

CHAPTER
4

Comprehension

Part III

Teacher Preparation
and Comprehension
Strategies
Instruction





COMPREHENSION III

Teacher Preparation and Comprehension Strategies Instruction

Introduction

The purpose of this subreport is to review what is currently the most promising research direction in the area: the preparation of teachers to deliver comprehension instruction. If further research in this direction is pursued, it is likely to lead to progress in our understanding of reading comprehension instruction, and it will also contribute to the general area of teacher preparation.

Background

Reading comprehension strategy instruction has been a major research topic for more than 20 years. The idea behind this approach to instruction is that reading comprehension can be improved by teaching students to use specific cognitive strategies or to reason strategically when they encounter barriers to comprehension as they read. The earliest work in this area used a “direct instruction” model, in which teachers taught a specific strategy or set of strategies to students. The goal of such training was, as it always is, the achievement of competent and self-regulated reading.

At first, investigators focused on teaching students one strategy at a time. A wide variety of strategies was studied, including imagery, question-generating, prediction, and a host of others. In this approach, teachers usually modeled the cognitive strategies in question, often by “thinking aloud” as they read to demonstrate what proficient readers do. The approach also involved guided practice in which students were led to the point where they were able to perform independently, via a gradual reduction of scaffolding. This type of instruction was effective in helping students acquire the strategy, and usually there was some evidence that the use of the strategy improved performance on reading comprehension tasks. In later studies, several strategies were taught in combination, and these studies showed similar effects. Recommendations to use particular combinations of strategies in actual teaching situations became common.

There are many additional questions that might be asked of the existing literature on single- and multiple-strategy instruction, and many loose ends that could be tied up. For example, few of the existing studies address issues of long-term maintenance of strategy use. Effects of strategy instruction on real reading tasks (e.g., reading connected text) are not well delineated, and there is little evidence on the issues that one typically pursues after the initial experimental forays into a topic, for example, the optimal age for training, how long training should last, and so on.

However, the pursuit of these sorts of detail questions within the context of the work already done might not be the most productive focus for future research because implementation of the direct instruction approach to cognitive strategy instruction in the context of the actual classroom has proved problematic. For one thing, it is often difficult to communicate what is meant by “teaching strategies and not skills.” Several papers have been written whose purpose is to explicate exactly *how* teachers are taught to become teachers of comprehension strategies, and it appears that no small part of the challenge of training teachers comes from the difficulty of describing what is required of them. In addition, acquiring and practicing individual strategies in isolation and then attempting to provide transfer opportunities during the reading of connected text makes for rigid and awkward instruction.

Proficient reading involves much more than utilizing individual strategies; it involves a constant, ongoing adaptation of many cognitive processes. To help develop these processes in their students, teachers must be skillful in their instruction. Indeed, successful teachers of reading comprehension must respond flexibly and opportunistically to students’ needs for instructive feedback as they read. To be able to do this, teachers themselves must have a firm grasp not only of the strategies that they are teaching the children but also of *instructional* strategies that they can employ to achieve their goal. Many teachers find this type of teaching a challenge, most likely because they have not been prepared to do such teaching. Thus, although the



literature on cognitive strategy instruction for reading comprehension has yielded valuable information, it has not provided a satisfactory model for effective instruction as it occurs in the classroom.

The area within comprehension strategy instruction that currently seems to have the most potential for moving the field along is teacher preparation. In this report, the NRP discusses four studies in which teachers are trained to teach strategies and in which the focus is the effectiveness of that training on students' reading. Four studies is not a large number; but it is not surprising that only a few relevant studies have been done. Interest in the topic is rather new, and preparing teachers to deliver effective strategy instruction is a lengthy process.

Methodology

Database

The NRP searched the ERIC and PsycINFO databases to locate relevant studies conducted since 1980. The search terms used were “comprehension,” “strategy,” and “instruction.” There were 453 articles. In addition, the Panel searched using the terms “direct explanation” and “teacher explanation”; this added 182 nonoverlapping items. Recent research reviews were also examined: Lysynchuk, Pressley, d’Ailly, Smith, and Cake (1989), Pressley (1998), Rosenshine and Meister (1994), and Rosenshine, Meister, and Chapman (1996); these reviews did not identify any relevant studies that the searches had not revealed.

Analysis

To be included, a study had to be

- Focused on the preparation of teachers for conducting reading comprehension strategy instruction.
- Published in a scientific journal.
- Empirical.
- Experimental using random assignment or quasi-experimental with initial matching on the basis of reading comprehension scores.
- Comprehensive in reporting the complete set of results of the study. (Ancillary articles that focused on specific aspects of the same database were not included but are listed in the References.)

Four studies met these criteria. A detailed outline of each of the selected studies, organized to permit comparison across studies, is presented in Appendix A.

Our Panel subcommittee reviewed the research in reading comprehension instruction broadly and also selected certain specific topics for a deeper focus, e.g., vocabulary and teacher preparation for teaching reading comprehension strategies. It should be noted that there are other relevant aspects of comprehension instruction, for example, instruction in listening comprehension and in writing, that were not addressed. In addition, the Panel subcommittee did not focus on special populations such as children whose first language is not English and children with learning disabilities. It did not review the research evidence concerning special populations and thus cannot say that its conclusions are relevant to them.

Consistency With the Methodology of the National Reading Panel

The methods of the NRP were followed in the conduct of the literature searches and the examination and coding of the articles obtained. A formal meta-analysis was not possible because of the small number of studies identified. However, comprehensive summaries according to NRP guidelines for each of the four studies appears in Appendix B.

Results

The results of the selected studies suggest that, in fact, good teacher preparation can result in the delivery of instruction that leads to improvements in students' reading comprehension. However, the variations among the four studies to be discussed here raise questions about what the best approach to teaching teachers to do strategy instruction might be.

There have been two major approaches to comprehension strategy instruction: Direct Explanation (DE) and Transactional Strategy Instruction (TSI). Two studies that represent each approach are described.

Direct Explanation

The Direct Explanation approach was designed to improve on the standard direct instruction approach to strategy instruction used in most of the early studies, in which students are simply taught to use one or several strategies as described above. Arguing that direct

instruction was insufficient because it did not attempt to provide students with an understanding of the reasoning and mental processes involved in reading strategically, Duffy, Roehler, and colleagues (1986) developed the DE approach. In this approach, teachers do not teach individual strategies but focus instead on helping students to (1) view reading as a problem-solving task that necessitates the use of strategic thinking and (2) learn to think strategically about solving reading comprehension problems. The focus in DE is on developing teachers' ability to explain the reasoning and mental processes involved in successful reading comprehension in an explicit manner, hence the use of the term "direct explanation." The implementation of DE requires specific and intensive teacher training on how to teach the traditional reading comprehension skills found in basal readers *as strategies*, for example, to teach students the skill of how to find the main idea by casting it as a problem-solving task and reasoning about it strategically.

Duffy, G. G., Roehler, L. R., Meloth, M. S., Vavrus, L. G., Book, C., Putnam, J., & Wesselman, R. (1986). The relationship between explicit verbal explanations during reading skill instruction and student awareness and achievement: A study of reading teacher effects. *Reading Research Quarterly*, 21(3), 237-252.

The first study done by Duffy and Roehler's research team investigated whether training teachers to be explicit in their teaching of reading strategies would be effective in increasing the explicitness of their verbal explanations and whether this explicitness would be related to students' meta-cognitive awareness of strategies and to their achievement. Twenty-two teachers were randomly assigned to either the treatment or the control condition. Treatment teachers were trained to use an explanation model that was designed to help them explain reading strategies explicitly to their 5th grade students in low-level reading groups. After an initial training session, the treatment teachers received 10 hours of additional training spaced throughout the school year. During these training sessions, the explanation model was described, and teachers designed lessons according to the model. Their teaching was observed and discussed on four occasions. Control teachers participated in a workshop on classroom management at the start of the study and

received no further training. The results of this study indicated that students of teachers who received training in the use of the explanation model had significantly greater awareness of (1) what strategies were taught, (2) why they are important, and (3) how they are used than did students of the comparison teachers.

The Duffy et al. (1986) study thus demonstrated the effectiveness of training teachers, and it showed that explicit explanations by teachers can lead to greater general awareness among students of reading strategies. However, the question of the extent to which students were able to apply these strategies and ways of thinking to their actual reading practice, that is, whether the use of such methods leads to significant improvements in reading comprehension performance, was not answered positively. The treatment and the comparison classrooms did not differ on the posttest administration of the comprehension subtest of the Gates-MacGinitie Test.

Duffy and colleagues (1986) did find, however, that students of the treatment teachers spent significantly more time answering the items on the comprehension test than did the other students. This suggested to them that perhaps these students were being more thoughtful and strategic in their reading.

There is little point in adapting new teaching methods if they are not shown to be effective in improving actual performance. Thus, the 1986 study by Duffy and colleagues cannot be considered conclusive about the value of training teachers to provide explicit explanations about how to read strategically. However, the results were promising enough to persuade the same research team to undertake another study, similar to this one in many respects, but incorporating a more elaborate program of teacher preparation.

Duffy, G. G., Roehler, L. R., Sivan, E., Rackliffe, G., Book, C., Meloth, M. S., Vavrus, L. G., Wesselman, R., Putnam, J., & Bassiri, D. (1987). Effects of explaining the reasoning associated with using reading strategies. *Reading Research Quarterly*, 23(3), 347-368.



In a 1987 study (Duffy et al.), as in the Duffy and colleagues 1986 study, there was random assignment of teachers to condition. Treatment teachers were shown how to provide explicit explanations, in this case to 3rd grade low-level reading students. In addition, the teachers were trained to analyze the skills prescribed in their basal reading texts and to recast these skills as problem-solving strategies. In essence, the emphasis in this study was on the effects of training teachers to provide students with explicit descriptive information about the types of reasoning and mental processes that are used strategically by skilled readers, as opposed to simple prescriptions of how to perform the basal text skills. Included in the 12 hours of training were one-on-one coaching, collaborative sharing among the teachers, observation of lessons and feedback, and videotaped model lessons. Comparison teachers were trained in classroom management and used management principles throughout the study.

The effectiveness of this approach was measured in terms of both student awareness and student achievement. Student awareness of strategic reasoning was assessed in interviews conducted both immediately following lessons and at the end of the yearlong treatment. As in the Duffy and colleagues (1986) study, the results indicated that, compared with students of untrained teachers, the students of trained teachers had higher levels of awareness of specific reading strategies, as well as a greater awareness of the need to be strategic when reading.

The fact that students have high awareness of the reasoning associated with strategic reading does not necessarily mean that they are proficient in using such strategies and better in reading comprehension. Duffy et al. (1987) designed an achievement measure to assess both students' ability to use the basal skills they had been taught and the degree to which their responses reflected the reasoning associated with using skills as strategies. Results indicated that there was no difference between students of treatment and control teachers in the ability to use the skills. However, the students of treatment teachers were found to have a greater ability to reason strategically when reading. Results on a task involving paragraph reading also indicated that students of treatment teachers (1) reported that they used such reasoning when

actually reading connected text, and (2) described the reasoning employed when using the strategies. In contrast, students of control teachers were unable to do so.

The 1987 study also used standardized measures to assess students' reading performance. The comprehension and word skills subtests of the Stanford Achievement Test (SAT) were used. Overall, students of the treatment teachers outperformed the others on the posttest. This difference was significant for the word skills subtest but was not significant for the comprehension subtest. A second standardized test, the Michigan Educational Assessment Program (MEAP), was administered as a delayed posttest, to assess whether the overall advantage of students of treatment teachers persisted over time. It was found that even 5 months after the instruction ended, students of the trained teachers had significantly higher reading scores than students of the control teachers.

The results of these two investigations of the DE approach to comprehension strategy instruction suggest that although this approach is clearly useful for increasing student awareness of the need to think strategically while reading, the effects on actual reading comprehension ability are less clearcut. As noted above, both of the Duffy and colleagues studies produced only mixed results on the standardized measures of reading performance. It should be noted, however, that the 1987 study reported that many of their lessons were oriented toward acquisition of word-level processes and not to what are usually considered comprehension processes.

Transactional Strategy Instruction

The TSI approach includes the same key elements as the DE approach, but it takes a somewhat different view of the role of the teacher in strategy instruction. Whereas emphasis in DE is on teachers' ability to provide explicit explanations, the TSI approach focuses not only on that but also on the ability of teachers to facilitate discussions in which students (1) collaborate to form joint interpretations of text and (2) explicitly discuss the mental processes and cognitive strategies that are involved in comprehension. In other words, although TSI teachers do provide their students with

explicit explanations of strategic mental processes used in reading, the emphasis is on the interactive exchange among learners in the classroom, hence use of the term “transactional.”

