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# Improving the Writing, Knowledge, and Motivation of Struggling Young Writers: Effects of Self-Regulated Strategy Development With and Without Peer Support

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*Writing development involves changes that occur in children's strategic behavior, knowledge, and motivation. The authors examined the effectiveness of self-regulated strategy development (SRSD), a strategy instructional model designed to promote development in each of these areas. Instruction focused on planning and writing stories and persuasive essays. The addition of a peer support component to SRSD instruction aimed at facilitating maintenance and generalization effects was also examined. SRSD had a positive impact on the writing performance and knowledge of struggling second-grade writers attending urban schools serving a high percentage of low-income families. In comparison with children in the Writers' Workshop condition, SRSD-instructed students were more knowledgeable about writing and evidenced stronger performance in the two instructed genres (story and persuasive writing) as well as two uninstructed genres (personal narrative and informative writing). Moreover, the peer support component augmented SRSD instruction by enhancing specific aspects of students' performance in both the instructed and uninstructed genres.*

**KEYWORDS:** peer assistance, self-regulated strategy development, strategy instruction, struggling learners, writing

In 2002, the National Commission on Writing in America's Schools and Colleges released a report, *The Neglected "R,"* designed to focus national attention on the teaching of writing. This commission was established by the College Board, an organization of more than 4,300 colleges, and created in large part because of growing concern that the writing of students in the United States "is not what it should be" (National Commission on Writing, 2003, p. 7). This concern is well founded given results from the National Assessment of Educational Progress (NAEP) indicating that three of every four

students in the 4th, 8th, and 12th grades demonstrate only partial mastery of the writing skills and knowledge needed at their respective grade level (Greenwald, Persky, Ambell, & Mazzeo, 1999). Furthermore, almost one in every five first-year college students require a remedial writing class, and more than one half of new college students are unable to write a paper relatively free of errors (Intersegmental Committee of the Academic Senates, 2002).

The commission's report highlights the need to make writing improvement a national goal. A critical element in developing an effective and comprehensive writing policy is the identification of effective instructional procedures, not only at the secondary level (where the report concentrates most of its attention) but with younger students as well, especially primary grade children who experience difficulty learning to write. This is important for two reasons. First, providing effective writing instruction to these children from the start should help ameliorate their writing problems (Graham & Harris, 2002). Second, waiting until later grades to address literacy problems that have their origin in the primary grades has not been particularly successful (Slavin, Madden, & Karweit, 1989).

The development and validation of effective writing procedures must also focus on how to improve the writing performance of children in poor urban settings. Although the NAEP writing scores of children served in these schools, including poor students as well as Black and Hispanic students, improved from 1998 to 2002, the gap between each of these groups and White and Asian students remained substantial (Persky, Daane, & Jin, 2003).

One purpose of the current study, therefore, was to examine the effectiveness of an instructional program in improving the performance of young, struggling writers attending urban schools serving a high percentage of children from low-income families. A struggling writer was defined as a child who scored at or below the 25th percentile on a norm-referenced test of writing performance that measured the inclusion of specific thematic elements in a story and who was also identified as a poor writer by the classroom teacher. The experimental intervention, self-regulated strategy development (SRSD; Harris & Graham, 1996, 1999), is compatible with current theories on the

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development of competence in a subject-matter domain (Alexander, 1992, 1997; Chi, 1985; Harris & Alexander, 1998; Pintrich & Schunk, 1996). These conceptualizations emphasize that learning is a complex process that depends, in large part, on changes that occur in a learner's strategic knowledge, domain-specific knowledge, and motivation (Alexander, Graham, & Harris, 1996).

Although the primary focus of SRSD is on teaching students strategies for successfully completing an academic task, students are also taught knowledge and self-regulatory procedures (e.g., goal setting, self-monitoring, and self-instruction) needed to carry out the target strategies and better understand the task. In addition, instructional procedures for fostering aspects of motivation, such as student effort, are embedded within the model. This emphasis on addressing multiple aspects of development reflects a basic premise that guided construction of the SRSD model over 20 years ago (Harris & Graham, 1999); students who experience academic difficulties benefit from an integrated approach to intervention that directly focuses on cognitive, metacognitive, behavioral, and affective factors. The theoretical underpinnings of this emphasis included Meichenbaum's (1977) integration of cognitive and behavioral perspectives; Brown and Campione's research (Brown, Campione, & Day, 1981) on the development of self-regulation, metacognition, and critical components of strategy instruction; and the work of Soviet theorists, such as Vygotsky (1978), on the origins of self-control.

Previous investigations have shown that SRSD has a strong impact on improving the writing performance of upper-elementary and middle school students (effect sizes typically exceed 0.80), including enhancing the writing of youngsters attending urban schools (Graham & Harris, 2003, in press). The effectiveness of SRSD with primary grade students, however, has been tested in only one study with third-grade children (Graham, Harris, & Mason, 2005), and data are limited on the effects of the model on writers' knowledge and motivation. In the study involving third-grade students, SRSD instruction in how to plan and write stories and persuasive essays had a strong impact on the writing performance of children who were experiencing difficulty learning to write. After treatment, SRSD-instructed students' stories and persuasive papers were longer, more complete, and qualitatively better than papers written by control students (effect sizes exceeded 1.78 for all of these measures). Positive effects of SRSD instruction were also observed in an uninstructed genre, informative writing (the effect size for quality was 1.08), and students' knowledge about writing was boosted as well. In the present study, we extended research on SRSD and writing by assessing the impact of this instructional approach on the writing, knowledge, and motivation of even younger struggling writers (second graders) who attended urban schools serving a high percentage of children from low-income families.

Like the older students in the Graham et al. (2005) investigation, the second-grade students in this study were taught a general strategy that emphasized planning in advance. This general strategy reminded them to carry out three basic processes: select a topic to write about, organize possible ideas into a writing plan, and use and upgrade their plan as they wrote. As a means of

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helping them organize possible ideas into a writing plan, students were also taught genre-specific planning strategies. During story writing, this included students asking themselves a series of questions, with each question focusing on a particular element typically found in stories (Stein & Glenn, 1979), such as "Who are the main characters?" and "What do they want to do?" Students also brainstormed "million-dollar" words to use in their story to enhance both story vocabulary and ideation. When instruction shifted to persuasive writing, students were taught a second genre-specific strategy, one specifically designed to help them plan and write a persuasive paper. This strategy included responding to a series of prompts and questions about the basic elements of a persuasive essay (Scardamalia, Bereiter, & Goleman, 1982), such as "Tell what I believe!" "Why do I believe this?" and "Do I have good reasons?" Students were again taught how to generate "million-dollar" words to use in their essay, as well as transition words.

In addition, students learned about the basic parts of a story and persuasive essay, the importance of using words that make a paper more interesting, and self-talk that facilitates performance. This provided them with knowledge essential to using the planning strategies just described. They also learned about the purpose of stories and persuasive writing, including the characteristics of a well-constructed paper in each genre. This strategy, accomplished in part through discussion and reading model stories and essays, provided students with a mental model of what constituted quality writing for each type of paper. Finally, students were taught how to set goals to write complete papers (i.e., ones that included all of the basic elements as well as million-dollar words), monitor and graph their personal success in achieving these goals, compare their pre-instructional performance with their performance during instruction, and credit their success to effort and use of the target strategies. Instructors further emphasized the importance of mastering these strategies and applying them independently. Mastery goals, evaluation of personal growth, self-reflection, development of autonomy, and attributional practices such as these are thought to enhance students' effort and motivation (Ames, 1992; Schunk & Zimmerman, 1998; Urdan, 1997).

We decided to make planning the central focus of our instruction for three reasons. First, planning is an essential ingredient in skilled writing; skilled writers spend a considerable amount of time planning what to do and say (Flower & Hayes, 1980; Graham, in press; Kellogg, 1987), including setting goals, generating ideas, and organizing ideas into a writing plan (Hayes & Flower, 1980). Second, struggling writers are less knowledgeable about the strategies and processes involved in planning a paper than their peers who are better writers (Graham & Harris, 2000). For example, Englert, Raphael, Fear, and Anderson (1988) found that poor writers were less knowledgeable than good writers about how to develop and organize ideas for writing a paper. Third, young writers, including those who find writing difficult, do little planning in advance of writing (Cameron & Moshenko, 1996; MacArthur & Graham, 1987). Advanced planning may be especially advantageous for both novice and struggling writers. A written plan provides an external memory wherein a child can

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store ideas without the risk of losing them. It may further reduce the need to plan while writing, freeing resources to engage in other writing processes such as translating ideas into words and transcribing words into printed text (Kellogg, 1986, 1987).

The second purpose of this investigation was to determine whether social support through peer assistance would enhance SRSD-instructed students' performance, especially in terms of maintenance and generalization. Children who experience academic difficulties are less likely than their normally achieving counterparts to maintain or generalize what they have learned (Wong, 1994). The SRSD model was designed to address this issue, in that it involves a number of instructional procedures for promoting maintenance and generalization, including making the purpose and value of the target strategies and their component steps clear, continuing strategy instruction until students can use strategies correctly and efficiently with different types of writing prompts for the target genres, teaching self-talk that facilitates the use of the strategies, providing feedback and self-reflection through self-monitoring and evaluation, tying performance gains to effort and strategy use, encouraging students to maintain and generalize strategy use, and discussing when, where, and how to use the learned strategies (Harris & Graham, 1996). Even with all of these components in place, however, not all SRSD-instructed students maintain or generalize what they have learned (Graham & Harris, 1998).

In the present study, therefore, we examined whether adding peers working together to support strategy use, maintenance, and generalization would augment performance effects. This concept of peer support draws upon theories of social learning that emphasize mental sharing and collective thinking in the undertaking of a demanding or complex task (Hastie & Pennington, 1991; Perkins, 1992; Salomon, 1993). The peer support component involved two peers working together to promote strategy use outside of the strategy instruction situation. Throughout instruction, the two students periodically met with the instructor to identify other places or instances where they might use all or some of the strategies they were learning (such as in the regular classroom). They also considered whether and how these procedures needed to be modified for each identified situation. They were then encouraged to apply the procedures they were learning to these situations, with the added provision that they remind and help each other as needed. In the subsequent instructional sessions, they each identified when, where, and how they applied the strategies, describing how the strategy helped them do better as well as detailing any problems encountered. They further identified any instance in which they helped their partner. It is important to note that, to eliminate any overlap between the two SRSD conditions (with and without peer support), we removed from the SRSD-only condition two components common to this model: overt encouragement by the instructor for students to use the strategies outside the instructional setting and discussion about when, where, and how to use the learned strategies outside this setting.

Although the concept of peers helping each other maintain and generalize gains outside of the instructional situation has been used extensively in

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clinical psychology (see Brownell & Jeffrey, 1987; Jacobson, 1989), the Graham et al. (in press) investigation is the only study we are aware of in which the added value of such a component has been tested with an academic task. In that study, adding the peer support component to the SRSD model was advantageous with third-grade students, enhancing their knowledge about planning, boosting their persistence in writing informational text (an uninstructed genre), and increasing the number of basic story elements they included in their personal narratives (an uninstructed genre). In this study, we attempted to increase the power of the peer support component by incorporating a functional mediator (see Stokes & Osnes, 1989), the instructor, into one of the possible generalization settings (i.e., the child's classroom). This occurred twice: once at the end of story instruction and again at the end of persuasive writing instruction. During these planned events, the instructor came into the children's classroom and met only with the pair of students in the SRSD plus peer support condition. She asked the students to write either a story or a persuasive essay (depending on where students were in the instructional sequence). Bringing the instructor into the classroom served as an additional stimulus for using the learned strategies in a different setting, but, even more important, it provided a more controlled generalization situation in which students were able to identify, discuss, and evaluate with the instructor during the peer support component of treatment.

