

Teaching Paragraph Composition to Students with Emotional/Behavioral Disorders Using the Simultaneous Prompting Procedure

Tina Marlene Hudson · Kim Hinkson-Lee ·
Belva Collins

Published online: 28 December 2012
© Springer Science+Business Media New York 2012

Abstract The purpose of this study was to examine the effectiveness of the simultaneous prompting procedure in teaching paragraph composition to 4, 5th grade students identified with emotional behavioral disorder (EBD) and attention-deficit hyperactivity disorder (ADHD). The instructor taught students how to construct and proofread a 5-sentence paragraph using the simultaneous prompting procedure with embedded non-targeted information related to the writing process. A multiple probe design across participants assessed effectiveness of the procedure. Results indicated that all students learned to compose a paragraph, acquired the non-targeted information, maintained the skills up to 6 weeks later, and generalized the skills to other writing tasks.

Keywords Simultaneous prompting procedure · Chained task · Writing · ADHD · EBD

Introduction

The increasing need to meet higher accountability standards, as mandated by the No Child Left Behind Act (NCLB) and the Individuals with Disabilities Education Act (IDEA 2004), requires educators to provide evidence-based practices for all students (Bergstrom 2008). Specifically, teachers are increasingly expected to provide the most effective academic instruction for students who have a history of being unsuccessful (Vannest et al. 2008). Moreover, the mandates of NCLB and the 1997 reauthorization of IDEA require that *all* students, even those with disabilities, participate in statewide, high-stake assessments (Goertz 2005). Although

T. M. Hudson (✉) · K. Hinkson-Lee · B. Collins
Department of Special Education and Rehabilitation Counseling, University of Kentucky,
Lexington, KY 40506, USA
e-mail: tina.hudson@g.uky.edu

participation of students with disabilities in high-stake assessments remains controversial, they have the potential to reach proficiency when provided with access to the curriculum by means of effective instruction (Ysseldyke et al. 2004).

Two student populations demonstrating a long history of difficulty in acquiring high levels of academic achievement are those identified with emotional and behavior disorders (EBD) and attention-deficit hyperactivity disorder (ADHD). In comparison with other disability groups, students with EBD exhibit lower than average academic achievement and display limited study skills and self-regulation strategies (Oliver and Reschly 2010). For example, when examining performance rates of students with EBD on statewide assessments in southeast Texas, Carr-George et al. (2009) found that of the 56 % of students participating, only 44 % met proficiency standards. Similar to students with EBD, students with ADHD also demonstrate a history of earning significantly lower grades, having higher rates of retention, being placed in special education, and dropping out (Barkley 2006; Frazier et al. 2007). In addition, students with ADHD often display weakness in graphomotor skills and slow speed of work completion, contributing to poor academic achievement, especially in the domain of written expression (Mayes and Calhoun 2007).

Studies indicate that students with ADHD and EBD often struggle with various aspects of writing tasks intended to prepare them for reaching proficiency on high-stake assessments and to help them acquire communication skills required for future occupational settings (Little et al. 2010; Mayes and Calhoun 2007). Nelson, Benner, Lane, and Smith (2004) found that from kindergarten through 12th grade, students with EBD scored well below average on a standardized test measuring writing ability. Moreover, Re, Pedron, and Cornoldi (2007) found that in their examination of expressive writing, students with ADHD exhibited much poorer performance than students in a control group on variables such as spelling, vocabulary, adjectives, and production of ideas.

Learning to write is complex and relies on mastery of a wide range of language skills (Harris et al. 2009; Hooper et al. 2002). Paragraph composition, for example, requires several steps and multiple cognitive processes for development and organization (Schumaker and Deshler 2009). One approach shown to be effective in helping poor writers is self-regulated strategy development (SRSD; Harris and Graham 1996; Mason et al. 2011). With SRSD, students are systematically taught strategies for the writing process, including planning ahead and using self-regulation. Although promising, SRSD requires an investment in teacher time and effort that consists of an increased need for flexibility in adapting modifications when meeting the needs of students with behavioral difficulties (Mason et al. 2002). Moreover, additional research is needed to fully identify the factors underlying writing development for the purpose of creating more effective writing interventions for students with or at-risk for behavior disorders (Lane et al. 2008). To date, few studies have conducted evaluations to assess interventions intended to improve the academic achievement of students with EBD and ADHD in the area of writing (DuPaul and Eckert 1997; Jacobson and Reid 2010).

A potentially effective intervention for improving the writing skills of students with EBD and ADHD may be a response prompting strategy. Response prompting

is an errorless learning strategy using verbal, model, and physical prompts to encourage correct responding, with subsequent fading of the prompts. One form of response prompting is the simultaneous prompting procedure (Gibson and Schuster 1992). Researchers developed the simultaneous prompting procedure when investigations with the time-delay procedure (an evidence-based response prompting procedure) indicated students often mastered a skill following initial 0-s delay trials (Schuster et al. 1992), thus making it unnecessary to increase the delay interval before prompting in subsequent sessions. In the simultaneous prompting procedure, the acquisition of skills is assessed during probe sessions that are conducted prior to instructional sessions, in which prompts are delivered immediately following a task direction (Fickel et al. 1998).

The simultaneous prompting procedure may be effective in teaching students with poor writing skills because it promotes errorless learning and has potential to facilitate systematic instruction. In errorless learning, the instructor uses prompts to facilitate correct responses, decreasing the possibility of a student responding incorrectly (Wolery et al. 1992). Moreover, the simultaneous prompting procedure can be used to teach either a discrete or chained task (e.g., Birkan 2005; Rao and Kane 2009). Discrete tasks are those that are broken down into basic components (e.g., identifying colors), whereas chained tasks consist of multiple steps (e.g., solving a mathematics problem) taught in a sequence with each response serving as the cue for the next. Systematic instruction has been effective in teaching writing to students with EBD and ADHD (Mason et al. 2011; Minskoff and Allsopp 2003), making the simultaneous prompting procedure a potentially effective strategy for teaching a multi-step writing task, such as composing a paragraph.

