USE OF STORY-MAPPING TO INCREASE THE STORY-GRAMMAR TEXT COMPREHENSION OF ELEMENTARY STUDENTS WITH LEARNING DISABILITIES

Tori Boulineau, Cecil Fore III, Shanna Hagan-Burke, and Mack D. Burke

Abstract. **This study examined the use of story-mapping to improve the reading comprehension of six third- and fourth-grade students with specific learning disabilities who exhibited reading deficits. Also of interest was whether the effects would maintain once the intervention was discontinued. Using a descriptive, three-phased, single-subject design, the effect of story-map instruction on student participants' comprehension of story-grammar elements was monitored. Positive results were observed, and maintenance probes suggested that the effects of the intervention maintained after the treatment was withdrawn.**

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Learning disabilities (LD) represent one of the fastest growing and largest classification areas within special education. One hallmark characteristic used to aid identification of LD is a significant discrepancy between an individual's potential for achievement and actual achievement level. While a federal definition exists to facilitate the identification process, instructional programming is typically left to the discretion of individual teachers.

Reading is often a deficient skill area and a frequent reason for referral to special education (Lentz, 1988; Lloyd, Kauffman, Landrum, & Roe, 1991; Miller, 1993). Indeed, Miller noted that as many as 60-80% of students classified as having LD exhibit significant reading deficits.

Effective reading instruction is vital for children to become independent readers and learners (Smith, 1998). Teachers often make decisions and implement practices based on their preservice training experiences and what they believe to be effective. Accordingly, instructional practices may vary greatly from teacher to teacher, even though they may share similar instructional goals, district guidelines, and state education agency standards.

An immense amount of research has been conducted and published in the area of reading; however, a large proportion of that research focuses on development of the alphabetic principle and, more recently, phonological awareness. Relatively less published research is available on reading comprehension instruction, particularly for students with LD.

The current study adds to the body of research regarding text comprehension instruction by providing a replication of previous research focused on teaching

story grammar using graphic organizers and story-mapping procedures.

REVIEW OF THE LITERATURE

Story mapping directs students' attention to relevant elements of stories using a specific structure. Story maps provide a visual-spatial display for key information in narrative (i.e., fiction) text. These maps function to prompt learners to identify story elements and provide space for them to record this information. Story maps may be used before reading a passage to elicit prior knowledge, facilitate discussion, and record relevant information about a topic. The use of story maps while reading a passage provides a guide for readers to record significant information and serves as a review after reading.

Story-mapping procedures have been used, modified, studied, and evaluated with a range of individuals with various abilities and grade levels (Beck & McKoewn, 1981). For example, story maps have been utilized to increase reading comprehension skills by prompting students to recognize story-grammar elements such as character, setting, and problem (Dimino, Taylor, & Gersten, 1995); organizing and sequencing story information (Pearson, 1985); and making connections between story components (Pearson, 1982). Sorrell (1990) described story-mapping as a tool for providing or building upon prior knowledge or schema. He explained that story-mapping can assist students with interpreting, organizing, and comprehending new information prior to, during, and after reading stories. This technique has effectively guided students through text and has increased reading comprehension by providing an organization of text structure.

Idol and Croll (1987), Idol (1987), Gardill and Jitendra (1999), Davis (1994), Vallecorsa and deBettencourt (1997), and Gardill and Jitendra (1999) used story maps successfully to teach reading comprehension. Students who were identified as poor readers or as having a specific LD were taught to successfully use an outline that required them to identify important story elements: setting, problem, goal, events, or actions that contribute to the goal, the outcome or resolution of each passage, and the theme. Idol and Croll (1987) found positive increases in story grammar utilizing a multiple-baseline-across-subjects ABA design to assess the effects of story-mapping on reading comprehension performance. Idol (1987) found similar improvements when examining the effects of a story-mapping strategy on text comprehension in a study of 27 low-achieving third and fourth graders. A multiple baseline across participants indicated positive results across a range of measures.

