The Effects of Writer Immersion and the Responses of a Peer Reader on Teaching the Function of Writing with Middle School Students

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Abstract

We tested the effects of writer immersion and the responses emitted by a peer reader across four male middle school participants diagnosed with behavioral disorders. The participants were chosen for this study due to their high structural errors and inability to write functionally in order to affect the behavior of a reader. Writer immersion and the observing responses of a peer reader were used to increase both accurate structural and functional components of written responses to a probe picture and selected tasks. The dependent measures were the percentage of accurate structural components written during the pre- and post-experimental probes, the number of components drawn by the reader during the pre- and post-experimental probes, the percentage of accurate structural components written during the writer immersion phase and the number of components completed by the reader during the writer immersion phase. Results showed that the writer immersion procedure and the effect of the peer reader's responses to the participant's writing functioned to increase accuracy in the both structure and function of writing across all four participants.
Keywords*:* writer immersion, technical writing, functional writing, peer reader, self-editing.

Writing is a crucial skill for children to acquire. While there is much emphasis on the form of writing, little emphasis has been placed on the teaching of the function of writing and its impact on a potential reader. In fact, many national standards focus on overarching goals in which children are required to speak and write from a variety of perspectives and across numerous tasks, but the effect that the child's writing has on the reader is seldom addressed. Just as a speaker utilizes vocal language to affect the listener, a writer writes in order to affect the reader. The writing repertoire of the child needs to be able to be clear enough to direct the behavior of the reader so that the reader will accurately perform the tasks required of him (Greer, 2002). According to Catania (1998), from a verbal behavior analysis or the functionalist perspective, units of speech are identified according to their function for the speaker or writer. Verbal behavior has consequences and these consequences affect subsequent verbal behavior. In other words, verbal behavior is characterized by the effect one person has on another person including effects on the listener and speaker, as well as the effects of the writer on the reader (Greer & Ross, 2007).

According to Greer and Ross (2007) in order to teach effective and functional writing, the curriculum must focus on instructing the writer on how to influence the actions of the reader. This type of technical writing is based on the outcomes of the writer's instructions to the reader. For example, the writer may produce written instructions for assembling a bicycle or baking a cheesecake. The descriptions that are provided to the reader are the stimulus control for the reader to act upon the instructions.

The curriculum for functional writing must focus on creating an establishing operation and relevant contingencies within the environment by assigning tasks that allow the writer to observe the effect that his writing has on a reader. Vargas (1978) arranged conditions in which the participants were assigned a writing task in which they how provide directions on how to complete a certain task. The participant had the reader complete the task based on the written information provided, and if the reader could not complete the task based on the directions, the writer immediately edited the directions so that the reader

could complete the task accurately. Therefore, the reader's behavior affected the writer's behavior by prompting the editing and the writer's behavior affected the reader's behavior through the directions provided for the task completion.

Verbal behavior training programs incorporate establishing operations in which the child's environment is manipulated to co-create naturally occurring motivational conditions in order to increase the frequency of verbal responses (Michael, 1988, 1993). Several experiments have identified establishing operation tactics that have been effective in producing the motivational contexts necessary to teach listener and speaker verbal capabilities (Greer & Keohane, 2005; Greer & Ross, 2007).

Listener immersion is an establishing operation that teaches the child to come under the auditory control of vowel-consonant combination to induce the consonant vowel control necessary for basic listener literacy (Greer, Chavez-Brown, Nirgudkar, Stolfi, & Rivera-Valdes, 2005). Listener immersion requires that all instruction be devoted to the child being taught to respond to vowel-consonant combinations until the child can respond consistently and solely to the vowel-consonant sound of instructions that are delivered. Greer, Chavez-Brown et al. reported the significant acceleration of rates of learning by eight pre-school children diagnosed with developmental disabilities as a function of listener immersion.

In addition to listener immersion, speaker immersion is often used to create conditions of deprivation or need so that the child learns to emit vocal verbal behavior in order to manipulate his environment. Ross, Nuzzolo, Stolfi, and Natarelli (2006) tested the effects of speaker immersion across four pre-school participants classified as having communication delays. The speaker immersion tactic uses multiple establishing operations to increase speaker behavior for individuals with limited mand and tact repertoires (Greer, 2002). Results of this study showed that speaker immersion resulted in increased mands, tacts, and autoclitics for all the participants.

Another establishing operation tactic from verbal behavior analysis (Greer & Ross, 2007) that was used in this study is writer immersion. Writer immersion is a procedure that includes setting aside a period of time in which all communication is done through written responses (Greer, 2002). Writer immersion creates the condition of the "need to write" so that the child must communicate solely through the medium of written communication. During a specified period of time, the child is provided with a writing utensil and paper and instructed to complete assignments, ask questions and request reinforcers through writing. Teachers conduct learn units in writing for structure and function and students respond until they affect the teacher's behavior.

Madho (1997) tested the effects of the responses of a reader on the effectiveness of a written description provide by the participant. Participants were required to edit their writing of a description of an object or task. Prior to the use of writer immersion, the participants were unable to provide the reader with accurate descriptions of the task to be performed or objects to be identified. After the impletion of the writer immersion procedure, the participants' writing significantly improved so that the reader could identify the object or complete the described task. Jadlowski (2000) tested the effects of self-editing and revising of written work on the behaviors of four developmentally disabled students. This study showed that when a target student acts as the peer editor, the student editor's writing improves significantly more than that of the student who received the corrections. Visalli-Gold (2005) studied the writing repertoires of emotionally disabled middle school students. Peer confederates were provided learn units on their writing while the participants observed the peer confederate receive the learn units and corrections for their writing. Results showed that both observing peers and those who received direct instruction on their writing, increased their writing accuracy for technical writing. According to Greer (2002), in order for the writer to acquire the self-editing repertoire, it is the teacher correction, or edits, that teaches the student to learn to respond to verbal antecedents so that the behavior of the reader is affected. In order for a student to achieve success using writer immersion, it is critical that the student is required to rewrite or recycle the essay until the

desired effect is achieved. (Greer, 2002).