Writing instruction for children in the comparison condition was based on the Writers' Workshop model (Calkins, 1986; Graves, 1983). We selected this approach for two reasons. First, this is the model that teachers in the participating schools used to teach writing. Second, Writers' Workshop, or other variants of the process approach to writing instruction, has become the most prominent paradigm for the teaching of writing in the United States (Pathey-Chavez, Matsumara, & Valdes, 2004; Pritchard & Honeycutt, in press). For example, the writing instruction of the majority of primary-grade teachers in a randomly selected national sample (Graham, Harris, Fink-Chorzempa, & MacArthur, 2003) comprised elements consistent with this approach, including (Lipson, Mosenthall, Daniels, & Woodside-Jiron, 2000) an emphasis on process (e.g., setting up a classroom routine wherein students are expected to plan, draft, revise, edit, and publish their work), time (e.g., students write frequently), ownership (e.g., students make decisions about the topics they write about, the content of their writing, and the pace of their writing), response (e.g., students share in progress and completed work with peers and conference with the teacher and classmates about their writing), and instruction (e.g., mini-lessons are developed according to teachers' judgments about what students need to work on next).

There are a number of broad similarities between the SRSD model and Writers' Workshop. Both emphasize process, frequent writing, student decision making, interactions with peers, sharing work with teacher and peers, and instruction. There are a number of key differences as well. First, instruction in SRSD is more explicit, systematic, and extended than instruction in Writers' Workshop. For example, teachers in the comparison classrooms did at times

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provide instruction on a specific planning strategy (in no instances were these students taught the strategies emphasized in this study). Unlike the two SRSD conditions, however, the strategy was typically taught in a single mini-lesson (with little or no scaffolding in this lesson or follow-up in a subsequent lesson to help the student learn or master the strategy). This instruction differed considerably from the experimental treatments, in which a concerted, systematic, and extended effort over time was put into place to ensure that the participating students did in fact master the target strategies and could use them independently. Second, although both Writers' Workshop and SRSD are based on the constructivist principle of socially situated active construction of knowledge by the learner, Writers' Workshop is a more student-centered (as opposed to teacher-directed) approach than SRSD (Harris & Graham, 1994).

Third, SRSD places more emphasis on the written product than is typical in Writers' Workshop. In the present study, this emphasis primarily centered on the inclusion of basic thematic and structural elements in students' papers (e.g., students learned about these elements, set goals to include them in their papers, monitored their success in meeting the goal, and linked the inclusion of these elements to use of the target strategies). Finally, in this particular study, Writers' Workshop and SRSD differed in the number of drafts students generated; children in the former condition planned, drafted, revised, and edited their papers, whereas students in the latter condition planned and drafted only.

In comparison with Writers' Workshop, we anticipated that SRSD instruction would have a stronger impact on students' writing performance, knowledge of writing, and motivational attributes. More specifically for story and persuasive writing, it was predicted that SRSD instruction would result in higher scores on amount of time spent planning in advance, number of words written, number of basic elements or parts, and overall quality. We also expected that SRSD students' predicted advantages in story writing would persist over time (as a result of time constraints, data were not collected on maintenance effects for persuasive writing). With the exception of planning time (for which data were not collected), these predictions were consistent with the findings obtained by Graham et al. (2005) with older struggling writers. Our prediction that planning time would increase among SRSD-instructed students was straightforward, given that the primary goal of instruction was to teach students strategies for planning their compositions in advance of writing.

We further predicted that the positive effects of SRSD instruction would transfer to two uninstructed genres: personal narratives and informational writing. We anticipated that SRSD students would spend more time planning as well as produce longer and qualitatively better papers for both of these genres than their peers in the comparison condition. We further expected that the personal narratives produced by SRSD students would contain more of the basic story elements they were taught, because these elements were relevant to the types of narratives children were asked to produce (they were asked to write about something that had happened to them). The prediction that SRSD would result in generalization to these untaught genres was based on a previous analysis of a small database showing that SRSD instruction in one genre

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typically transferred to another genre (Graham & Harris, 2003). Our predictions were also supported, in part, by Graham et al. (in press), who found that the positive effects of SRSD instruction transferred to informative writing among third-grade students who were struggling writers.

With regard to knowledge, we expected that SRSD students would be more knowledgeable than comparison students about how to plan a paper as well as the basic elements included in a good story and persuasive essay. Changes in writing knowledge have been found in several previous SRSD studies (Graham et al., 2005; Graham, MacArthur, Schwartz, & Voth, 1992; MacArthur, Schwartz, & Graham, 1991), and students in the two experimental treatments in this study were provided explicit instruction on each of these topics.

We also anticipated that SRSD students would evidence greater effort and a higher sense of intrinsic motivation than comparison students, as previous research has shown that strategy instruction can enhance motivational attributes (Gaskill & Murphy, 2004; Graham et al., 2005; Schunk & Zimmerman, 1998). Most previous SRSD studies have focused their evaluation efforts on students' sense of efficacy, with mixed results, in part as a consequence of measurement issues involved in assessing the self-efficacy of young children (see Graham et al., 1991; Page-Voth & Graham, 1999). In the current study, we shifted our attention to measures of student effort and intrinsic motivation. Previous research has shown that SRSD instruction can increase the amount of time struggling writers spend composing (Graham et al., 2005), suggesting that students exert more effort after such instruction. Moreover, we anticipated that intrinsic motivation would increase among SRSD-instructed students, given that this approach contains a number of practices thought to enhance such motivation (see Ames, 1992; Wentzel & Wigfield, 1998). These practices include treating students as active collaborators in the learning process, recognizing and rewarding effort, adjusting the pace of instruction to meet each student's needs, emphasizing mastery of the target strategies, setting self-referenced goals for writing, teaching students the tools they need to be successful, and emphasizing evaluation of personal progress and mastery, not just outcomes.

It must be noted, however, that the comparison condition, Writers' Workshop, also included a variety of practices believed to facilitate effort and intrinsic motivation, including choice, the creation of a noncompetitive working environment, and personal responsibility and autonomy (Ames, 1992; Urdan, 1997). Thus, our prediction concerning the impact of SRSD on these motivational variables was more tentative than our predictions concerning writing performance and knowledge.

Finally, we predicted that SRSD students in the peer support condition would outperform their counterparts in the SRSD-only condition on all of the writing and knowledge variables. Although students in the two SRSD conditions received an equal amount of instructional time (equated by providing SRSD-only students with additional practice in using the strategies to plan and write stories and persuasive essays), the peer support component included stu-

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dent discussion on when, where, and how to use the writing strategies as well as opportunities to apply, monitor, discuss, and evaluate their use beyond the instructional setting. We expected that this would not only enhance writing performance for the two instructed genres but increase the likelihood that treatment effects would generalize to the two uninstructed genres as well, because students would have a more fully developed understanding of the intricacies involved in using these strategies. Likewise, we predicted that students' knowledge of writing would increase, in that students in the SRSD plus peer support condition were thinking about and discussing with their partner the application of substantive procedures involving planning as well as the application of story and persuasive writing knowledge to other literacy tasks.

## Method

### Participants

*Screening*

At the end of October 2001, 273 second-grade children (from 11 classrooms) attending four schools in a single urban school district in the Washington, D.C., area were administered the Story Construction Subtest from the Test of Written Language 3 (TOWL-3; Hammill & Larsen, 1996). This subtest assesses a child's ability to write a complete and interesting story (by examining whether specific thematic elements are included in the story). To be identified as a struggling writer, a student had to have a score on this test that fell two thirds of a standard deviation or more below the mean for the normative sample. In addition, his or her classroom teacher had to independently verify that the child was a poor writer (i.e., experiencing difficulty learning to write).

All tests were scored by the second author (after all identifying information had been removed by the teachers), and half of the tests were rescored by a graduate student unfamiliar with the design and purpose of the study. Interrater reliability was .80. Seventy children were identified as struggling writers according to the criteria just specified. The parents of 66 of these 70 children granted informed consent for their children to take part in the study.

*Conditions*

The 66 second-grade children were randomly assigned to three conditions: SRSD instruction only ($n = 22$), SRSD plus peer support ($n = 22$), and comparison ($n = 22$). During the 7-month course of the study, 3 students (2 from the comparison condition and the other from the SRSD plus peer support condition) moved from the study area. The student in the SRSD plus peer support condition moved in the second half of the study and was replaced by another student from the same classroom. The replacement student was not administered any of the assessment measures.

The mean age of the 63 students who completed the study was 7 years, 3 months ($SD = 0.39$). English was the primary language among 86% of these

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children, whereas 14% ($n = 9$) spoke both English and Spanish. Thirty-seven of the students were boys, and 26 were girls. Seventy-eight percent were Black, 14% were White, and 8% were Hispanic. The racial composition of the sample was consistent with that of the student body of each participating school as well as the school district. Fifty-seven percent of the participants received free or reduced-price lunches. Again, this distribution was equivalent to that of the students' schools, which were located in relatively poor urban settings. Thirteen students were identified as having a disability.

Of the 13 students with a disability, 7 experienced speech and language difficulties, 3 were classified as having a learning disability, and 2 were receiving special education services for behavioral difficulties. The 7 students with speech and language difficulties scored one standard deviation or more below the mean on one or more standardized tests of language or speech functioning (e.g., Comprehensive Receptive and Expressive Vocabulary Test [Wallace & Hammill, 1994], Expressive One Word Picture Vocabulary Test Revised [Gardner, 1990], Receptive One Word Picture Vocabulary Test Revised [Wallace & Hammill, 1994], or Test of Auditory Comprehension of Language [Carrow-Wolfolk, 1985]). All of the students with learning disabilities scored within the normal range on an individually administered intelligence test (e.g., Wechsler Preschool and Primary Scale of Intelligence Revised [Wechsler, 1967] or Wechsler Intelligence Scale for Children III [Wechsler, 1999]) and one or more standard deviation below the mean in reading or mathematics on the Woodcock-Johnson Psycho-Educational Battery Revised (Woodcock & Johnson, 1990) or the Wechsler Individual Achievement Test (Wechsler, 1992). The 2 children classified as having an emotional disturbance primarily experienced difficulty with acting out behaviors and aggression.

Information on the characteristics of the 63 students by condition is presented in Table 1. According to *t* tests for independent means, there were no statistically significant differences among students assigned to the three conditions at the start of the study in terms of chronological age or TOWL-3 Story Construction score (all $ps > .15$). Chi-square analyses showed that there were no statistically significant differences between conditions in terms of gender, number of students receiving free/reduced-price lunches, or students identified as having a disability (all $ps > .70$). As can be seen in Table 1, the racial composition and proportion of students who spoke English as their primary language were similar across conditions.

### General Instructional Procedures

Instruction was delivered to students in the two SRSD conditions (with and without peer support) by six graduate students majoring in either special education or counseling. Each instructor taught an equal number of pairs in both conditions. Before the study started, instructors were taught how to implement the two SRSD conditions. For each SRSD condition, instructors were provided with a notebook that contained detailed directions for implementing all activities and lessons. This material was printed on different colored paper (blue

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*Table 1*

**Student Characteristics by Instructional Condition at
the Start of the Study**

| Variable | Condition | | |
| --- | --- | --- | --- |
| | SRSD only | SRSD + PS | Comparison |
| Age (months) | | | |
| *M* | 87.69 | 90.24 | 89.95 |
| *SD* | 3.88 | 5.34 | 4.68 |
| Gender | | | |
| Female | 10 | 8 | 8 |
| Male | 12 | 13 | 12 |
| Race | | | |
| Black | 17 | 17 | 15 |
| White | 3 | 3 | 3 |
| Hispanic | 2 | 1 | 2 |
| English as First Language | | | |
| Yes | 20 | 17 | 17 |
| No | 2 | 4 | 3 |
| Free or reduced lunch | | | |
| Yes | 13 | 12 | 11 |
| No | 9 | 9 | 9 |
| Students with disabilities | | | |
| Yes | 5 | 4 | 4 |
| No | 17 | 17 | 16 |
| TOWL-3 Story Construction score | | | |
| *M* | 7.55 | 7.33 | 7.35 |
| *SD* | 0.60 | 0.73 | 0.88 |

*Note.* SRSD = self-regulated strategy development; PS = peer support; TOWL-3 = Test of
Written Language 3.

or yellow) for each condition to help ensure that instructors did not confuse
conditions. The value of both instructional conditions was stressed so that
instructors would not be predisposed to one condition over the other, and
instructors were unaware of the study hypotheses. Instructional procedures
differed slightly from those used in the previous study (Graham et al., 2005);
initial lessons were broken down into slightly smaller steps and simpler vocab-
ulary was used, when appropriate, for these younger students.