In both DE and TSI, teachers explain specific strategies to students and model the reasoning associated with their use. Both approaches include the use of systematic practice of new skills, as well as scaffolded support, in which teachers gradually withdraw the amount of assistance they offer to students. Perhaps the most salient distinction to be made between DE and TSI is the manner in which the different emphases of the two approaches (explanation vs. discussion) result in differences in the level of collaboration among students that takes place in each approach. In the DE approach, strategy instruction is primarily conducted by the teacher. In contrast, the TSI approach is more collaborative: Although explicit teacher explanation is an important part of this approach, TSI is designed for learning to occur primarily through the interactive transactions among the students during classroom discussion.

Anderson, V. (1992). A teacher development project in transactional strategy instruction for teachers of severely reading-disabled adolescents. Teaching and Teacher Education, 8(4) 391-403.

Anderson (1992) worked with experienced teachers of severely reading-disabled adolescent students. The students ranged from grades 6 through 11, but three-quarters of them had incoming reading levels of grade 3 or below. The teachers were randomly assigned to a treatment or control condition. The nine treatment teachers received three 3-hour sessions of training in the use of the TSI approach, held at intervals during the period during which the actual reading intervention with the students was going on. Special features of Anderson’s teacher preparation included (1) the involvement of the teachers as coresearchers who were part of the development of the project and (2) the availability of a previously trained peer coach for each teacher throughout the project.

In their training, the teachers were given a list of changes, or “shifts,” that need to be made in most classrooms for more active reading to be fostered. This list of 20 teacher shifts and 12 student shifts first

described ways in which teachers and students typically behave during remedial reading instruction and then described contrasting behaviors that characterize or promote active reading. The teachers were also given a set of principles for fostering active reading through reading instruction with specific teaching techniques for each principle. Each treatment teacher was also assigned a previously trained teacher for peer support. There were seven comparison teachers, who received no training.

In the intervention, both teacher groups taught reading comprehension for 3 months, using expository texts. The instruction in treatment classrooms emphasized both direct explanation and collaborative discussion. To evaluate the effects of the TSI approach, the phonics, structural analysis, and reading comprehension subtests of the Stanford Diagnostic Reading Test were administered. There was no difference from pretest to posttest in the performance of students of the trained and untrained teachers on the phonics and structural analysis subtests. However, significantly more students of the trained teachers (80%) made gains on the reading comprehension subtest than did students of the other teachers (50%), suggesting that preparation given the teachers was effective in improving reading comprehension performance. The amount of gain was not reported.

Brown, R., Pressley, M., Van Meter, P., & Schuder, T. (1996). A quasi-experimental validation of transactional strategies instruction with low-achieving second-grade readers. Journal of Educational Psychology, 88(1), 18-37.

Over the past decade, Pressley and associates have developed a transactional strategy instruction program called Students Achieving Independent Learning (SAIL). In SAIL, reading processes are taught as strategies through direct explanation, teacher modeling, coaching, and scaffolded practice. An important feature of the program is its emphasis on collaborative discussion among teacher and students, including extended interpretive discussions of text, with these discussions emphasizing student application of strategies. A goal of the SAIL program is for students to develop more personalized and integrative understanding of text.



A yearlong study by Brown, Pressley, Van Meter, and Schuder (1996) provides evidence of the effectiveness of the TSI approach as exemplified by the SAIL program. In this study, SAIL was contrasted with a more traditional approach to reading instruction. There was no specific teacher preparation within the context of this study; the five SAIL teachers had all been previously trained and had at least 3 years of experience as SAIL teachers. The five comparison teachers had even more years of teaching experience than the SAIL teachers had, but they had no SAIL training. The students in this study were in 2nd grade; all were reading below grade level at the beginning of the study.

The SAIL teachers and comparison teachers were matched on a variety of measures to form five pairs. In each pair of classrooms, data were collected on six low-achieving students from each classroom who were matched on the basis of their reading comprehension scores. Thus, Brown and colleagues (1996) did the careful matching required when doing a quasi-experiment.

Students' strategy awareness was assessed through interviews. Students of SAIL teachers reported more awareness of comprehension and word-level strategies than did students of comparison teachers (operationalized as the number of strategies they claimed to use during reading). In an evaluation of story recall, the SAIL students did better on literal recall of story content and also were more interpretive in their recalls. On a think-aloud task, SAIL students used more strategies on their own than did the other students. Student reading achievement was also assessed, using the comprehension and word skills subtests of the Stanford Achievement Test. Over the course of the study, students of the SAIL teachers showed greater improvement than the students of the other teachers, and at posttest, they significantly outperformed the others on both subtests.

Discussion

Every one of these studies reported significant differences, and although none of them reported effect sizes, they provided enough information so that effect sizes could be calculated for most of the effects. The

effect sizes were substantial, suggesting that these initial attempts to provide effective instruction for teachers in reading comprehension strategy training are promising and worth following up.

It is encouraging to see that random assignment is indeed feasible in these real-life classroom situations. This statement is not intended as a criticism of Brown and colleagues' quasi-experiment, which was done carefully and which, in fact, posed a question that could not be tested in a true experiment: What is the effect of a particular model of instruction (TSI) delivered by teachers experienced and committed to it, working in the context of schools also committed to that approach? This is an important question. But most of the relevant research questions do not demand a quasi-experimental design, and therefore a much better choice would be a true experiment. Sometimes researchers argue that school administrators refuse to allow random assignment because it disrupts their schools. Perhaps researchers should make serious and sincere efforts to find schools that *will* cooperate, because they do exist; and researchers should also help the field by making an effort to educate school administrators about random assignment and other important design standards.

These comments should not be taken as implying that it is easy to do classroom-based naturalistic studies of the type discussed here. It is difficult, and the difficulty should not be minimized. Such research cannot be undertaken without substantial funding and adequate institutional support. It also requires collaboration among researchers; school personnel, including both teachers and administrators; and parents, which does not come about quickly—it requires time and effort. And doing this type of research takes commitment and energy. The research team must remain motivated and effective during a lengthy developmental phase and then during the study itself. Moreover, a high-quality study of this type has probably been preceded by descriptive and correlational work. The emphasis on the importance of experimental studies should not be interpreted as negating the valuable contributions of these other research paradigms in preparing to do intervention research.

Of course, any evaluation of these instructional approaches is limited by the fact that these studies cannot easily be compared. They differed in terms of specific purpose, teacher preparation method,

intervention, type of student (age, reading level, etc.), control group, and other characteristics. Nevertheless, taken together, the studies do indicate that instructional methods that generate high levels of student involvement and engagement during reading can have positive effects on reading comprehension. The classroom procedures in each of the studies required substantial cognitive activity on the part of the students. Also, these studies demonstrate that providing teachers with instruction that helps them use such methods leads to students' awareness of strategies and use of strategies, which can in turn lead to improved reading comprehension.

These findings beg the question as to what it is, in fact, that makes for effective strategy instruction. Is it the teacher preparation? (If so, how extensive does it have to be? Would the teachers maintain their instructional effectiveness without the supports inherent in an ongoing study?) Is it the use of direct explanation and/or collaborative discussion when teaching students? Is it the particular strategies that are taught, or would a broader repertoire of instructional activities also be effective? Is it a combination of some or all of these possibilities or of other factors not mentioned here? Clearly, more research is warranted on this topic. In light of the findings to date, one can expect that further work in this area will yield valuable knowledge concerning optimal conditions for improvement in reading comprehension.

Thus, the results of the research to date represent significant progress in our understanding of the nature of reading comprehension and of how to teach it. There is much more to learn, of course. What we must remember is that reading comprehension is extremely complex and that teaching reading comprehension is also extremely complex. The work of the researchers discussed here makes this clear. They have not recommended an "instructional package" that can be prescribed for all students. They have not identified a specific set of instructional procedures that teachers can follow routinely. Indeed, they have found that reading comprehension instruction cannot be routinized.

What they have shown, and this is an important new direction in which to take our research efforts, is that intensive instruction of teachers can prepare them to teach reading comprehension strategically and that such teaching can lead students to greater awareness of what it means to be a strategic reader and to the goal of improved comprehension.

Implications for Reading Instruction

General guidelines for teachers that derive from the research evidence on comprehension instruction with normal children include the suggestions that teachers help students by explaining fully what it is they are teaching: what to do, why, how, and when; by modeling their own thinking processes; by encouraging students to ask questions and discuss possible answers among themselves; and by keeping students engaged in their reading via providing tasks that demand active involvement.

The current dearth of comprehension instruction research at the primary grade level should not lead to the conclusion that such instruction should be neglected during the important period when children are mastering phonics and word recognition and developing reading fluency.

In evaluating the effectiveness of strategy instruction in the classroom, the primary focus must be not on the students' performance of the strategies themselves. The appropriate assessment is of the students' reading achievement and, in addition, other outcome measures such as how interested students are in reading and how satisfied teachers are with their instructional methods.

Implementation of effective comprehension instruction is not a simple matter; substantial teacher preparation is usually required for teachers to become successful at teaching comprehension.

There is a need for greater emphasis in teacher education on the teaching of reading comprehension. Such instruction should begin at the preservice level, and it should be extensive, especially with respect to teaching teachers how to teach comprehension strategies.



Conclusions From the Research on Comprehension Instruction

1. The most active topic in the research on comprehension instruction over the last few years has been comprehension strategies instruction with normal children.
2. Teaching strategies for reading comprehension in normal children leads to increased awareness and use of the strategies, improved performance on commonly used comprehension measures, and, sometimes, higher scores on standardized tests of reading.
3. For further progress to be made, research is needed that focuses on ways that strategies can be taught within the natural setting of the classroom and for both normal children and those with reading difficulties. Work of this type is enhanced when cognitive researchers collaborate with researchers knowledgeable about teacher education.

Conclusions From the Research on Teacher Preparation and Comprehension Strategies

1. Teachers can be taught to teach comprehension strategies effectively; after such instruction, their proficiency is greater, and this leads to improved performance on the part of their students on awareness and use of the strategies, to improved performance on commonly used comprehension measures, and, sometimes, higher scores on standardized tests of reading.
2. Teaching comprehension strategies effectively in the natural setting of the classroom involves a level of proficiency and flexibility that often requires substantial and intensive teacher preparation.

Directions for Further Research

Research evidence suggests that further work in the area of comprehension instruction, on the topic of strategy instruction as well as on other topics, will lead to even more progress. Following is a list of issues that deserve further consideration.

1. Our understanding of the complex construct of reading comprehension has been expanded and refined in our recent research, but the construct is still not completely understood. Studies incorporate

a large variety of heterogeneous measures derived from tasks ranging from those requiring simple recognition and recall, through making inferences, to using text information in solving problems and performing other complex tasks. There is no “map” of the construct that investigates relationships among the various methods of defining and measuring comprehension and that determines which measures are optimal for evaluating performance in research studies and in assessing student achievement in the school context.

2. Many investigators do not describe fully all important aspects of their studies—the reader, the text and other materials, the task, and the teacher (see Methodology in Chapter 1 of this volume). An excellent discussion of methodological and reporting standards to ensure high-quality studies is available in Lysynchuk, Pressley, d’Ailly, Smith, and Cake (1989).
3. A variety of methodologies, including descriptive and correlational procedures, will contribute to our knowledge, but intervention research requires experimental studies, using wherever possible a true experimental design, that is, random assignment. Quasi-experiments are acceptable when the specific purpose of the study demands such a design but not when done simply for convenience or ease of implementation.
4. The relationship of comprehension to word-level processes and fluency has not been well investigated.
5. It will be important to know the effects of interventions aimed at increasing motivation.
6. Research should extend to students at the secondary level as well as to children with reading difficulties. Study skills instruction traditionally given to normally achieving and above-average students should be compared to the newer cognitive strategy instruction.
7. There is little research at the K to 2nd grade level on teaching reading comprehension. One important topic at this level is the relationship between listening comprehension and reading comprehension.

8. The research base is scanty with respect to the development of effective methods of vocabulary instruction, especially methods that incorporate direct instruction, how these might vary across age and reading levels and abilities, and how vocabulary training can be integrated optimally with other types of comprehension instruction.
 9. Research is needed on how writing is related to reading comprehension.
 10. It will be important to develop further the use of videotapes, technology in general, and other techniques for teacher preparation.
 11. There is little evidence from cost-benefit analyses to determine the amount of gain in student achievement (and other outcome measures) relative to the cost of implementing a reading comprehension instructional program.
 12. With respect to comprehension strategy instruction and teacher preparation:
3. Can teachers maintain their proficiency after their own preparation to teach comprehension has been completed?
 4. Does the fact that teachers are involved in an ongoing research study make a difference in their performance?

Other Important Concerns

1. Teacher characteristics

How does a teacher's age, amount of teaching experience, type of preservice education, or other characteristics affect success in comprehension instruction? Which components of successful teacher preparation programs are the effective ones? What characteristics of the teacher preparation itself (its focus, its intensity, its timing) affect the success of a teacher preparation program?

2. Reader characteristics

How do a student's age, reading level, learning ability, proficiency in English, or other characteristics affect success in comprehension instruction?

