Teaching Children with High-Functioning Autism Spectrum Disorders to Write Persuasive Essays

Kristie Asaro-Saddler and Nicole Bak

In this single-subject design study, we examined the effects of an intervention targeting planning and self-regulation strategy use on the persuasive writing of children with high-functioning autism spectrum disorders (ASD). Three 8- to 9-year-old children with ASD in third and fourth grades learned a mnemonic-based strategy for planning and writing a persuasive essay using the self-regulated strategy development (SRSD) approach. The intervention was provided by the students’ special education teachers following 2 professional development sessions, accompanied by weekly consultation by the authors. Comparison of 3 persuasive essay baseline probes with 3 postintervention probes revealed increases in holistic quality for all 3 participants, with mean increases from 3.2 to 7.0, 3.4 to 7.0, and 2.7 to 6.5 respectively. Word length decreased for 1 participant and increased for 2 participants, indicating that essay length in words was not directly correlated to improvements in overall quality. Evidence of planning and self-regulation was noted for all 3 participants on all 3 posttest probes, whereas planning was not evident on any of the pretest probes. Results of calculating the percentage of nonoverlapping data points from pre/posttest holistic scores showed 100% posttest scores exceeding lowest baseline scores; this fell above the 90% effect-size threshold, providing evidence for the SRSD approach using POW + TREE as a “very effective” treatment option for improving the persuasive writing skills of students with high-functioning ASD. This study also showed that special education teachers could learn to implement the intervention with fidelity with limited training and consultation. Key words: autism spectrum disorders, persuasive essays, self-regulation, SRSD, writing

WRITING is a key communication skill within literate societies. Written expression skills allow the sharing of opinions, the demonstration of critical thinking skills, and the display of content knowledge. Although writing is an important skill for school-aged children to learn, it is also a difficult one. In fact, the 2007 report from the National Assessment of Educational Progress (Salahu-Din, Persky, & Miller, 2008) indicated that, despite some improvements over previous years, only 33% of 8th graders and 25% of 12th graders performed at or above the “proficient” level in writing (defined as solid academic performance). For students with documented disabilities, those numbers were even lower, with just 6% of 8th graders and 5% of 12th graders with disabilities being...
evaluated as writing proficiently. These numbers are consistent with the observation that 19 of every 20 students with disabilities “do not acquire the writing skills needed for success in school” (Graham, Herbert, & Harris, 2011, p. 1).

As the NAEP (Salahu-Din et al., 2008) data indicate, many students struggle with writing and those struggles often persist and may become even more pervasive into high school. A logical conclusion from these findings is that educators need to provide effective writing instruction early in a child’s schooling to prevent or ameliorate difficulties in the later grades (Graham & Harris, 2005). Generally, this instruction should teach the steps in the process of writing, improve the quality of feedback and elaborative dialogue, and help writers understand the requirements of different text structures and writing genres (Baker, Gersten, & Graham, 2003).

One genre that national and state assessments frequently test is a student’s ability to craft persuasive compositions (National Assessment of Educational Progress, 2007). The persuasive genre includes a thesis and supportive arguments, elements that differ substantially from other genres (Baker et al., 2003). Persuasion, or argumentation, requires the writer to create a reasonable, acceptable proposition to convince readers of the writer’s perspective and to refute opposing counterarguments (Ferretti, Andrews-Weckerly, & Lewis, 2007). Convincing a reader requires considerable skill on the part of writers, as they need to employ fairly sophisticated styles of syntax, semantics, and pragmatics (Nippold, Ward-Lonergan, & Fanning, 2005). Not surprisingly, constructing effective persuasive compositions that are organized, logical, convincing, and that consider varying perspectives can be a challenging task for individuals both with and without disabilities (Nippold et al., 2005).

CHARACTERISTICS OF WRITERS WITH AUTISM SPECTRUM DISORDERS

One group of individuals who experience considerable difficulty with writing is children with autism spectrum disorders (ASD). Children with ASD characteristically exhibit a range of impairments, including impairments in communication, social interaction, sensory integration, motor coordination, self-regulation, and a limited range of interests, that make written expression difficult (Myles & Simpson, 2002). Such impairments in communication and social interaction skills can significantly impact writing skills by making compiling, expressing, and recording thoughts a challenging task for an individual with ASD (Jurecic, 2007). A writer with such challenges is likely to produce a composition lacking a clear, central focus, or one that is poorly organized, missing transitions, and devoid of emotional perspectives (Goldman, 2008; Myles et al., 2003). Writers with ASD might perceive the writing task as unendurably frustrating or anxiety provoking (Harbinson & Alexander, 2009), particularly if they are unable to relate to or interpret emotional perspectives connected to the topic.