Over the course of a 2- to 3-week period, instructors received training and
practiced implementing both SRSD conditions until they were able to do each
without error. To help ensure that the two experimental conditions were cor-
rectly implemented, we provided instructors with a checklist for each lesson
that furnished step-by-step directions. As instructors taught a lesson, each step
was checked as it was completed.

Each instructor was randomly assigned to one of the four participating
schools. Instructors worked with their assigned pairs of students from the two
SRSD conditions three times a week for 20 minutes a session. Pairs of students

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in the SRSD conditions were formed in the following way. First, teachers in each school were told which students were randomly assigned to a condition. Then students in the same SRSD condition were paired together on the basis of teachers' opinions of their compatibility and issues of scheduling. There were 11 pairs of students in both SRSD conditions, and students remained in the same instructional pair throughout the course of the study. As noted earlier, one student from the SRSD plus peer support condition moved at the start of the second half of the study. He was replaced by a child from the same classroom. In each school, instruction was delivered in a quiet location outside the children's classroom.

Each student pair in the SRSD-only condition was yoked with a student pair in the SRSD plus peer support condition. SRSD plus peer support took slightly longer than SRSD only, in that it incorporated additional activities to promote maintenance and generalization of strategy effects. Instructors monitored the number of sessions completed by their yoked pairs and provided students in the SRSD-only condition with additional instructional sessions to equalize differences in time. The additional sessions involved extra practice applying the strategies to writing stories and persuasive essays.

On average, students in both SRSD conditions required 6.3 hours to master the target strategies, knowledge, and skills in writing stories. Depending on the pair of students, this involved a period of time from 9 to 11 weeks. The time it took to learn to use these same procedures with persuasive writing was almost one third less; instruction averaged 4.0 hours of time. The number of weeks needed to learn to use the strategies and accompanying procedures with persuasive writing was also shorter, ranging from 6 to 8 weeks. Overall, testing and instruction took place over a 6-month period.

## Specific Instructional Procedures

### SRSD Only

SRSD (Harris & Graham, 1992) was used in teaching the general planning strategy, the two genre-specific strategies, and the accompanying knowledge and self-regulatory procedures needed to use these strategies and manage the writing task. With this approach, students are explicitly and systematically taught strategies for accomplishing specific writing tasks. They are also taught any information or skills needed to use these strategies. They further learn how to use the self-regulation procedures, including goal setting, self-monitoring, self-reinforcement, and self-instructions, to help them manage the writing strategies and task of writing as well as to obtain concrete and visible evidence of their progress.

SRSD instruction is designed to promote students' independent use of the target strategies and accompanying self-regulation procedures. Instruction is scaffolded so that responsibility for applying and recruiting the target strategies, accompanying knowledge or skills, and self-regulation procedures gradually shifts from instructor to students. Children are viewed and treated as

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active collaborators in the learning process. The role of effort in learning is emphasized and rewarded. The level and type of feedback and instructional support are individualized by the instructor so that they are responsive to students' needs. Instruction is criterion rather than time based, in that children move through each instructional stage at their own pace and do not proceed to later stages of instruction until they have met initial criteria for doing so. Instructional stages are revisited and combined as necessary.

The general planning strategy taught to students included three steps, represented by the mnemonic POW: *P*ick my ideas (i.e., decide what to write about), *O*rganize my notes (i.e., organize possible writing ideas into a writing plan), and *W*rite and say more (i.e., continue to modify and upgrade the plan while writing). Students were first taught to use POW to write stories. As a means of helping them carry out the second step of POW (organizing notes), they were also taught a genre-specific strategy that prompted them to generate ideas for each of the basic parts of a story. Students asked themselves the following questions represented by the mnemonic WWW, What = 2, How = 2: *W*ho are the main characters? *W*hen does the story take place? *W*here does the story take place? *What* do the main characters want to do? *What* happens when the main characters try to do it? *How* does the story end? *How* do the main characters feel? For each question, students generated notes on possible ideas that might be used in their story.

Once students had learned how to use these strategies to write stories, they were taught how to apply the general planning strategy and a second genre-specific strategy to write persuasive essays. As with story writing, this genre-specific strategy was designed to help them carry out the second step of POW (organizing notes), but now the focus was on generating writing content relevant to persuasive essays. This strategy, represented by the mnemonic TREE, reminded students to do the following: *T*ell what you believe (state your topic sentence), provide three or more *R*easons (Why do I believe this?), *E*nd it (wrap it up right), and *E*xamine (Do I have all of my parts?). This differed slightly from the version of TREE used in the study with third-grade children (Graham et al., in press), wherein the last two steps of TREE reminded children to *E*xplain reasons (say more about each reason) and *E*nd it (wrap it up right). The reason for this modification was to make the strategy simpler for the younger second-grade children in this study (some third-grade children had difficulty generating explanations in the previous study).

The instructional processes for teaching students to use the general planning strategy and appropriate genre-specific strategy involved the same five stages (discussed subsequently in order of occurrence) for both stories and persuasive writing. We first describe SRSD instruction with stories and then persuasive essays. During the first stage of instruction, *develop background knowledge,* students acquired the knowledge and skills needed to apply POW and the genre-specific strategy for story writing. First, POW and its corresponding steps were introduced, and the instructor and students discussed what POW stood for and why each step was important. Students then worked together until both children could explain what POW meant and why it was

important. Second, the characteristics of a good story were discussed, including that stories are fun to read and write, make sense, have several parts, and include exciting, colorful, and descriptive words (referred to as million-dollar words). Some of these elements were based on common conceptualizations of stories (Weis, 1979), whereas others, such as story parts and vocabulary, were drawn from empirical studies (e.g., Grobe, 1981; Stein & Glenn, 1979). Third, the instructor introduced the mnemonic WWW, What = 2, How = 2 as a "trick" for remembering the seven story parts emphasized in this study. After the instructor provided examples for each part, students listened as a story was read. When students identified a story part, the instructor wrote it in the appropriate place on a chart containing the story parts reminder. This continued with other stories until students could identify accurately all of the parts. Students spent a few minutes during each succeeding lesson rehearsing the POW steps, the story part mnemonic, and what each stood for; this continued throughout instruction until they were memorized.

During the second stage of instruction, *discuss it,* students were first tested to determine whether they remembered what POW and the story part reminder mnemonic stood for and why they were important. They again practiced finding story parts as the instructor read a story out loud, but this time they used a graphic organizer wherein they made notes for each part of the story. At this point, self-monitoring and graphing were introduced. Students were asked to analyze their pretest story and determine how many of the seven story elements were included. They graphed the number of elements included in the story by coloring in the corresponding number of segments on the first rocket ship contained on a page with a series of rocket ships standing next to each other. They then discussed which parts they included and did not include. The instructor stressed that even if a story part was included, it could be improved (e.g., fleshed out). The instructor and students further discussed how using POW and the story part reminder could help students write better stories with all of the parts. Students were told that they could see how the strategy helped them by looking at their progress in coloring in the parts on the rocket ships. Then the instructor introduced the idea of goal setting, indicating that students' goal in writing stories was to include all seven parts, as well as to ensure that each part was well done, the story made sense, and it was fun to read. Finally, additional stories were read together, and parts were written on the story chart.

During the third stage of instruction, *model it,* the instructor showed students how to apply POW and the story part reminder and introduced the use of self-instructions (i.e., self-talk) as well. The instructor modeled, while "talking out loud," how to plan and write a story using POW and the story part reminder. The instructor began by setting a goal to include all of the parts and emphasized the importance of using the strategies that had been previously introduced. Students helped the instructor by generating ideas for the parts of the story as well as million-dollar words to use in the story. They recorded their ideas on a graphic organizer that included a prompt and picture for each of the seven story parts. While applying the strategies, the instructor used a

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variety of self-statements to assist with problem definition (e.g., What do I have do here?), planning (e.g., What comes next?), self-evaluation (e.g., Does that make sense?), self-reinforcement (e.g., I really like that part!), and coping (e.g., I'm almost finished!). Students continued to help the instructor do additional planning while the story was being composed (i.e., "Write and say more"), suggesting new words and ideas as well as recommending modifications in the initial ideas recorded on the graphic organizer. Once the story was completed, the importance of "what we say to ourselves" was discussed, and the types of self-instructions used by the instructor were identified. Each student then identified a few self-statements that he or she would use while planning and writing and recorded them on a small chart. Next, the instructor and students examined whether the story they had created together had all seven parts. They graphed the results, reinforcing themselves verbally for a job well done.

The next stage, *support it,* started with a collaborative writing experience. The instructor and students set a goal to include all seven elements in their story and then planned and wrote the story together using POW, the story part reminder, the graphic organizer, and their self-instructions. This time, however, students directed the process, and the instructor provided support when needed. From the plan that was generated collectively, each student wrote his or her own story. Students then read their stories to each other and graphed the parts, looking to see whether they met their goal and how much improvement had occurred since baseline. They discussed how the strategies helped them write better.

Students next used POW, the story part reminder, and their self-statements to write additional stories. Instructors provided students with as much assistance as needed to ensure that they were successful in using the strategies. Scaffolding included instructor or peer support in carrying out the strategies, use of charts with personal self-statements or reminders about the steps in POW or the seven story parts, and the graphic organizers. These supports were faded as appropriate, however. For each story, students were encouraged to set a goal to include all seven parts. After a story was completed, they shared it with the other child in their pair, graphed their performance, determined whether they had met their goal, and examined their progress. For each story, students were provided with two line drawings involving children or animals and asked to choose one to write about (this was identical to the procedures used during testing).

Students moved into the final stage, *independent performance,* when each of them could use POW and the story part reminder to write a story without using any of the props (e.g., the chart with strategy steps, the graphic organizer, or the self-statement chart) or receiving help from the instructor or a peer. To complete this stage of instruction, they had to include all seven parts in their story.

The procedures for teaching POW and the persuasive writing part reminder (i.e., TREE) to students were identical to story instruction with the following exceptions. First, during the develop background knowledge stage,

POW was only reviewed, and instruction focused on the characteristics and parts (i.e., TREE) of persuasive essays instead of stories. The instructor emphasized that the story part reminder should not be used when writing persuasive papers. Second, during the discuss it stage, the graphic organizer students used was intended for a persuasive paper, and they graphed their pretest performance on a sheet of rockets designed specifically for this genre (i.e., each rocket contained five parts, and students drew a star next to each colored part that represented a reason). Third, students did not develop a new self-statement chart during the model it stage but, rather, added self-statements to their existing chart.

*SRSD Plus Peer Support*

The only differences between the instructional procedures in the SRSD-only condition and the SRSD with peer support condition were as follows. During the develop background knowledge stage, the concept that students would act as partners to help each other apply the strategies they were learning to other situations and in other classes was introduced. This included helping each other identify when, where, and how part or all of what they were learning could be applied in other classes; helping each other do so; and discussing at the next session their successes and difficulties in using these procedures in one or more situations.

The instructor then asked both students to set a goal to use part of POW or the story part reminder in another situation or class. The students identified (with help from the instructor) where they could apply these procedures. They further considered how the strategy might need to be modified for particular tasks (i.e., changing part of it, adding something, or dropping something). The meaning of transfer was explained and discussed, and students were asked to set a second goal to help their partner use the strategies they were learning in other situations. This could include reminding them to use these strategies or even providing them with help in doing so. Then they were told that at their next meeting with the instructor they would be asked to indicate where they used the strategies they were learning and how they helped their partner. They were also told that they would record this information on an "I transferred my strategies/I helped my partner" chart.

During the subsequent lesson, students recorded how they used the strategies and helped their partner on the "I transferred my strategies/I helped my partner" chart. The instructor placed a star next to each instance and verbally reinforced students for meeting or exceeding their goal. Students also considered how the strategies helped them and discussed any difficulties encountered. They added to their list other situations or classes where they could apply the strategies, again thinking about how to modify them as necessary. This was followed by setting goals to use the strategies and help each other. This cycle (recording and discussing strategy use and peer help, generating and discussing situations where the strategies could be applied, and setting goals to use the strategies and help each other) was repeated once a week.