3. Text characteristics

Does the difficulty level of the texts used in instruction make a difference?

Can one expect transfer from one text genre to another (e.g., from narrative to expository text)?

4. Task characteristics

What characteristics of the instruction delivered to the students are the effective ones? The direct explanation? The collaborative discussion? The particular strategies and tasks taught to the students? The amount of instruction? The active involvement on the part of the students? Other factors?

Comprehension Strategy Instruction: Maintenance and Transfer

1. Do teaching comprehension strategies have lasting effects on students?
2. Do the effects generalize to other reading situations, such as content area instruction?
3. Can comprehension instruction be done successfully within the context of content area instruction?

Teacher Preparation

1. How much teacher preparation is required for successful performance?
2. How should teacher preparation be conducted at the preservice and at the inservice levels?

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Appendix A: Outlines of the Studies

Teacher Participants	Duffy et al. (1986)	Duffy et al. (1987)	Anderson (1992)	Brown et al. (1996)
Number	Total = 22 Treatment group = 11 Control group = 11	Total = 20 Treatment group = 10 Control group = 10	Total = 16 Treatment group = 9 Control group = 7	Total = 10 Treatment group = 5 Control group = 5
Age	Not reported.	Not reported.	Not reported.	Not reported.
Educational background	Not reported.	Not reported.	Not reported.	Not reported.
Years of experience	Not reported.	Not reported.	Not reported.	The SAIL teachers had an average of 10.4 years of general teaching experience, and all of them had taught in the SAIL program for between 3 and 6 years. The comparison group had an average of 23.4 years of teaching experience.
Random assignment to conditions?	Yes. Teachers were observed and given baseline scores on their classroom management skills (high, medium, low). Researchers then randomly assigned teachers within each management level to either the treatment or control group.	Yes.	Yes.	No. SAIL teachers had already been trained before the beginning of the study. The authors state that "preparing teachers to become competent transactional strategies instructors is a long-term process; therefore, we felt we could not randomly assign teachers, provide professional development, and wait for teachers to become experienced in teaching SAIL in a realistic time frame."
Student Participants	Duffy et al. (1986)	Duffy et al. (1987)	Anderson (1992)	Brown et al. (1996)
States represented	Not reported, Midwest USA	One Midwestern state	Not reported	One mid-Atlantic state
Number of different schools	Not reported.	Treatment group: 9 Control group: 8 All schools were in the same district.	Not reported.	Number not reported; all schools were in the same district.
Number of different classrooms	Total: 22 Treatment group: 11 Control group: 11	Total: 20 Treatment group: 10 Control group: 10	Total: 16 Treatment group: 9 Control group: 7	Total: 10 Treatment group: 5 Control group: 5



<i>Teacher Participants</i>	Duffy et al. (1986)	Duffy et al. (1987)	Anderson (1992)	Brown et al. (1996)-
Number	Total = 22 Treatment group = 11 Control group = 11	Total = 20 Treatment group = 10 Control group = 10	Total = 16 Treatment group = 9 Control group = 7	Total = 10 Treatment group = 5 Control group = 5
Age	Not reported.	Not reported.	Not reported.	Not reported.
Educational background	Not reported.	Not reported.	Not reported.	Not reported.
Years of experience	Not reported.	Not reported.	Not reported.	The SAIL teachers had an average of 10.4 years of general teaching experience, and all of them had taught in the SAIL program for between 3 and 6 years. The comparison group had an average of 23.4 years of teaching experience.
Random assignment to conditions?	Yes. Teachers were observed and given baseline scores on their classroom management skills (high, medium, low). Researchers then randomly assigned teachers within each management level to either the treatment or control group.	Yes.	Yes.	No. SAIL teachers had already been trained before the beginning of the study. The authors state that "preparing teachers to become competent transactional strategies instructors is a long-term process; therefore, we felt we could not randomly assign teachers, provide professional development, and wait for teachers to become experienced in teaching SAIL in a realistic time frame."
Student Participants	Duffy et al. (1986)	Duffy et al. (1987)	Anderson (1992)	Brown et al. (1996)
States represented	Not reported, Midwest USA	One Midwestern state	Not reported	One mid-Atlantic state
Number of different schools	Not reported.	Treatment group: 9 Control group: 8 All schools were in the same district.	Not reported.	Number not reported; all schools were in the same district.
Number of different classrooms	Total: 22 Treatment group: 11 Control group: 11	Total: 20 Treatment group: 10 Control group: 10	Total: 16 Treatment group: 9 Control group: 7	Total: 10 Treatment group: 5 Control group: 5



<i>Number of participants</i>	Total number: not reported. Number per group: ranged from 4 to 22. Average group size = 11.76.	Total: 148 Treatment group: 71 Control group: 77 Number per group: Ranged from 3 to 16 students per class. Overall average: 7.4 per classroom.	Total: 83-Number per group: Ranged from 2 to 10 and was "approximately equal" across groups.	Total: 60 Treatment group: 30 Control group: 30 Number per group: 6
<i>Age</i>	Not reported.	Not reported.	Not reported.	Not reported.
<i>Grade</i>	5th grade.	3rd grade.	Students ranged from 6th through 11th grade.	2nd grade.
<i>Reading level</i>	Low-level reading groups.	Low-level reading groups.	Severely reading disabled.	Reading below 2nd grade level.
<i>Setting</i>	Large urban school district.	Elementary school classrooms in an urban school district in the Midwest.	Not reported.	Unclear.
<i>Exceptional learning characteristics</i>	All students scored more than 1 year below grade level in reading achievement.	"The individuals in the low groups represented the typical range of reading difficulties associated with low-level reading groups in urban centers. Mainstreamed special education students, immigrant children with severe language problems, and students with behavioral disorders were all included."	"All but a very few had been diagnosed as learning disabled," and more than 75% of them had incoming reading levels of grade 3 or below.	None reported.
<i>Selection restrictions</i>	None reported.	None reported.	Not reported.	Only six students in one SAIL class met eligibility requirements, so the researchers decided to use six matched pairs in each classroom as the basis of comparison.
<i>All English speaking?</i>	Yes.	Yes, although the authors note that the sample included "immigrant children with severe language problems."	Yes.	Yes.
<i>Ethnic background</i>	Not reported	Not reported.	Not reported.	Not reported.



<i>SES</i>	Not reported.	Not reported.	Not reported	Not reported.
Duration of study	Duffy et al. (1986)	Duffy et al. (1987)	Anderson (1992)	Brown et al. (1996)
Total duration of study	One academic year.	One academic year.	Three months.	One academic year.
Number of sessions	Not reported.	Not reported.	Approximately 20.	Not reported.
Minutes per session	Not reported.	Not reported.	30 minutes.	Not reported.
Brief description of instructional approach	Duffy et al. (1986)	Duffy et al. (1987)	Anderson (1992)	Brown et al. (1996)
	<p>Direct explanation (DE) with a focus on the use of an explanation model for teaching strategies.</p> <p>The DE approach includes direct explanation of strategy usage, modeling, systematic practice, and scaffolding.</p>	<p>DE with a focus on explaining the reasoning associated with skill and strategy usage.</p> <p>Approach contains all the elements of DE but also requires teachers to analyze the skills prescribed in basal texts and to recast these skills as problemsolving strategies.</p>	<p>TSI with a focus on progressive shifts of teacher attention toward fostering active reading.</p> <p>The TSI approach contains all the elements of DE and also includes extended discussions that emphasize joint construction of text interpretations and student strategy usage.</p>	<p>TSI with a focus on evaluating the effectiveness of an existing TSI program.</p> <p>The TSI approach contains all the elements of DE and also includes extended discussions that emphasize joint construction of text interpretations and student strategy usage.</p>
Specific elements of instructional approach	Duffy et al. (1986)	Duffy et al. (1987)	Anderson (1992)	Brown et al. (1996)
Teacher analysis of skills in basal textbook; - recasting these skills as strategies?-	Yes	Yes	No	No
Direct explanation of strategy usage (What is the strategy? When can it be used? How is it done?)	Yes	Yes	Yes	Yes



Modeling?	Yes	Yes	Yes	Yes
Systematic practice?	Yes	Yes	Yes	Yes
Scaffolding?	Yes	Yes	Yes	Yes
Extended discussions that emphasize joint construction of text interpretations and student strategy usage?	No	No	Yes	Yes
Student choice of reading materials?	No	No	Yes. (Teachers and students collaborated on choice of texts.)	No
Complete description of instructional approach and curricular emphasis	Duffy et al. (1986)	Duffy et al. (1987)	Anderson (1992)	Brown et al. (1996)
	<p>The curriculum in this study comprised the skills prescribed in Houghton-Mifflin and Ginn basal textbooks for use with low-level reading groups in the post-primary grades, such as identifying main ideas, drawing conclusions, using glossaries, and decoding. For the purposes of this study, skills are not viewed as rules to be memorized as procedural algorithms. Instead, they are taught as strategies or flexible plans for reasoning about how to remove blockages to meaning. Rather than being applied automatically, skills are applied thoughtfully, consciously, and adaptively.</p>	<p>This research is based on the assertion that "because poor readers lack understanding of the strategic nature of reading, instruction needs to place greater emphasis on the development of poor readers' ability to reason strategically."</p> <p>According to the authors, "it may be necessary when working with poor readers for teachers to explain explicitly, in consistent ways over extended instructional periods, the mental processing associated with [a given] strategy, when it can be used, and how to apply it in a flexible manner."</p> <p>In particular, the authors are interested in the relationship between the explicitness of teacher strategy explanations on the one hand and student strategy awareness and reading ability on the other.</p>	<p>The teacher development model studied in this research is based on the principles of TSI.</p> <p>According to the author, TSI is a method of teaching reading that emphasizes "transactions or negotiations that occur among teacher and students, and students and students while working together to determine text meaning."</p> <p>The view of teacher education presented in this study involves a progressive shift of the teacher's attention.</p> <p>The first stage shifts attention from overt performance of tasks to the underlying comprehension processes. The next stage shifts from teacher questioning, modeling, and explaining to students carrying out these processes.</p> <p>The final stage shifts from students' carrying out active processes under teacher guidance to their assumption of that responsibility themselves.</p>	<p>"The purpose of SAIL is the development of independent, self-regulated meaning-making from text."</p> <p>The SAIL program uses a TSI approach to teaching reading comprehension to low-performing students.</p> <p>According to the authors, "the short-term goal of TSI is the joint construction of reasonable interpretations by group members as they apply strategies to texts. The long-term goal is the internalization and consistently adaptive use of strategic processing whenever students encounter demanding text. Both goals are promoted by teaching reading group members to construct text meaning by emulating expert readers' use of comprehension strategies."</p>



	<p>The particular curricular goal for this study was for readers, when they encounter meaning blockages, to (1) know what skills can be used as strategies for removing the blockage, (2) select a specific strategy, and (3) use that strategy to remove the blockage.</p> <p>Treatment teachers, therefore, were trained to recast basal skills as strategies and to teach students in low-level reading groups to use them when encountering meaning blockages.</p>	<p>Consequently, the instructional approach used in this study focused on teaching students the reasoning that expert readers are presumed to employ when using strategically those skills traditionally taught in association with basal textbooks.</p> <p>Specifically, teachers were taught to recast the skills prescribed in basal textbooks as problem-solving strategies. They were taught to do this by analyzing the cognitive and metacognitive components of the skills and by modeling the cognitive and metacognitive acts involved in performing the skills.</p> <p>The curricular emphasis in the treatment classrooms, therefore, was on the reasoning associated with strategic skill usage, not on the performance of isolated skill tasks.</p>		<p>SAIL teachers are taught to achieve the goals of TSI through direct explanations. Modeling, coaching, and scaffolded practice.</p> <p>In addition, SAIL teachers are taught to facilitate extended discussions of text, which emphasize student application of strategies to text comprehension.</p> <p>In the SAIL reading program, students are taught strategies for adjusting their reading to their specific purpose and to text characteristics.</p> <p>Specifically, students are instructed to predict upcoming events, alter expectations as text unfolds, generate questions and interpretations while reading, visualize represented ideas, summarize periodically, attend selectively to the most important information, and think aloud as they practice applying comprehension strategies during reading instruction.</p> <p>Overreliance on any one strategy is discouraged. In general, students are taught that getting the overall meaning of text is more important than understanding every word.</p>
Materials	Duffy et al. (1986)	Duffy et al. (1987)	Anderson (1992)	Brown et al. (1996)
	Basal reading textbooks; difficulty not reported.	Second grade basal reading textbooks.	<p>A total of 135 single-page, expository texts was prepared, and it was left to the teachers and students to decide which of the texts they wished to read. Texts were drawn and edited (primarily shortened) from a variety of "real text" sources (e.g., Cricket Magazine, Open Court Publishing).</p> <p>Readability levels ranged from grades 2 to 8, with the majority of texts at grades 4 and 5.</p>	<p>It is not entirely clear what texts were used during the course of the school year. The three texts used in the study for assessments were illustrated stories from trade books, with numbers of words and readability levels as follows:</p> <p>341 words; 2.4 512 words; 2.2 129 words; 3.9</p>