Reilly-Lawson and Greer (2006) found writer immersion procedure to be a successful tactic for teaching the function of writing with middle school students with academic delays. They investigated the effects of the students' writing on responses emitted by readers who were naïve to the conditions and objectives of the experiments under writing immersion conditions. They conducted two experiments in the study.

In the first experiment, during baseline, the experimenter gave participants a picture with a number of components (colors, shapes, letters, words located at different areas on the paper) and written instructions to write a paragraph describing the picture. After the target students finished their writing, the written response was given to a naïve reader. The reader drew a picture based only on the student's written instructions. The target students did not see the effects of their writing on the reader's drawings and received no feedback on their writing. In the second phase, experimenter editing was given to both the writer and the reader. The experiment gave the students a picture and written antecedent as in the baseline condition. The reader then read the target student's written responses and drew a picture based on the student's written instruction. The experimenter then provided learn units (Greer & McDonough, 1999) for the structural components of the writing in written form. The function of the writing was also discussed in vocal form. The paper was returned to the student and the student had to rewrite the essay with the corrections for each structural and functional component until the student met the criterion at 100% accuracy in structural components for the essay. In the third phase, writer immersion was implemented. In addition, the experimenter also gave the students a picture and written directions to describe the picture as in the baseline phase. The written instructions were then given to a naïve reader and the reader drew a picture based on the written instructions provided only. Learn units were given in written form for the structural components of the essay and the picture drawn by the naïve reader was also given to the writer. The writer saw the effects of their writing and the feedback given by the experimenter, and then rewrote the essay until criterion was met.

The results showed increases in the numbers of sentences written and the percent of accurate structural components after the experimenter editing was completed. However, the number of correct components drawn by the reader did not increase until after the writer immersion procedure was implemented. In other words, the use of learn units alone was not effective on teaching middle school students the function of writing.

In the second experiment, all of the components were the same as the first experiment except that the writer immersion procedure and the students viewing the effects of their writing on the reader were used as the independent variable. After the writer immersion condition, the students edited their own writing after viewing drawings done by a reader. The students kept editing their essay until their writing met criterion of 100% accuracy on both structural and function components prior to experimenter editing. The results again showed a significant increase in both functional and structural accurate components of writing of the students.

The purpose of the present study was to examine the effects of writer immersion with a peer yoked contingency and the function of the writer observing a peer reader on the teaching of the functional and structural components of writing with four middle school students. Pre- and post-experimental probes consisted of a picture given to the participants to describe with no peer feedback or teacher edits. During the treatment phase, four "how-to" tasks were given to each participant in which the participants had to write instructions for each task in order for a reader to complete the tasks. The tasks were the following: 1) how to make a peanut butter sandwich, 2) egg hunt I, 3) egg hunt II, and 4) how to make a snowman.

Method

Participants

Four middle school students participated in this study. All participants were selected from an 8th grade classroom in which all instruction employed a behavior analytic approach. Participant 1 was a 13-year old male diagnosed with a behavioral disorder. He functioned at a reader/writer level of verbal behavior. He was assessed to have a full IQ score of 59 with the Wechsler Intelligence Scale for Children (WISC)-III. He was also assessed using the Terra Nova Reading and Math (2005) scoring a grade equivalent of 2.0 in both areas. Participant 2 was a 14-year old male diagnosed with a behavioral disorder and also functioned at a reader/writer level of verbal behavior. Participant 2 was assessed with WISC-IV with a full scale IQ score of 70. He functioned at 3.9 grade level equivalent as assessed through Woodcock Johnson-III Acheivement Test. Participant 3 was a 13-year old male diagnosed with emotional disabilities. His WISC-IV full scale IQ score was a 52 when last tested in 2005. His 2005 Terra Nova reading grade equivalent score was a 1.1 and 0.8 in math. Participant 4 was a 15-year old male also diagnosed with an emotional disability. His WISC-IV full scale IQ score was a 72 when last tested in 2006.

Table 1. Description of Participants

Participant	Age	Level of Verbal Capability	Full Scale IQ
Participant 1	13	reader/writer	WISC-IV 82
Participant 2	14	reader/writer	WISC-III 83
Participant 3	13	reader/writer	WISC-III 70
Participant 4	15	reader/writer	WISC-IV 52

According to Greer and Keohane (2005) verbal repertoires can be placed into categories or stages which provide behavioral functions in order for instructors to develop a verbal behavior based curricula. In turn, these categories help provide a functional approach to change state and national standards into teachable higher order operants necessary for a child to increase learner independence. All of the participants in this study were at the reader/writer levels of verbal behavior. More specifically, all participants had full naming across 2-dimensional and 3-dimensional objects, textually responding at a rate of 100 words per minute, print transcription, say-do correspondence, print transcription, reading governs responding, listening to story read by others as conditioned reinforcer, respond to own textual responding as listener and joint stimulus control across saying and writing. The participants were chosen for this study due to their inability to write functionally as well as a high number of structural errors in their writing.