The restricted range of interests of children with ASD (Griswold, Barnhill, Myles, Hagiwara, & Simpson, 2002) can make writing tasks not specifically tailored to those interests tedious and meaningless. Using a nonpreferred topic might contribute to a decrease in motivation to complete the task or work through frustrations associated with writing. Children with ASD also may experience difficulty using imagination or engaging in abstract thinking, considering the perspectives of others, and imagining future events or possible scenarios (Griswold et al., 2002; Harbinson & Alexander, 2009; Myles & Simpson, 2001). When combined, these characteristics can lead to literal interpretation of a writing task and inability to comprehend or use metaphors, idioms, parables, allegories, or rhetorical questions. They also may hinder the exploration of counter-arguments and consideration of various perspectives when composing a persuasive essay.

Sensory integration deficits, also common among children with ASD (Griswold et al., 2002), can impede processing and integration of information received from various...
sensory systems that writers utilize, including visual, auditory, and tactile systems. If a writer cannot process information rapidly, he or she may fail to grasp the changing purposes of a writing task while proceeding through the planning, drafting, and revising stages (Graham & Harris, 2005). These sensory deficits also might make it difficult for the individual to focus enough to achieve the objectives of the writing task.

Deficits in fine motor skills and coordination also can contribute to difficulty with handwriting and composing (Broun, 2009). For some individuals with ASD, recording ideas and composing sentences are physically laborious, which may lead them to generate as few words as possible so as to reduce the handwriting burden (Broun, 2009). Restricting the output can inhibit the ability to effectively communicate ideas (Myles et al., 2003), adding to other difficulties experienced by students with ASD. Similarly, individuals with ASD may not create written plans, because they do not want to write everything twice (Asaro-Saddler & Saddler, 2010).

Individuals with ASD also may struggle with self-regulation skills (Gomez & Baird, 2005). Researchers have suggested that children with ASD may not use language for self-regulation (Joseph, McGrath, & Tager-Flusberg, 2005), and that their ability to use self-speech may be impaired (Whitehouse, Maybery, & Durkin, 2006). Students with ASD also may exhibit poor cognitive flexibility, including an inability to shift attention or multitask (Mackinlay, Charman, & Karmiloff-Smith, 2006), and this may contribute to observed difficulty regulating cognitive acts (Hill, 2004). Without an ability to engage in self-regulatory behaviors independently, individuals with ASD may struggle to maintain attention to task, work through frustrations, and monitor progress toward their objectives.

The ability to self-regulate is an important writing skill because self-regulation assists an individual to maintain focus on the process of developing a main idea and details to support the topic (Harris, Graham, & Mason, 2006). The development of self-regulation skills is vital for writers with ASD to encourage engagement and continuous motivation throughout the writing process. Self-regulatory ability helps writers monitor the organization and content of their writing and handle frustrations associated with drafting and revision, which, in turn, may allow them to persevere enough to craft a cohesive draft (Harris et al., 2006). Self-regulatory skills also enable writers to reflect on strategies they found helpful and to acknowledge their accomplishments (Harris et al., 2006).

**SELF-REGULATED STRATEGY DEVELOPMENT**

Self-regulated strategy development (SRSD) is an intervention that emphasizes the importance of self-regulation in the development of persuasive writing skills (Harris & Graham, 1985). Thus, it may be particularly well suited to addressing the problems of writers with ASD. The SRSD model of strategy instruction focuses on developing an individual’s strategic behavior, knowledge of writing elements, and motivation. Through explicit instruction, accompanied by guided and independent practice, students are taught to plan, compose, and review their writing. In addition, students are provided with strategic methods to engage in goal setting, self-monitoring, self-instruction, and self-reinforcement. Finally, motivation to write may be developed through progress-monitoring techniques for helping students build awareness of the results of their efforts, thus, ideally, increasing their sense of writing self-efficacy.

The development of these skills is targeted through the six stages of instruction described in Table 1 (Harris & Graham, 1996). Because SRSD is a criterion-based rather than a time-based intervention, the instructor can monitor individual progress and adapt the instructional stages as needed (Graham & Harris, 2005). This flexibility allows the strategy to be utilized with students who have unique strengths and needs.
Table 1. Stages of Self-Regulated Strategy Development

<table>
<thead>
<tr>
<th>Stage</th>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td>Develop background knowledge</td>
<td>Teacher explains the strategy and how it will help the writer and gains a commitment from the student to learn the strategy. Baseline performance is established.</td>
</tr>
<tr>
<td>Stage 2</td>
<td>Discuss it</td>
<td>Steps and components of the strategy are explained. Teacher explores student’s current attitudes and beliefs and introduces the concept of self-talk, self-reinforcement, and self-monitoring.</td>
</tr>
<tr>
<td>Stage 3</td>
<td>Model It</td>
<td>Teacher models while using the strategy and all of its components, as well as the self-regulatory procedures. Teacher works through the entire task (i.e., writing an essay) thinking aloud to overtly indicate the steps of the strategy.</td>
</tr>
<tr>
<td>Stage 4</td>
<td>Memorize it</td>
<td>Student memorizes the steps of the mnemonic and the strategy. This stage may or may not be its own discrete stage, depending on the needs of the student.</td>
</tr>
<tr>
<td>Stage 5</td>
<td>Support it</td>
<td>Teacher and student use the strategy and establish goals collaboratively, with teacher fading prompts as appropriate.</td>
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<tr>
<td>Stage 6</td>
<td>Independent practice</td>
<td>When there has been sufficient guided practice, student is given the opportunity to engage independently in planning, composing, and reviewing the work using the strategy.</td>
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**POW + TREE strategy**