The simultaneous prompting procedure has been effective with age groups ranging from pre-school to adults in one-to-one and small-group settings (Fickel et al. 1998). To date, studies examining the simultaneous prompting procedure primarily have included students with moderate to severe disabilities (e.g., Birkan 2005; Wolery et al. 1992). Only two studies have evaluated the effects of the procedure with students identified with high-incidence disabilities (e.g., Head et al. 2011; Johnson et al. 1996), and only one has examined the procedure's effects in the area of writing. Pennington, Ault, Schuster, and Sanders (2010) evaluated the effectiveness of the simultaneous prompting procedure with computer-assisted instruction on the story-writing responses of three boys with autism, ages 7–10 years. Results indicated that the procedure was effective in improving story-writing skills of all three participants.

The addition of non-targeted information within the context of the simultaneous prompting procedure can increase the amount of learning that takes place (Jones and Collins 1997; Smith et al. 2011). Non-targeted information can be related or unrelated to the topic and can be presented within the task direction or stimulus, the prompt hierarchy, or as a consequence during the trial (i.e., instructional feedback). For example, after giving a student instruction on how to find a given location on a U.S. map, the teacher also may provide the following non-targeted information, "...and remember, the capital of Texas is Austin." Research has shown that post-test acquisition of non-targeted information improves the efficiency of instruction as

a result of the extra practice and increased amount of learning that occurs during instruction (e.g., Smith et al. 2011; Werts et al. 1995).

In light of reported effectiveness of the simultaneous prompting procedure in teaching a variety of skills and the need for further research on improving the academic needs of students with high-incidence disabilities and behavior disorders, this study assessed the effectiveness of the simultaneous prompting procedure on the acquisition of paragraph composition of four fifth-grade students identified with EBD or ADHD. The following research questions were addressed: (a) Does implementation of the simultaneous prompting procedure increase student acquisition of paragraph composition writing? (b) Do skills acquired using the simultaneous prompting procedure generalize to other school subjects and maintain over time? (c) Do students acquire non-targeted information related to the writing process that is inserted into instruction?

Methods

Participants

Participants included four fifth-grade students receiving specialized instruction in a resource classroom. The instructor (first author) selected students for participation based on recommendations from their special education teacher due to low test scores in areas of written expression, poor classroom performance on routine writing tasks, and a history of inattention during writing class. In an interview conducted by the instructor, the teacher described written work from the students (e.g., paragraphs, short essays) as unorganized, incomplete, incoherent, and taking too long to complete. The teacher also expressed concern that the students were off-task and not adequately attending to classroom writing activities. The teacher also identified students for this study based on similar individualized educational program (IEP) goals and results from special education evaluation reports.

The first student, Mitch, was a 10-year-old African American boy with ADHD, who was receiving services under the category of other health impairment (OHI). Mitch's IEP indicated that he exhibited deficits in receptive and expressive language, often struggling with sentence structure, grammar, spelling, capitalization, punctuation, and idea development. Mitch had a Mental Processing Index Score of 84 (low average) on the *Kaufman Assessment Battery for Children—Second Edition, Standard Battery* (K-ABC; Kaufman and Kaufman 2004a). He had a Written Expression Standard Score of 66 (extremely low) on the *Kaufman Test of Educational Achievement—Second Edition* (KTEA-II; Kaufman and Kaufman 2004b). Results of classroom observations indicated Mitch followed simple directions, but did not copy information from the board, follow through on oral directions, or complete academic tasks in a neat fashion. Mitch's teacher indicated that he often refused to comply with directions, hitting his fists on the desk when required to write for a long period of time or under time constraints. IEP goals for Mitch included (a) idea development, (b) improvement of sentence structure,

(c) application of correct spelling and grammar, and (d) written completion of a five-sentence paragraph that included a topic sentence, multiple examples, and a conclusion.

The second student, Allen, was an 11-year-old Caucasian boy with EBD. Allen's disruptive behaviors (e.g., arguing with staff, refusing to do class work) often impeded his learning. On the *Measure of Academic Progress* (MAP; Northwest Evaluation Association 2003) assessment, Allen received a below average Rasch unIT (RIT) Score of 198. Observations noted in his IEP indicated that when given a writing task, Allen engaged in negative comments toward peers and required explicit instruction to self-monitor academic and behavioral performance. IEP information indicated Allen demonstrated the ability to form simple sentences and basic grammar with minimal skill in forming simple sentences. However, Allen's teacher also noted that he demonstrated poor ability to organize, plan ahead, and sequence ideas and frequently responded to tasks too quickly. Written expression goals for Allen included (a) completion of a logical/coherent, five-sentence paragraph that included a topic sentence, three supporting details, and a closing statement and (b) proofreading written work for a minimum of 4 out of 5 errors.

Sally, the third student, was a 10-year-old Caucasian girl with ADHD who was receiving services under the category of OHI. Sally exhibited difficulty with written expression, poor spelling, and improper use of capitalization and punctuation. Sally received a below average RIT Score of 185 on the MAP (Northwest Evaluation Association 2003) assessments with the most difficulty in written expression and a need for frequent prompting due to limited ability to focus. Sally received small-group instruction in the resource room due to inability to attend to task. Written expression goals for Sally included (a) completion of a logical/coherent, five-sentence paragraph that included a topic sentence, three supporting details, and a closing statement and (b) proofreading written work for a minimum of 3 out of 4 errors.

The fourth student, Pat, was an 11-year-old Hispanic girl who received special education services for ADHD under the category of OHI and speech services for a speech and language impairment. Pat rarely initiated verbal communication. When prompted to speak, she uttered 3–5 words. On the *Kaufman Assessment Battery for Children—Second Edition* (K-ABC-11; Kaufman and Kaufman 2004a), Pat received a standard score of 68 (extremely low) on the Mental Processing Index. On the *Kaufman Test of Educational Achievement—Second Edition* (KTEA-II; Kaufman and Kaufman 2004b), she also received a standard score of 68 (extremely low) in written expression. Results from observations indicated Pat was cooperative but exhibited difficulty attending to directions, often sighing when directed to complete routine writing tasks. Although Spanish was the primary language spoken in her home, Pat did not have limited English language proficiency. Written expression goals for Pat included (a) developing writing pieces to a proficient level across various genres and (b) proofreading completed work for grammatical errors.