Setting

All participants attended a special education classroom that employed a behavior analytic approach to teaching in a public middle school in a metropolitan area (Greer, 2002). The classroom contained one head teacher, two teaching assistants and seven students. All pre- and post probe sessions of the study were conducted at the back of the classroom at a rectangular-shaped table (4ft X 2.5ft). Writer immersion sessions took place while each participant was seated at an individual rectangular student desk which was arranged in rows facing the front of the classroom. All students in the classroom were diagnosed with emotional/behavioral disabilities. All instruction was presented in the form of learn units (Greer &

McDonough, 1999). During the pre- and post-probe and the writer immersion sessions, the participants were either seated at the back of the classroom or at their own desks.

Design

A delayed multiple probe across participants design was used in this study. Each participant was probed following the baseline and the writer immersion treatment conditions (Horner & Baer, 1978). The sequence of the experiment was: 1) pre-experimental probe on Picture A in which no feedback or consequation was given for participants, 2) writer immersion, peer yoked contingency and teacher editing for the following writing sessions of: how to make a peanut butter sandwich, Egg Hunt I, Egg Hunt II, and how to make a snowman 3) post-experimental probe on Picture A in which no feedback or consequation was given for participants.

Dependent Variables: Structural and Functional Writing Measures

The dependent measures in this study were the number of accurate structural components written during the pre- and post-experimental probes, the number of components drawn by the reader during the pre- and post-experimental probes, the percentage of accurate structural components written during the writer immersion phase and the number of components completed by the reader during the writer immersion phase. Across all the conditions of the study, the target behaviors were the structural components (i.e., spelling, grammar, punctuation) and functional components of the participants' writing. The function of the participants' writing was measured by the effects the writing had on a peer reader (i.e., the reader accurately completes the drawings per the writer's instructions).

In the pre- and post- probe sessions, each participant was given the same picture (Picture A) to describe in writing. The picture included colored shapes, lines, and a number. Each picture or session consisted of 20-components for the reader to draw based on the writer's instructions. Students were to include detailed descriptions of 20 steps for drawing the picture during probe sessions. The participants had to describe each of the specific components of the drawing: 1) the two shapes, 2) the colors of the shape, 3) if the shapes were shaded in or not 3) the position of the shapes on the page, 4) the number, 5) the color of the number, 6) the line, 7) the color of the line, 9) the position of the line on the page. After the participant finished the probe session, the written responses were given to a peer reader. The peer reader then tried to accomplish the task according to the participant's written instruction. The number of components the peer reader followed correctly was measured as the number of accurate functional components of the participant's writing. A participant's writing description was determined to be functional if the peer reader could replicate Picture A with 100% accuracy based on the written description provided.

During the writer immersion treatment phase, each participant was provided with four tasks to write instructions for: 1) how to make a peanut butter sandwich, 2) Egg hunt I, 3) Egg hunt II, and 4) how to make a snowman. The participants had to describe each "how-to" for each task in written form. Each task consisted of 20 components.

The first task included all the steps needed in order to make a peanut butter and jelly sandwich. The participants were to include the followings steps in their written descriptions: 1) materials needed for making the sandwich which included two knives, a loaf of bread, peanut butter, jelly and a plate, (each material is counted separately for a total of 5 steps), 2)open the peanut butter jar, 3) open the jelly jar, 4) open the bread package 5) take out two slices of bread, 5) place the two slices of bread next to each other on the plate, 6) take one knife, place it in the peanut butter jar and scoop out some peanut butter 7) spread the peanut butter on one slice of bread 8) take the other knife, place in it the jelly jar and scoop out some jelly, 9) take the jelly and spread it on the other piece of bread 10) take the two pieces of bread and lie one

on top of the other so that the jelly and peanut butter face each other 11) close the lid of the peanut butter jar 12) close the lid of the jelly jar 13) close the bread 14)put all the materials back in the proper locations 15) it is now time to eat your sandwich.

The second and third writing tasks were comprised of an "Egg Hunt" in which the experimenter and the participant walked to two different locations outside of the classroom setting, one location for 'Egg Hunt I" and another location for "Egg Hunt II". Once at the specified location, the experimenter and participant hid a plastic egg that contained primary reinforcers in the form of candy and coins. This location was unknown to the peer reader. The purpose of the writing task was for the participant to provide the peer reader written directions from the classroom to the egg's hidden location. Each of the written direction tasks included 20 components.

The final writing task was, "How to make a snowman," in which each participant made his own snowman prior to writing the instructions for the task. Each participant was provided with the following materials prior to making his snowman: 1) a pre-cut form of three white circles and two long thin rectangles made out of construction paper that represented the body and arms of the snowman, 2) numerous pairs of shapes for eyes which included pink triangles, blue squares, purple circles, red ovals, and green diamonds, 3) singular shapes for a nose which included an orange square, a blue square, green diamonds, a purple circle, a brown oval, and a red triangle, 4) different colored hats consisting of hats with and without fringes, pom-poms, and bells 5) various colors of mittens for the ends of each arm, and 6) different types of mouths that included smiles with missing teeth, smiles with sharp teeth, closed lipped smiles and frowns. After the participant created his snowman, he wrote instructions to the peer on how to replicate his snowman by providing the peer reader with the shape and color to choose and the position in which to glue the shape on the pre-cut form, so that when a peer reader followed the written instructions, he would produce the same snowman as the one created by the participant. Each snowman creation consisted of 20 components based upon each individual participant's creation.