For this investigation, the instructional steps for persuasive writing within the SRSD model were taught and reinforced through the use of two mnemonics: POW + TREE. POW provides students with the steps an individual would engage in when planning and writing any type of genre, namely: Pick my Idea, Organize my Notes, and then Write and Say More (Graham, Harris, & Mason, 2005). TREE specifies the elements within a persuasive essay, namely: Topic Sentence, Reasons—three or more, Explanations for the reasons, and Ending Sentence (Graham & Harris, 1989). Instruction in the POW + TREE self-regulatory strategy is described in greater detail in the “Procedures” section of this article.

The use of the SRSD strategy of POW + TREE to teach persuasive writing has been investigated in a number of studies with a wide variety of participants, including struggling writers (Graham et al., 2005; Harris et al., 2006), students with learning disabilities (Graham & Harris, 1989; Mason, Kubina, & Taft, 2010a), students with emotional and behavioral disorders (Mason, Kubina, Valasa, & Cramer, 2010b; Mason & Shriner, 2008; Mastropieri et al., 2009), and students at risk for emotional disabilities (Little et al., 2010). Results from these studies indicated that the POW + TREE strategy could increase the number of essay elements, amount of planning time, and overall writing quality in the participants’ essays. Evidence of strategy use was noted in each of these studies as well.

**SRSD for students with ASD**

Prior studies also have supported the effectiveness of the SRSD approach for improving the writing performance of students with ASD in both narrative and persuasive writing.
Delano (2007a) provided three phases of instruction to an adolescent with ASD targeted at increasing the number of action words and describing words in his story writing and encouraging meaning-changing revisions. After treatment, the student was able to increase both the number of action words and describing words and the number of revisions in his story writing over baseline.

Two studies by Asaro and Saddler (2009) and Asaro-Saddler and Saddler (2010) explored the use of SRSD with students with ASD to improve story writing. At the conclusion of the first study, the participant, a fourth grader, had increased the number of elements and the overall quality of his stories from baseline (Asaro & Saddler, 2009). In the second study, all three participants increased the number of fictional story elements, words, amount of planning time, and overall writing quality (Asaro-Saddler & Saddler, 2010). The students also were able to transfer and apply the strategy components to the composition of a personal narrative while maintaining gains in the number of elements and the holistic quality of the writing piece.

One known study explored the effects of SRSD in the area of persuasive writing with students with ASD. This study (Delano, 2007b) found that the use of the SRSD strategy in conjunction with video modeling led to an increase in persuasive essay elements and number of written words for participants with a diagnosis of Asperger syndrome. Given the combination of interventions (video modeling and SRSD), however, it was difficult to determine the singular effects of the SRSD component in this study.

The results from these collective studies provided preliminary support for SRSD as an effective approach to teaching writing to students with ASD; however, other than Delano (2007b), no known studies have explored the SRSD approach for teaching persuasive writing. Given the effectiveness of SRSD in developing persuasive writing ability, as well as the success that students with ASD have had in the past utilizing the SRSD approach with other writing genres, we selected POW + TREE as the intervention to be investigated in this study. The purpose of this study was to explore the singular effects of POW + TREE utilizing the SRSD approach on the persuasive writing of children with high-functioning ASD, as taught by their special education teachers.

**METHODS**

**Setting and participants**

Participants were a convenience sample from a public elementary school in a suburb in upstate New York. At the time of the study, the school had approximately 50 faculty and staff members and 350 students in kindergarten through Grade 4. The educational setting options in this school included general education classes, inclusion classes, resource room classes, and self-contained classes. The school consisted of a student body that was 23% minority, with 9% having limited English proficiency. Approximately 25% of students were eligible for free or reduced price lunch. All teachers at the school had appropriate certification, and the majority (96%) had at least 3 years of teaching experience.

The student participants in this study met the following criteria: (a) documented diagnosis of an ASD; (b) deficits in written expression (as reported by the special education teacher, based on writing samples collected during typical classroom writing instruction and standardized writing tests, such as the Test of Written Language–4); (c) IQ within the normal to low average range based on the measure utilized by the school psychologist; and (d) ability to write independently with a pencil or pen (confirmed by the special education teacher). All students used spoken language as their primary means of communication and were considered to be “high-functioning individuals with ASD” by both the general and special educators and the school psychologist. As

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per the University Institutional Review Board, parental permission was obtained by the participants’ parents before the children could participate in the study in any way. Participants also gave assent to participate after being told the purpose and potential benefits of the study and that they could stop participating at any time without penalty.