<i>What were treatment teachers taught?</i>	Duffy et al. (1986)	Duffy et al. (1987)	Anderson (1992)	Brown et al. (1996)
	<p>Treatment teachers were taught to emphasize the mental processing one does when using the skills prescribed in the basal textbook. The teachers were trained to talk to students about the reasoning one does when encountering a blockage to meaning, how the skill being taught can be applied to remove a particular blockage, and the mental steps one follows when using the skill.</p> <p>Treatment teachers were told to present skills not within the context of workbook exercise but within the context of the use of those skills in actual reading situations.</p> <p>To assist in their planning, teachers were taught to organize their instructional talk into a five-step lesson format: introduction, modeling, guided interaction, practice, and application. To help teachers use the lesson plan, they were taught how to model the mental processing readers do by "talking out loud" about their own use of the skill, direct attention to the salient features of the skill, refocus student attention during interactions, review, provide practice, and help students apply the skill in connected text.</p>	<p>Treatment teachers were taught to modify the curricular and instructional skill prescriptions of the basal text so that the emphasis was on the mental processing involved in using skills as strategies.</p> <p>Specifically, treatment teachers were taught to adapt their basal text instruction in the following ways:</p> <p>Because basal textbooks often present prescribed skills as isolated memory-based tasks, treatment teachers were taught to recast the prescribed skills as problem-solving strategies by analyzing the cognitive and metacognitive components of the skill.</p> <p>Because the teaching suggestions in the basal text teacher's guide emphasize procedural skill exercises and drill, treatment teachers were taught to supplement these suggestions with modeling of the cognitive and metacognitive acts involved in performing the skills.</p> <p>Teachers were taught "to explain explicitly, in consistent ways over extended instructional periods, the mental processing associated with [a given] strategy, when it can be used, and how to apply it in a flexible manner."</p> <p>Teachers were taught "to present their explanations to students as descriptive of what good readers do, rather than as prescriptions to be procedurally applied in all situations."</p> <p>Treatment teachers were not provided with scripts for teaching skills in this way. Instead, they used the information from the research intervention sessions to develop their own explanations for each lesson.</p>	<p>A set of 20 teacher shifts and 12 student shifts was presented to the treatment teachers. The shifts represent changes that need to be made in order to foster more active reading.</p> <p>This list of shifts first describes ways in which teachers and students typically behave in remedial reading sessions, and then provides a contrasting list of behaviors that characterize or promote active reading.</p> <p>The set of student shifts that was presented to teachers included the following as desired goals: Participating in reading to learn new information;- trying to read difficult or unfamiliar material; focusing on collaborating with the group in reading sessions; revealing and investigating errors in reading; directing effort toward explaining how to arrive at correct answers; attempting to take on the role of the teacher; asking questions; reacting to text; providing models for others;-giving elaborated responses; focusing on learning from the reading; and seeking challenges in thinking.</p> <p>Teachers were also given a set of principles for fostering active reading through reading instruction, with specific teacher techniques for each principle. Particular attention was given to: procedures for making thinking explicit by thinking aloud, and for turning over responsibility for this to students, collaborative problem-solving, as well as accessing, applying and evaluating students' existing and alternative problem-solving strategies "upgrading" questioning by both teachers and students to be less content-specific, and more focused on the use of strategies, turning questioning and the entire reading session over to students, and increasing student talk and decreasing teacher talk during reading discussions.</p>	<p>The treatment (SAIL) teachers were not trained specifically for this study; however, they all had extensive experience (i.e., 3 or more years) teaching in the SAIL program.</p>



<i>How did treatment teacher training occur?</i>	Duffy et al. (1986)	Duffy et al. (1987)	Anderson (1992)	Brown et al. (1996)
	<p>All teachers attended an initial orientation meeting in November. Subsequent to the initial meeting, the treatment teachers received 10 hours of training on how to incorporate explicit explanations into their ongoing reading skill instruction. This training emphasized:</p> <p>how to recast prescribed basal text skills as strategies useful when removing blockages to meanings, how to make explicit statements about the reading skill being taught, when it would be used, and how to apply it, and how to organize these statements for presentation to students.</p> <p>There were five training sessions, beginning in late November and continuing at about 1-month intervals through March. All the training sessions except one were timed to occur approximately 1 week before each scheduled round of classroom observations.</p> <p>Each training session followed a 4-stage sequence. First, the teachers were provided with information about strategy</p>	<p>Treatment teachers were told that the purpose of the project was to study teacher explanation.</p> <p>They received six 2-hour training sessions in the course of one academic year.</p> <p>These sessions emphasized:-how to make decisions about recasting prescribed basal text skills as strategies; how to decide on explicit statements about the strategy being taught, when it would be used, and how to do the mental processing involved; how to organize these statements into a lesson format that progressed from an introduction, to modeling, to interaction between teacher and students, to closure.</p> <p>The training interventions also included one-on-one coaching, collaborative sharing between the teachers, specific feedback regarding observed lessons, and videotapes of model lessons.</p>	<p>The training of the treatment teachers involved three sessions of 3 hours each, held at one month intervals while the teachers were conducting reading sessions with their students.</p> <p>In these training sessions, treatment teachers were instructed in principles and techniques for fostering active reading. The training module included the following elements and techniques:</p> <p>Research involvement:-The treatment teachers participated in discussions about the study procedures. "Every effort was made to make teachers feel they were a part of the development and evolution of the project."</p> <p>Teaching shifts: As described above, a set of 20 teacher shifts and 12 student shifts, representing changes that need to be made in order for more active reading to be fostered, were presented to the treatment teachers and used throughout their training for self-evaluation.</p> <p>Videotape and self evaluations: At each training session, the teachers were shown videotaped clips of their own teaching and asked to evaluate them in terms of the shifts. During self-evaluation, treatment teachers also discussed and selected the shifts on which they felt they needed the most help and guidance from the experimenter and/or peer teachers.</p> <p>Principles and techniques for fostering active reading: As described above, treatment teachers were given a set of principles for fostering active reading through reading instruction, with specific teacher techniques for each principle.</p> <p>Peer support: Treatment teachers received peer support and</p>	<p>The SAIL teachers were not trained specifically for this study; however, they all had extensive experience (i.e., 3 or more years) teaching in the SAIL program.</p>



	<p>instruction, and links were made to teachers' background experiences in reading instruction, to basal textbook experiences, and to expected student responses. Second, the researchers modeled strategy instruction and assisted teachers as they developed their own instructional plans. Third, teachers read the transcripts of their own previous lessons and student interviews, and the researchers guided them in analyzing and critiquing the transcripts. Finally, the researchers provided teachers with oral feedback following each observation about the appropriateness of their explanations. This feedback was consistent with the information provided to teachers during training interventions.</p>		<p>coaching from previously trained teachers who attended the training sessions and were available as needed for teachers.</p>	
<i>What was the intervention for the control group?</i>	Duffy et al. (1986)	Duffy et al. (1987)	Anderson (1992)	Brown et al. (1996)
	<p>The control group received a presentation on effective classroom management.</p> <p>In addition, they were observed teaching classes on four occasions following the baseline observation.</p>	<p>Treated-control teachers were told that the purpose of the study was to validate at the 3rd grade level the results of a previous (unrelated) study involving classroom management for 1st-graders.</p> <p>They received three 2-hour training sessions on using the management principles employed in the 1st grade study.</p> <p>In the classroom, they followed their usual instructional routines regarding basal textbook skill instruction, while adding the management principles of the 1st grade study.</p>	<p>The control teachers were told that they would receive the same training as the treatment teachers after the research data were collected.</p>	<p>The control teachers received no special training; however, they were all "highly regarded for their teaching abilities by district personnel."</p> <p>In addition, the control group had, on average, a greater number of years of teaching experience than the treatment teachers.</p>



<i>What training or information was given to both groups of teachers?</i>	Duffy et al. (1986)	Duffy et al. (1987)	Anderson (1992)	Brown et al. (1996)
	The teachers were unaware that the two groups received different information.	Neither the treatment nor the control group was made aware of the others' existence. Both groups of teachers received identical information about how to implement an Uninterrupted Sustained Silent Reading (USSR) program and how to prepare students to take a standardized reading test.	Not reported.	Not reported.
<i>Outcome measures</i>	Duffy et al. (1986)	Duffy et al. (1987)	Anderson (1992)	Brown et al. (1996)
<i>Student reading achievement:</i>	Gates-MacGinitie Reading Test: The comprehension subtest, Level D (designed for use with grades 4-6) was used. (PRE and POST)	Stanford Achievement Test (SAT): The comprehension and word skills subtests were used. (PRE and POST). Michigan Educational Assessment Program (MEAP): The MEAP was administered five months after the treatment ended. (DELAYED POST).	Stanford Diagnostic Reading Test: The phonics, structural analysis, and reading comprehension-subtests were used (PRE and POST).	Stanford Achievement Test (SAT):-The comprehension and word skills subtests were used. (PRE and POST). Story recall: Students were asked cued and picture cued retelling questions about 2 stories. This measure was designed to assess both recall skills and the degree to which students were interpretive in their retelling of the story. (POST).



<p><i>Student strategy awareness:</i></p>	<p>Lesson interviews: Immediately following each of the four observed lessons subsequent to the baseline observation, students were interviewed to determine whether they were consciously aware of what strategy the teacher taught during the lesson (declarative knowledge), when to use it (situational knowledge), and how to use it (procedural knowledge). (DURING).</p>	<p>Lesson interviews: Immediately following a reading lesson, students were interviewed to determine whether they were consciously aware of what strategy the teacher taught during the lesson (declarative knowledge), when to use it (situational knowledge), and how to use it (procedural knowledge). (DURING).</p> <p>Concept interviews: At the end of the year, students were interviewed to measure their awareness of the general need to be strategic when reading. (POST).</p>	<p>Not measured.</p>	<p>Strategy awareness interview: In October and November, (i.e., when SAIL components were being introduced to SAIL students) and in March and April, a strategies interview was administered to all students participating in the study. This interview tapped students' reported awareness of strategies, as measured by the number and types of strategies they claimed to use during reading. It was also designed to measure students' awareness of where, when, and why to use strategies. (DURING).</p> <p>Students were asked the following six open-ended questions, adapted from the ones used by Duffy et al. (1987):</p> <p>What do good readers do?</p> <p>What makes someone a good reader?</p> <p>What things do you do before you start to read a story?</p> <p>What do you think about before you start to read a story?</p> <p>What do you do when you come to a word you do not know?</p> <p>What do you do when you read something that does not make sense?</p>
<p><i>Student strategy usage:</i></p>	<p>Not measured.</p>	<p>Supplemental Achievement Measure (SAM): This measure was designed by the experimenters to determine whether students could perform the specific skill tasks they had been taught (Part I), and whether their rationale for choosing an answer reflected the reasoning associated with using skills as strategies (Part II). (POST).</p> <p>Modified Graded Oral Reading Paragraph (GORP): This test involved students reading passages orally, and examined self-reports of their self-corrections and their responses to 2 embedded words meeting semantic cueing criteria. (POST).</p>	<p>Not measured.</p>	<p>Think-aloud measure: Students were stopped at four points while reading a difficult story individually with a researcher, and asked to describe their thinking and their strategy usage. (POST).</p>