In addition to function of the writing and the number of correct components written by the participant, data were also collected on the structural components of the participant's writing. Structural measures included the percent of accurate structural components (grammar, spelling, punctuation, and sentence structure) throughout the essay. These measures were converted to percentage by dividing the numbers of correct responses to spelling, grammar, punctuation, and sentence structure divided by the total numbers of opportunities to respond within each essay and multiplied by 100%.

Independent Variables: Writer Immersion Package

The independent variables for this study was a package that included: 1) writer immersion, 2) the yoked contingency of the peer reader and 3) teacher editing of structural components.

During the pre- and post-experimental probes, the experimenter provided the participant Picture A in which he had to write a paragraph describing the picture during a typical instructional session. A peer reader then read the participant's written instructions independently and drew a picture based only on the participant's written responses. The participant did not see the effects of his writing on the peer reader's drawing. Therefore, no feedback or consequation for structure or function was provided to the participant during the pre- and post- experimental probes. Data were collected and measured based on the number of accurate components of the drawing was counted and percentage of correct structural components was calculated.

During all treatment phases, the writer immersion procedure was implemented, in which all communication between the participants, peers and experimenters was done through written responses for a specified period of time each day (Greer, 2002). The participant was provided with a written antecedent

to write a paragraph describing the steps for a specified task. In addition, the participant was provided with paper and a pencil.

After completion of each of the written tasks, a peer reader from the same classroom sat next to the participant and read the participant's writing aloud while the participant observed the peer reader implement each of the written directions provided. While the participant sat silently beside the peer, he was able to view the effects of his writing on the reader. This peer yoked contingency provided the participant with direct feedback on the effectiveness of his written directions. If the peer reader was able to complete the task with 100% accuracy, the participant met the criterion for the functional writing components. If not, the participant rewrote the instructions until the peer reader could complete each task successfully.

In addition, the experimenter provided learn units to the participant in written form for the structural components of the essay. After the peer reader read the participant's written instructions in order to complete the task, the experimenter edited the writing for the structural components. The experimenter then returned the written directions to the participant, and the participant has to rewrite directions while making all the corrections provided by the experimenter. Criterion for the implementation of the treatment was set at 100% accuracy for functional components and 90% accuracy for structural components after editing.

Data Collection

During the probes, the numbers of the components drawn by the peer reader served as the measure of the effectiveness of the participant's writing on the reader. Structural accuracy was measured by counting the number of correct spelling, the number of correct punctuation, and the number of correct structural components and grammar for each essay. No feedback was given during the probes. During the treatment phase, the number of the steps the reader accomplished in a task served as the measure of the effectiveness of the participant's writing on the peer reader. The same measurement procedure was used for the structural components as during the probes. During the treatment sessions, the experimenter provided and collected data on responses to learn units for the structural components of participant's writing.

Interscorer Agreement

Interscorer agreement (ISA) was obtained by comparing the experimenter and an independent reader measure of all aspects of four participants' writing during 63% of the treatment phase sessions and during 100% of the pre-and post-experimental probes. Point-to-point interscorer agreement was calculated by dividing the number of agreements by the number of agreements and disagreements and multiplying by 100. The lead experimenter and one other experimenter scored each participant's writing assignment with total correct words out of total incorrect and correct words, grammar, and punctuation, and sentence structure to obtain the ISA for the structural component of writing. The ISA measurement was conducted during 65% of the treatment phase and 100% during the pre/post experimental probes with a mean interscorer agreement of 100% for the structural component of writing during both the treatment and probes sessions for Participant 1. For Participant 2, the ISA measurement was conducted during 63% of the treatment phase and 100% during the probe sessions with a mean ISA of 98% and 100% for the structural component of writing during the treatment session and the probe session respectively. The mean ISA measurements for the functional component of the writing for Participant 1 and 2 were both 100% across the treatment phase and the probe sessions. For Participant 3, the ISA measurement was conducted for 84% of the treatment phases and 100% for the probes sessions with a mean interscorer agreement of 92% for structural and 100% for functional. For Participant 4, the ISA measurement was conducted for 95% of the sessions during the treatment phase and 100% of the probe sessions. The mean interscorer agreement for structural components was 97% and 100% for functional components.

Results

Figure 1 shows the number of components of the drawing the participant described accurately measured by the components drawn by the peer reader during pre- and post-experimental probes. During the pre-experimental probe, the peer reader for Participant 1 drew 5 of the 20 components of the drawing correctly. After writer immersion and the peer yoked contingency, the number of correct components drew by the peer reader increased to 20 out of the 20 components. For Participant 2, during the pre-experimental probe, the peer reader drew 6 of the 20 components of the drawing correctly. After writer immersion and the peer yoked contingency, the number of correct components drawn by the peer reader increased to 19 out of the 20 components. The peer reader for Participant 3 drew 6 of the 20 components of the drawing correctly during the pre-experimental probe and the number of components drawn correctly after treatment increased to 18 out of 20 correct components. During the pre-experimental probe, the peer reader for Participant 4 drew 14 of the 20 components of the drawing correctly. After treatment, the number of correct components drew by the peer reader increased to 18 out of 20 components.

FIGURE 1, NEXT PAGE!

Figure 1.

