers require integration of textual information, or inferences must be made from textual information), and experience-based items (answers require analysis, synthesis, and inferences based on the reader's prior knowledge and the textual information).

The means of the immediate and the delayed testing results for all six groups are graphically represented in Figure 1. ANOVAs, $p<.05$, and Newman-Keuls post hoc tests, $p<.05$ (Dayton, 1970), revealed that in the immediate results, Group I performed significantly higher than the other groups. In the delayed testing, Groups I and III performed significantly higher than the other four groups. To measure higher-level thinking skills, an analysis of textual explicit versus textual implicit versus experienced based items by group in the immediate and long-term retention testing, and an analysis of textual implicit plus experienced based items, and significantly higher on the combination measure of textual implicit plus experienced based items. In the testing of long-term retention, Groups I and III performed significantly higher than the other four groups on textual implicit, and experienced based items versus textual explicit items, and significantly higher on textual implicit plus experienced based items.

Discussion

The purpose of this study was to test the speculation that pre-teaching in understanding structure of text or main ideas is a prerequisite for effective use of a textbook-study system like SRQ2R by elementary school students (Pauk, 1979). Also tested was the effect several study paradigms had on higher-level thinking ability.

The results of the study gave support to the contention that the pre-teaching of students in structure of text or main ideas is a necessary requirement for effective use of SRQ2R. This is an interesting finding, because the group pre-taught in main ideas demonstrated significantly higher performance on the delayed test only. Future studies may want to explore the nature of the differences between the use of SRQ2R with pre-teaching in main ideas and SRQ2R with pre-teaching in structure of text. It is interesting to speculate on the nature of the performance of an SRQ2R group receiving main ideas plus structure of text pre-teaching.

In the immediate testing, only the group that received instruction in SRQ2R plus structure of text pre-teaching performed significantly higher than the other groups of students on Comprehension Test I, and on the measures of higher-level thinking. What are the reasons for the dramatically higher performance of Group I on the immediate testing? In her written comments on the implementation of the SRQ2R Plus Structure of Text training, the teacher of this group noted the sophistication of the questions that students in this group constructed due to their more frequent inclusion of textual implicit- and experienced based-type questions than would normally be expected of fifth-graders. The teacher believed that students' understanding of text structures in combination with their use of SRQ2R contributed not only to their

comprehension of textual material, but also to their question construction and their writing in general.

The observation that the students in Group I wrote better questions, and improved their writing generally, is in consonance with one of the findings by Armbruster et al. (1987) that the structure-taught group in their study wrote better organized summaries than did the traditionally taught group. Since self-constructed questions constitute an important step in SRQ2R, structure teaching may have had a direct positive impact on students' understanding and use of the SRQ2R system of strategies, and, consequently, on comprehension and higher-level thinking. In the delayed testing, the group receiving SRQ2R plus main ideas instruction (Group III) improved its performance so that it was statistically similar to the performance of Group I. What could account for the significantly higher performance of Group III in the delayed testing as opposed to its performance in the immediate testing?

Clues to the understanding of this phenomenon may reside in the comments recorded by the classroom teacher who taught Group III. As students interacted with the SRQ2R Plus Main Ideas study system, the teacher was surprised at the high levels of learning and active involvement by the students as they employed this relatively complex system. She said, "...after we completed the material we were asked to cover, I asked my class if they liked this way of doing Social Studies, and if they felt they learned more, and they unanimously said, 'Yes'. This teacher saw growth in the areas of understanding the reading process, and understanding the importance of getting meaning from what they read on the part of students employing SRQ2R with pre-teaching in main ideas understanding. This new quest for meaning, relationships, and competence in Social Studies by the students in Group III resulted in a dramatic increase in comprehension three weeks

after instruction. Long-term improvement from the use of a textbook-study system like SQ3R has been noted by other researchers (Caverly, & Orlando, 1991; Walker, 1991); the addition of main ideas instruction may have enhanced long-term improvement exponentially.

It seems unlikely, intuitively, that students who do poorly on factual questions would do well on items requiring them to synthesize, analyze, compare, contrast, and make inferences. In the delayed testing, but not in the immediate testing, significantly higher levels of performance on factual (textual explicit) items accompanied significantly higher performance on textual implicit and experienced based items is of more relevance to an understanding of this anomaly than is speculation about the reasons for a high performance of Group I.