<p>Teacher effectiveness:</p>	<p>Classroom observation: All teachers in both groups were observed on four separate occasions subsequent to the baseline observation. On the basis of these observations, teachers were rated on the explicitness of their explanations, using a rating scale developed by the researchers. Two aspects of explanation were rated: the information conveyed, and how the teacher conveyed it.</p> <p>The first aspect focused on the content of what the teacher said to students, and was divided into 5 sub-categories: what was said about the skill being taught, when it would be used, the features to attend to, the sequence to follow, and the examples used.</p> <p>The second aspect focused on the pedagogical means by which the information was conveyed, and included 6 sub-categories, focusing on the teachers use of: modeling, highlighting, feedback, review, practice, and application.</p>	<p>Teacher explicitness measure:</p> <p>To measure the explicitness of treatment and treated-control teachers' explanations, the researchers developed an instrument to rate transcripts of audiotaped lessons.</p> <p>(DURING).</p> <p>The rating instrument was organized into three parts: Part I of the instrument focused on the information presented. Teachers were rated on what they students said to students about (a) the task to be learned, (b) its usefulness, (c) the selection of the strategy to be used, and (d) how to do the mental processing associated with the strategy).</p> <p>Part II focused on the means used to present information. Teachers were rated on their (a) introduction to the lesson, (b) modeling, (c) diminishing assistance during interaction, (d) eliciting of student responses, and (e) closure. Part III focused on the cohesion both within the lesson and across lessons.</p>	<p>Videotaped classroom observation: Teachers were videotaped giving a reading lesson for approximately 30 minutes. (PRE and POST).</p> <p>A rating scale was developed using the teacher and student shifts as a base. Teachers were rated on the following 14 dimensions: Treating reading problems openly, focusing on how to solve problems, providing models of thinking, teaching question-asking, asking thought-provoking questions, allowing student control, focusing on group collaboration, informing students of learning, focusing on text and learning about reading, setting reading goals before reading, problem solving during reading, summarizing to check comprehension, reflecting on reading goals after text, and stressing new learning from text.</p> <p>Teacher effectiveness was also assessed by rating students on the following 8 dimensions: Treating reading problems openly, focusing on how to solve problems, expressing thinking, asking questions, giving elaborated answers, taking teacher role, focusing on group collaboration, involvement in sessions.</p>	<p>Classroom observation: SAIL and non-SAIL teachers were observed teaching two story lessons and were compared in terms of the number of strategies they taught in each lesson. (DURING).</p>
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Results	Duffy et al. (1986)	Duffy et al. (1987)	Anderson (1992)	Brown et al. (1996)
Student reading achievement:	<p>Gates-MacGinitie Reading Test: There was no significant difference between students in the treatment and control classrooms on the comprehension subtest at posttest (ES = 0.24).</p> <p>Students in treatment and control classrooms spent equal amounts answering comprehension test items on the pretest, but on the posttest, treatment students spent significantly more time answering questions (ES = +0.42).</p>	<p>Stanford Achievement Test (SAT):-Students of treatment teachers scored significantly higher than students of control teachers on word skills (ES = +1.63), but not on comprehension (ES = +0.25).</p> <p>Michigan Educational Assessment Program (MEAP): Students of treatment teachers scored significantly higher than students of control teachers (ES = +1.33).</p>	<p>Stanford Diagnostic Reading Test: A significantly higher number of students of treatment teachers (about 80%) made gains on the reading comprehension subtest than students of control teachers (about 50%).</p> <p>There was no significant difference in the number of students of treatment teachers and the number of students of control teachers who made gains on the phonics and the structural analysis subtests.</p>	<p>Stanford Achievement Test (SAT): Students of treatment teachers scored significantly higher than students of control teachers on the comprehension subtest (ES = +1.70) and the word skills subtest (ES = +1.67); they also showed significantly greater improvement on these measures over the course of the study. Story retelling questions: Students of the treatment (SAIL) teachers recalled more literal information (Story 1: ES = +0.69; Story 2: ES = +1.37) and were significantly more interpretive in their retelling of the stories (Story 1: ES = +1.01; Story 2: ES = +1.07) than were students of control teachers.</p>
Student strategy awareness:	<p>Strategy awareness interview: Students of treatment teachers scored significantly higher than students of control teachers on strategy awareness ratings (ES = +1.39).</p>	<p>Lesson interviews: Lesson interview responses of students of treatment teachers were rated significantly higher than the responses of students of control teachers. These findings were due to significantly higher ratings given to students of treatment teachers on situational knowledge (ES = +2.22) and procedural knowledge (ES = +1.50). No difference in response ratings was found between groups for declarative knowledge (ES = +0.84).</p> <p>Concept interviews:-Concept interview responses of students of the treatment teachers were rated significantly higher than the responses of students of the control teachers (ES = +1.15), thus suggesting that the treatment students were more aware of the strategic nature of reading.</p>	Not measured.	<p>Strategies interview: Toward the end of the treatment, the students of the treatment (SAIL) teachers reported more awareness of comprehension (ES = +4.03) and word-level strategies (ES = +1.38) during the interview than did the students of control group teachers.</p>



<p>Student strategy usage</p>	<p>Not measured.</p>	<p>SAM Test: Students of treatment teachers did not differ significantly from students of control teachers in their performance on Part I (ES = -0.21). However, students of treatment teachers were significantly superior to students of control teachers in their performance on Part II (ES = +1.67).</p> <p>Modified GORP Test: -Students of treatment teachers scored significantly higher on both the word meaning subtest (ES = +1.51) and the word recognition subtest (ES = +5.00).</p> <p>"According to these GORP results, low-group students who received explicit explanations about the reasoning associated with using skills as strategies (a) reported that they used such reasoning when actually reading connected text, and (b) described the reasoning employed when using the strategies."</p>	<p>Not measured</p>	<p>Think-aloud measure: Students of treatment (SAIL) teachers applied significantly more strategies during the think-aloud task than did the students of control teachers (ES = +2.98).</p>
<p>Teacher effectiveness</p>	<p>Teacher explicitness measure: Across all observations after the baseline observation, treatment teachers were rated as significantly more explicit in their explanations than control teachers (ES = +2.11).</p>	<p>Teacher explicitness measure: The treatment teachers were found to be more explicit in explaining the reasoning associated with using reading skills as strategies than the treated-control teachers (ES = +1.67).</p>	<p>Videotaped teaching sessions: The treatment teachers showed significant improvements across all 14 dimensions: Treating reading problems openly (ES = +3.80), focusing on how to solve problems (ES = +2.80),-providing models of thinking (ES = +3.25), teaching question-asking (ES = +2.00), asking thought-provoking questions (ES = +3.14),-allowing student control (ES = +2.08), focusing on group collaboration (ES = +2.56),-informing students of learning (ES = +2.35), focusing on text and learning about</p>	<p>Classroom observations: The treatment (SAIL) teachers were found to have taught significantly more comprehension strategies (ES = +5.48) and more word-level strategies (ES = +1.38) than control teachers.</p>



			<p>reading (ES = +2.52), setting reading goals before reading (ES = +3.99), problem solving during reading (ES = +5.73), summarizing to check comprehension (ES = +1.90), reflecting on reading goals after text (ES = +2.21), and stressing new learning from text (ES = +2.45).</p> <p>Students of treatment teachers showed significant improvement on all 8 dimensions: Treating reading problems openly (ES = +3.24), focusing on how to solve problems (ES = +3.20), expressing thinking (ES = +2.85), asking questions (ES = +2.81), giving elaborated answers (ES = +1.48), taking teacher role (ES = +2.74), focusing on group collaboration (ES = +2.46), and involvement in sessions (ES = +2.14).</p> <p>Treatment teachers showed a far greater percentage of problem solving incidents at posttest than at pretest. No statistical test is presented.</p> <p>There was a significant increase in student talk and a decrease in teacher talk in the treatment condition. The relevant data are not presented.</p> <p>"It is clear... that the experimental teachers and their students changed substantially from pre- to posttest, while control teachers and students remained about the same."</p>	
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Appendix B:

Comprehensive Summaries Based on NRP Guidelines

Duffy et al. (1986)

1. Reference

Duffy, G. G., Roehler, L. R., Meloth, M. S., Vavrus, L. G., Book, C., Putnam, J., & Wesselman, R. (1986). The relationship between explicit verbal explanations during reading skill instruction and student awareness and achievement: A study of reading teacher effects. *Reading Research Quarterly*, 21(3), 237-252.

2. Research Question

The goal of this study was to determine whether, given skills prescribed in a mandated basal reading series, classroom teachers of low-group students who provide more explicit explanations of how to use these reading skills strategically would be more effective than teachers who were less explicit in explaining how to use skills.

The authors hypothesized that explicit teacher explanation would result in improved student awareness about what was taught, which in turn would result in increased reading achievement on a standardized measure.

The study sought to answer the following questions:

- Are teachers trained to be more explicit during low-group reading skill instruction more explicit than teachers who receive no training?
- Are low-group students of teachers who receive training in how to provide explicit explanation more aware of what skill was taught and of how to use it strategically than low-group students of teachers who receive no training?
- Do the low-group students of trained teachers score significantly higher on the comprehension subtest of a standardized reading achievement test than low-group students of untrained teachers?

3. Sample of student participants

States or countries represented: Not reported, Midwest, USA

Number of different schools: Not reported.

Number of different classrooms:

Total: 22

Treatment group: 11

Control group: 11

Number of participants (total, per group):

Total number: Not reported.

Number per group: Ranged from 4 to 22.

Average group size = 11.76.

Age: Not reported

Grade: 5th.

Reading levels of participants: Low reading groups.

Setting: Large urban school district.

Pretests administered prior to treatment:

Form 2 of the Gates-MacGinitie was administered in early October to low-group students in all 22 classrooms.

Special characteristics:

SES: Not reported.

Ethnicity: Not reported.

Exceptional learning characteristics:

Learning disabled: Not reported.

Reading disabled: Not reported.

Hearing impaired: Not reported.

English language learners (LEP): Not reported.

Selection restrictions used to limit the sample of participants: None reported.

Contextual information (concurrent reading instruction that participants received in their classrooms during the study): Not reported.

Description of curriculum/instructional approach:

Direct explanation (DE) with a focus on the use of an explanation model for teaching strategies. The DE approach includes direct explanation of strategy usage, modeling, systematic practice, and scaffolding.



The curriculum in this study comprised the skills prescribed in the Houghton-Mifflin and Ginn basal textbooks for use with low reading groups in the postprimary grades, such as identifying main ideas, drawing conclusions, using glossaries, and decoding. For the purposes of this study, skills are not viewed as rules to be memorized as procedural algorithms. Instead, they are taught as strategies, or flexible plans for reasoning about how to remove blockages to meaning. Rather than being applied automatically, skills are applied thoughtfully, consciously, and adaptively.

The recasting of traditional reading skills as strategies is based on cognitive science research and on the application of such research to reading comprehension.

The particular curricular goal for this study was for readers, when they encounter meaning blockages, to (a) know what skills can be used as strategies for removing the blockage, (b) select a specific strategy, and (c) use that strategy to remove the blockage.

Treatment teachers, therefore, were trained to recast basal skills as strategies and to teach students in low reading groups to use them when encountering meaning blockages.

How was the sample obtained?

The teachers volunteered in response to a survey of all 5th grade teachers of low reading groups in the district. The students were assigned to reading groups by teachers as part of the participating school district's policy of using the Joplin Plan to group 5th grade students homogeneously for reading. Student assignments to reading groups were made on the basis of Stanford Achievement Test scores from the previous year and the recommendations of previous teachers. All the low-group students in this study scored more than 1 year below grade level in reading achievement.

Attrition: Not reported.

4. Setting of the Study

Elementary school classroom with low-group reading students.

5. Design of the Study

Random assignment of participants (teachers) to treatments (randomized experiment), after a pretest of classroom management skills and stratification on this dimension.

6. Independent Variables

a. Treatment variables

Describe all treatments and control conditions.

All teachers attended an initial orientation meeting in November. Subsequent to the initial meeting, the treatment teachers received 10 hours of training on how to incorporate explicit explanations into their ongoing reading skill instruction. This training emphasized:

- How to recast prescribed basal text skills as strategies useful when removing blockages to meanings
- How to make explicit statements about the reading skill being taught, when it would be used and how to apply it
- How to organize these statements for presentation to students.

Specifically, treatment teachers were taught to emphasize the mental processing one does when using the skills prescribed in the basal textbook. The teachers were trained to talk to students about

- The reasoning one does when encountering a blockage to meaning
- How the skill being taught can be applied to remove a particular blockage
- The mental steps one follows when using the skill.

That is, teachers were told to present skills not within the context of workbook exercises but within the context of the use of those skills in actual reading situations.

To assist in their planning, teachers were taught to organize their instructional talk into a five-step lesson format: introduction, modeling, guided interaction, practice, and application. To help teachers use the lesson plan, they were taught how to

- Model the mental processing readers do by “talking out loud” about their own use of the skill

- Direct attention to the salient features of the skill and how to refocus student attention during interactions
- Review
- Provide practice
- help students apply the skill in connected text.

The five training sessions were conducted immediately after school, beginning in late November and continuing at about 1-month intervals through March. All the training sessions except one were timed to occur approximately 1 week before each scheduled round of classroom observations.

Each training session followed a four-stage sequence. First, the teachers were provided with information about strategy instruction, and links were made to teachers' background experiences in reading instruction, to basal textbook experiences, and to expected student responses. Second, the researchers modeled strategy instruction and assisted teachers as they developed their own instructional plans. Third, teachers read the transcripts of their own previous lessons and student interviews, and the researchers guided them in analyzing and critiquing the transcripts. Finally, the researchers provided teachers with oral feedback following each observation about the appropriateness of their explanations. This feedback was consistent with the information provided to teachers during training interventions.

The control group received a presentation on effective classroom management. In addition, these teachers were observed teaching classes on four occasions following the baseline observation.

Was instruction explicit or implicit? Explicit.

Difficulty and nature of texts used: Basal texts, difficulty not reported.

Was trainers' fidelity in delivering treatment checked? Yes, via classroom observation.

Properties of trainers (teachers)

Number of teachers who administered treatments:

Experimental = 11

Control = 11

Total = 22

Teacher/student ratio: Not reported

Type of trainer (teacher): Classroom teacher

Length of training given to trainers (teachers): See above.