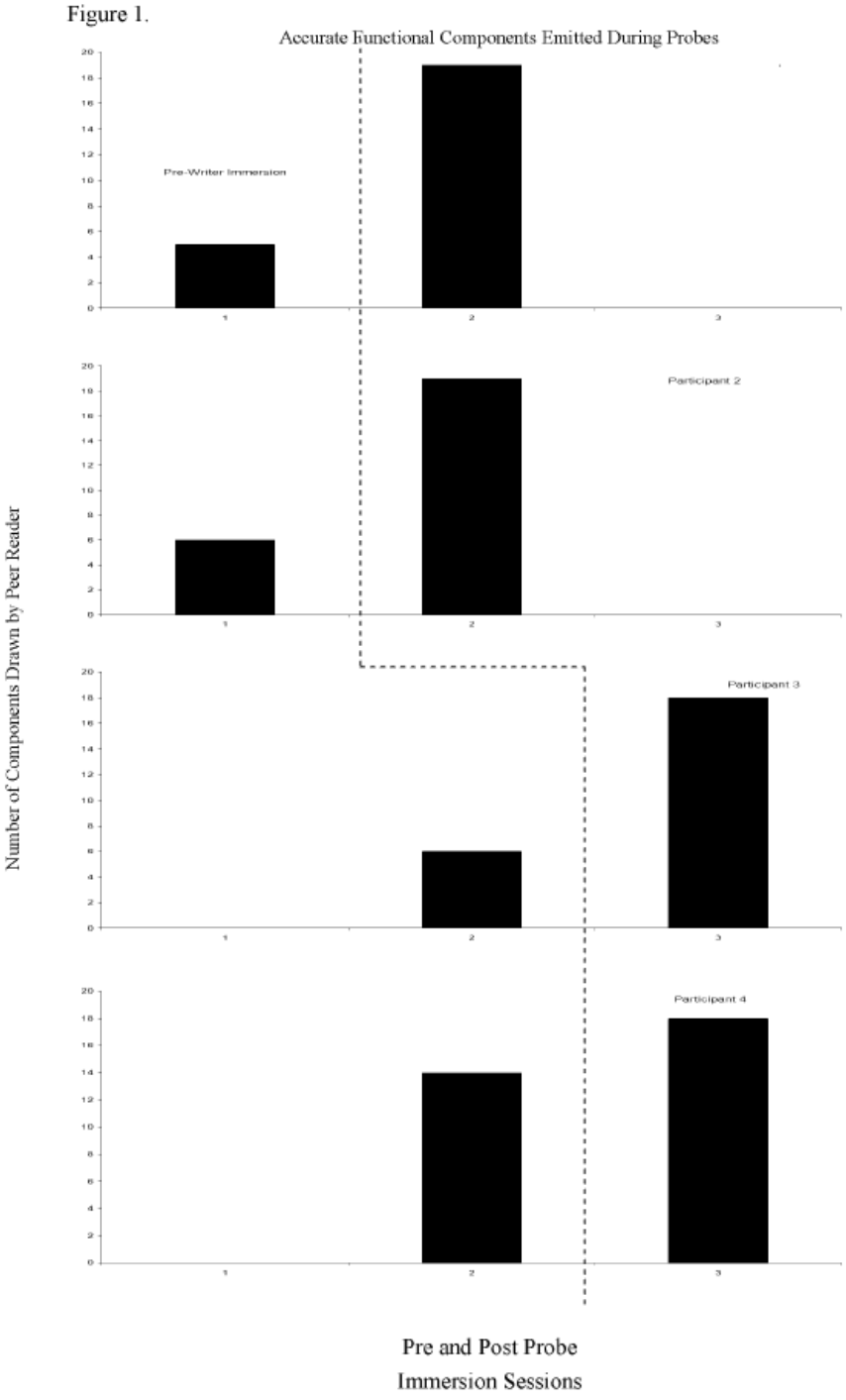

Figure 1. Figure 1 shows the number of accurate functional components emitted during the pre- and post- experimental probes

Figure 2 shows the percentage of accurate structural components written during pre- and post-experimental probes. Participant 1 emitted 42% accurate structural components during the pre-probe and after writer immersion and teacher editing, the percentage of structural accuracy increased to 83% during the post-probe session. Participant 2 emitted 61% accurate structural components during the pre-probe and after writer immersion and teacher editing, the percentage of structural accuracy increased to 82%. Participant 3 emitted 61% accurate structural components during the pre-probe and after writer immersion and teacher editing, the percentage of accurate structural components increased to 93% during the post-probe. Participant 4 emitted 67% accurate structural components during the pre-probe and the percentage of accurate structural components increased to 93% during the post probe.

Figure 2.