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When students moved from stories to persuasive writing, they included TREE when thinking about strategies to transfer.

Once at the end of story instruction and again at the end of persuasive writing instruction, the SRSD instructor came into the regular classroom of each pair of students in the SRSD with peer support condition. During these planned events (set up in advance with the regular classroom teacher), the instructor met alone with this pair of students and asked them to write either a story or persuasive essay (depending on the phase of instruction). Care was taken to ensure that the instructor did not interact with any students from the SRSD-only or comparison conditions during these visits, nor was the purpose of the visits discussed with students in either of these other two conditions. Students in the SRSD plus peer support condition knew when these visits would occur and identified them as generalization situations during their regular sessions. Subsequently, the instructor and students discussed and evaluated their use of the strategies during each of these planned events.

*Comparison Condition*

Writing instruction was delivered to students in the comparison condition by their regular teacher. Before the start of the study, these teachers were interviewed to determine their approach to writing instruction (interviews were conducted by the second author). All of the teachers and their principals were asked to indicate what approach they used to teach writing. Each teacher as well as the principals indicated that they used a Writers' Workshop model (Calkins, 1986; Graves, 1983). As a means of substantiating that this approach was applied by the teachers and obtaining additional information on what they actually did, they were asked to fill out a questionnaire. This questionnaire included items focusing on how frequently they wrote as well as how often students engaged in planning, revising, and publishing their work; shared their work with their peers; conferenced with teachers and peers; selected their own writing topics; worked at their own pace; helped their classmates; and used invented spellings. Teachers were also asked to indicate how often they taught mini-lessons, modeled writing strategies, and taught specific writing skills. In addition, two graduate students observed their classrooms on four different occasions before and during the course of the study. During these observations, they recorded all of the activities they witnessed during the writing period. Observation notes were examined to determine whether elements common to Writers' Workshop were evident in the teachers' classrooms, including an emphasis on process, time to write, student ownership, response, and instruction.

The data from the questionnaire and observations substantiated that teachers used a Writers' Workshop approach with students in the comparison condition. First, all of the teachers set up a composing routine wherein students were expected to plan their composition, write a first draft, revise and edit this draft, and publish the completed paper (emphasis on process). Second, students were writing during each of the observations (time to write), and

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during the course of instruction story and persuasive writing were emphasized in each teacher's classroom. Students also occasionally constructed poems, crafted personal narratives, completed book reports, kept a journal, and wrote descriptions. Third, most of the teachers allowed students to select their own writing topics or work at their own pace, at least some of the time, and emphasized student decision making in terms of paper content (ownership). Fourth, teachers conferenced with students about their current writing projects, and students shared completed work or work in progress with their peers (response).

Finally, all of the teachers taught basic writing skills, such as grammar and spelling, primarily relying on mini-lessons conducted several times a week (instruction). There was little congruence across teachers in terms of what skills were taught when; the content of mini-lessons was primarily based on teachers' judgments about what students needed at that point in time. It should be noted that some of the mini-lessons in each classroom involved the teaching of planning strategies (emphasis on process), including brainstorming, webbing, outlines, Venn diagrams, and F-TAP (a strategy for the statewide writing assessment that asked students to identify the form of their writing, topic, audience, and purpose). Although the teachers did not all teach the same strategies, their approach to instruction was similar and differed greatly from SRSD. A strategy was typically taught in a single mini-lesson, with the teacher briefly describing and modeling the strategy and then asking students to use it. Furthermore, teachers were inconsistent in providing students with reminders to use the strategy at appropriate times and did not continue instruction on strategy use until students demonstrated at least initial mastery.

There was variability among teachers in terms of how they actualized specific aspects of Writers' Workshop. This is not surprising given that the approach is flexible and allows teachers to make adjustments according to their beliefs and experiences (e.g., Lipson et al., 2000). In the current study, this variability was observed not only in instruction (as just described) but in other key features such as sharing, personal pace, and choice. Some teachers, for instance, held daily conferences and encouraged children to share daily, whereas others held conferences only once a week and limited sharing to a couple of times a month. Likewise, some teachers encouraged students to work at their own pace, whereas two teachers expected students to complete various aspects of the writing process at approximately the same time.

### Fidelity of Treatment Implementation

To ensure that both SRSD conditions were delivered as intended, we implemented the following safeguards. First, instructors received intensive training in applying the instructional procedures for both conditions until they could apply them without error. Second, instructors met with the first or third author weekly to discuss any glitches that occurred in implementing instructional procedures. Reported difficulties were rare and usually involved the need to indi-

vidualize further for a particular student to deal with a behavioral issue. Responses to issues such as these were discussed and implemented.

Third, instructors had a checklist for each student pair that contained step-by-step directions for each lesson. As they completed a lesson step, instructors placed a check by it. Examination of these checklists at the end of the study showed that instructors completed 93% and 91% of the steps in all lessons during SRSD only and SRSD with peer support, respectively. Fourth, one third of all lessons were tape recorded and independently checked by a graduate student to determine whether each step of a lesson was executed as intended. The percentage of steps completed correctly across lesson plans by the six instructors was 94% for each SRSD condition. Fifth, the overall quality of the lessons that were tape recorded was rated by an experienced teacher (who was also a graduate student) on a 5-point Likert-type scale on which a score of 1 represented low quality and a score of 5 represented high quality. The average quality rating across tape-recorded lessons was 4.99 for each condition.

## Assessing Writing Performance

Before the start of instruction (pretest), students' writing skills were assessed in four different genres: story, persuasive, personal narrative, and informative writing. After instruction in how to plan and write a story, students' story and personal narrative writing skills were again assessed. These posttest measures allowed us to examine whether SRSD instruction had a positive effect on children's story writing skills and to determine whether instructional effects transferred to a similar but different genre, personal narratives. Likewise, after students learned how to plan and write a persuasive essay, their persuasive and informative writing skills were assessed. The instructors administered a persuasive and informative writing probe at this point, whereas the students' regular teacher administered a persuasive writing probe in their classroom (i.e., classroom generalization writing probe). These posttest probes allowed us to examine whether SRSD instruction improved children's performance when writing to persuade and to determine whether instructional effects transferred to the classroom and to another expository genre, writing to inform. At this point, students' story writing skills were assessed once again, allowing us to examine whether changes in story writing performance were maintained over time.

### Writing Prompts

Assessments for each genre involved writing a composition in response to a writing prompt. As a means of increasing motivation, students were provided with a choice of two prompts (in the same genre) whenever they were asked to write a paper. The only exception involved the persuasive writing classroom generalization probe, in which students were asked to write about a single topic. This situation more closely resembled what teachers did when they assigned a writing topic.

For story writing, writing prompts involved line drawings depicting children or animals involved in an activity (e.g., three children baking something, two dogs paddling a row boat, two boys watching a girl sled uphill). With the other three genres, prompts included specific statements or questions that students were asked to write about. For persuasive writing, these included questions asking students their opinion on school or home issues (e.g., Should parents make children clean their bedrooms? and Should children be allowed to choose their own pets?). For personal narratives, students were asked to write about something that had happened to them (e.g., when they were at home, younger, on the playground). For informative writing, students were asked to describe a place (i.e., their favorite place), a person (i.e., someone in the family), or how to do something (i.e., play a game or make friends).

Before the start of the study, these writing prompts and others were evaluated by two primary-grade teachers and a second-grade child in terms of their suitability. The evaluators were asked to select writing prompts that they thought second-grade children would enjoy writing about and be able to write about. All of the prompts just described were selected by all three evaluators. As a means of assessing the equivalence of the writing prompts, the prompts from each of the four genres were randomly assigned to 132 second and third graders who were at risk for writing difficulties (their standard scores on the TOWL-3 Story Construction Subtest were below the 25th percentile). In the case of each genre, there were no statistically significant differences between the length or overall quality of papers written in response to the different prompts (all $ps > .06$). In addition, Olinghouse (2004) established the equivalence of the story writing prompts, randomly assigning the different prompts to 132 third-grade children and finding no statistically significant difference between the overall quality of stories written in response to them ($p = .25$). For each genre, the writing prompts were paired together randomly to form three sets for story writing and two sets for each of the other genres. The remaining persuasive essay prompt was used for the classroom generalization writing probe.

## Administration of Writing Prompts

During testing, administration of writing prompt sets for each specific genre was counterbalanced across pretest, posttest, and maintenance (for stories). The order in which genre writing probes were administered at each testing time was counterbalanced as well, with the exception of the story writing maintenance probe, which was always the last writing probe administered. Students were never administered more than one assessment on an individual day (to minimize fatigue), and they were given as much time as they needed to complete their paper. Each student was individually tested (except in the case of the classroom generalization probe) and told that she or he could ask for help only in spelling a word.

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*Writing Measures*

Several measures were collected for each paper (regardless of genre). The examiner recorded the amount of time students spent planning their paper (this measure was not collected for the classroom generalization writing probe). Papers were also scored for number of words written (length). Number of words included all written words, regardless of spelling, that represented spoken words. All stories were scored for number of words by the second author, and one half of the papers were rescored by a graduate student who was unfamiliar with the design and purpose of the study. Interrater reliability was .99.

A holistic rating scale was used in further scoring each paper for overall quality. Examiners were asked to read each paper attentively to obtain a general impression of overall writing quality. Compositions were then rated on an 8-point scale on which 1 represented the lowest quality of writing and 8 represented the highest quality. Examiners were told that ideation, organization, sentence structure, grammar, and aptness of word choice should all be taken into account in forming a judgment about overall quality and that no single factor should receive undue weight.

Papers for each genre were scored for quality separately. Examiners were provided with a paper representative of a low-, middle-, and high-quality score for each genre. These papers, collected in January, were obtained from two second-grade classes in one of the participating schools. Students in these classrooms did not participate in the study. All students in the two classes wrote four papers, one for each of the genres tested in this study. For each genre separately, two former primary-grade teachers selected the best, average, and poorest-quality stories on the basis of the scoring criteria just described. These papers served as the anchor points for their respective genres.

All papers were typed before scoring and identifying information was removed. In addition, the spelling, punctuation, and capitalization in each composition were corrected. These steps were undertaken to minimize any bias that might occur when examiners scored papers. Previous research has shown that the appearance of text- or surface-level features (e.g., handwriting legibility or number of spelling miscues) can influence judgments about writing quality (Graham, 1999).

Composition quality was scored by two former primary-grade teachers who were unfamiliar with the design and purpose of the study. Genres were scored separately, and examiners were trained on how to use each genre's 8-point scale and corresponding anchor points. Interrater reliabilities for story, persuasive, narrative, and informational quality were .91, .91, .85, and .79, respectively. For each genre, the quality score for a student's paper was the average score of the two raters.

Stories and personal narratives were further scored to determine whether they contained basic story elements (Stein & Glenn, 1979), including main characters, locale, time, what the main characters want to do (goals), actions

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to achieve goals, consequences of actions, and characters' reactions. For each element, a score of 1 was assigned if the element was present, and a score of 0 was assigned if it was not present. We decided to ascertain whether personal narratives contained these basic story elements because the writing prompts for this genre asked students to tell a story about their personal life. All stories and personal narratives were scored by a graduate student, and a second graduate student scored one half of these compositions. Neither of the scorers were familiar with the purpose or design of the study. In terms of elements, interrater reliabilities for stories and personal narratives were .88 and .84, respectively.

Persuasive essays were also scored to determine whether they contained basic elements of persuasive writing (Scardamalia et al., 1982), including premise, reason, examples, and conclusion. For premise and conclusion, a score of 1 was assigned if the element was present, and a score of 0 was assigned if it was not present. For reasons and examples, 1 point was awarded for each separate and unique reason and example included in the composition. All persuasive essays were scored by a graduate student, and a second graduate student scored one half of these compositions. Neither of these scorers were familiar with the purpose or design of the study. Interrater reliability for elements of persuasive essays was .83.