Only the groups receiving a combination of SRQ2R and instruction in main ideas or structure of text performed significantly better than the other groups on the items requiring higher-level thinking in both the immediate and delayed testing. What can be learned about the development and assessment of higher-level thinking abilities from these results? First, criterion measures must include roughly equal numbers of textual explicit, textual implicit, and experienced based items if these measures are to assess higher-level thinking in credible fashion. Secondly, students must be given instruction on measures that contain textual explicit, textual implicit and experienced based items, and they must be afforded extensive opportunities to practice and discuss these items. Finally, before readers expend large amounts of cognitive effort on the comprehension of textual material as they do with the SRQ2R system, they must develop the ability to encode that material in a structured or thematic manner as they do with structure of text or main ideas pre-teaching.

Although the performance of the SRQ2R-only group on the immediate test was higher (though not significantly higher) than the Control, Structure of Text, Main Idea, and the SRQ2R Plus Main Ideas groups on Comprehension Test I, this higher performance was not maintained on the delayed test. Unfortunately, the relatively low performance of the SRQ2R-only group in the delayed testing may have been caused by an artifact of the teacher's instructional procedures. The teacher of this group reported that she often let groups of students and sometimes the entire class read the practice expository passages orally in a round-robin style. This practice may have militated against the students' performing at the highest levels they were capable of during the testing. Since the students' performance on all items would have been affected, further study is necessary of SRQ2R-only performance in general and of SRQ2R-only performance on items requiring higher-level thinking.

This study should not be viewed as another measurement of the "best" teaching technique. It should be viewed as a study that attempted to shed light on what happened when a pedagogically appealing system was actually applied to classroom materials, and was taught by classroom teachers. If the research into SQ3R is to be successful in convincing educators that such a complex study system can offer fourth- through ninth-grade students a viable way of dealing with the serious problems that result from the necessity to use reading to learn, and an almost exclusive use of textbooks and other expository material in the content areas, then the research literature must be replete with studies that experimentally test basic issues like the ones addressed in this study.

Areas where studies are needed have been uncovered by this study. How would pre-teaching in structure of text *and* main ideas affect the performance of students trained in

SRQ2R? Would pre-teaching in main ideas or structure of text plus the use of SQ3R be a powerful enough paradigm to overcome the problems inherent in the problematic placement of the questioning step in SQ3R? Is it possible to "jump-start" a group of students receiving pre-training in main ideas plus SRQ2R into a higher performance on an immediate assessment?

The findings of the present study may be useful to fourth-and fifth-grade classroom teachers in their instructional practices. These findings could also serve as the starting point for action research that modifies study systems for specific groups of students, and that charts the short-term and long-term outcomes of such modifications. It is conceivable that variations of the elements investigated in this study will be effective for different groups of students. (There has been very little SQ3R research that has manipulated the variables of reading ability, prior knowledge, and materials, for example.)

SRQ2R plus pre-teaching in either main ideas or structure of text appears to be a system of strategies that upper-elementary and middle-level students can effectively use to improve their comprehension of expository material. Assuming validity in the findings of this study on higher-level thinking ability, performance on criterion task items requiring higher-level thinking will be positively affected by one of the combinations that was effective in this study; writing ability in general will improve with use of either of these successful study paradigms. Most importantly, the introduction of either of the combinations of SRQ2R plus pre-teaching in structure of text or main ideas will fill the void in study skills instruction that is often seen at the early stages in emergent content readers' development. It is sometimes a fruitless task to attempt

to teach these strategies to older students in secondary and post-secondary settings.

Students left to their own devices in finding successful study strategies often adopt inappropriate, inefficient ones. If SRQ2R plus pre-teaching in main ideas or structure of text is taught at the early stages of students' need to read to learn, content area teachers in succeeding years will likely spend more time in maintenance, customization, and individualization of study strategies than in wrestling with their introduction to older, resistant learners.

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Correspondence regarding this article should be addressed to Michael L. Walker, Department of Teacher Education, Eastern Michigan University, Ypsilanti, MI 48197.

Michael L. Walker is a faculty member in the Department of Teacher Education, at Eastern Michigan University, in Ypsilanti, Michigan.