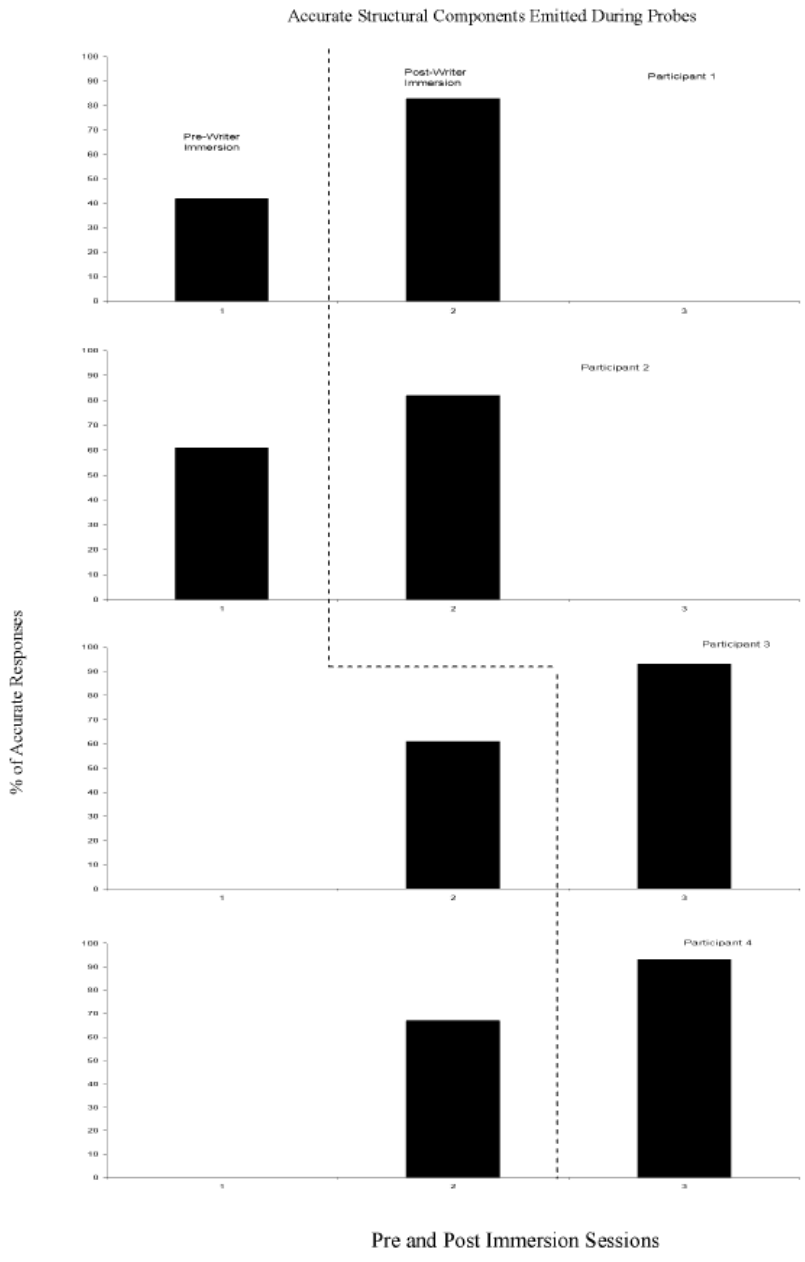

Figure 2. Figure 2 shows the percentage of accurate structural components emitted during the pre-and post- experimental probes

Figure 3 shows the numbers of components of the drawing the student described accurately measured by the components drawn by the peer reader during the treatment phase. For Participant 1, during the first phase of the treatment "How to make a peanut butter sandwich," he required 4 sessions to meet criterion set at 100% accuracy and the number of components completed by the reader ranged from 1 to 20 out of 20 components with a mean of 10.75 components completed. During the second phase of writer immersion "The egg hunt I," Participant 1 met criterion in 2 sessions and the number of components completed by the reader increased to 20 from 7. The reader during the third phase of the treatment "The egg hunt II" completed all 20 components in the first session for Participant 1. Lastly, during the phase of "How to make a snowman", the number of components completed by the reader increased to 20 from 15. Participant 1 reached criterion in this phase in 2 sessions. For Participant 2, during the first phase of the treatment "How to make a peanut butter sandwich," he required 3 sessions to meet the 100% accuracy criterion and the number of components completed by the reader ranged from 1 to 20 out of 20 components with a mean of 8.3 components completed. During the second phase of writer immersion "The egg hunt I," Participant 2 met criterion in 2 sessions and the number of components completed by the reader increased to 20 from 3. The reader during the third phase of the treatment "The egg hunt II" completed all 20 components in the first session for Participant 2. Lastly, during the phase of "How to make a snowman," the number of components completed by the reader increased to 20 from 18. Participant 2 reached criterion in this phase in 2 sessions.

FIGURE 3, NEXT PAGE!

Figure 3.