The first participant, Peter (pseudonyms are used for all participants), was a 9.2-year-old Caucasian boy. Peter had a diagnosis of autism at the age of 2 years 4 months by a physician and began receiving services at the age of 3 years. His primary educational setting was a fourth-grade inclusion classroom, with a general education teacher, a teacher’s assistant, and consultant support from a special education teacher. He also received special education resource room support in a small group setting (two to three students with one teacher) 5 days per week, as well as speech and language therapy, and occupational therapy two times per week for 30 min each. Peter’s writing goal on his Individualized Education Plan (IEP) was to write a paragraph that stays on topic. His classroom teacher described Peter as struggling with literacy, stating he is “far behind his classmates” in reading and writing. His special education teacher said Peter has difficulty staying on topic.

The second participant, Paul, was an 8-year 9-month-old, fourth-grade Caucasian boy. He also received a diagnosis of autism at the age of 2 years 4 months. His primary educational setting was another general education fourth-grade classroom, with full-time access to a shared aide, and special education resource room support in a small group setting 5 days per week. He also received speech and language therapy (three times per week for 30 min), counseling (two times per week for 30 min), and occupational therapy (two times per week for 30 min). In addition, he received keyboard training due to his handwriting difficulties. Paul’s IEP writing goals were to use proper conventions and to begin using the keyboard for writing. Paul was described by his teacher as having very creative ideas but being resistant to writing because of the physical difficulty he experienced. She said that Paul never engaged in planning before writing and that he was “better at responding to prompts orally than in writing.”

The third participant, Mary, was an 8-year 2-month-old, third-grade Caucasian girl. She had a diagnosis of autism at the age of 3 and began receiving services immediately upon receiving the diagnosis. Mary’s primary educational setting was a third-grade classroom staffed by a general education teacher and a teacher’s assistant. At the time of the study, she was receiving special education resource room support 5 days per week individually or in a group of two, and counseling services two times per week for 30 min per session. Mary’s special education teacher indicated that interfering behaviors (daydreaming and off-topic conversation) often impeded her writing ability. Like Paul, she was described as having “excellent ideas” but lacking the ability to transfer those thoughts to paper. Mary’s special education teacher reported that Mary’s writing goals on her IEP were to remain on topic.

The students’ resource room special education teachers were recruited to participate in the study and expressed willingness to receive training from the authors in the SRSD approach in both a story writing strategy and a persuasive writing strategy. Ms. Adams (also a pseudonym) had New York state certification in Special Education and master’s of science in education (MSEd) degrees in both Special Education and Childhood Education. At the time of the study, she had 3 years of teaching experience, all of which involved working with children with ASD. Ms. Barton had New York state certification in Special Education and MSEd degrees in both Special Education and Reading. At the time of the study, she had 13 years of teaching experience, 11 of which involved working with children with ASD.

Before training, the two teachers were asked to read articles describing the research rationale and intervention steps. They received 2 days of training and bimonthly visits from the first author, along with frequent communication via e-mail and telephone calls. This communication consisted of
the researcher checking to be sure the teachers felt comfortable with the lessons and answering any questions they had, and the teachers confirming that the students had reached criterion and could move on to the next lesson, or reporting that a student was absent and that the schedule would be changed. Ms. Adams taught the strategy to Peter and then Paul (individually) in her resource room setting. The second teacher, Ms. Barton, taught Mary the strategy in her resource room setting. Sessions were scheduled for approximately 45 min, three times per week.

**Design**

A single-subject design with multiple baselines across participants was used to investigate the effects of the intervention. This design was selected because it has been used effectively in previous single-subject studies utilizing the SRSD approach (cf. Asaro-Saddler & Saddler, 2010; Little et al., 2010; Mason et al., 2010b). With this design, an intervention is applied under the same conditions to three individuals with a goal to achieve the same target behavior. After a stable baseline was established for all individuals (minimum of three data points) in holistic quality (including number of essay elements), the intervention was initiated with one participant while monitoring the others with baseline conditions continued. According to this design, a functional relationship between dependent measures and participant’s progress would be demonstrated only if the target skill improved after instruction and if the other participants’ performance remained at or near preintervention levels across baseline.

For this study, when the first participant reached criterion and completed his posttesting, instruction began with the second participant while monitoring of the third participant continued under baseline conditions. When the second participant reached criterion and completed his posttesting, instruction was initiated with the third participant. The order in which students received instruction was randomized, with the order of instruction being Peter, Paul, and Mary.

**Baseline probes**

During baseline, each student was asked to plan and write a minimum of three essays (one per day for 3 days) to establish pretreatment skill level. The teachers read scripted directions for testing administration in which they prompted the student to select one of two questions, such as, “Should children have to go to school in the summer?” or “Should children own cell phones?” Teachers then said, “Before you begin writing, take time to plan your paper. If you do not know how to spell a word just try your best. I cannot give you any help today. Please skip one line when you are writing your paper. Finally, you can use as many pieces of paper as you need.” Prompts were systematically randomized. Students were given 20 min to write. When a student finished writing, he or she read the essay to the instructor, who made notes for any unreadable text.