### Assessing Writing Knowledge

Before instruction started (pretest) and once instruction ended (posttest), students individually answered three open-ended questions. The first question was taken from a writing knowledge survey constructed by Graham, Schwartz, and MacArthur (1993). It assessed students' knowledge about planning: "When you are asked to write a paper for class or for homework, what kinds of things can you do to help you plan and write your paper?" The other two questions, developed by Graham et al. (in press), examined students' knowledge of the two genres taught in this study. The first asked students to tell a friend what kinds of things are included in a story, whereas the second made the same inquiry about writing to persuade.

Each question was read aloud to the student. If the question elicited a response such as "I don't know," the question was reread, and the student was asked to think about it some more. If a general or nonspecific response was elicited, the examiner asked follow-up questions to obtain more specific information (e.g., "How would you do that?"). As a means of scoring individual questions, students' responses were divided into idea units. If one or more idea units captured the same basic concept (e.g., "spell words correctly" and "get the words spelled right"), only the first instance was scored. Consequently, the same idea was not counted more than once for each question.

To score the first question, we used the categories devised by Graham et al. (1993). Each idea unit was scored as a production procedure (statement referring to transcribing oral language to written language, for example "Write it neatly" or "Spell the words correctly"), a substantive process (statement refer-

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ring to the writing process such as planning, drafting, or revising, for example "First, I would think about how I want to start," "They read their paper over to see what to change," or "They put their notes in order"), a motivation response (statement referring to motivation for writing or imagined rewards or punishments for success or failure, for example "They give up" or "They keep doing it until they get an A"), or other (statement that could not be classified in one of the other categories). Two graduate students scored Question 1. Interrater reliabilities between the two scorers for production procedures, substantive processes, motivation, and abilities were .94, .84, .71, and .82, respectively. These four categories also accounted for 80% of the idea units generated by students.

For the two questions examining students' knowledge about stories and persuasive essays, each idea was scored in one of the following categories: production procedure (statement referring to transcribing oral language to written language, for example "You capitalize the first letter in sentences when writing a story" or "Get all the words spelled right"), element (statement referring to an attribute or element in a story or persuasive essay, for example "A story has a beginning," "It tells what you believe," or "It is exciting"), or other (statement that could not be classified in one of the other categories). Two graduate students scored Questions 3 and 4. Interrater reliabilities between the two scorers were .88, .83, and .70 for production procedures, elements, and "other," respectively. In addition, production procedures and elements accounted for 82% of the idea units generated by students.

### Assessing Effort and Intrinsic Motivation

Through the use of procedures described by Gottfried (1990), classroom teachers were asked to rate students' intrinsic motivation before the start of the study and at the end of it. The directions for this assessment were as follows: "The definition of Academic Intrinsic Motivation is enjoyment of school learning; an orientation toward mastery, curiosity, and persistence; and an orientation to learn challenging, difficult, and novel tasks. For each student on the roster below, rate the student's intrinsic motivation in writing." Teachers rated each student's intrinsic motivation on an 11-point scale (at 10% intervals ranging from 0% [*student not motivated at all*] to 100% [*student very highly motivated*]). Teachers did not have access to their pretest motivation ratings when making posttest ratings.

According to the procedures described by Mac Iver, Stipek, and Daniels (1991), teachers also rated students' effort at pretest and posttest. The directions for this assessment were as follows: "If a student works to his/her highest potential in a class, then we could say that he/she is putting forth 100% effort to learn the subject matter. Please estimate how much effort each student listed below is putting forth in writing." Teachers rated each student's effort on an 11-point scale (at 10% intervals ranging from 0% [*student is not trying at all*] to 100% [*student is working hard enough to fulfill his/her*

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*highest potential*). Again, teachers did not have access to their pretest effort ratings when making posttest ratings.

### Assessing Social Validity

At the conclusion of the study, students in the two SRSD conditions were interviewed to obtain information on the perceived value of the strategies and procedures they were taught as well as the effectiveness of the teaching procedures. Specifically, students were asked to indicate whether POW and the two genre-specific strategies should be taught to other students, whether the teaching of the procedures should remain the same or change, and what they liked or disliked about the writing strategies, graphing procedures, and self-instructions.

## Results

Students in both SRSD conditions worked together in small groups of two. Thus, the unit of analysis was the pair's mean performance. For the SRSD-only condition, there were 11 pairs of students. Likewise, the SRSD plus peer support condition initially included 11 pairs, but one student moved during the course of the study. Because neither the child who moved nor the one who replaced him completed all of the assessments, only the scores of the student who completed the full instructional regime in this pair were used in the analyses. There were also 11 pairs of students in the comparison condition at the start of the study, one pair for each classroom teacher. Two of these students, from different classrooms, moved before the experiment was completed. The remaining student's scores were used in the analyses in both of these instances.

We conducted a two-way analysis of variance (ANOVA) with repeated measures to test for statistically significant differences between conditions for each of the writing and motivation measures. The independent variable was condition, and the repeated measure was time of testing. For stories, time of testing included three levels: pretest, posttest, and maintenance. For all other writing and motivation variables, time of testing included two levels: pretest and posttest. The only exceptions involved the measures for planning time and the persuasive writing classroom generalization probe. The classroom generalization probe was administered once at the end of the study. Thus, quality, basic parts, and length scores for this probe were analyzed via a one-way ANOVA (the independent variable was treatment condition). Furthermore, because students did so little planning at the start of the study, we did not include pretest planning time in any of the analyses. Average planning time at this point never exceeded 21 seconds for any condition on any writing probe. Because planning time scores at posttest and maintenance were not normally distributed (the measure for either kurtosis or skewness exceeded 1.0), we used a nonparametric procedure, the Kruskal-Wallis test (Siegel, 1956), to determine statistically significant differences. Follow-up analyses were conducted with the Mann-Whitney U procedure (Siegel, 1956).

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In the case of the knowledge survey, neither the motivation nor the ability category was included in any analysis of the first question about student planning, because they accounted for only 4% and 1% of student responses, respectively. Furthermore, because knowledge scores were not normally distributed, we used nonparametric procedures to test for statistically significant differences between conditions. This meant that we were not able to simultaneously test for differences across both time (pretest and posttest) and condition, as can be done with parametric procedures, because there is no nonparametric equivalent to a two-way ANOVA with repeated measures. Therefore, at each testing time, we used the Kruskal-Wallis test (Siegel, 1956) to determine whether there were statistically significant differences between treatment conditions; we conducted follow-up analyses using the Mann-Whitney U procedure (Siegel, 1956). Finally, Cohen's *d* (Hedges & Olkin, 1985) was used in computing effect sizes for all statistically significant differences. The pooled (or averaged) standard deviation was used to calculate the effect size for each of these comparisons.

## Writing Performance

Means and standard deviations for each writing variable by genre, time of testing, and condition are presented in Tables 2 and 3. Statistical results and effect sizes for planning time are shown in Table 4, and results and effect sizes for the writing product variables (length, elements, and quality) are presented in Table 5 (tests of simple main effects are described in the text). In describing the analyses for each writing variable, we first look at the effects of treatment on the two instructed genres in the order in which they were taught and then examine the effects on the two uninstructed genres in the order in which they were tested.

### *Planning Time*

Immediately after instruction, there was a statistically significant difference in the amount of time (in minutes) that students in the three treatment conditions spent planning their stories. As expected, students in the two SRSD conditions spent more time than comparison students planning their posttest stories. SRSD students in both conditions spent almost 5 minutes planning their stories, whereas comparison students spent less than one fourth of a minute planning (see Table 2). There was not, however, a statistically significant difference between the two SRSD conditions. This pattern was sustained over time, as there was again a statistically significant difference for planning time at maintenance. Students in the two SRSD conditions spent more time planning stories at maintenance than their peers in the comparison condition, and there was no statistical difference between the SRSD conditions.

The pattern was further replicated with persuasive writing, in that there was a statistically significant treatment effect. Once again, students in the two SRSD conditions spent more time planning than their counterparts in the

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Table 2
**Means (and Standard Deviations in Parentheses) for Story and Persuasive Writing (Instructed Genres) by Genre, Time of Testing, and Condition**

| Measure | Story | | | Persuasive | | |
|---|---|---|---|---|---|---|
| | Pretest | Posttest | Maintenance | Pretest | Posttest | Classroom generalization |
| Planning time (minutes) | | | | | | |
| Comparison | 0.20 (0.25) | 0.23 (0.29) | 0.05 (0.11) | 0.33 (0.50) | 0.12 (0.27) | — |
| SRSD only | 0.25 (0.31) | 4.67 (3.74) | 4.00 (3.31) | 0.15 (0.14) | 5.13 (5.03) | — |
| SRSD + PS | 0.15 (0.18) | 4.42 (3.56) | 4.50 (4.87) | 0.20 (0.20) | 4.91 (4.49) | — |
| Number of words | | | | | | |
| Comparison | 22.70 (22.70) | 45.32 (20.63) | 34.64 (15.91) | 25.55 (17.76) | 28.50 (14.36) | 58.18 (29.47) |
| SRSD only | 34.14 (8.37) | 64.64 (20.06) | 51.91 (13.88) | 23.18 (10.26) | 52.86 (09.90) | 76.41 (30.91) |
| SRSD + PS | 32.00 (13.22) | 75.27 (34.77) | 55.27 (16.66) | 28.36 (27.06) | 50.55 (12.78) | 74.50 (33.06) |
| Story elements | | | | | | |
| Comparison | 3.86 (1.67) | 3.14 (0.81) | 3.23 (1.23) | — | — | — |
| SRSD only | 2.73 (0.75) | 5.77 (1.35) | 5.55 (0.91) | — | — | — |
| SRSD + PS | 2.82 (0.78) | 6.27 (0.61) | 5.82 (1.31) | — | — | — |
| Persuasive elements | | | | | | |
| Comparison | — | — | — | 1.45 (1.11) | 1.55 (0.96) | 2.59 (1.30) |
| SRSD only | — | — | — | 1.00 (0.92) | 4.64 (0.98) | 4.23 (1.21) |
| SRSD + PS | — | — | — | 1.73 (0.93) | 6.00 (1.91) | 6.23 (4.14) |
| Quality | | | | | | |
| Comparison | 1.73 (1.46) | 2.27 (1.17) | 1.50 (1.32) | 1.18 (0.93) | 1.77 (0.96) | 3.16 (0.98) |
| SRSD only | 1.64 (0.95) | 3.27 (1.25) | 2.59 (1.18) | 0.95 (0.93) | 4.23 (1.78) | 4.50 (0.89) |
| SRSD + PS | 1.59 (1.02) | 3.45 (1.31) | 3.09 (1.20) | 1.27 (0.98) | 4.82 (1.15) | 5.00 (1.25) |

*Note.* SRSD = self-regulated strategy development; PS = peer support.

**Means (and Standard Deviations in Parentheses) for Narrative and Informative Writing (Uninstructed Genres) by Genre, Time of Testing, and Condition**

| Measure | Narrative | | Informative | |
|---|---|---|---|---|
| | Pretest | Posttest | Pretest | Posttest |
| Planning time (minutes) | | | | |
|   Comparison | 0.10 (0.17) | 0.15 (0.28) | 0.16 (0.26) | 0.05 (0.09) |
|   SRSD only | 0.20 (0.18) | 1.49 (2.49) | 0.34 (0.73) | 4.20 (4.67) |
|   SRSD + PS | 0.11 (0.12) | 2.71 (4.10) | 0.26 (0.34) | 2.82 (3.51) |
| Number of words | | | | |
|   Comparison | 28.55 (17.54) | 36.41 (19.72) | 30.18 (17.62) | 22.14 (9.46) |
|   SRSD only | 37.32 (31.42) | 49.50 (25.77) | 39.82 (39.04) | 52.86 (21.40) |
|   SRSD + PS | 34.23 (22.08) | 46.59 (18.73) | 40.14 (31.23) | 53.86 (20.33) |
| Story elements | | | | |
|   Comparison | 2.86 (1.58) | 2.95 (0.91) | — | — |
|   SRSD only | 2.50 (1.69) | 4.32 (1.06) | — | — |
|   SRSD + PS | 2.55 (1.01) | 5.36 (1.19) | — | — |
| Persuasive elements | | | | |
|   Comparison | — | — | — | — |
|   SRSD only | — | — | — | — |
|   SRSD + PS | — | — | — | — |
| Quality | | | | |
|   Comparison | 1.59 (1.16) | 2.18 (1.37) | 1.23 (0.88) | 1.55 (1.06) |
|   SRSD only | 1.73 (1.10) | 2.59 (1.38) | 1.91 (1.02) | 2.18 (1.75) |
|   SRSD + PS | 1.55 (0.91) | 2.45 (1.17) | 1.50 (1.22) | 3.32 (1.66) |

*Note.* SRSD = self-regulated strategy development; PS = peer support.

comparison condition, but there was no statistical difference between the strategy conditions. SRSD students in both conditions spent almost 5 minutes planning their stories, whereas comparison students spent less one fifth of a minute planning (see Table 2).