For inclusion in the study, participants had to have the following: (a) fine motor skills to hold a pencil, (b) ability to write a sentence, (c) intelligible verbal communication with the instructor, and (d) IEP goals for improving written expression. Prior to collection of baseline data, the instructor held an introductory

conversation with each student to determine his/her capacity for verbal communication (e.g., exchange of names and interests). The instructor also conducted one screening session with each student in an one-to-one format. Using an attentional cue “Are you ready to work?” followed by a response from the student indicating that he or she was ready (e.g., “Yes”), the instructor delivered a verbal task direction, “I would like for you to write a paragraph on what you would like to be when you grow up.” This enabled the instructor to observe whether the participant could use a pencil and write a sentence. Finally, the instructor reviewed copies of IEPs for all participants as well as special education evaluation reports and work samples to provide further evidence that they had writing difficulties.

Setting

The investigation took place in a resource room of a suburban elementary school serving approximately 475 students in the mid-Atlantic region. To minimize distractions, the instructor worked with students in an one-to-one format at a rectangular table in a small meeting room adjoining the main classroom. Both probe and instructional sessions took place at 1:30 p.m., prior to the students’ writing class.

Materials

Materials required for this study included the following items: (a) 8 in × 11 in white board with dry erase marker; (b) eraser, white, wide-ruled lined paper, and pencil; (c) data collection sheets; and (d) two timing devices, including a MotivAider™ and an iPod (see procedures for how these devices were used). The special education teacher provided a different writing theme for every day of the study aligned with what the students were learning in class or a topic of interest. For example, if the theme for the day’s class was Native American culture, the student might write in probe and training trials about Native American ceremonies. When the student went to class, the required written paragraph may be about Native American habitat. Over half of the topics that students worked on were teacher selected (e.g., current events from the news). The teacher also provided the instructor with five tickets to give each student for attending to task, following each session. Tickets were part of a school-wide, token economy system. Contingent upon earning 20 tickets by the end of the school week, students could spend them on Friday for small items or activities (e.g., toys, school supplies, lunch with gym teacher).

Measures

The instructor collected data on several outcome measures including (a) the number of six correctly completed steps to composing a paragraph, (b) the number of six correct oral responses to questions about non-targeted information, and (c) social validity data from students and teachers on acceptability of the intervention.

Probe Data

Probe sessions were conducted during baseline, intervention (just prior to instructional sessions), and maintenance phases. During all probe sessions, the instructor allowed 5 s for each student to initiate a response and 2 min to complete each step. Step 1 was writing a topic sentence, Step 2 was writing an explanatory sentence, Steps 3 and 4 consisted of writing sentences that contained examples, Step 5 was writing an ending or summarizing sentence, and Step 6 was proofreading and correcting errors. Proofreading and error correction consisted of the student reading the sentence he/she had written either aloud or silently and then taking an action to make corrections (if needed), such as capitalizing the first letter of a sentence, correcting a misspelled word, adding punctuation, or reversing the order of the words. If the student failed to locate or correct an error, the instructor scored this step as incorrect. Maintenance data were collected once a week for 6 weeks following the last training session by asking students to write a paragraph on a topic identical to that used during training. Table 1 shows a breakdown of all steps in the task analysis as well as the six questions assessing non-targeted information. To be scored as correct, each sentence needed to be (a) complete (i.e., subject and predicate) and (b) written in correct sequence (e.g., predicate following subject). For example, a correct response would be “Frogs jump into ponds” instead of “Jump frog in.” Incorrect responses included (a) duration errors—the student’s response took place after the 5-s response interval, (b) topographical errors—the student incorrectly completed the sentence in the step (e.g., not related to the topic), (c) sequence errors—the student performed the step out of order (e.g., wrote final conclusion sentence during an earlier step), or (d) failure to proofread for errors, as indicated in the final step.

Daily Training Trial Data

During training trials, the instructor recorded correct and incorrect responses on each of the six steps of the task analysis in the same manner as in probe trials.

Non-targeted Information Data

The instructor created a pre- and post-test consisting of six questions presented orally to assess student knowledge of related non-targeted information (e.g., capital letters) prior to collection of baseline data (see Table 1). She recorded correct responses initiated within 5 s after the task direction, incorrect responses, and no responses. Incorrect responses could be categorized as either duration (i.e., not responding to the question within 5 s) or topographical errors (e.g., incorrect wording such as “A comma comes at the end of a sentence.”).

Generalization Data

Prior to and following intervention, the instructor obtained generalization data by collecting samples of writing assignments from other classes (e.g., mathematics, science, social studies, language arts, and art). To assess generalization, a minimum

Table 1 Task analysis of paragraph writing with non-targeted information

Steps	Prompts	Training directions	Non-targeted information
1. Topic sentence: introduces main idea of the paragraph	“Show me the first step in writing a paragraph”	“The topic sentence comes first in the paragraph. I am going to show you a topic sentence on the dry erase board. (e.g., This is a topic sentence about frogs)”	“It is good to begin with an exciting sentence or a question!”
2. Explaining sentence: defines or describes topic	“Show me what comes next in writing a paragraph”	“The explaining sentence comes next. I am going to show you an explaining sentence on the dry erase board. (e.g., Frogs are amphibians)”	“Remember to begin your sentence with a capital letter”
3. Example sentence: gives a detailed example or fact related the concept	“Show me what comes next in writing a paragraph”	“The example sentence comes next. I am going to show you an example sentence on the dry erase board (e.g., Salamanders are also amphibians)”	“Good detail is important in helping the reader to picture the topic in their mind”
4. Example sentence: gives another detailed example or fact related to the concept for clarity	“Show me what comes next in writing a paragraph”	“The example sentence comes next. I am going to show you an example sentence on the dry erase board (e.g., Amphibians live on land and in the water)”	“Remember to place the correct punctuation mark at the end of the sentence”
5. Ending sentence: summarizes up the main idea, similar to the first sentence	“Show me what comes next in writing a paragraph”	“The ending sentence comes next. I am going to show you an example of an ending sentence on the dry erase board (e.g., Frogs and salamanders are cool amphibians that can live on the land and water!)”	“The ending sentence is a lot the beginning sentence, because it tells what the whole paragraph is about”
6. Proofreading: checking for spelling and grammar errors	“Show me the last thing you do in a paragraph”	“This is how you proofread your work. I am going to read my work aloud and check for mistakes”	“Reading your paragraph aloud is a good way to proofread”

of four work samples per student were scored on all six steps of the writing process taught during instruction, as well as non-targeted information. The samples mostly included open response items (e.g., a paragraph providing a response to a question about a story read by the teacher or a paragraph describing how to complete a mathematics problem). Unlike daily probes where the student was present, generalization probes were completed artifacts from classes. The instructor created a rubric listing all six steps of the task analysis to compose a paragraph and the presence of non-targeted information. The instructor scored each step as containing evidence of the step or skill or not. The expectation was that the paragraphs in

generalization would be formatted in the same manner as the probes used during intervention (e.g., topic sentence, example sentences, ending sentences).