Source of training: The researchers.

Assignment of trainers (teachers) to group:

Teachers were observed and given baseline scores on their classroom management skills (high, medium, low). This resulted in teachers being assigned to the following management levels:

"High" = 8

"Average" = 4

"Low" = 2

Researchers then randomly assigned teachers within each management level to either the treatment or control group.

Management ratings were made again at four observation points during the year to validate the initial management ratings.

Teachers were also observed at the beginning of the study to obtain a baseline measure of their skill instruction to establish that all 22 teachers were relatively equal in the explicitness of their explanations.

Baseline data were unavailable for two teachers (1 treatment and 1 control).

Cost factors: Not reported.

b. Moderator variables

List and describe other nontreatment independent variables included in the analyses of effects: None reported.

7. Dependent (Outcome) Variables

List processes that were taught during training and measured during and at the end of training: See #6 above.

Student strategy awareness:

Student awareness data for both treatment and control classrooms were obtained in interviews with five randomly selected low-group students from each classroom immediately following each of the four



observed lessons subsequent to the baseline observation. The same five students were interviewed each time, except in the case of one classroom that had only four low-group students, where all four were interviewed each time. If a designated student was absent or moved away during the study, another student from the low-reading group was randomly selected to complete the complement of five interviewees.

Three questions were asked of each student, followed by prepared probes if responses to the initial questions were incomplete or vague.

- What were you learning in the lesson I just saw?
- When would you use what was taught in the lesson?
- How do you do what you were taught to do?

The criteria for determining student awareness were contained in a rating scale developed by the research team. Ratings ranged from 0 to 4 on each of the following three criteria:

1. Awareness of what had been taught
2. Awareness of the context or situation in which the strategy should be used or applied
3. Awareness of how the strategy is employed.

Teacher explicitness:

All teachers in both groups were observed on four separate occasions subsequent to the baseline observation. On the basis of these observations, teachers were rated on the explicitness of their explanations, using a rating scale developed by the researchers. Two aspects of explanation were rated: the information conveyed and how the teacher conveyed it.

The first aspect focused on the content of what the teacher said to students and was divided into five subcategories:

1. What was said about the skill being taught
2. When it would be used
3. The features to attend to
4. The sequence to follow

5. The examples used.

The second aspect focused on the pedagogical means by which the information was conveyed and included six subcategories, focusing on the teachers' use of:

- Modeling
- Highlighting
- Feedback
- Review
- Practice
- Application.

Teachers received ratings for degrees of explicitness on each of the 11 subcategories on a scale of 0 to 2 (with 0 indicating absence, and 2, exemplary presence of the criterion).

Student Achievement

The achievement measure was the comprehension subtest of the Gates-MacGinitie Reading Test (2nd ed., MacGinitie, 1978), Level D (designed for use with grades 4 to 6). This test consists of short paragraphs followed by a series of two to four multiple-choice questions about the content of each paragraph (43 total items). Form 2 was given as the pretest and Form 1 as the posttest.

8. Nonequivalence of groups

Any reason to believe that treatment and control groups might not have been equivalent prior to treatments?

No. "Although baseline data were not available for student awareness ratings, the stratified random assignment of teachers to treatment and control groups, coupled with the similarity of baseline explanation ratings (4.1 for each group) and the similarity of pretest comprehension scores, suggests that there was no initial awareness [or achievement] difference between groups."

Were steps taken in statistical analyses to adjust for any lack of equivalence?

Not reported.

9. Result (for each measure)

a. Name of Measure: Student strategy awareness interview

Students of treatment teachers scored significantly higher than students of control teachers on strategy awareness ratings.

Value of effect size: +1.39

Type of summary statistics from which effect size was derived: ANOVA

Number of classrooms providing the effect size information: Ns = 11 and 11

b. Name of Measure: Teacher explicitness

Across all observations after the baseline observation, treatment teachers were rated as significantly more explicit in their explanations than control teachers.

Value of effect size: +2.11.

Type of summary statistics from which effect size was derived: ANOVA

Number of classrooms providing the effect size information: *Ns = 11 and 11*

c. Name of Measure: Student Achievement

There was no significant difference between students in the treatment and control classrooms on the comprehension subtest at either pretest or posttest.

Value of effect size: 0.24.

Type of summary statistics from which effect size was derived: ANOVA

Number of classrooms providing the effect size information: Ns = 11 and 11

Students in treatment and control classrooms spent equal amounts of time answering comprehension test items on the pretest, but on the posttest, treatment students spent significantly more time answering questions.

Value of effect size: +0.42

Type of summary statistics from which effect size was derived: t-test.

Number of classrooms providing the effect size information: Ns = 11 and 11

Duffy et al. (1987)

1. Reference

Duffy, G. G., Roehler, L. R., Sivan, E., Rackliffe, G., Book, C., Meloth, M.S., Vavrus, L. G., Wesselman, R., Putname, J. & Bassiri, D. (1987). Effects of explaining the reasoning associated with using reading strategies. *Reading Research Quarterly*, 23(3), 347-368.

2. Research Question

The purpose of this study was to investigate the effects of explaining the reasoning associated with using reading strategies. Three specific research questions were posed.

- Can teachers learn to be more explicit in explaining the reasoning associated with using basal text skills as strategies?
- Can explicit teacher explanations increase low-group students' awareness of both lesson content and the need to be strategic while reading?
- Can explicit teacher explanations increase low-group students' conscious use of skills as strategies and lead, ultimately, to greater reading achievement?

3. Sample of student participants

States or countries represented: The Midwest (no state given), USA

Number of different schools: Treatment Group = 8; Control Group = 9

Number of different classrooms = 20

Number of student participants:

Total: 148

Treatment group: 71

Control group: 77

Number per group: Ranged from 3 to 16 students per class.

Overall average: 7.4 per classroom.

Age: Not listed



Grade: 3rd

Reading levels of participants: “Low”

Setting: Urban, suburban

Pretests administered prior to treatment:

Stanford Achievement Test (SAT), reading section, administered at end of 2nd grade.

Special characteristics, if relevant:

SES: Not reported.

Ethnicity: Not reported.

Exceptional Learning Characteristics:

These students “represented the typical range of reading difficulties associated with low reading groups in urban centers.” Groups included mainstreamed special education students, immigrant children with severe language problems, and students with behavioral disorders.

Selection restrictions used to limit the sample of participants: Not reported.

Contextual information (concurrent reading instruction that participants received in their classrooms during the study): Not reported.

Description of curriculum/instructional approach:

Direct explanation (DE) with a focus on explaining the reasoning associated with skill and strategy usage.

Duffy et al.’s approach contains all the elements of DE but also requires teachers to analyze the skills prescribed in basal texts, and to recast these skills as problem-solving strategies.

This research is based upon the assertion that “because poor readers lack understanding of the strategic nature of reading, instruction needs to place greater emphasis on the development of poor readers’ ability to reason strategically.”

According to the authors, “it may be necessary when working with poor readers for teachers to explain explicitly, in consistent ways over extended instructional periods, the mental processing associated with [a given] strategy, when it can be used, and how to apply it in a flexible manner.”

In particular, the authors are interested in the relationship between the explicitness of teacher strategy explanations on the one hand and student strategy awareness and reading ability on the other.

Consequently, the instructional approach used in this study focused on teaching students the reasoning that expert readers are presumed to employ when using strategically those skills traditionally taught in association with basal textbooks.

Specifically, teachers were taught to recast the skills prescribed in basal textbooks as problem-solving strategies. They were taught to do this by analyzing the cognitive and metacognitive components of the skills, and by modeling the cognitive and metacognitive acts involved in performing the skills.

The curricular emphasis in the treatment classrooms, therefore, was on the reasoning associated with strategic skill usage, not on the performance of isolated skill tasks.

How sample was obtained: Selected from the population of those available.

Attrition: One urban teacher was replaced by a suburban teacher in mid-September.

4. Setting of the Study

Classrooms for low-level reading groups.

5. Design of the Study

Random assignment of participants (teachers) to treatments (randomized experiment). Each teacher’s pre-existing reading groups remained intact. Pretest measures revealed no significant differences between the participating groups of students.

6. Independent Variables

a. Treatment variables

Describe all treatments and control conditions.

Treatment teachers were taught to modify the curricular and instructional skill prescriptions of the basal text so that the emphasis was on the mental processing involved in using skills as strategies. Specifically, treatment teachers were taught to adapt their basal text instruction in the following ways:

- Because basal textbooks often present prescribed skills as isolated memory-based tasks, treatment teachers were taught to recast the prescribed skills as problem-solving strategies by analyzing the cognitive and metacognitive components of the skill.
- Because the teaching suggestions in the basal text teacher’s guide emphasize procedural skill exercises and drill, treatment teachers were taught to supplement these suggestions with modeling of the cognitive and metacognitive acts involved in performing the skills.
- Teachers were taught “to explain explicitly, in consistent ways over extended instructional periods, the mental processing associated with [a given] strategy, when it can be used, and how to apply it in a flexible manner.”
- Teachers were taught “to present their explanations to students as descriptive of what good readers do, rather than as prescriptions to be procedurally applied in all situations.”

Treatment teachers were not provided with scripts for teaching skills in this way. Instead, they used the information from the research intervention sessions to develop their own explanations for each lesson.

Treatment teachers were told that the purpose of the project was to study teacher explanation. They received six 2-hour training sessions in the course of one academic year. These sessions emphasized how to

- Make decisions about recasting prescribed basal text skills as strategies.
- Decide on explicit statements about the strategy being taught, when it would be used, and how to do the mental processing involved.
- Organize these statements into a lesson format that progressed from an introduction, to modeling, to interaction between teacher and students, to closure.

The training interventions also included one-on-one coaching, collaborative sharing between the teachers, specific feedback regarding observed lessons, and videotapes of model lessons.

Treated-control teachers were told that the purpose of the study was to validate at the 3rd grade level the results of a previous (unrelated) study involving classroom management for 1st graders. They received three 2-hour training sessions on using the management principles employed in the 1st grade study. In the classroom, they followed their usual instructional routines regarding basal textbook skill instruction, while adding the management principles of the 1st grade study.

Neither the treatment nor the control group was made aware of the other’s existence.

Both groups of teachers received identical information about how to implement an uninterrupted sustained silent reading (USSR) program and how to prepare students to take a standardized reading test.

Was instruction explicit or implicit? Explicit.

Difficulty and nature of texts used: Basal reading textbooks for the 2nd grade.

Was trainers’ (teachers’) fidelity in delivering treatment checked? Yes, by observations and checklists.

Properties of teachers/trainers:

Number of teachers who administered treatments:

Treatment group = 10

Control group = 10

Total = 20

Teacher/student ratio: Depended on class; ranged from 1:3 to 1:16.

Type of trainer: Classroom teacher.

Any special qualification of trainers (teachers)? No.

Length of training given to trainers (teachers): 12 hours (six 2-hour sessions over the course of the school year).

Source of training: The researchers.

Assignment of trainers to groups: Teachers were already assigned to students at beginning of study.



Cost factors: Not reported.

b. Moderator variables:

List and describe other nontreatment independent variables included in the analyses of effects: None reported.

7. Dependent (Outcome) Variables

Student reading achievement:

Stanford Achievement Test (SAT):

The comprehension and word skills subtests were used. (PRE and POST).

Michigan Educational Assessment Program (MEAP):

The MEAP was administered 5 months after the treatment ended. (DELAYED POST).

Student strategy awareness:

Lesson interviews:

Immediately following a reading lesson, students were interviewed to determine whether they were consciously aware of what strategy the teacher taught during the lesson (declarative knowledge), when to use it (situational knowledge), and how to use it (procedural knowledge).

(DURING).

Concept interviews:

At the end of the year, students were interviewed to measure their awareness of the general need to be strategic when reading.

(POST).

Student strategy usage:

Supplemental Achievement Measure (SAM):

This measure was designed by the experimenters to determine whether students could perform the specific skill tasks they had been taught (Part I) and whether their rationale for choosing an answer reflected the reasoning associated with using skills as strategies (Part II).

(POST).

Modified Graded Oral Reading Paragraph (GORP):

This test involved students reading passages orally and examined self-reports of their self-corrections and their responses to two embedded words meeting semantic cueing criteria.

(POST).

Teacher effectiveness:

Teacher explicitness measure:

To measure the explicitness of treatment and treated-control teachers' explanations, the researchers developed an instrument to rate transcripts of audiotaped lessons.

(DURING).

The rating instrument was organized into three parts:

- Part I of the instrument focused on the information presented. Teachers were rated on what they said to students about (1) the task to be learned, (2) its usefulness, (3) the selection of the strategy to be used, and (4) how to do the mental processing associated with the strategy.
- Part II focused on the means used to present information. Teachers were rated on their (1) introduction to the lesson, (2) modeling, (3) diminishing assistance during interaction, (4) eliciting of student responses, and (5) closure.
- Part III focused on the cohesion both within the lesson and across lessons.