**Intervention**

The intervention for the first student began within 3 calendar days of the final baseline probe. Once the intervention commenced, teachers followed the six instructional lessons described in the “Procedures” section, which follows. Instruction occurred with one participant individually as described previously. One lesson was taught per day, with sessions lasting approximately 45 min. Lessons were taught 3–4 days per week (depending on the student’s schedule). Treatment continued until the student demonstrated mastery of the writing strategy by independently writing an essay with all required elements on an instructional day. All lessons were recorded as a fidelity check.

**Posttreatment**

In this stage, students wrote three essays, again under baseline conditions, with the first probe given within 3 days of treatment completion. Students were given one posttest per day for 3 days. Maintenance and generalization probes could not be collected because the intervention finished at the end of the school year.
Materials

Materials for this study were similar to those used by Harris et al. (2006). Writing prompts for baseline, instruction, and posttreatment consisted of a paper with two printed questions (see the “Baseline probe” section earlier for examples). A graphic organizer and a self-monitoring chart were also used, as described in the “Procedures” section.

Procedures

Following the six stages of the SRSD approach, the intervention consisted of six lessons designed to develop the student’s knowledge of the strategy components, scaffold the application of the strategy through authentic tasks, monitor progress, promote independent application, and generalize the strategy to other environments. Advancement from one lesson to the next was criterion-based and individualized, based on the goal set by the student (e.g., include all elements) with teacher scaffolding. If mastery of the lesson objective was not met, the lesson components were revisited. Therefore, although the time of each lesson remained constant at approximately 45 min per session, the number of sessions that each participant engaged in could vary on the basis of the student’s response to the treatment.

Lesson 1

This lesson focused on developing and discussing background knowledge associated with the POW + TREE strategy. The instructor set the purpose for this lesson by describing the terminology of both an opinion and an essay. The two components were then synthesized by stating that an opinion essay is a paper that tells a reader what the author believes or thinks about a particular topic and that a student has to pick a side that he or she believes to be supportable. The strategy of POW was first introduced through the use of a mnemonic chart. The components of the TREE mnemonic were subsequently introduced and reviewed as a strategy used specifically for the development of opinion essays or persuasive writing. Following the development of the background knowledge, the student was given an opportunity to practice reciting the mnemonic to facilitate memorization. Next, two models of opinion essays that had been used in previous SRSD studies were examined to identify the different components of TREE within the essay (see Harris, Graham, Mason, & Friedlander, 2008). After a student successfully identified a component of TREE in the model, the instructor recorded the information in note form on the POW + TREE graphic organizer (Figure 1).

The remainder of the lesson focused on discussing the transfer of POW + TREE to other academic writing tasks. The student was instructed to utilize the strategy outside the immediate setting and to report back on their use on the “I transferred my strategy” chart provided, a chart that students referred to each day as a prompt to use the strategy outside the instructional sessions. The student also was informed that he or she would be assessed on his or her ability to recite the POW + TREE mnemonic at the beginning of the next lesson.

Lesson 2

This lesson began with assessment of the student’s knowledge of the POW + TREE mnemonic and discussion of an opinion essay provided by the instructor. The instructor also inquired about the student’s use of the strategy in other academic tasks and recorded instances of transfer. The child was then presented with two additional model opinion essays (see Harris et al., 2008) and was asked to identify the eight essay elements, as he or she had done in the previous stage. The student also was prompted to brainstorm further ideas that could be used to support or refute the author’s opinion. Next, the student was provided with a copy of a persuasive essay he or she had written during the collection of baseline data. The student was asked to review his or her own essay and identify the elements that were present or absent. Discussion of the essay concluded with recommendations about how POW + TREE could be utilized to improve the essays. At the conclusion of this lesson, the student

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was exposed to a self-monitoring “rocket chart” (see Supplemental Digital Content available at http://links.lww.com/TLD/A5) used for monitoring progress toward writing essays with all elements. The rocket contained five boxes, with students filling in one box for each of the following: topic sentence, one reason with an explanation, a second reason with an explanation, a third reason with an explanation, and an ending. The student was asked to graph the number of essay elements his or her pretest persuasive essay possessed. The instructor highlighted for the student that the goal of these lessons was to work toward blasting off the rocket by including each element.

**Lesson 3**

Lesson 3 and subsequent lessons began with recitation of the mnemonic POW + TREE and a discussion of any strategy transfer. The student was then exposed to another
model essay and asked to locate all of the elements. The majority of the lesson was devoted to the teacher modeling how to utilize the POW + TREE through an authentic writing task. After introducing a prompt, the teacher demonstrated how she would apply the “Pick my idea” and “Organize my notes” strategies, emphasizing that the student would have the opportunity to engage in the same process in subsequent lessons. During the modeling portion for Organize my notes, the teacher engaged in thinking aloud and recording her ideas in note form on the graphic organizer. The teacher emphasized planning, utilizing rich vocabulary (e.g., “million dollar words”), self-evaluating, and using self-reinforcement statements. After completing the graphic organizer, the teacher modeled the “Write and say more” strategy by constructing sentences from the notes recorded on the graphic organizer, adding additional ideas as the essay was developed, self-evaluating the content and organization of the essay, and using self-statements and re-inforcement through the entire process. At the end of the modeling phase, the instructor helped the student construct his or her own individualized self-statements to work through any frustrations and acknowledge his or her hard work before, during, and after engaging in the writing process. The list of self-statements was presented to the student at each subsequent lesson, and the student was prompted to look at the list if necessary. All lessons from this point forward concluded with students graphing the essay elements on the rocket chart and being reminded to transfer the strategy to other tasks.