Social Validity Data

At the end of the investigation, the instructor obtained student and teacher perspectives on intervention acceptability. The instructor interviewed students one at a time, asking them five questions regarding the simultaneous prompting procedure and how they perceived its effect on their writing performance. Specifically, students were asked (a) if they liked the procedure, (b) if they would use the procedure in other classes, (c) if they would share the procedure with a peer, (d) if they would use the procedure in other settings, (e) if the procedure helped them to stay on-task during writing class. The special education and enrichment-writing teachers completed a questionnaire on their perspectives regarding the acceptability of the intervention. The enrichment teacher worked with the students' biweekly providing supplemental writing instruction and could provide evidence of the extent to which the students' newly acquired composition skills generalized to writing tasks in her classroom. The 10-item questionnaire measured acceptability, effectiveness, and overall intervention practicality (e.g., "I would like to use this intervention myself to help other students how to write completed paragraphs."). Likert-type response choices ranged from 1 (strongly agree) to 5 (strongly disagree). (specific social validity questions are available from the first author on request.)

Experimental Design and Procedures

The first author, a doctoral student with 2 years of general education teaching experience and 4 years of special education teaching experience with students with high-incidence disabilities in grades 1 through 5, developed the intervention procedures and served as instructor. Procedures consisted of daily probe sessions during baseline, intervention, and maintenance phases, simultaneous prompting sessions (intervention), as well as pre- and post-tests to measure non-targeted information. Criterion for acquiring paragraph composition skills was established as completing all steps in the paragraph with 100 % accuracy for three consecutive sessions at which point training was discontinued and maintenance was assessed.

The instructor used a multiple probe design across participants to evaluate effects of the simultaneous prompting procedure on students' writing (Tawney and Gast 1984). The instructor used pre- and post-tests to assess the effects of training on students' recall of non-targeted information. Baseline data were collected on all students in the first session, followed by consecutive baseline sessions for the first student for 3 days when stability was reached. The instructor collected intermittent baseline probe data for each remaining student in a time-lagged fashion until immediately prior to intervention and then collected 3 consecutive days of baseline. A multiple probe design was chosen due the practical benefit of not requiring students to participate in continuous probe sessions in baseline, especially when it was unlikely that they would respond correctly prior to intervention (Gast and Ledford 2010).

Daily Probe Procedures

During baseline, intervention, and maintenance phases, probe sessions began with each student entering the room and taking a seat across from the instructor who began with a general attention cue (e.g., “Today, we are going to write a paragraph. Are you ready to work?”). Following a general attentional response from the student (e.g., nodding), the instructor presented the task direction, “I would like for you to write a paragraph about _____. Show me the first step in writing a paragraph.” If the student initiated the first step within 5 s and completed the step within 2 min, the instructor delivered general praise (e.g., “Thanks for following directions.”). The instructor then gave a task direction for the next step by saying, “Show me what comes next in writing a paragraph.” She continued in this manner until the last step, proofreading for errors, when she gave the task direction, “Show me the last thing you do in writing a paragraph.” As with the previous steps, the instructor gave the student 5 s to initiate proofreading and 2 min to complete the step. If, at any time, a student failed to initiate or complete a step, the instructor terminated the session (i.e., single opportunity probe). Throughout the session, the instructor praised the students for attending behaviors a minimum of two times during the sessions. She gave the students five tickets at the end of each session contingent on following directions, regardless of correct or incorrect responses, as was customary in the all classrooms in the school.

After criterion was reached during the intervention phase, the instructor conducted maintenance probe sessions twice during the first week, then once every 5 days, until all students incurred a minimum of three data points.

Simultaneous Prompting Procedures

Following the baseline phase and immediately after daily probe trials, daily training trials consisting of the simultaneous prompting procedure were conducted. It is important to note that although the instructor used a single opportunity format during daily probe sessions, she used a multiple opportunity format during training trials, allowing students to complete the entire task analysis. The instructor conducted daily probe sessions in the same format as baseline probe sessions, using the same task directions and reinforcement schedule.

The instructor began training trials with a general attentional cue (e.g., “Are you ready to work? Today, we are going to learn how to write a paragraph.”). Once the student provided the attentional response (e.g., nodding), the instructor presented the task direction, “I would like for you to write a paragraph about _____. Show me the first step in writing a paragraph.” However, instead of allowing the student 5 s to initiate a response, a 0-s delay occurred, with the instructor immediately proceeding to deliver a model prompt by writing the sentence on a white board. This was followed by a verbal prompt that included embedded non-targeted information that the special education teacher had requested to be associated with general writing tasks (e.g., capital letters, punctuation). For example, the instructor stated, “The topic sentence comes first in the paragraph. I am going to show you a topic sentence on the dry erase board. This is an example of a topic sentence about a frog.

Remember, it is good to begin your paragraph with an exciting sentence or question.” Following the model prompt, the instructor repeated, “I would like for you to write a paragraph about frog. Show me the first step in writing a paragraph.” If the student initiated writing within 5 s and completed the sentence within 2 min, the instructor delivered general praise for following directions. If the student did not provide a correct response, the instructor responded, “No, that is not a correct topic sentence” and proceeded to model the correct response, followed by a repeat of the task direction. The instructor repeated the same procedures with steps 2–5. For Step 6, the instructor gave the task direction, “Show me the last thing you do in writing a paragraph” and, using a 0-s delay, immediately modeled proofreading on the whiteboard, stating, “This is how you proofread your work. I am going to read my work aloud and check for mistakes. Remember, reading your paragraph aloud is a good way to proofread.” Following the model, the investigator repeated, “Show me the last you do in writing a paragraph.” The instructor gave the student 5 s to initiate proofreading and making corrections 2 min to complete the process. At the end of the training trials, the instructor delivered general praise and gave students five tickets contingent upon task effort, regardless of correct or incorrect responses.