8. Nonequivalence of groups

Any reason to believe that treatment and control groups might not have been equivalent before treatments? No.

Were steps taken in statistical analyses to adjust for any lack of equivalence? Yes.

9. Result (for each measure):

Student reading achievement:

a. Name of measure: SAT: Word Skills

Students of treatment teachers scored significantly higher than students of control teachers on word skills.

Value of effect size: +1.63

Type of summary statistics from which effect size was derived:

MANCOVA

Number of classrooms providing the effect size information:

Ns = 10 and 10

b. Name of measure: SAT: Comprehension

Students of treatment teachers did not score significantly higher than students of control teachers on comprehension.

Value of effect size: +0.25

Type of summary statistics from which effect size was derived:

MANCOVA

Number of classrooms providing the effect size information:

Ns = 10 and 10

c. Name of measure: MEAP

Students of treatment teachers scored significantly higher than students of control teachers.

Value of effect size: +1.33

Type of summary statistics from which effect size was derived:

ANOVA

Number of classrooms providing the effect size information:

Ns = 10 and 10

Student strategy awareness:

d. Name of measure: Lesson interviews

Lesson interview responses of students of treatment teachers were rated significantly higher than the responses of students of control teachers. These findings were due to significantly higher ratings given to students of treatment teachers on situational knowledge and procedural knowledge.

Value of effect size:

Declarative knowledge: +0.84

Situational knowledge: +2.22

Procedural knowledge: +1.50

Type of summary statistics from which effect size was derived:

ANOVA

Number of classrooms providing the effect size information:

Ns = 10 and 10

e. Name of measure: Concept interviews

Concept interview responses of students of the treatment teachers were rated significantly higher than the responses of students of the control teachers, thus suggesting that the treatment students were more aware of the strategic nature of reading.

Value of effect size: +1.15

Type of summary statistics from which effect size was derived:

MANOVA

Number of classrooms providing the effect size information:

Ns = 10 and 10

f. Student strategy usage:

Name of measure: SAM: Part II

(performance of skill tasks)

Students of treatment teachers did not differ significantly from students of control teachers in their performance on Part I.

Value of effect size: -0.21



Type of summary statistics from which effect size was derived:

MANOVA

g. Number of classrooms providing the effect size information:

Ns = 10 and 10

Name of measure: SAM: Part II

(reasoning associated with use of skills as strategies)

Students of treatment teachers were significantly superior to students of control teachers in their performance on Part II.

Value of effect size: +1.67

Type of summary statistics from which effect size was derived:

MANOVA

Number of classrooms providing the effect size information:

Ns = 10 and 10

h. Name of measure:

GORP: Word meaning ratings

Students of treatment teachers scored significantly higher on the word meaning subtest.

Value of effect size: +1.51

Type of summary statistics from which effect size was derived:

MANOVA

Number of classrooms providing the effect size information:

Ns = 10 and 10

i. Name of measure:

GORP: Word recognition ratings

Students of treatment teachers scored significantly higher on the word recognition subtest.

Value of effect size: +5.00

Type of summary statistics from which effect size was derived:

MANOVA

Number of classrooms providing the effect size information:

Ns = 10 and 10

“According to these GORP results, low-group students who received explicit explanations about the reasoning associated with using skills as strategies (1) reported that they used such reasoning when actually reading connected text and (2) described the reasoning employed when using the strategies.”

Teacher effectiveness:

j. Name of measure: Teacher explicitness measure

The treatment teachers were found to be more explicit in explaining the reasoning associated with using reading skills as strategies than the treated-control teachers.

Value of effect size: +1.67

Type of summary statistics from which effect size was derived:

ANOVA

Number of classrooms providing the effect size information:

Ns = 10 and 10

Anderson (1992)

1. Reference

Anderson, V. (1992). A teacher development project in transactional strategy instruction for teachers of severely reading-disabled adolescents. *Teaching and Teacher Education*, 8(4) 391-403.

2. Research Question

The purpose of this study was to test the effectiveness of a teacher development model designed to provide teachers with collaborative transactional strategies for helping severely reading-delayed adolescents take a more active approach to understanding informational texts.

The research question addressed by this study is: Does the use of the TSI approach to reading instruction result in positive changes in severely reading-delayed adolescent students' reading performance?

3. Sample of Student Participants

States or countries represented: Not reported.

Number of different schools: Not reported.

Number of participants (total, per group):

Total: 83

Per group: Ranged from 2 to 10 and was "approximately equal" across groups.

Age: Not reported.

Grade: Ranged from 6 to 11.

Reading levels of participants:

Severely reading disabled: "All but a very few had been diagnosed as learning disabled." More than 75% of the adolescent students in the study had incoming reading levels of grade 3 or below.

Setting: Not reported.

Pretests administered before to treatment:

At the beginning of the study, teachers in both an experimental and a control group were videotaped giving a reading lesson for approximately 30 minutes, using one of two expository passages developed for the study that were matched for difficulty but had different content.

In addition, students were given three subtests of the Stanford Diagnostic Reading Test (phonics, structural analysis, and reading comprehension).

The purpose of these steps was to establish pretest baseline measures of teaching style and student ability.

Special characteristics, if relevant:

SES: Not reported.

Ethnicity: Not reported.

Exceptional learning characteristics?

Learning disabled: yes

Reading disabled: yes

Selection restrictions used to limit the sample of participants: Not reported.

Contextual information (concurrent reading instruction that participants received in their classrooms during the study): Not reported.

Description of curriculum/instructional approach:

TSI with a focus on progressive shifts of teacher attention toward fostering active reading. The TSI approach contains all the elements of DE and also includes extended discussions that emphasize joint construction of text interpretations and student strategy usage.

According to the author, TSI is a method of teaching reading that emphasizes "transactions or negotiations that occur among teacher and students, and students and students while working together to determine text meaning."

The view of teacher education presented in this study involves a progressive shift of the teacher's attention.

- The first stage is to shift the attention from overt performance of tasks to the underlying comprehension processes.
- The next stage shifts from teacher questioning, modeling, and explaining to students carrying out these processes.
- The final stage shifts from students' carrying out active processes under teacher guidance to their assuming that responsibility themselves.

How was sample obtained?

Teachers were invited to volunteer via a letter from the participating board of education.

Attrition:

Experimental: 1 teacher

Control: 3 teachers

(originally, there were 10 teachers in each group)

4. Setting of the Study

Small-group reading session, in which teachers work directly with students on the reading and understanding of informational text.



5. Design of the Study

Random assignment of participants (teachers) to treatments (randomized experiment).

6. Independent Variables

a. Treatment variables:

Describe all treatments and control conditions:

A set of 20 teacher shifts and 12 student shifts was presented to the treatment teachers. The shifts represent changes that need to be made for more active reading to be fostered. This list of shifts first describes ways in which teachers and students typically behave in remedial reading sessions; it then provides a contrasting list of behaviors that characterize or promote active reading. The set of student shifts that was presented to teachers included the following as desired goals:

- Participating in reading to learn new information
- Trying to read difficult or unfamiliar material
- Focusing on collaborating with the group in reading sessions
- Revealing and investigating errors in reading
- Directing effort toward explaining how to arrive at right answers
- Attempting to take on the role of the teacher
- Asking questions
- Reacting to text
- Providing models for others
- Giving elaborated responses
- Focusing on learning from the reading
- Seeking challenges in thinking.

Teachers were also given a set of principles for fostering active reading through reading instruction, with specific teacher techniques for each principle.

Particular attention was given to:

- Procedures for making thinking explicit by thinking aloud and for turning over responsibility for this to students
- Collaborative problem-solving, as well as accessing, applying, and evaluating students' existing and alternative problem-solving strategies

- “Upgrading” questioning by both teachers and students to be less content-specific and more focused on the use of strategies
- Turning questioning and the entire reading session over to students and increasing student talk and decreasing teacher talk during reading discussions.

The training of the treatment teachers involved three sessions of 3 hours each, held at 1-month intervals while the teachers were conducting reading sessions with their students. In these training sessions, treatment teachers were instructed in principles and techniques for fostering active reading. The training module included the following elements and techniques:

Research involvement:

The treatment teachers participated in discussions about the study procedures. “Every effort was made to make teachers feel they were a part of the development and evolution of the project.”

Teaching shifts:

As described above, a set of 20 teacher shifts and 12 student shifts, representing changes that need to be made in order for more active reading to be fostered, was presented to the treatment teachers and used throughout their training for self-evaluation.

Videotape and self-evaluations:

At each training session, the teachers were shown videotaped clips of their own teaching and asked to evaluate them in terms of the shifts. During self-evaluation, treatment teachers also discussed and selected the shifts on which they felt they needed the most help and guidance from the experimenter and/or peer teachers.

Principles and techniques for fostering active reading:

As described above, treatment teachers were given a set of principles for fostering active reading through reading instruction, with specific teacher techniques for each principle.

Peer support:

Treatment teachers received peer support and coaching from previously trained teachers who attended the training sessions and were available as needed for teachers.

The control teachers were told that they would receive the same training as the treatment teachers after the research data were collected.

Was instruction explicit or implicit? Explicit.

Difficulty and nature of texts used:

A total of 135 single-page, expository texts was prepared, and it was left to the teachers and students to decide which of the texts they wished to read during the approximately 20 reading sessions in which they would engage.

Texts were drawn and edited (primarily shortened) from a variety of “real text” sources, e.g., Cricket Magazine.

Readability levels ranged from grades 2 to 8, with the majority of texts at grades 4 and 5.

(Because the intervention included a particular emphasis on identifying reading problems and sharing problem-solving strategies, all texts were somewhat challenging so that problems would arise during reading.)

Was trainers’ (teachers’) fidelity in delivering treatment checked?

Yes: experimental teachers were videotaped 3 times during the study (pretest, intervention, and posttest).

Properties of trainers (teachers):

Number of trainers (teachers) who administered treatments:

Experimental: 9

Control: 7

Total: 16

Teacher/student ratio: Not reported.

Type of trainer (teacher): Classroom teacher.

Any special qualification of trainers?

All of the teachers were experienced special education teachers.

Length of training given to teachers:

Experimental teachers participated in three afternoon sessions of 3 hours each, held at 1-month intervals while the teachers were conducting reading sessions with their students.

Source of training: The researchers

Assignment of trainers to groups: Random

Cost factors: Not reported.

b. Moderator variables:

List and describe other nontreatment independent variables included in the analyses of effects: None reported.

7. Dependent (Outcome) Variables

Student reading achievement:

Stanford Diagnostic Reading Test:

The phonics, structural analysis, and reading comprehension

subtests were used.

(PRE and POST).

Teacher effectiveness:

Videotaped classroom observation:

Teachers were videotaped giving a reading lesson for approximately 30 minutes. (PRE and POST). A rating scale was developed using the teacher and student shifts as a base. Teachers were rated on the following 14 dimensions:

1. Treating reading problems openly
2. Focusing on how to solve problems
3. Providing models of thinking
4. Teaching question-asking
5. Asking thought-provoking questions
6. Allowing student control
7. Focusing on group collaboration
8. Informing students of learning
9. Focusing on text and learning about reading



10. Setting reading goals before reading
11. Problem-solving during reading
12. Summarizing to check comprehension
13. Reflecting on reading goals after text
14. Stressing new learning from text.

Teacher effectiveness was also assessed by rating students on the following eight dimensions:

1. Treating reading problems openly
2. Focusing on how to solve problems
3. Expressing thinking
4. Asking questions
5. Giving elaborated answers
6. Taking teacher role
7. Focusing on group collaboration
8. Involvement in sessions.

8. Nonequivalence of groups

Any reason to believe that treatment and control groups might not have been equivalent before treatments? Not reported.

Were steps taken in statistical analyses to adjust for any lack of equivalence? Not reported.

9. Result (for each measure)

Student reading achievement:

a. Name of measure: Stanford Diagnostic Reading Test

A significantly higher number of students of treatment teachers (about 80%) made gains on the reading comprehension subtest than did students of control teachers (about 50%).

There was no significant difference in the number of students of treatment teachers and the number of students of control teachers who made gains on the phonics and the structural analysis subtests.

Teacher effectiveness:

b. Name of measure: Videotaped teaching sessions: Dimensions of teacher shifts.

The treatment teachers showed large significant improvements across all dimensions.

Value of effect size:

1. Treat reading problems openly: +3.8
2. Focus on how to solve problems: +2.80
3. Provide models of thinking: +3.25
4. Teach question-asking: +2.00
5. Ask thought-provoking questions: +3.14
6. Allow student control: +2.08
7. Focus on group collaboration: +2.56
8. Inform students: +2.35
9. Focus on text and learning about reading: +2.52
10. Set reading goals before reading: +3.99
11. Problemsolve during reading: +5.73
12. Summarize to check comprehension: +1.90
13. Reflect on reading goals after reading: +2.21
14. Stress new learning from text: +2.45

Type of summary statistics from which effect size was derived: t-tests

Number of classrooms providing the effect size information: $Ns = 9$ and 7

c. Name of measure: Videotaped teaching sessions: Dimensions of student shifts.