Contrary to expectations, these positive effects on planning time did not generalize to narrative writing; there were no statistical differences among the three treatment conditions. However, transfer effects were obtained for the second uninstructed genre, informative writing. Students in the two SRSD conditions spent more time planning than their counterparts in the comparison condition, but there was no statistical difference between the strategy conditions. It should be noted that students in the two SRSD conditions did not spend as much time planning informative papers as they did stories or persuasive papers (see Table 3).

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*Table 4*
**Results of Kruskal-Wallis Tests of Planning Time and
Knowledge of Writing After Instruction**

| Variable | $\chi^2$ | Mann-Whitney $U$ | $d$ |
|---|---|---|---|
| Story planning time: posttest | 13.41** | SRSD > C** | 1.83 |
| | | SRSD + PS > C** | 0.97 |
| Story planning time: maintenance | 8.98* | SRSD > C* | 1.95 |
| | | SRSD + PS > C* | 1.95 |
| Persuasive planning time: posttest | 9.95** | SRSD > C* | 1.10 |
| | | SRSD + PS > C* | 1.21 |
| Narrative planning time: posttest | NS | | |
| Informative planning time: posttest | 13.32** | SRSD > C* | 1.95 |
| | | SRSD + PS > C* | 1.93 |
| Knowledge of planning: substance | 6.48* | SRSD > C* | 0.99 |
| | | SRSD + PS > C* | 0.80 |
| Knowledge of planning: production | NS | | |
| Knowledge of planning: motivation | NS | | |
| Knowledge of stories: elements | 13.57** | SRSD > C* | 0.97 |
| | | SRSD + PS > C* | 1.14 |
| Knowledge of stories: production | NS | | |
| Knowledge of persuasion: elements | 9.62** | SRSD > C* | 1.08 |
| | | SRSD + PS > C* | 1.29 |
| Knowledge of persuasion: production | 13.57** | SRSD > C* | 1.06 |

*Note.* SRSD = self-regulated strategy development only; SRSD + PS = SRSD plus peer support;
C = comparison; NS = nonsignificant. *df* = 2.
*$p$ < .05. **$p$ < .01.

*Length*

There was a statistically significant main effect for time of testing as well as a statistically significant interaction between condition and time of testing for length of students' stories. Tests of simple main effects for the interaction revealed that there was a statistically significant difference in the length of students' stories at posttest, $F(2, 30) = 3.74$, $MSE = 2,536.60$, $p = .036$, and maintenance, $F(2, 30) = 5.59$, $MSE = 1,348.46$, $p = .009$, but not at pretest. A follow-up posttest analysis indicated that students in the SRSD plus peer support condition wrote longer stories than did students in the comparison condition. There was no statistically significant difference between the length of posttest stories among comparison and SRSD-only students or between the two SRSD conditions. At maintenance, students in both SRSD conditions wrote longer stories than did the children in the comparison condition. It should be noted that stories of SRSD students at maintenance were not as long as their posttest stories (see Table 2).

In the case of length of persuasive essays, there was also a statistically significant main effect for time of testing, along with a statistically significant interaction between condition and time of testing. Tests of simple main effects for

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*Table 5*

**Results of Analyses of Variance for Writing Product Measures by Genre**

| Genre | Variable | Condition $F(2, 30)$ | Time of testing $F(1, 30)$ | Condition × Time $F(2, 30)$ | $d$ |
|---|---|---|---|---|---|
| Story | Length | NS | 12.22** | 5.87** | |
| | | | | Post: SRSD + PS > C* | 0.94 |
| | | | | Maint: SRSD > C* | 0.47 |
| | | | | Maint: SRSD + PS > C* | 1.08 |
| | Elements | 11.89** | 72.60** | 34.06* | |
| | | | | Post: SRSD > C** | 1.52 |
| | | | | Post: SRSD + PS > C** | 1.79 |
| | | | | Maint: SRSD > C** | 1.46 |
| | | | | Maint: SRSD + PS > C** | 1.42 |
| | Quality | NS | 8.22** | 3.87* | |
| | | | | Post: SRSD + PS > C* | 0.87 |
| | | | | Maint: SRSD > C* | 0.81 |
| | | | | Maint: SRSD + PS > C* | 1.07 |
| Persuasive | Length | NS | 41.14** | 7.81** | |
| | | | | Post: SRSD > C** | 1.41 |
| | | | | Post: SRSD + PS > C** | 1.27 |
| | Elements | 18.12** | 104.86** | 24.96** | |
| | | | | Post: SRSD > C** | 1.68 |
| | | | | Post: SRSD + PS > C** | 1.64 |
| | | | | Post: SRSD + PS > SRSD* | 0.83 |
| | Quality | 7.09** | 147.93** | 14.66** | |
| | | | | Post: SRSD > C** | 1.31 |
| | | | | Post: SRSD + PS > C** | 1.63 |
| Persuasive: | Length | NS | — | — | |
| classroom | Elements | 5.43** | — | — | |
| | | | | Post: SRSD + PS > C** | 1.03 |
| | Quality | 8.79** | — | — | |
| | | | | Post: SRSD > C** | 1.16 |
| | | | | Post: SRSD + PS > C** | 1.26 |
| Narrative | Length | NS | NS | NS | |
| | Elements | NS | 36.59** | 9.35** | |
| | | | | Post: SRSD > C** | 1.15 |
| | | | | Post: SRSD + PS > C** | 1.50 |
| | | | | Post: SRSD + PS > SRSD* | 0.85 |
| | Quality | NS | 21.67** | NS | |
| Informative | Length | 4.36* | NS | NS | |
| | Quality | NS | 10.56** | 4.22* | |
| | | | | Post: SRSD + PS > C** | 1.08 |

*Note.* NS = nonsignificant; Post = posttest; SRSD = self-regulated strategy development only; SRSD + PS = SRSD plus peer support; C = comparison; Maint = maintenance.
*$p$ < .05. **$p$ < .01.

the interaction revealed that there was a statistically significant difference in the length of students' persuasive papers at posttest, $F(2, 30) = 12.77$, $MSE = 1989.10$, $p = .000$, but not at pretest. A follow-up posttest analysis indicated that students in both SRSD conditions wrote longer persuasive papers than did their counterparts in the comparison condition. These effects did not transfer to the classroom generalization persuasive writing probe, however; there were no statistically significant differences among the three conditions in the length of these papers.

Contrary to expectations, the positive effects of SRSD on the length of students' papers did not generalize to narrative writing, in that there were no statistical differences on this variable among the three treatment conditions, there was no effect of time of testing, and there was no interaction between condition and time. Although there was a statistically significant main effect of condition for length of students' informative papers, the interaction between condition and time of testing was not statistically significant. Because the means for the main effect of condition involved students' average performance across pretest and posttest, we did not conduct any follow-up analyses.

*Elements*

There were statistically significant effects for time for testing, condition, and the interaction between the two in terms of the number of basic elements that students included in their stories. Tests of simple main effects for the interaction revealed that there was a statistically significant difference between the number of basic story elements at posttest, $F(2, 30) = 32.98$, $MSE = 31.24$, $p = .000$, and maintenance, $F(2, 30) = 16.50$, $MSE = 22.30$, $p = .000$, but not at pretest. A follow-up posttest analysis indicated that students in both SRSD conditions included more basic elements in their stories than did children in the comparison condition. These findings were replicated at maintenance as well.

For number of basic elements included in persuasive essays, there were also statistically significant effects of time for testing, condition, and their interaction. Tests of simple main effects for the interaction revealed that there was a statistically significant difference in the number of basic elements included in persuasive papers at posttest, $F(2, 30) = 31.02$, $MSE = 57.03$, $p = .000$, but not at pretest. A follow-up posttest analysis indicated that students in both SRSD conditions included more elements in their persuasive papers than did their counterparts in the comparison condition. Furthermore, students in the SRSD plus peer support condition wrote posttest persuasive essays that included more basic elements than those written by students in the SRSD-only condition.

SRSD effects generalized to the classroom generalization persuasive writing probe as well as narrative writing. On the classroom generalization probe, there was a statistically significant effect of condition in terms of the number of basic elements students included in these papers. Follow-up analysis indicated that students in the SRSD plus peer support condition included more basic elements in the persuasive papers they wrote for their regular classroom

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teacher than did comparison students. There was, however, no statistically significant difference between comparison and SRSD-only students or between the two SRSD conditions.

For the number of basic story elements included in narrative papers, there was a statistically significant main effect of time of testing as well as a statistically significant interaction between condition and time of testing. Tests of simple main effects for the interaction revealed that there was a statistically significant difference in number of basic elements included in narrative papers at posttest, $F(2, 30) = 14.42$, $MSE = 16.05$, $p = .000$, but not at pretest. A follow-up posttest analysis indicated that students in both SRSD conditions included more story elements in their narrative papers than did their counterparts in the comparison condition. Furthermore, students in the SRSD plus peer support condition wrote posttest narrative papers that included more basic story elements than the papers written by students in the SRSD-only condition.

*Quality*

There was a statistically significant main effect for time of testing as well as a statistically significant interaction between condition and time of testing for quality of students' stories. Tests of simple main effects for the interaction revealed that there was a statistically significant difference in quality of stories at posttest, $F(2, 30) = 3.74$, $MSE = 2,536.60$, $p = .036$, and maintenance, $F(2, 30) = 2.67$, $MSE = 4.46$, $p = .042$, but not at pretest. A follow-up posttest analysis indicated that students in the SRSD plus peer support condition wrote qualitatively better stories than did students in the comparison condition. There was no statistically significant difference between the quality of posttest stories among comparison and SRSD-only students or between the two SRSD conditions. At maintenance, students in both SRSD conditions wrote qualitatively better stories than did the children in the comparison condition. It should be noted that the quality of stories produced by SRSD students in both conditions showed some decline from posttest to maintenance (see Table 2).

For quality of persuasive essays, there were statistically significant effects of time of testing, condition, and their interaction. Tests of simple main effects for the interaction revealed that there was a statistically significant difference in the quality of persuasive papers at posttest, $F(2, 30) = 15.94$, $MSE = 26.69$, $p = .000$, but not at pretest. A follow-up posttest analysis indicated that students in both SRSD conditions wrote qualitatively better persuasive papers than did children in the comparison condition. There was, however, no statistically significant difference between the two SRSD conditions.

SRSD quality effects generalized to the classroom generalization persuasive writing probe as well as informative writing. On the classroom generalization probe, there was a statistically significant effect of condition in terms of the quality of these papers. Follow-up analysis indicated that students in the two SRSD conditions wrote qualitatively better persuasive papers for their regular classroom teacher than did comparison students. There was, however, no statistically significant difference between the two SRSD conditions.

In terms of quality of informative papers, there was a statistically significant main effect of time of testing as well as a statistically significant interaction between condition and time of testing. Tests of simple main effects for the interaction revealed that there was a statistically significant difference in the quality of informative papers at posttest, $F(2, 30) = 3.83$, $MSE = 8.87$, $p = .033$, but not at pretest. A follow-up posttest analysis indicated that students in the SRSD plus peer support condition wrote qualitatively better informative papers than did students in the comparison condition. There was, however, no statistically significant difference in the quality of posttest stories between comparison and SRSD-only students or between the two SRSD conditions. SRSD effects for quality did not transfer to narrative writing. There was, however, a statistically significant main effect of time of testing, showing that the narrative writing of students in all three conditions improved from pretest to posttest (see Table 3).