Non-targeted Information Probe Sessions

Prior to baseline and after students met criterion during intervention, the instructor assessed non-targeted information. She gave the verbal task direction to answer each of the six questions about the related non-targeted information (e.g., “What should go at the end of your sentence?”) and allowed participants 5 s to initiate a verbal response. The instructor praised students at the end of each session for demonstrating effort and attending behaviors.

Interscorer Agreement and Procedural Integrity

The second author, who served as the integrity data collector, simultaneously assessed both interscorer agreement during 33 % of all probe sessions and procedural integrity during 31.75 % of intervention sessions distributed evenly across experimental conditions for each student. The second author was a doctoral student with 5 years of special education experience teaching students with high-incidence disabilities. The instructor calculated interscorer agreement (ISA) using the point-by-point method (i.e., number of agreements on each step/skill divided by number of agreements plus disagreements multiplied by 100 %; Wolery et al. 1988). In addition to collecting ISA during probe and training trials, the instructor and the integrity data collector immediately reviewed paragraphs for grammatical and spelling errors as part of the scoring process. The second author also independently reviewed all student work samples completed in class, using the rubric to measure evidence of generalization. In addition, the second author collected ISA data during both pre- and post-test measures for non-targeted information for all students. The instructor and second author independently recorded data from teacher social validity surveys. ISA was 99.9 % for probe sessions (range 99–100 %) with intervention and maintenance sessions at 100 %.

ISA for generalization, non-targeted information assessment sessions, and social validity was 100 %.

The second author collected procedural integrity data on instructor implementation of the simultaneous prompting procedure 31.75 % of all instructional sessions. Instructor implementation of each of the following behaviors was scored as present or absent: (a) provided a general attention/response cue, (b) provided task direction, (c) provided correct controlling prompt (model plus verbal), (d) used correct reinforcement schedule, (e) used correct delay intervals, (f) appropriately terminated probe sessions prior to paragraph completion contingent upon an incorrect response, and (g) recorded of data. Procedural integrity variables for assessment of non-targeted information included (a) having materials ready, (b) giving a 5-s time limit for response initiation, and (c) asking all six test questions related to non-targeted information. The instructor calculated procedural integrity by dividing correct number of instructor behaviors by the number of planned behaviors and multiplying by 100 % (Billingsley et al. 1980). Average agreement for procedural integrity was 95 % (range 80–100 %) during daily probe sessions, 98 % (range 95–100 %) during instructional sessions, and 99 % (range 99–100 %) during maintenance sessions.

Results

Figure 1 depicts the percentage of correct responses (i.e., daily trial data) during baseline, daily, and maintenance probe sessions. Data collected prior to intervention indicated that Mitch was averaging one sentence per probe session. He reached criterion at the end of the seventh probe session. Prior to intervention, Allen averaged only two sentences per probe session. He reached criterion at the end of the sixth probe session. Similar to Allen, results for Sally indicated that prior to intervention, she demonstrated completion of only two sentences. Sally reached criterion at the end of the fifth probe session. Data collected prior to intervention indicated that Pat averaged one sentence per probe session. Pat reached criterion at the end of the tenth probe session.

Maintenance data indicated that all students continued completing paragraphs with a mean accuracy of 99 %. Allen and Sally maintained at 100 % accuracy for 6 weeks following criterion. Mitch decreased to 83 % during the fourth maintenance probe session but returned to 100 % accuracy during the final maintenance probe session. Pat decreased from 100 % during the first two maintenance sessions to 83 % during the last maintenance session. Due to schedule changes and practice for accountability tests, the instructor was unable to collect additional maintenance data with Pat.

Non-targeted Information Probes

According to results of the pre- and post-tests, all students acquired non-targeted information embedded in the task direction of the simultaneous prompting procedure with 100 % accuracy by the end of the instructional sessions. Prior to

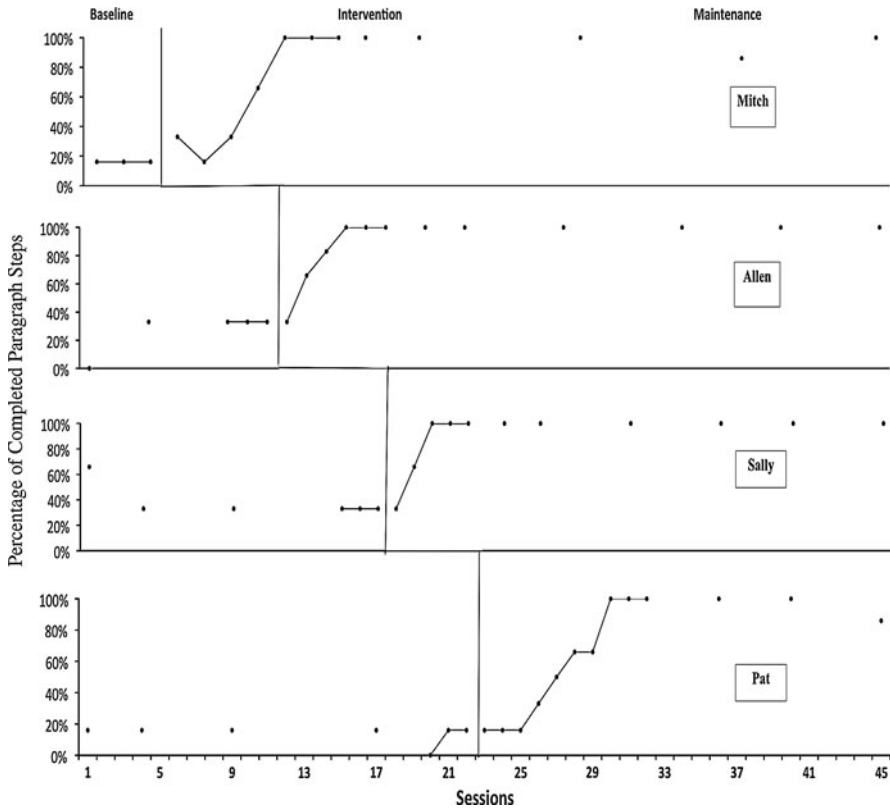


Fig. 1 Percentage of steps in a paragraph completed correctly during daily probe sessions across student participants using the simultaneous prompting procedure

onset of the intervention, the first student, Mitch, identified 50 % of the non-targeted information on the pre-test; however, he achieved 100 % acquisition of the information at post-test. Pre-test results indicated that Allen identified 83 % of the non-targeted information prior to intervention and 100 % during the post-test. Sally correctly answered 33 % of the non-targeted information prior to intervention, achieving 100 % at post-test. Pat answered 0 % of the non-targeted information prior to intervention and achieved 100 % correct at post-test.