The students of treatment teachers showed large significant improvements across all dimensions.

Value of effect size:

1. S: Focus on how to solve problems: +3.24
2. S: Treat reading problems openly: +3.2
3. S: Express thinking: +2.85
4. S: Ask questions: +2.01
5. S: Give elaborated answers: +1.48
6. S: Take teacher role +2.74
7. S: Focus on group collaboration: +2.46

8. S: Involvement in session: +2.14

Type of summary statistics from which effect size was derived: t-tests

Number of classrooms providing the effect size information: Ns = 9 and 7

Name of measure: Videotaped teaching sessions: Teaching incidents involving problem-solving and collaboration

Treatment teachers showed a far greater percentage of teaching incidents that involved problem-solving and collaboration at posttest than at pretest. No statistical test is presented.

Name of measure: Videotaped teaching sessions: Student and teacher talk

There was a significant increase (t-test) in student talk and a decrease in teacher talk in the treatment condition. The relevant data are not presented.

Brown, Pressley, et al. (1996)

1. Reference

Brown, R., Pressley, M., Van Meter, P., & Schuder, J. (1996). A quasi-experimental validation of transactional strategies instruction with low-achieving second-grade readers. *Journal of Educational Psychology*, 88(1), 18-37.

2. Research Question

The purpose of this research was to evaluate the effectiveness of the Students Achieving Independent Learning (SAIL) program. Three hypotheses were examined:

Participating in SAIL would enhance reading comprehension as measured by a standardized test.

After a year of SAIL instruction, there would be clear indications of students learning and using strategies.

Students would develop deeper, more personalized, and interpretive understandings of text after a year of SAIL.

3. Sample of Student Participants

States or countries represented: Mid-Atlantic state (unnamed), United States

Number of different schools: Not reported; all schools in the same district.

Number of different classrooms: 10.

Number of participants (total, per group):

SAIL group = 30

Control group = 30

Total = 60

Number per group = 6

The SAIL and non-SAIL reading groups were matched on the basis of school demographic information and the students' fall standardized test performances (see below).

Age: Not reported.

Grade: Second.

Reading levels of participants: Reading below second grade level.

Setting: Not reported.

Pretests administered before treatment:

Comprehension subtest of the SAT. (Primary 1, Form J; Grade level 1.5 to 2.5); administered in late November or early December.

Special characteristics:

SES: Not reported.

Ethnicity: Not reported.

Exceptional learning characteristics: None, other than reading below grade level.

Selection restrictions used to limit the sample of participants:

Only six students in one SAIL class met eligibility requirements so the researchers decided to use six matched pairs in each classroom as the basis of comparison.

Contextual information (concurrent reading instruction that participants received in their classrooms during the study): Not reported.

Description of curriculum/instructional approach:



The SAIL program uses a TSI approach to teaching reading comprehension to low-performing students. The TSI approach contains all the elements of DE and also includes extended discussions that emphasize joint construction of text interpretations and student strategy usage.

“The purpose of SAIL is the development of independent, self-regulated meaning-making from text.”

Students are taught to adjust their reading to their specific purpose and to text characteristics.

According to the authors, “the short-term goal of TSI is the joint construction of reasonable interpretations by group members as they apply strategies to texts. The long-term goal is the internalization and consistently adaptive use of strategic processing whenever students encounter demanding text. Both goals are promoted by teaching reading group members to construct text meaning by emulating expert readers’ use of comprehension strategies.”

SAIL teachers are taught to achieve the goals of TSI through:

- Direct explanations
- Modeling
- Coaching
- Scaffolded practice.

In addition, SAIL teachers are taught to facilitate extended discussions of text, which emphasize student application of strategies to text comprehension.

In the SAIL reading program, students are taught strategies for adjusting their reading to their specific purpose and to text characteristics. Specifically, students are instructed to:

- Predict upcoming events
- Alter expectations as text unfolds
- Generate questions and interpretations while reading
- Visualize represented ideas
- Summarize periodically
- Attend selectively to the most important information

- Think aloud as they practice applying comprehension strategies during reading instruction.

Overreliance on any one strategy is discouraged. In general, students are taught that getting the overall meaning of text is more important than understanding every word.

When SAIL instruction occurs in reading groups, it differs in a number of ways from more conventional reading group instruction:

Prereading discussion of vocabulary is eliminated in favor of discussion of vocabulary in the context of reading.

The almost universal classroom practice of asking comprehension-check questions as students read in group (e.g., Mehan, 1979) is rarely observed in transactional strategies instruction groups (Gaskins et al., 1993). Instead, a teacher gauges literal comprehension as students think aloud after reading a text segment.

There are extended interpretive discussions of text, with these discussions emphasizing student application of strategies to text.

Although reading group is an important SAIL component, the teaching of strategies extends across the school day, during whole-class instruction, and as teachers interact individually with their students. Reading instruction is also an across-the-curriculum activity.

How was sample obtained?

The five SAIL teachers exhausted the pool of 2nd grade teachers in the district with extensive experience (i.e., 3 or more years) teaching in the SAIL program. The comparison teachers were recommended by principals and district reading specialists.

Attrition

Between the first and second semesters, one SAIL student and two comparison students in one pair of classrooms left their classrooms. Backup students were substituted, with no significant difference occurring between the newly constituted groups on the fall reading comprehension subtest.

4. Setting of the Study

Elementary school classrooms.

5. Design of the Study

Quasi-experimental, in that teachers and students were not randomly assigned to conditions.

The authors state that “preparing teachers to become competent transactional strategies instructors is a long process; therefore, the Panel felt that it could not randomly assign teachers, provide professional development, and wait for teachers to become experienced in teaching SAIL in a realistic time frame.”

However, as noted above, each of the SAIL groups was matched with a comparison group that was “close in reading achievement level at the beginning of the study” (based on standardized test performance) and from a school that was “demographically similar to the school the school representing the SAIL group.”

6. Independent Variables

a. Treatment variables

Describe all treatments and control conditions:

The treatment (SAIL) teachers were not trained specifically for this study; however, they all had extensive experience (i.e., 3 or more years) teaching in the SAIL program.

The control teachers received no special training; however, they were all “highly regarded for their teaching abilities by district personnel.” In addition, the control group had, on average, a greater number of years of teaching experience than the treatment teachers.

Was instruction explicit or implicit? Explicit.

Difficulty and nature of texts used:

It is not entirely clear what texts were used during the course of the school year. The three texts used in the study for group comparisons were illustrated stories from trade books, with numbers of words and readability levels as follows:

- 341 words; 2.4
- 512 words; 2.2
- 129 words; 3.9 (used for a different measure than the previous two).

Was trainers’ (teachers’) fidelity in delivering treatment checked?

The article states that there were “informal observations of the comparison teachers over the year, [which] confirmed that they were more eclectic in their approach to reading instruction than the SAIL teachers . . .” However, it does not indicate whether the SAIL teachers were also observed.

Properties of trainers (teachers):

Number of trainers (teachers):

SAIL group = 5

Control group = 5

Total = 10

Teacher/student ratio:

It is unclear how many students were in each teacher’s class; however, the reading groups within each class that were compared had six students each, for a ratio of 1:6.

Type of teacher: Classroom teacher.

Any special qualification of trainers (teachers)?

All the SAIL teachers had between 3 and 6 years of experience teaching in the SAIL program; therefore, one may assume that they delivered the treatment effectively.

The SAIL teachers had an average of 10.4 years of teaching experience compared to an average of 23.4 years for the comparison teachers.

The authors acknowledge that given this difference, “there is no way to separate out the effects that years of experience may have had on the way teachers taught their students.”

However, they state that readers should “bear in mind that the comparison teachers were highly regarded for their teaching abilities by district personnel; therefore, if anything, their greater number of years of experience could be construed as an advantage.”

Length of training given to trainers: Not reported.

Source of training: Not reported.

Assignment of trainers (teachers) to groups:



“The five SAIL teachers exhausted the pool of 2nd grade teachers in the district with extensive experience teaching in the SAIL program.”

Cost factors: Not reported.

Moderator variables:

List and describe other nontreatment independent variables included in the analyses of effects: None reported.

7. Dependent (Outcome) Variables:

Student reading achievement:

SAT:

The comprehension and word skills subtests were used. (PRE and POST).

Story recall:

Students were asked cued and picture-cued retelling questions about two stories. This measure was designed to assess both recall skills and the degree to which students were interpretive in their retelling of the story. (POST).

Student strategy awareness:

Strategy awareness interview:

In October and November (i.e., when SAIL components were being introduced to SAIL students) and in March and April, a strategies interview was administered to all students participating in the study. This interview tapped students’ reported awareness of strategies, as measured by the number and types of strategies they claimed to use during reading. It was also designed to measure students’ awareness of where, when, and why to use strategies.

(DURING).

Students were asked the following five open-ended questions, adapted from the ones used by Duffy et al. (1987):

What do good readers do? What makes someone a good reader?

What things do you do before you start to read a story?

What do you think about before you start to read a story?

What do you do when you come to a word you do not know?

What do you do when you read something that does not make sense?

Student strategy usage:

Think-aloud measure:

Students were stopped at four points while reading a difficult story individually with a researcher and asked to describe their thinking and their strategy usage.

(POST).

Teacher effectiveness:

Classroom observation:

SAIL and non-SAIL teachers were observed teaching two story lessons and were compared in terms of the number of strategies they taught in each lesson.

(DURING).

8. Nonequivalence of groups

Any reason to believe that treatment and control groups might not have been equivalent before treatments?

Although it is possible, because the groups were not randomly assigned, it is unlikely because of the careful matching done in the fall on both mean performance and variability on standardized reading comprehension tests.

Were steps taken in statistical analyses to adjust for any lack of equivalence?

Not reported.

9. Result (for each measure):

Student reading achievement:

a. Name of measure: SAT: Comprehension

Students of treatment teachers scored significantly higher than students of control teachers on the comprehension subtest of the SAT.

Value of effect size: + 1.70

Type of summary statistics from which effect size was derived: t-test

Number of classrooms providing the effect size information:

Ns = 5 and 5

b. Name of measure: SAT: Word skills

Students of treatment teachers scored significantly higher than students of control teachers on the word skills subtest of the SAT.

Value of effect size: +1.67

Type of summary statistics from which effect size was derived: t-test

Number of classrooms providing the effect size information:

Ns = 5 and 5

c. Name of measure: Story recall: Literal information

Students of the treatment (SAIL) teachers recalled more literal information than students of control teachers.

Value of effect size:

Story 1: +0.69

Story 2: +1.37

Type of summary statistics from which effect size was derived: t-test

Number of classrooms providing the effect size information:

Ns = 5 and 5

d. Name of measure: Story recall: Interpretation

Students of the treatment (SAIL) teachers were significantly more interpretative in their retelling of the stories than were students of control teachers.

Value of effect size:

Story 1: +1.01

Story 2: +1.07

Type of summary statistics from which effect size was derived: t-test

Number of classrooms providing the effect size information:

Ns = 5 and 5

Student strategy awareness:

e. Name of measure: Strategy awareness interview: Comprehension strategies

Toward the end of the treatment, the students of the treatment (SAIL) teachers reported more awareness of comprehension strategies during the interview than did the students of control group teachers.

Value of effect size: +4.03

Type of summary statistics from which effect size was derived: t-test

Number of classrooms providing the effect size information:

Ns = 5 and 5

f. Name of measure: Strategy awareness interview: Word-level strategies

Toward the end of the treatment, the students of the treatment (SAIL) teachers reported more awareness of word-level strategies during the interview than did the students of control group teachers.

Value of effect size: +1.38

Type of summary statistics from which effect size was derived: t-test

Number of classrooms providing the effect size information:

Ns = 5 and 5

Student strategy usage:

g. Name of measure: Think-aloud measure

Students of treatment (SAIL) teachers applied significantly more strategies during the think-aloud task than did the students of control teachers.

Value of effect size: +2.98

Type of summary statistics from which effect size was derived: t-test



Number of classrooms providing the effect size information:

Ns = 5 and 5

Teacher effectiveness:

h. Name of measure: Classroom observation: Comprehension strategies

The treatment (SAIL) teachers were found to have taught significantly more comprehension strategies than control teachers.

Value of effect size: +5.48

Type of summary statistics from which effect size was derived: t-test

Number of classrooms providing the effect size information:

Ns = 5 and 5

i. Name of measure: Classroom observation: Word-level strategies

The treatment (SAIL) teachers were found to have taught significantly more word-level strategies than control teachers.

Value of effect size: +1.38

Type of summary statistics from which effect size was derived: t-test

Number of classrooms providing the effect size information:

Ns = 5 and 5.