Lesson 4

In Lesson 4, the student was provided with a blank graphic organizer, the list of self-statements created in Lesson 3, and two practice prompts from which to select. The student was guided through the steps of POW + TREE, with specific reminders to take notes and not write full sentences while planning. The student was encouraged to complete the process with minimal support and to utilize the self-statements. When complete, the student evaluated the essay using the rocket chart. This was the first lesson in which the student physically wrote his or her own essay, as opposed to the teacher writing their joint ideas.

Lesson 5

During Lesson 5, the use of the graphic organizer was discontinued by encouraging the student to jot the components of the graphic organizer on a blank piece of paper instead. The instructor continued to provide scaffolding through the writing process by providing verbal prompts when necessary, but the amount of scaffolding was greatly reduced to promote independent engagement in the writing process. The student was then provided with an opportunity to share his or her essay and to evaluate it.

Lesson 6

During Lesson 6, the student used all parts of the strategy independently while writing an essay. The student created notes on a blank sheet of paper, completed the steps of POW, and used the mnemonic of TREE to guide the formation of the content. Although the teacher was present during this process, she provided prompts only to stay on topic or to keep going if the student needed them, encouraging independent use of the strategy.

Preparation of the samples for scoring

Before scoring, all writing samples were typed into Microsoft Word by the first author, who entered the student’s spelling and punctuation exactly as it was written on the paper (i.e., with word spacing and other features, such as capitalization, maintained as well). Any identifying information was removed. An independent researcher verified that all essays were entered exactly as written on the students’ papers.

Measures of writing quantity and quality

Three measures were used to document changes from baseline to posttreatment: overall holistic quality (specific to persuasive
essays), number of words, and evidence of planning. All of these are measures have been used in previous POW + TREE studies (cf. Little et al., 2010).

**Holistic story quality**

Holistic quality of the essays was measured using an 8-point scale adapted from Mason et al. (2010b; see Supplemental Digital Content [available at http://links.lww.com/TLD/A6]). This scale considered the number of essay elements (eight possible elements could be incorporated in each writing sample: topic sentence, three reasons, an explanation for each of the reasons, and an ending sentence, which paralleled the TREE mnemonic. Organization (i.e., sentence and/or paragraph formation) of the written product also was considered in the holistic scale. Raters were asked to read each paper to obtain a general impression of overall writing quality and to assign a score on the basis of the scale.

**Total number of words**

The number of words for each essay was counted using the Microsoft Word “Word Count” function for the transcribed samples. A word was counted if it was at least one-character long and was separated from other characters by a space before and after it. Titles were included in the word count.

**Evidence of planning**

To determine whether the intervention affected planning behavior, any notes written by students before or during the probe-gathering process were collected. Spoken comments indicating planning or strategy use also were recorded by the teachers on the back of the students’ written essays. This information was not evaluated quantitatively but was used as qualitative evidence.

**Holistic scoring procedures and reliability**

Two doctoral students in Educational Psychology were trained by the first author to score the essays for holistic quality, including the number of persuasive essay elements. During training, the author discussed the scoring rubrics and provided sample essays to rate. After raters independently scored each essay, interrater reliability for holistic quality was established and discussion of the rating ensued. Training continued until the raters could obtain an agreement of 80% with the researchers’ ratings of the training samples, which was considered a minimal acceptance of reliability based on other SRSD TREE studies (cf. Jacobson & Reid, 2010). Raters were blinded to pre-/posttest condition.

For the samples collected during the study, interrater reliability was calculated first between the two doctoral student raters and then scores for each rater were averaged to arrive at the final reported scores for holistic quality. Differences in scores of 1 point on the rubric were averaged, and scores that differed by more than 1 point on the rubric were discussed until an agreement was reached. Exact interrater agreement for holistic quality was 81%; reliability for scores within 1 point was 100%.

**Data analysis**

A visual analysis of the means for holistic quality and number of words was used to compare baseline to posttreatment data for each student. In addition to this visual analysis, data were analyzed using the percentage of nonoverlapping data (PND) procedure described by Scruggs, Mastropieri, and Casto (1987). Using this procedure, 90% of the posttreatment points exceeding the extreme baseline value indicate a very effective treatment, 70%–90% indicate an effective treatment, 50%–70% indicate a questionable treatment, and less than 50% indicate an ineffective treatment. This type of analysis was used in this intervention because it is commonly used in single-subject research designs utilizing the TREE intervention (cf. Mastropieri et al., 2009) and has been validated for detecting intervention effects (Campbell, 2004).