Additional instructional data for each student are displayed in Table 2. This table depicts the percentage of errors for probe and instructional sessions as well as the time spent conducting these sessions. Note that Table 2 reflects errors in the steps only and not individual errors (e.g., capital letters, lack of punctuation) that would have been found by students in the process of proofreading.

Generalization Data

A review of writing samples from the students’ classwork indicated that Mitch and Allen generalized 100 % of the six paragraph skills and related non-target

Table 2 Instructional data results for probe and instructional sessions

Students	Probe errors (%)	Time	Instructional errors (%)	Time
Mitch	15 (35 %)	1 h 32 min	0	1 h 45 min
Allen	7 (19 %)	1 h 18 min	0	1 h 30 min
Sally	6 (20 %)	1 h 08 min	0	1 h 15 min
Pat	16 (33 %)	1 h 43 min	0	2 h 05 min
Average	11 (26.75 %)	1 h 25 min	0	1.25 h 24 min

information (e.g., capitalization, punctuation). Sally and Pat generalized all steps and non-targeted information with the exception of proofreading (i.e., finding and correcting punctuation errors). Thus, generalization probes were scored in the same manner as all probes (e.g., grammatical and punctuation errors would score as a single error in proofreading).

Social Validity Data

The 10-question teacher survey provided social validity data regarding the simultaneous prompting procedure with non-targeted information to improve paragraph composition. On a scale of 1 (strongly agree) to 5 (strongly disagree), teachers ranked such items as follows: (a) the intervention was acceptable for students with EBD and ADHD, (b) students seemed to be more confident in their writing ability, and (c) there was an overall improvement in the student's writing ability. The writing enrichment education teacher rated 80 % ($n = 8$) of the responses as "strongly agree," with only 2 responses rated as "agree." The special education teacher rated all 10 responses as strongly agree (100 %).

Responses from the student interview helped verify that student participants viewed the simultaneous prompting procedure in a positive manner. All students indicated that they would use this strategy to help a peer learn writing and it could help them to remain on-task during writing class. Students also identified other assignments in the classroom (e.g., mathematics) as well as career and leisure situations (e.g., journal writing), in which they could apply their new writing skills.

Discussion

Results from the data indicated that the simultaneous prompting procedure with non-targeted information was effective in teaching the composition of a paragraph to all four fifth-grade students identified with EBD and ADHD. Each of the students reached criterion of 100 % of the steps across 3 days. In addition, all students remained above baseline level during maintenance probes conducted up to 19 days/6 weeks later, and both students and teachers rated the intervention very favorably.

Although the majority of research has primarily focused on improving social and behavioral challenges of students with EBD and ADHD, more attention is now being given to strategies to improve both behavioral and academic skills (Lane et al. 2008;

Re et al. 2007). According to Mastropieri et al. (2009), only 1.5 % of intervention research has focused on both academic and behavioral interventions for students with EBD. Results of this investigation extend the current knowledge base regarding use of academic writing strategies for students with EBD and ADHD (Lane et al. 2008; Mason and Shriner 2008; Minscuff and Allsopp 2003). Moreover, this study also extends the knowledge base examining the effects of the simultaneous prompting procedure and its potential benefits to improve writing skills of students with EBD and ADHD (Head et al. 2011; Johnson et al. 1996).

This study also provides additional evidence that the simultaneous prompting procedure may have potential to increase student acquisition and fluency in completing a chained task. Findings of this study were consistent with other studies examining the effects of the simultaneous prompting procedure on chained tasks (e.g., Parrott et al. 2000; Rao and Kane 2009). Moreover, the special education teacher indicated that students showed substantial improvement in both proficiency and fluency on daily writing assignments in the classroom. The opportunity to write a paragraph under timed conditions, with contingent praise upon completing paragraphs, may have provided students with the modeling, feedback, and reinforcement needed to increase paragraph writing skills; in addition, similarities between training and generalization writing tasks may have facilitated accurate student performance.

Although evidence of generalization was demonstrated for all 4 students, Pat and Sally did not show evidence of proofreading and correct punctuation in their writing samples. The reason could be due to limited time allotted in class to proofread work. Both teachers commented that they had limited amounts of time to teach grammatical and proofreading skills due to preparing students to respond to open response questions on upcoming accountability tests.

Results of this study have potential implications for future research and practical application; however, several limitations need consideration. A primary limitation of this investigation was not having the teacher, paraeducator, or other qualified staff, implement the simultaneous prompting procedure. Although the teacher commented in an earlier interview that she was familiar with the procedure from her college coursework and previously observed the instructor model the procedure prior to the start of the investigation, she declined to take part in instruction due to time constraints. Future studies should consider training teachers, paraeducators, peers, or other personnel to use this procedure in both resource and inclusive classroom settings. A second limitation was lack of examination of the type of probe errors (e.g., sequential, topographical) that occurred during the study. Finally, this study was limited to only students with EBD and ADHD. Further research is needed to examine effects of the procedure with students identified with other disabilities, as well as those without disabilities who may be considered at-risk for academic and behavioral problems.

Despite the limitations, the simultaneous prompting procedure in this study was effective in teaching the composition of a complete five-sentence paragraph, which is a finding not previously reported in the literature. The simultaneous prompting procedure as a potentially effective intervention for increasing writing skills is promising, due to its efficiency and versatility. Because criterion is based on probe

trial data, instructors do not have to collect training trial data as done in this investigation. Only collecting probe data can save time and be less disruptive to the flow of instruction during small group activities (Waugh et al. 2011).