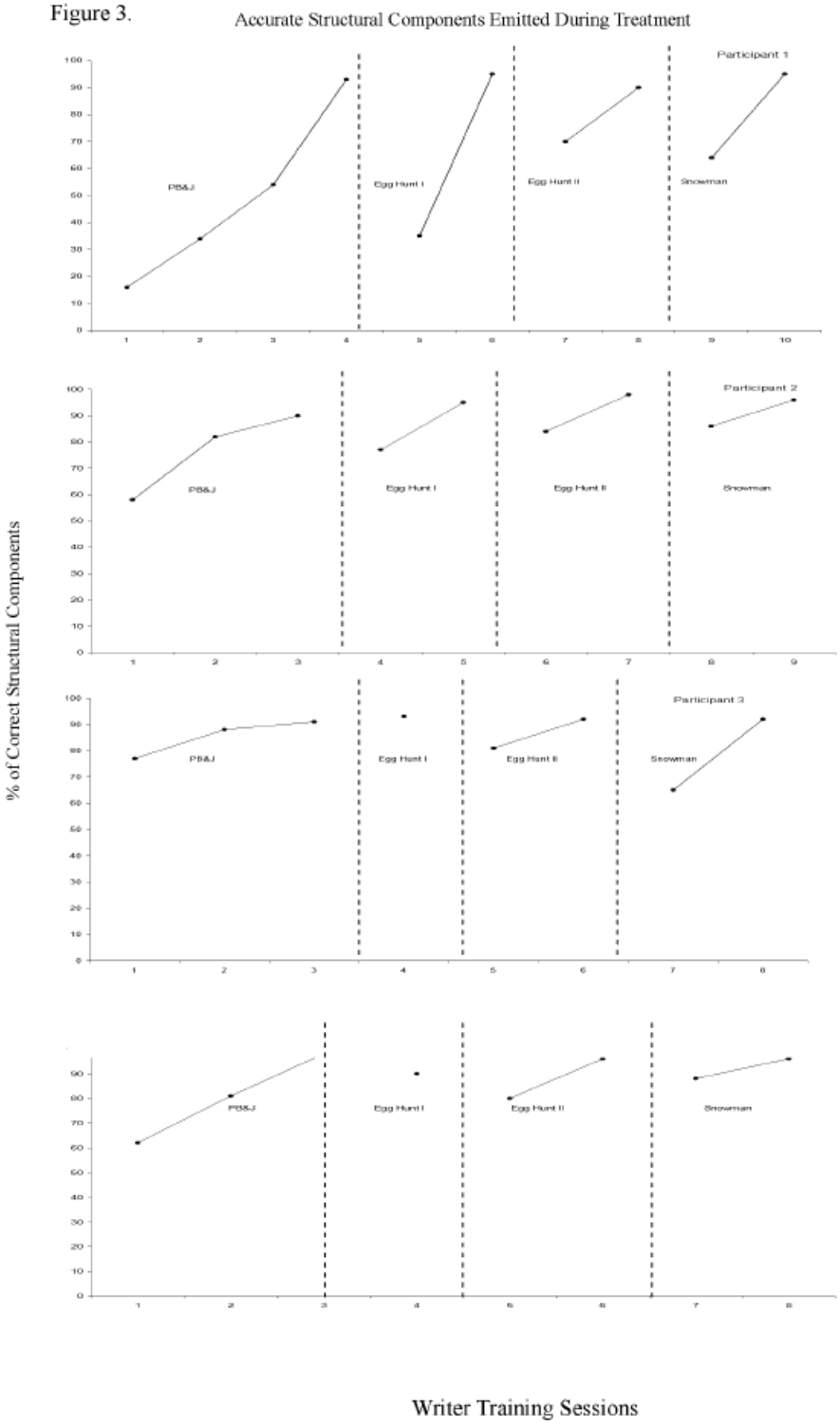

Figure 3. Figure 3 shows the percentage of accurate structural components emitted during the treatment phase.

For Participant 3, during the first phase of the treatment "How to make a peanut butter sandwich," he required 4 sessions to meet the 100% accuracy criterion and the number of components completed by the reader ranged from 7 to 20 out of 20 components with a mean of 13 components completed. During the second phase of writer immersion "The egg hunt I," Participant 3 met criterion in 1 session with a score of 20 out of 20 components completed. In the third phase "The egg hunt II," Participant 3 required 2 sessions to meet criterion with a score of 19 and 20 respectively. Lastly, during the phase of "How to make a snowman," the number of components completed by the reader was again 20 out of 20 steps. For Participant 4, during the first phase of the treatment "How to make a peanut butter sandwich," he required 2 sessions to meet the 100% accuracy criterion and the number of components completed by the reader was 6 in the first session and 20 in the second session. During the second and the third phase of writer immersion "The egg hunt I and II," Participant 4 met criterion in 1 session with a score 20 out of 20 steps completed by the reader. Lastly, during the phase of "How to make a snowman," the number of components completed by the reader increased to 20 from 17. Participant 4 reached criterion in this phase in 2 sessions.

Figure 4 shows the percentage of accurate structural components emitted by each participant during writer immersion. The mean percentage of accurate structural components for Participant 1 in the first phase "How to make a peanut butter sandwich" was 49.25% with a range of 16% to 93% in 4 sessions. The mean percentage of accurate structural components in the second phase "The egg hunt I" was 65% with a score of 35% and 95% in two sessions. The mean percentage of accurate structural components in the third phase "The egg hunt II" was 80% with a score of 80% and 90% in two sessions. The mean percentage of accurate structural components in the "How to make a snowman" was 80% with a score of 64% and 95% in two sessions for Participant 1. For Participant 2, the mean percentage of accurate structural components in the first phase "How to make a peanut butter sandwich" was 76% with a range of 58% to 90% in 3 sessions. The mean percentage of accurate structural components in the second phase "The egg hunt I" was 86% with a score of 77% to 95% in two sessions. The mean percentage of accurate structural components in the third phase "The egg hunt II" was 91% with a score of 84% to 98% in two sessions. Lastly, the mean percentage of accurate structural components during "How to make a snowman" was 91% with a score of 86% to 96% in two sessions.

FIGURE 4, NEXT PAGE!

Figure 4.