### Writing Knowledge

Means and standard deviations for scores on the writing knowledge instrument by question, time of testing, and condition are presented in Table 6. At pretest, there were no statistically significant differences between conditions on any of the writing knowledge variables tested for any of the three questions. Statistical results and effect sizes at posttest are presented in Table 4.

When asked to indicate how they would plan a paper at posttest (Question 1), students primarily answered this question by describing substantive processes such as making a list, writing ideas down, webbing, planning, organizing notes, and so forth (see Table 4). Eighty-four percent of the ideas they generated involved substantive processes. Although students in the three conditions did not differ statistically in how many different production procedures or motivation features they identified when describing how to plan a paper, there was a statistically significant difference in the number of substantive processes they described. As predicted, students in both SRSD conditions identified more substantive processes for planning than their peers in the comparison condition. There was no statistically significant difference between the two SRSD conditions, however.

When students were asked at posttest to describe the types of things included in a story, 76% of the ideas they generated described specific story elements, such as beginning, middle, end, characters, what happens, feelings, opening sentence, where it takes place, description, and so forth (see Table 4). Although students in the three treatment conditions did not differ statistically in the emphasis they placed on production procedures, there was a statistically significant difference in the number of different story elements they identified. As predicted, students in the two SRSD conditions identified more attributes and elements when describing a persuasive paper than their peers in the comparison condition. Contrary to expectations, there was not a statistically significant difference between the two SRSD conditions. Consequently, SRSD had a positive impact on children's knowledge about persuasive

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*Table 6*

**Mean Scores (and Standard Deviations in Parentheses) for Writing Knowledge by Question, Time of Testing, and Condition**

| Measure | Knowledge of planning (Question 1) | | Knowledge/stories (Question 2) | | Knowledge/persuasion (Question 3) | |
|---|---|---|---|---|---|---|
| | Pretest | Posttest | Pretest | Posttest | Pretest | Posttest |
| Production | | | | | | |
| Comparison | 0.14 (0.23) | 0.05 (0.15) | 0.14 (0.23) | 0.41 (0.44) | 0.32 (0.56) | 0.18 (0.25) |
| SRSD only | 0.32 (0.46) | 0.32 (0.72) | 0.32 (0.46) | 0.59 (0.77) | 0.59 (0.89) | 0.68 (0.51) |
| SRSD + PS | 0.55 (0.88) | 0.41 (0.88) | 0.55 (0.88) | 0.05 (0.15) | 0.36 (0.50) | 0.05 (0.15) |
| Substantive | | | | | | |
| Comparison | 1.50 (1.20) | 1.09 (0.92) | — | — | — | — |
| SRSD only | 1.36 (0.90) | 2.64 (1.72) | — | — | — | — |
| SRSD + PS | 1.86 (1.83) | 2.32 (1.83) | — | — | — | — |
| Motivation | | | | | | |
| Comparison | 0.23 (0.52) | 0.098 (0.20) | — | — | — | — |
| SRSD only | 0.098 (0.20) | 0.14 (0.32) | — | — | — | — |
| SRSD + PS | 0.05 (0.15) | 0.09 (0.11) | — | — | — | — |
| Abilities | | | | | | |
| Comparison | 0.00 (0.00) | 0.00 (0.00) | — | — | — | — |
| SRSD only | 0.00 (0.00) | 0.00 (0.00) | — | — | — | — |
| SRSD + PS | 0.09 (0.30) | 0.00 (0.00) | — | — | — | — |
| Elements | | | | | | |
| Comparison | — | — | 1.95 (1.25) | 1.82 (1.37) | 0.77 (1.10) | 0.73 (0.68) |
| SRSD only | — | — | 2.82 (1.69) | 3.41 (1.55) | 0.95 (1.78) | 2.45 (1.80) |
| SRSD + PS | — | — | 2.36 (1.78) | 4.36 (2.25) | 1.41 (2.61) | 2.68 (1.49) |

*Note.* SRSD = self-regulated strategy development; PS = peer support.

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writing, but the added peer support component did not further enhance this knowledge.

When students were asked at posttest to describe the types of things included in a persuasive paper, 74% of the ideas they generated described elements such as topic sentence, beginning, reasons, examples, ending, and so forth. As expected, there was a statistically significant difference in the number of different persuasive elements students identified. Students in the two SRSD conditions identified more elements when describing a persuasive paper than their peers in the comparison condition. There was not, however, a statistically significant difference between the two SRSD conditions. In addition, there was a statistically significant difference between conditions in terms of the number of different production procedures identified. Students in the SRSD-only condition identified more production attributes than their comparison counterparts when describing what to include in a good persuasive paper. There was, however, no statistically significant difference between the SRSD plus peer support and comparison conditions or between the two SRSD conditions.

### Intrinsic Motivation and Effort

The means and standard deviations for the intrinsic motivation and effort measures completed by teachers at pretest and posttest are presented in Table 7. There were no statistically significant effects of condition, time of testing, or their interaction for either of these measures. Thus, contrary to predictions, SRSD instruction did not influence teachers' perceptions of these two measures of children's motivation.

Table 7
**Means and Standard Deviations for Intrinsic Motivation and Effort Scores by Condition and Time of Testing**

| | Condition | | | | | |
|---|---|---|---|---|---|---|
| | Comparison | | SRSD only | | SRSD + PS | |
| Variable | Pre | Post | Pre | Post | Pre | Post |
| Intrinsic motivation | | | | | | |
| M | 59.5 | 64.3 | 63.6 | 78.6 | 70.0 | 70.7 |
| SD | 25.8 | 13.2 | 15.8 | 11.4 | 14.5 | 21.8 |
| Effort | | | | | | |
| M | 66.4 | 69.8 | 64.5 | 78.9 | 70.2 | 74.1 |
| SD | 22.6 | 11.8 | 20.2 | 12.7 | 18.3 | 21.0 |

*Note.* Scores range from 1 to 5. SRSD = self-regulated strategy development; PS = peer support; Pre = pretest; Post = posttest.

## Social Validity

The responses of students from the two SRSD conditions are presented together for the most part, because students were highly positive about the procedures they were taught and the methods used to teach them. When asked whether they would recommend teaching POW and the two genre-specific strategies to other children, 94% of these children said yes. The most common reason given for teaching these procedures to others focused on improved writing (e.g., "They can write better"). The three children who recommended that these strategies not be taught to other children were all from the SRSD-only condition, and their reasons were that these procedures required too much time to use ($n = 2$) or that it was easier to write a story without using them ($n = 1$).

When asked what they would do the same or different if they were to teach the strategy, 91% of the students indicated that they would do the same things (four students indicated that they were not sure). Twelve students, however, indicated one or more things that they would add or change. These included having students write more during instruction ($n = 2$), teaching students how to write a paragraph ($n = 1$), putting more emphasis on revising ($n = 1$), generating different self-statements ($n = 1$), using different writing prompts ($n = 1$), getting students to listen better ($n = 1$), and eliminating the two genre-specific strategies ($n = 1$), endings from stories ($n = 2$), and topic sentences from persuasive papers ($n = 1$).

Students were also quite positive when asked to evaluate each strategy, the graphing procedure, and self-instruction. Seventy-six percent of the students indicated that they liked POW, 18% indicated that they did not, and 6% were unsure. The most common reasons for liking POW was that it reminded students to generate and organize ideas and helped them write better papers. Reasons why children did not like POW varied. Three children did not like it because they "didn't like writing so much"; one student thought that the mnemonic had too many letters; and another student did not like "write and say more." Two students said that they had to use it too much, and one student was not sure why he did not like it.

Seventy percent of the students indicated that they liked the genre-specific strategy for story writing. The primary reasons for liking the strategy were that it helped them think of ideas and write better stories. Among those who were less positive, four students indicated that it required too much writing, two noted that the mnemonic had too many letters, one indicated that she did not like to plan, and the other three did not like a specific part of the strategy (such as figuring out what happens or where the story takes place).

The genre-specific strategy for persuasive writing was viewed positively; 88% of the participants indicated that they liked this strategy, primarily because it helped them think of parts for their papers and write better. The reasons listed by the five children who did not like this strategy included the following: They made too many mistakes when using it ($n = 1$), they disliked writing persuasive papers ($n = 2$), the mnemonic had too many letters ($n = 1$), and they did not like thinking of ideas for their paper ($n = 1$).

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The graphing procedure was enjoyed by all of the students. The most common reason was that "you get to color the rocket." More than half of the students, however, mentioned that it helped them know whether they included all of the parts. One child did mention that it was "embarrassing" to not be able to color all of the rocket. Finally, 85% of the students indicated that they liked the self-statements they created and used. The primary reasons students offered for liking these self-statements focused on how they served as reminders and were encouraging. Reasons for not liking them included that they were too hard to remember ($n = 2$), interfered with the writing process ($n = 1$), and required too much time to use ($n = 1$).

## Discussion

We examined whether SRSD (Harris & Graham, 1996), an approach already validated with older students, would enhance the writing, knowledge of writing, and motivational attributes of struggling writers in second grade who attended urban schools serving mostly children from low-income families. It is important to identify instructional procedures that are effective with beginning writers, especially those who find learning to write difficult, in that primary-grade children's early writing performance is strongly related to their later success (Juel, 1988). We also examined whether peer support designed to facilitate maintenance and transfer would enhance the effects of the SRSD treatment, as struggling writers may not continue to use learned strategies or apply them to other pertinent tasks (Wong, 1994).

### Impact of SRSD on Writing Performance, Knowledge, and Motivation

*Writing*

Instruction involving a general strategy and genre-specific strategies for planning compositions, procedures for regulating the use of these strategies and the writing process (self-instructions, goal setting, self-reinforcement, and self-monitoring), and knowledge about the basic purpose and characteristics of stories and persuasive writing had positive effects on the writing performance of second-grade children experiencing difficulty learning to write. Students in the SRSD-only condition spent more time initially planning their paper and wrote stories that were more complete than the ones produced by students in the comparison condition. The impact of the SRSD-only treatment immediately after story instruction was strong for these two variables, both effect sizes exceeding 1.50. Contrary to expectations, however, there was no statistically significant difference between comparison and SRSD-only students in length and quality of posttest stories.

These findings only partially replicated the results for posttest story writing obtained with slightly older struggling writers in the Graham et al. (2005) investigation. In the previous study, not only were the stories of SRSD-only students more complete than those written by their peers in the comparison condition, but their papers were longer and qualitatively better. One

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possible explanation for why the younger second-grade students in this study did not do as well as the third-grade children in the previous investigation is that they were not ready either academically or cognitively to take full advantage of the relatively sophisticated set of processes for planning and writing a composition they were taught. If this were the case, then similar findings should be obtained with the second SRSD-instructed genre, persuasive writing. This did not occur, however. In this study and the Graham et al. (2005) investigation, SRSD-only students wrote longer, more complete, and qualitatively better posttest persuasive papers than did comparison students (we found that SRSD-only students did more advanced planning as well). Thus, the younger students in the current investigation were able to take advantage of what they were taught, resulting in strong improvements in multiple aspects of their writing performance with another genre (all effect sizes equaled or exceeded 1.10), weakening the argument that they were not yet academically or cognitively capable of benefiting from these procedures.

A second explanation for why the effects of SRSD-only instruction on story writing at posttest were not stronger is that the younger students in this study needed more practice in applying the basic strategic actions (i.e., selecting topics, generating and organizing notes, and writing and saying more) and self-regulatory procedures (e.g., self-instruction, goal setting, self-reinforcement, and self-monitoring) they were learning to take full advantage of these processes. If this argument is valid, then this should have been reflected in children's writing performance at maintenance, because SRSD-instructed students received additional practice in applying these processes to a second genre (i.e., persuasive writing) during the posttest/maintenance interval. Maintenance data were consistent with this explanation. Students in the SRSD-only condition retained their posttest advantage over comparison students in terms of advanced planning time and story completeness but evidenced two new advantages as well: longer and qualitatively better stories. With the exception of length (effect size = 0.47), the differences between SRSD-only and comparison students' compositions at maintenance were large (all effect sizes were greater than 1.45).