**Treatment fidelity**

To assess treatment fidelity, two procedures identical to those in the Asaro-Saddler
and Saddler (2010) study were followed. First, teachers were asked to check off each step of the lesson as it was taught. This helped them deliver the lessons in accordance with the plan and obtain a record of instruction completion. Upon examination of the lessons after instruction, 98% of the steps were checked off. Second, each of the sessions was tape-recorded. Half of the tapes were randomly selected to be reviewed by a graduate student who listened with a copy of the script, checking each step off as it was completed. The tapes indicated that 93% of the steps were followed.

RESULTS

Number of sessions to criteria

As shown in Table 2, Peter and Paul each completed the intervention after eight lessons, with both Lesson 5 and Lesson 6 being repeated. Mary completed the intervention in seven lessons, with only Lesson 5 being repeated.

Holistic quality

All participants improved in holistic ratings of essay quality from baseline to posttreatment (Figure 2). Peter improved from a mean of 3.2 quality points (3.0, 3.0, and 3.5) at baseline to 7.0 (7.0, 7.0, and 7.0) at posttreatment, and Paul increased from a mean of 3.4 (4.0, 3.0, 4.0, and 2.5) at baseline to a mean of 7.0 (7.0, 7.0, and 7.0) at posttreatment. Mary, who started at the lowest level, demonstrated the greatest gains, improving her mean holistic score from 2.7 (0, 3.0, 4.0, 3.5, and 3.0) at baseline to a mean of 6.5 (6.0, 6.5, and 7.0) at posttreatment. The PND for each participant for holistic quality was also 100%, exceeding the 90% effect-size criterion to qualify as a “very effective treatment” for increasing persuasive essay quality (Scruggs et al., 1987).

Number of words

Outcomes for the number of words written were inconsistent for the participants from pretest to posttest (Figure 3). Interestingly, Peter averaged 85 words (109, 92, and 56) during baseline and decreased to an average of 57 words (51, 60, and 61) during posttreatment. Paul wrote an average of 68 words (87, 68, 79, and 39) during baseline and increased to 93 words (112, 85, and 83) at posttreatment. Mary increased her average from 46 words (73, 44, 41, 30, and 41) at baseline to 82 words (68, 91, and 88) at posttreatment. The PND for number of words was 66.6% for Peter and Mary and 33.3% for Paul. These results indicate that the intervention could be considered “questionable” if the goal were to increase word count alone, which it was not.

Evidence of planning

Increased planning was a goal of the treatment. None of the participants engaged in any overt planning behaviors before receiving the intervention. In fact, the teachers administering the baseline writing samples reported that each participant started writing his or her essay immediately after being prompted to “begin.” Peter was the lone exception, waiting 2 min before beginning to write one baseline probe. However, he was not observed to engage in any overt planning behaviors during this time.

After receiving the intervention, all students engaged in overt, identifiable planning during all posttest essays. For each of them, this planning took the form of writing the letters TREE down the page and writing notes next to the appropriate letter. On all three posttests, each student was observed to write a topic sentence beside the T, three reasons next to the R, a corresponding explanation beside the first E, and an ending sentence next to the second E. This behavior mimicked exactly
what the students had learned to do in Lesson 5, at the point when they were “weaned off” the graphic organizer (Graham & Harris, 2005).

**DISCUSSION**

In this study, we examined the effects of strategy instruction utilizing the SRSD approach for teaching persuasive writing to children with ASD. Results indicated that teaching the POW + TREE strategy using the SRSD approach improved the persuasive essay writing of the children with ASD within the confines of this study, with a large effect size. Each participant improved overall holistic quality, and each included all the taught elements in three consecutive persuasive essay probes at posttest, demonstrating effects on written products. The PND for holistic quality was 100% for all participants. In addition, all three students engaged in overt planning of their essays before writing after being taught the strategy, demonstrating effects on writing processes. These results for persuasive essay writing were consistent with the findings of previous literature (Asaro & Saddler, 2009; Asaro-Saddler & Saddler, 2010) for
children with ASD, using the SRSD approach to improve story writing.

Although increasing essay length was not a target of the intervention, because the percentage of PND for the number of words was low for all students, we further analyzed the samples to better understand these results. We found that although PND was lower than across other variables, both Paul and Mary still increased average number of words at posttest. Mary had one outlier at pretest, a sample that included 78 words, which prevented her PND from being higher. Peter actually had a decrease in his number of words from pretest to posttest. However, for all students, the content was much more topic focused and meaningful at posttest. One possible conclusion is that word count is not a good measure of essay quality. A tightly organized essay could easily contain fewer words than...
an essay that rambles. For example, as shown in Supplemental Digital Content (available at http://links.lww.com/TLD/A7), Peter wrote a longer, but less focused, essay to the prompt, “Should children your age have cell phones?” at pretest, whereas he wrote a shorter, but more focused and higher scoring, essay to the parallel prompt, “Should children be allowed to bring video games to school?” at posttest.