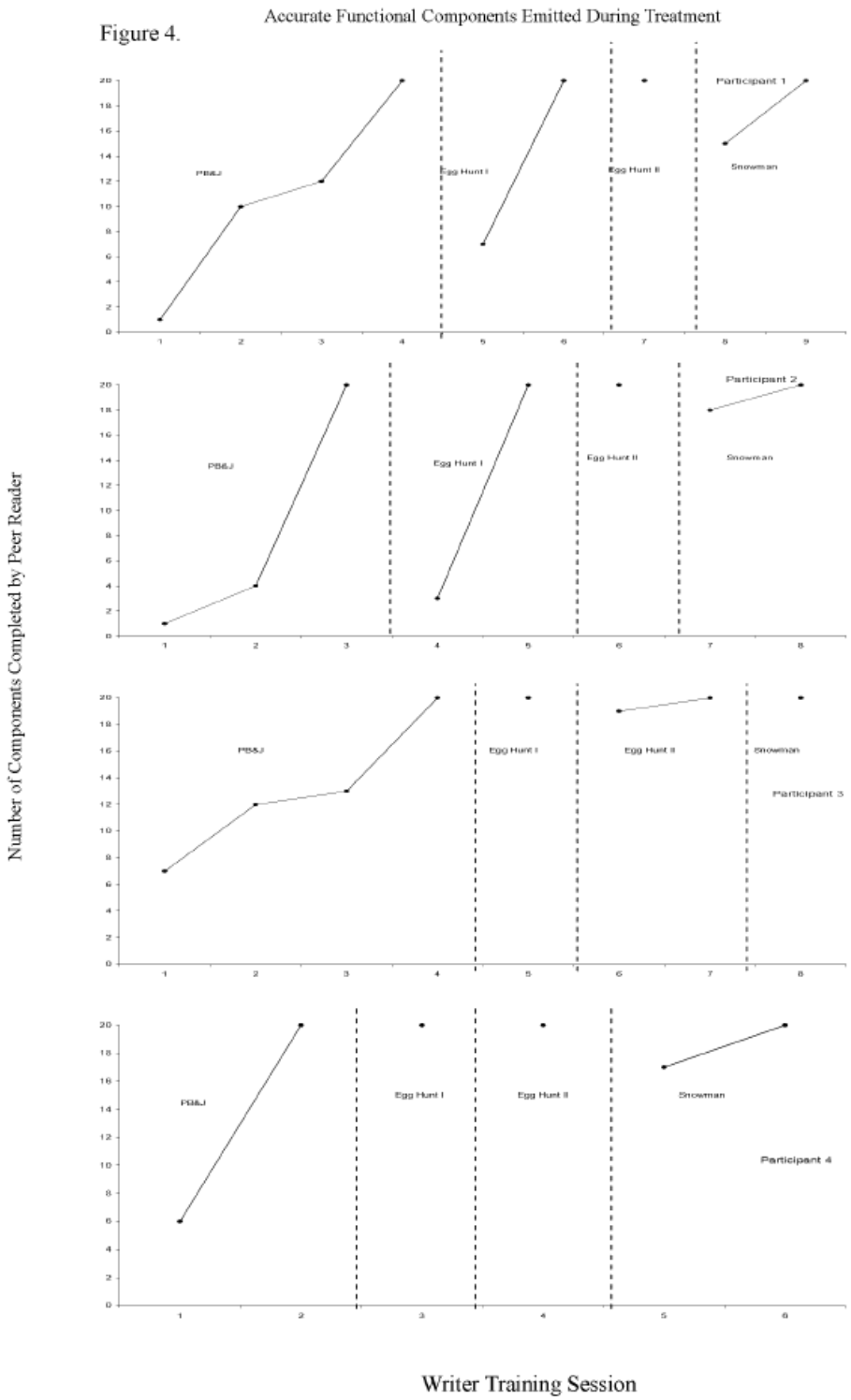

Figure 4. Figure 4 shows the number of accurate components completed by the reader during the treatment phase.

For Participant 3, the mean percentage of accurate structural components in the first phase "how to make a peanut butter sandwich" was 85% with a range of 77% to 91% in 3 sessions. The percentage of accurate structural components in the second phase "The egg hunt I" was 93%. In the third phase, Participant 3 scored 81% in the first session and scored 92% in the second session. The mean percentage of accurate structural components during "How to make a snowman" was 79% with a score of 65% and 92% in two sessions. Participant 4 had a 80% mean percentage of accurate structural components in the first phase with a range of 61% to 98% in three sessions. The percentage of accurate structural components in the second phase was 90% in the first session, which was the criterion. In the third phase, the participant increased from 80% accuracy in the first session to 96% in the second session. In the fourth phase, the participant scored 88% in the first session and increased to 96% in the second session.

Discussion

The data showed a significant increase in the percent of accurate structural components written and the number of components drawn by the peer reader during the post-experimental probe sessions across all four participants. As a result of writer immersion, the participants' viewing the effects of their writing on the peer reader's behaviors and the experimenter edits and recycles, a treatment package was created which effectively changed the writer behavior of four participants that did not have functional or technical writing in their repertoires during pre-experimental probes. In addition, there was a significant difference in the structural components of writing after the implementation of writer immersion. The results indicated that writer immersion is an effective tactic to teach these participants to write functionally. In addition, it also improved their accuracy in the use of the structural components of writing. For all participants, as they wrote to affect the behavior of the reader, the number of accurate technical components increased. Moreover, the number of sentences increased significantly for all the participants.

It is also noteworthy that as the participants moved through the four treatment phases, the number of accurate components completed by the peer reader and the percentage of accurate structural components in the first session of each phase increased incrementally as compared to the data in the first session of each preceding phase. This suggested that each phase of the treatment procedure strengthened the participants' ability to write functionally as well as increase their structural accuracy.

In addition, the participant's ability to view the peer reading the writing aloud and implementing each of the steps was very highly effective in having the participant change his writing behavior to result in a more effective revision. In the Reilly-Lawson & Greer (2006) study, a naïve reader followed the directions of the writing while in a separate location. The participants only saw the final effect of their writing by seeing the completed accurate or inaccurate implementation of their written description. Throughout the course of the treatment package in this study, the participants viewed every step of implementation and observed the immediate effects of their writing on the readers' responses. It is important to note this difference between the two studies, and how immediately viewing the writing effects may be either a more effective procedure or part of a sequence of procedures.

Overall, the combination of the establishing operation of writer immersion, the implementation of the peer reader while the participant viewed the immediate effects of the writing, and experimenter edits for recycles led the participants in this study to acquire the significant skills of functional and technical writing within the higher order verbal capability of writer status. Without the means to effectively write, children are at a significant disadvantage when they enter the work force. Written communication is a necessary skill that needs to be mastered at an early age so that it can be developed and strengthened to include aesthetic writing, critical analysis and many other forms of writing that result in the writer affecting the behavior of the reader.

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