As expected, the effects of SRSD instruction transferred to the children's regular classroom. At the end of the study, the participating students were asked by their regular teacher to write a persuasive paper. Papers written in the regular classroom by children in the SRSD-only condition were qualitatively better than those produced by comparison students. The difference in the quality of students' papers was large, with an effect size of 1.16. This replicates findings from earlier studies showing that the effects of SRSD instruction generalize to other settings (Graham & Harris, 2003), even when students are very young.

In addition to the positive impact that SRSD instruction had on students' story and persuasive writing, there was some degree of transfer to the two uninstructed genres assessed. First, the knowledge students acquired about the basic parts of a story generalized to compositions about their own lives, in that SRSD-only students included more of these elements than comparison students in their posttest narratives. Second, the emphasis placed on planning in advance

generalized as well, at least to informative writing, as SRSD-only students spent more time initially planning this type of paper than their peers in the comparison condition. The generalization effects for these two variables were large (both effect sizes were 1.15 or greater), adding to a growing body of literature showing that the positive effects of SRSD instruction transfer to other uninstructed genres (see also Graham & Harris, 2003; Graham et al., 2005). Nevertheless, the narratives and informative papers produced by SRSD-only students were neither longer nor qualitatively better than those written by comparison students. SRSD instruction in planning and writing narrative and informative papers is probably needed to obtain substantial gains in these areas.

It is possible that we did not obtain broader transfer effects for SRSD-only instruction because of our decision to remove the following two elements from the instructional routine: (a) explicitly encouraging students to generalize what they had learned and (b) discussing with the instructor when, where, and how to use the learned writing strategies. We removed these two procedures from the SRSD-only condition to eliminate overlap between the two SRSD conditions. Even with the removal of these procedures, however, the SRSD-only condition was still powerful enough to facilitate a certain amount of generalization to the two uninstructed genres. Nevertheless, future research on the SRSD model should examine the contribution of these two elements to promoting maintenance and generalization.

## Knowledge

As predicted, SRSD instruction had a positive impact on students' knowledge about writing. Relative to comparison students, children in the SRSD-only condition were more knowledgeable about how to plan a paper as well as the basic attributes of both a good story and a persuasive essay. The impact of SRSD instruction on these three aspects of writing knowledge was strong (effect sizes were 0.97 or greater), providing added support for the contention, verified in three other studies (Graham et al., 1992, 2005; MacArthur et al., 1991), that such instruction enhances not only writing performance but students' understanding of writing as well. This is important because there is considerable agreement that development of competence in a particular subject is shaped not just by changes in learners' strategic behaviors but also by their knowledge about that domain (Alexander, 1992, 1997; Chi, 1985).

In the Graham et al. (2005) study with third-grade struggling writers, SRSD-only students were not more knowledgeable than comparison students about how to plan a paper or what attributes were included in a good story. We had hypothesized in that study that students' knowledge about writing might have been limited by our decision to eliminate discussion with the instructor about when, where, and how to use the knowledge and strategies taught. We reasoned that this reduced students' opportunities to acquire additional knowledge about writing. In light of the findings of the present study, this explanation does not appear to be valid, given that the same restrictions were in place. We are not sure why the slightly younger SRSD-only students in this study evidenced advantages over comparison students for these two

variables while the students in the Graham et al. (in press) study did not; how-ever, it did not appear to be due to initial differences in knowledge. In both studies, students' knowledge at pretest was low, and the means were similar. Although these divergent findings might have been related to differences in the writing instruction received by comparison students in the two studies, we think this is unlikely for two reasons. First, students in these two studies were from the same school, and their teachers used basically the same approach to writing instruction. Second, changes in pretest to posttest performance among students in the comparison condition were similar in the two studies. There was a slight decline at posttest in comparison students' knowledge about the substantive aspects of planning, whereas there was a small increase in their knowledge about the attributes of a good story.

### Effort and Intrinsic Motivation

Contrary to expectations, teachers' estimates of students' writing effort or intrinsic motivation for writing were not enhanced by SRSD instruction. Like-wise, in the previous study with third-grade struggling writers (Graham et al., 2005), SRSD instruction did not influence students' judgments of their writing efficacy, in that students tended to overestimate their abilities before instruc-tion. We did not reexamine writing efficacy in the present study because of concerns about young children's ability to accurately assess their own capa-bilities (Gaskill & Murphy, 2004). Instead, we studied other aspects of moti-vation, relying on teachers' perceptions rather than children's self-reports. Although the use of these two approaches did not provide evidence to sup-port the claim that SRSD instruction enhances student motivation, future research (both quantitative and qualitative) should continue to examine this possible link for two reasons.

First, several studies have shown increases in motivational variables such as self-efficacy and persistence after SRSD instruction with older students (Graham & Harris, 1989a, 1989b; Graham et al., 2005). Second, students in this and previous studies (see Graham, 2006) were typically very positive about the effects of SRSD instruction, recommending that it be taught to other children and identifying specific ways it helped them write better. We also observed, however, that the second-grade students taking part in this study had not yet developed the level of negative attitudes and emotions about writing evidenced by third and fourth graders with whom we have worked. These second-grade students were primarily positive about writing, making the earlier stages of instruction easier (rather than more difficult, as we had anticipated). Further research should address potential positive effects in these and other areas and should extend SRSD instruction (modified as appropriate) into first grade.

### Incremental Effects of Peer Support Component

Before examining the incremental effects of adding the peer support compo-nent to the SRSD instructional routine, it is important to note that students in the SRSD with peer support condition exhibited all of the same advantages

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over comparison students exhibited by children in the SRSD-only condition. They did more advanced planning and wrote more complete stories at posttest and maintenance than did comparison students; their maintenance stories were also longer and qualitatively better. They spent more time planning their posttest persuasive papers than their peers in the comparison condition and produced essays that were longer, more complete, and qualitatively better. In addition, the persuasive papers that they wrote for their classroom teacher were qualitatively better than the ones produced by comparison students. Generalization effects further transferred to narrative and informational writing; SRSD plus peer support students wrote narratives containing more story elements than did comparison students, and they did more advanced planning when writing informative papers. Finally, these children were more knowledgeable than comparison students about planning as well as the attributes of both a good story and a persuasive paper. All of these differences were large; the corresponding effect sizes were 0.87 or greater. Consequently, these findings provide further verification of the effectiveness of the SRSD instructional model.

Although there were no statistically significant differences between the two SRSD conditions on the majority of writing and knowledge variables assessed in this study, adding the peer support component to the SRSD model was advantageous for four reasons. First, in contrast to the SRSD-only condition, students who received peer support wrote longer and qualitatively better posttest stories than did comparison students. Second, including this component had a positive impact on posttest persuasive papers, in that SRSD students who received peer support included more basic elements in these compositions than did students in the SRSD-only condition. Third, addition of this component facilitated generalization to the regular classroom. Unlike students in the SRSD-only condition, students who received peer support wrote persuasive papers for their regular classroom teacher that contained more basic elements than the ones produced by comparison students. Fourth, peer support enhanced transfer to the two uninstructed genres tested. SRSD students who received peer support included more story elements in their posttest narratives than did SRSD-only students, whereas only the SRSD plus peer support students wrote qualitatively better informative papers than did comparison students. However, a limitation of this study was that two components common to the SRSD model were removed in the SRSD-only condition: overt encouragement by the instructor for students to use the learned strategies outside the instructional setting and discussion about when, where, and how to use the strategies outside this setting. Future research should continue to focus on these components in the full SRSD model. All of these differences were large, the corresponding effect sizes exceeding 0.82.

Graham et al. (2005) also found that adding the peer support component of SRSD had positive effects on the performance of struggling writers, including advantages in the number of story elements contained in posttest narratives, time spent composing posttest informative papers (a variable not included in this study), and knowledge about how to plan a paper. In terms of the writing variables, the impact of peer support in this previous study was

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not as extensive as it was in the current investigation. Although it is tempting to conclude that this was due to the change made in the peer support component (i.e., incorporating the instructor as a functional mediator in the regular classroom twice during the course of the study), other factors may have been responsible for these differences. In any event, this study and the earlier investigation by Graham et al. (2005) demonstrate that the concept of peers helping each other apply what they have learned can facilitate the academic performance of young children, at least those who experience difficulty learning to write. The sample size in the present study was not large, however, and future investigations should address results among larger samples. But it should be noted that the results of this study are convergent with those of previous studies.

The peer support component in this study involved a number of different elements, including working with a peer to identify when, where, and how the strategies being learned could be used; applying the strategies to these situations and helping one another as needed; discussing and evaluating the successes and difficulties encountered; and placing the instructor as a functional mediator in the regular classroom setting. Additional research is needed to replicate the added effects of the peer support component with writing as well as other academic areas and to identify the elements responsible for changes in students' performance.

## Conclusion

The present results demonstrate that, as early as second grade, the writing performance and knowledge of young struggling writers can be improved substantially by teaching them general and genre-specific strategies for planning in conjunction with the knowledge and self-regulatory procedures needed to use these strategies effectively. These findings provide further verification that explicit and systematic strategy instruction can enhance students' writing performance (e.g., see De La Paz, 1999, 2001; Englert, Raphael, Anderson, Anthony, & Stevens, 1991; Graham, 2006; Wong, 1997; Yeh, 1998), including the writing of children in the primary grades (Beal, Garrod, & Bonitatibus, 1990) as well as children attending urban schools primarily serving low-income families (Graham et al., 2005). Finally, our results show that a common procedure in clinical psychology, peers helping each other maintain and generalize gains (Brownell & Jeffrey, 1987; Jacobson, 1989), can be applied successfully to academic learning with young children.

The findings of this study have several important educational implications. First, they support the contention that it is beneficial to explicitly and systematically teach struggling writers specific strategies for carrying out writing processes such as planning. Although we did not examine whether such instruction is also effective with average and above-average writers, the findings from a recent meta-analysis suggest that this is the case. Graham (2006) examined effect sizes for studies in which strategies for planning, revising, or both were explicitly taught to school-aged students. In terms of

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overall writing quality, mean effect sizes were 0.82 (based on 13 calculated effect sizes) for average writers and 1.15 (based on 9 calculated effect sizes) for above-average writers. It must be noted that these strategy studies involving average and above-average writers were conducted with children in Grade 4 and above. Thus, additional research is needed to determine whether strategy instruction in writing is effective with these primary-grade children.

Second, the findings of this study raise important issues as to whether Writers' Workshop or other process approaches to writing instruction are powerful enough for students who experience difficulty learning to write. Although students in the comparison condition did evidence growth in their writing development during the 6 months of this experiment, they made significantly less progress than their peers in the two SRSD conditions. Several other studies with struggling writers have yielded similar results (e.g., Graham et al., 2005; Saddler, Moran, Graham, & Harris, 2004; Troia & Graham, 2002). Although additional research is needed to determine the overall effectiveness of process approaches such as Writers' Workshop with struggling writers, investigators should also examine how such approaches can be made more effective for these students. One possibility is to integrate more explicit strategy instruction directly into Writers' Workshop. This was done in a study conducted by Danoff, Harris, and Graham (1993) and had a positive effect on the writing performance of both average and poor writers.

Finally, an important issue is how strategy instruction procedures such as SRSD can be implemented in schools where writing practices are strongly driven by high-stakes testing. If high-stakes assessments focus more on mechanical concerns, such as spelling or usage, then instructional practices that promote the development of planning, revising, and other self-regulatory processes will probably be ignored by school officials looking to increase test scores. Many high-stakes assessments, however, are designed to assess writing more broadly, including evaluation of organization, ideation, vocabulary, and overall quality (Johnston, Penny, & Gordon, 2001). De La Paz (1999, 2001) applied the SRSD model to the teaching of writing strategies designed to improve performance on the mandatory writing competency test used by the state of Tennessee. This instruction had positive effects on the writing of students who were both good and poor writers.

## Notes

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