Although the simultaneous prompting procedure has a promising research base, continued research is needed further to examine alternative forms of the procedure to increase efficiency and generalization across various student populations (e.g., Johnson et al. 1996). Researchers have recommended that future studies examine the role of previous learning histories on the effectiveness of the simultaneous prompting procedure (Singleton et al. 1999), the use of error correction during probe sessions, and a comparison of intermittent versus daily probes (e.g., Waugh et al. 2011). For example, providing error correction during probe sessions may decrease instructional time since students would have more opportunities to perform correct responses; however, adding error correction to probe trials changes the focus from assessment to instruction. In addition, conducting probe trials less frequently would save time for teachers and possibly be less frustrating to students but still allow for data-based decision making.

Finally, it should be noted that the simultaneous prompting procedure facilitates fluency in that students are given a set amount of time to respond in writing. In this investigation, however, the authors did not record fluency data; this should be done in future research. Another variable for future investigations would be to measure or quantify the number of errors students locate and correct during proofreading.

Findings of this study may provide ideas for a possible approach to help students meet rising academic standards by providing teachers with an academic strategy to help struggling students reach proficiency. Due to the paucity of research in determining the effectiveness of interventions to meet the academic needs of students with EBD and ADHD, and the given benefits of the simultaneous prompting procedure, further studies are warranted to extend this knowledge base and address limitations of this current study (Waugh et al. 2011; Wehby et al. 2003).

References

- Barkley, R. A. (Ed.). (2006). Developmental course, adult outcome, and clinical-referred ADHD adults. In *Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment*, 3rd edn (pp. 197–198). New York: Guilford.
- Bergstrom, M. K. (2008). Professional development in response to intervention: Implementation of a model in a rural region. *Rural Special Education Quarterly*, 27(4), 27–36.
- Billingsley, F. F., White, O. R., & Munson, R. (1980). Procedural reliability: A rationale and an example. *Behavioral Assessment*, 2, 229–241.
- Birkan, B. (2005). Using simultaneous prompting for teaching various discrete tasks to students with mental retardation. *Education and Training in Developmental Disabilities*, 40(1), 68–79.
- Carr-George, C., Vannest, K. J., Willson, V., & Davis, J. L. (2009). The participation and performance of students with emotional and behavioral disorders in a state accountability assessment in reading. *Behavioral Disorders*, 35(1), 66–78.
- DuPaul, G. J., & Eckert, T. L. (1997). Interventions for students with attention deficit hyperactivity disorder: One size does not fit all. *School Psychology Review*, 26(3), 369–381.

- Fickel, K. M., Schuster, J. W., & Collins, B. C. (1998). Teaching different tasks using different stimuli in a heterogeneous small group. *Journal of Behavioral Education, 8*(2), 219–244. doi: [10.1023/a:1022887624824](https://doi.org/10.1023/a:1022887624824).
- Frazier, T., Youngstrom, E., Glutting, J., & Watkins, M. (2007). ADHD and achievement: Meta-analysis of the child, adolescent, and adult literatures and a concomitant study with college students. *Journal of Learning Disabilities, 40*(1), 49–65.
- Gast, D. L., & Ledford, J. (2010). Variations of multiple baseline designs and combination designs. In D. L. Gast (Ed.), *Single subject research methodology in behavioral sciences* (pp. 276–328). New York: Routledge.
- Gibson, A. N., & Schuster, J. W. (1992). The use of simultaneous prompting for teaching expressive word recognition to preschool children. *Topics in Early Childhood Special Education, 12*(2), 247–267.
- Goertz, M. E. (2005). Implementing the no child left behind act: Challenges for the states. *Peabody Journal of Education, 80*, 73–79.
- Harris, K. R., & Graham, S. (1996). *Making the writing process work: Strategies for composition and self-regulation*. Cambridge, MA: Brookline.
- Harris, K. R., Graham, S., Brindle, M., & Sandmel, K. (2009). Metacognition and children's writing. In D. J. Hacker, J. Dunlosky, A. C. Graesser, D. J. Hacker, J. Dunlosky, & A. C. Graesser (Eds.), *Handbook of metacognition in education* (pp. 131–153). New York, NY, USA: Routledge/Taylor & Francis Group.
- Head, K. D., Collins, B. C., Schuster, J. W., & Ault, M. J. (2011). A comparison of simultaneous prompting and constant time delay procedures in teaching state capitals. *Journal of Behavioral Education, 20*(3), 182–202. doi:[10.1007/s10864-011-9127-8](https://doi.org/10.1007/s10864-011-9127-8).
- Hooper, S. R., Swartz, C. W., Wakely, M. B., de Kruijff, R. E. L., & Montgomery, J. W. (2002). Executive functions in elementary school children with and without problems in written expression. *Journal of Learning Disabilities, 35*, 57–68.
- IDEIA-Building The Legacy of IDEA 2004. (n.d.). *IDEA-Building The Legacy of IDEA 2004*. Retrieved from: <http://idea.ed.gov/>.
- Jacobson, L. T., & Reid, R. (2010). Improving the persuasive essay writing of high school students with ADHD. *Exceptional Children, 76*(2), 156–174.
- Johnson, P., Schuster, J., & Bell, J. K. (1996). Comparison of simultaneous prompting with and without error correction in teaching science vocabulary words to high school students with mild disabilities. *Journal of Behavioral Education, 6*(4), 437–458. doi:[10.1007/bf02110516](https://doi.org/10.1007/bf02110516).
- Jones, G. Y., & Collins, B. C. (1997). Teaching microwave skills to adults with disabilities: Acquisition of nutrition and safety facts presented as non-targeted information. *Journal of Developmental and Physical Disabilities, 9*(1), 59–78. doi:[10.1023/a:1024944811896](https://doi.org/10.1023/a:1024944811896).
- Kaufman, A. S., & Kaufman, N. L. (2004a). *Kaufman assessment battery for children: Second edition (KABC-II)*. Circle Pines, MN: AGS Publishing.
- Kaufman, A. S., & Kaufman, N. L. (2004b). *Kaufman test of educational achievement, comprehensive form: Second edition (KTEA-II)*. Circle Pines, MN: AGS Publishing.
- Lane, K. L., Harris, K. R., Graham, S., Weisenbach, J. L., Brindle, M., & Morphy, P. (2008). The effects of self-regulated strategy development on the writing performance of second-grade students with behavioral and writing difficulties. *Journal of Special Education, 41*(4), 234–253.
- Little, M. A., Lane, K. L., Harris, K. R., Graham, S., Story, M., & Sandmel, K. (2010). Self-regulated strategies development for persuasive writing in tandem with schoolwide positive behavioral support: Effects for second-grade students with behavioral and writing difficulties. *Behavioral Disorders, 35*(2), 157–179.
- Mason, L. H., Harris, K. R., & Graham, S. (2002). Every child has a story to tell: Self-regulated strategy development for story writing. *Education and Treatment of Children, 25*, 496–506.
- Mason, L. H., Harris, K. R., & Graham, S. (2011). Self-regulated strategy development for students with writing difficulties. *Theory in Practice, 50*, 20–27.
- Mason, L. H., & Shriner, J. G. (2008). Self-regulated strategy development instruction for writing an opinion essay: Effects for six students with emotional/behavior disorders. *Reading and Writing: An Interdisciplinary Journal, 21*(1–2), 71–93.
- Mastropieri, M. A., Scruggs, T. E., Mills, S., Cerar, N. I., Cuenca-Sanchez, Y., Allen-Bronaugh, D., et al. (2009). Persuading students with emotional disabilities to write fluently. *Behavioral Disorders, 35*(1), 19–40.