The other two participants also wrote more focused essays that were of higher overall quality at posttest than their baseline samples. In this case, their mean word lengths did increase (see examples in Table 4), except for the one longer pretest sample for Mary, mentioned previously. The observation that, in this study, the number of words produced did not correspond directly to the overall quality is in line with other research that has shown that the quality and number of words are not always related (Mason et al., 2010b). We believe that students’ improved ability to remain focused on a topic while writing is a more important outcome, especially given that many children with ASD may have trouble remaining on topic or may include irrelevant comments in their writing (Losh & Capps, 2003).

An interesting point was that these students with ASD appeared to have difficulty weaning off the graphic organizer. In fact, in Lesson 5, when the organizer was removed, each student made an exact duplicate of the graphic organizer on their notes paper and then filled in the organizer they created. Not having the organizer may have been difficult because it provided concrete visual support. This is not surprising, given that many students with ASD are visual learners who benefit from concrete supports (Moore, 2002). We did not believe this behavior was problematic, however, as reproducing the graphic organizer could be viewed as a valid and strategic planning behavior.

Although not measured on a standardized scale, students demonstrated the use of learned self-regulation skills during the study. They enjoyed utilizing the rocket chart to monitor progress; in fact, Paul said that he wished he could use the chart in all of his classes. Charting progress proved effective in helping each student realize when he or she did not reach a goal and knowing how to set a goal for the next day to use all of the elements—both important self-regulatory skills. Each student was able to create self-statements to use during the writing process with supports from teacher scaffolding (e.g., “What might you say to yourself to help you get started?”).

Most of the prior studies that were conducted using SRSD with children with ASD utilized a trained instructor to work individually with each student (cf. Asaro-Saddler & Saddler, 2010). An important difference in this study was that special education resource room teachers successfully delivered SRSD instruction after only limited training with subsequent consultation on a weekly basis. The teachers in this study reported that they were pleasantly surprised at how effective the strategy was given the short amount of time they dedicated to it. They believed that it was a research-based practice that they could easily integrate into their everyday instruction. This is an important finding that should be explored further, as few studies have explored the effects of teacher training in research-based interventions for students with ASD (National Research Council, 2001). The current study also provided additional evidence for the SRSD POW + TREE intervention as an effective, research-based practice for teaching persuasive essay writing to students with high-functioning ASD.

Implications for practice

Results provided several educational implications. First, when asked about what helped them the most, all three student participants reported that the mnemonic devices and graphic organizers used to teach the steps of the strategy and to organize the persuasive elements were the most essential element of the strategy. This was not surprising, as children with ASD often require a concrete presentation of information (Griffin, Griffin, Fitch, Albera, & Gingras, 2006; Myles & Simpson,
and benefit from visual supports (Moore, 2002). Given that these findings replicate those of studies of children with ASD in the area of story writing (cf. Asaro-Saddler & Saddler, 2010), teachers should use visual mnemonics and graphic organizers when teaching children with ASD to write. Similarly, the self-monitoring components were an important element of the intervention and should be included in strategy instruction. The participants enjoyed monitoring their performance, and the visual representation was a critical part of their ability to set and achieve goals. The rocket charts also proved an important tool for helping the students “buy into” the intervention because they helped students see that before the intervention, their essays lacked important elements but after learning the intervention, they were able to complete most essays to criterion. This visual validation of the need for the strategy was essential because often children with writing disabilities have difficulty understanding the need to improve their writing (Graham & Harris, 2005). With the self-monitoring chart, they could easily see that their essays improved after learning the strategy.

Limitations and future research

In any single-subject design, the low number of participants is a key limitation. In this study, three students with high-functioning ASD participated. Because children with ASD are diverse, there is limited generalizability to other children with ASD. However, given that this was the first study to explore the singular effects of the SRSD approach to teach children with ASD persuasive writing, it is a meaningful contribution. Future research should attempt to replicate the results with more participants at varying ability levels. In addition, this study was conducted in two special education resource rooms. However, with more students with ASD being included in general education classrooms (Callahan, Henson, & Cowan, 2008), future researchers may wish to conduct studies that place children with ASD in pairs or small groups within a general education classroom for SRSD instruction. Unfortunately, because this study occurred at the end of the school year, maintenance probes could not be collected. Future research should explore whether the effects of SRSD instruction for children with ASD are maintained over time. Finally, because students with ASD often experience difficulty with handwriting (Broun, 2009), it may be important to find alternative ways, such as keyboarding, to express their thoughts and demonstrate their knowledge. Students who struggle with handwriting, such as Paul in this study, might still make gains when being taught a strategy; however, future research should explore whether eliminating the barrier of handwriting would further improve quality of writing output for students with ASD.

CONCLUSION

This study contributes to a small but growing corpus of studies evaluating the effectiveness of writing interventions for children with high-functioning ASD. Instruction in persuasive writing utilizing the SRSD approach resulted in our participants writing essays that were of higher overall quality and included important essay elements. In addition, students exhibited increases in planning and self-regulatory behaviors. Although this evidence is promising, future research is warranted to determine whether this intervention is a viable option for students with high-functioning ASD in inclusive settings and whether gains can be maintained over time.

REFERENCES


Teaching Children With ASD to Write Persuasive Essays


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