- Mayes, S. D., & Calhoun, S. L. (2007). Learning, attention, writing, and processing speed in typical children and children with ADHD, autism, anxiety, depression, and oppositional-defiant disorder. *Child Neuropsychology*, *13*(6), 469–493. doi:[10.1080/0929704060111277](https://doi.org/10.1080/0929704060111277).
- Minskoff, E. H., & Allsopp, D. H. (2003). *Academic success strategies for adolescents with learning disabilities & ADHD*. Baltimore: Paul H. Brookes Publishing Co.
- Nelson, J. R., Benner, G. J., Lane, K., & Smith, B. W. (2004). Academic achievement of K-12 students with emotional and behavioral disorders. *Exceptional Children*, *71*(1), 59–73.
- Northwest Evaluation Association. (2003). *Measures of academic progress and achievement level tests*. Lake Oswego, OR: Author.
- Oliver, R. M., & Reschly, D. J. (2010). Special education teacher preparation in classroom management: Implications for students with emotional and behavioral disorders. *Behavioral Disorders*, *35*(3), 188–199.
- Parrott, K. A., Schuster, J. W., Collins, B. C., & Gassaway, L. J. (2000). Simultaneous prompting and instructive feedback when teaching chained tasks. *Journal of Behavioral Education*, *10*(1), 3–19. doi:[10.1023/a:1016639721684](https://doi.org/10.1023/a:1016639721684).
- Pennington, R. C., Ault, M. J., Schuster, J. W., & Sanders, A. (2010). Using simultaneous prompting and computer-assisted instruction to teach story-writing to students with autism. *Assistive Technology Outcomes and Benefits*, *7*(1), 24–28.
- Rao, S., & Kane, M. T. (2009). Teaching students with cognitive impairment chained mathematical task of decimal subtraction using simultaneous prompting. *Education and Training in Developmental Disabilities*, *44*(2), 244–256.
- Re, A. M., Pedron, M., & Cornoldi, C. (2007). Expressive writing difficulties in children described as exhibiting ADHD symptoms. *Journal of Learning Disabilities*, *40*(3), 244–255. doi:[10.1177/00222194070400030501](https://doi.org/10.1177/00222194070400030501).
- Schumaker, J. B., & Deshler, D. D. (2009). Adolescents with learning disabilities as writers: Are we selling them short? *Learning Disabilities Research & Practice*, *24*(2), 81–92.
- Schuster, J. W., Griffen, A. K., & Wolery, M. (1992). Comparison of simultaneous prompting and constant time delay procedures in teaching sight words to elementary students with moderate mental retardation. *Journal of Behavioral Education*, *2*(3), 305–325. doi:[10.1007/bf00948820](https://doi.org/10.1007/bf00948820).
- Singleton, D. K., Schuster, J. W., Morse, T. E., & Collins, B. C. (1999). A Comparison of antecedent prompt and test and simultaneous prompting procedures in teaching grocery words to adolescents with mental retardation. *Education and Training in Mental Retardation and Developmental Disabilities*, *34*(2), 182–199.
- Smith, B. R., Schuster, J. W., Collins, B., & Kleinert, H. (2011). Using simultaneous prompting to teach restaurant words and classifications as non-target information to secondary students with moderate to severe disabilities. *Education and Training in Autism and Developmental Disabilities*, *46*(2), 251–266.
- Tawney, J. W., & Gast, D. L. (1984). *Single subject research in special education*. Columbus, Ohio: C.E. Merrill Pub. Co.
- Vannest, K. J., Temple-Harvey, K. K., & Mason, B. A. (2008). Adequate yearly progress for students with emotional and behavioral disorders through research-based practices. *Preventing School Failure*, *53*(2), 73–84.
- Waugh, R. E., Alberto, P. A., & Fredrick, L. D. (2011). Effects of error correction during assessment probes on the acquisition of sight words for students with moderate intellectual disabilities. *Research in Developmental Disabilities: A Multidisciplinary Journal*, *32*(1), 47–57.
- Wehby, J. H., Lane, K. L., & Falk, K. B. (2003). Academic instruction for students with emotional and behavioral disorders. *Journal of Emotional and Behavioral Disorders*, *11*(4), 194–197.
- Werts, M. G., Wolery, M., Holcombe, A., & Gast, D. L. (1995). Instructive feedback: A review of the parameters and effects. *Journal of Behavioral Education*, *5*, 55–75.
- Wolery, M., Ault, M. J., & Doyle, P. M. (1992). *Teaching students with moderate and severe handicaps: Use of response prompting strategies*. New York: Longman.
- Wolery, M., Bailey, D. B., & Sugai, G. M. (1988). *Effective teaching: Principles and procedures of applied behavior analysis with exceptional students*. Boston: Allyn and Bacon.
- Ysseldyke, J., Nelson, J., Christenson, S., Johnson, D. R., Dennison, A., Triezenberg, H., et al. (2004). What we know and need to know about the consequences of high-stakes testing for students with disabilities. *Exceptional Children*, *71*(1), 75–96.