Davis (1994) used a group design to determine the effects of a directed reading activity (DRA) versus a story-mapping procedure on inferential and literal reading comprehension of third and fifth graders when used for teacher-directed prereading instruction. Participants were 90 third-grade and 90 fifth-grade students who were randomly assigned to treatment groups or control groups. The dependent variables were literal and inferential reading comprehension, and the independent variables were directed reading activity and a prereading story map. The prereading story map discussion was conducted to assist students in understanding the way that the text was organized and the relationship between events in the story and the story as a whole. Findings indicated that the story-map prereading procedure had an added positive effect on literal and inferential comprehension with third-grade students than the DRA procedure. Statistically significant differences were shown on literal and inferential measures at the third-grade level and on inferential measures at the fifth-grade level.

Vallecorsa and deBettencourt (1997) examined the effects of direct reading instruction in the elements of the story form on story comprehension skill, the effects of story form reading instruction on story writing performance, and the effects of direct transfer training on story writing performance. Using a single-subject design with multiple baselines across behaviors (reading and writing), Vallecorsa and deBettencourt documented positive results for several story elements, including recall of stories. Transfer of training to writing performance was also documented.

Gardill and Jitendra (1999) used a multiple baseline across participants to determine the effects of advanced story-map instruction on the reading comprehension performance of six middle school students in sixth and eighth grade identified with SLD. The study assessed (a) the degree to which direct story-map instruction affects reading comprehension skills relative to story-grammar and basal questions, (b) generalization of strategy effects upon a novel passage and maintenance of the skill, and (c) oral story retells. The dependent variables were percentage correct of story-grammar questions, percentage correct of basal comprehension questions, number of words, number of correct word sequences, number of thought units, and number of sentences included in story retells. The independent variable was a story map that provided space for students to write the significant information from stories read. Results indicated an increase on the basal comprehension (literal and inferential) tests for each participant. In addition, generalization was documented, an area in which students with LD often have difficulty (Ellis, Lenz, & Sabornie, 1987; Haring & Liberty, 1990).

Many students with LD exhibit significant problems in reading, including text comprehension. Story maps

have been identified as effective for increasing reading comprehension. However, while previous studies have assessed the utility and benefits of story maps (Alvermann, 1981; Barron & Stone, 1974; Davis, 1994; Durkin, 1978-1979; Gardill & Jitendra, 1999; Montague & Leavell, 1994; Vallecorsa & DeBettencourt, 1997), much of the research is dated.

The present study was designed to replicate previous research substantiating the effectiveness of story-grammar mapping and to examine the intervention's effect on elementary-aged students with LD. Two main research questions were posed: (a) What are the effects of story-grammar mapping on the reading comprehension of students with specific learning disabilities? and (b) Will the effects maintain after story-grammar mapping is discontinued?

METHOD

Participants

Six elementary-aged students participated in the study. These third through fifth graders attended a school of 750 students (prekindergarten-5th grade) in rural northern Georgia. Each participant had a label of SLD and was receiving special education services in an interrelated resource classroom for students with mild disabilities. Five of the participants received primary instruction or supplemental support for English, spelling, math, science, and/or social studies in the resource classroom. All six students were placed in general education classrooms for science, social studies, art, music, and physical education. One student received special education services for mild articulation weaknesses. None of the participants took medication during the study.

Students selected for participation met the following criteria: (a) had no previous exposure to any specific type of story-mapping procedure/format during their special education courses; (b) spent at least one class period a day receiving reading instruction in a special education resource setting; (c) scored a grade equivalence (GE) of at least 2.0 on the Kaufman Test of Educational Achievement (K-TEA; Kaufman & Kaufman, 1985) word identification subtest and a GE of at least one grade level below grade placement on the comprehension subtest; and (d) attended 95% of school days during the previous grading periods. All six participants were familiar with the teacher who delivered the intervention and had worked with her prior to the study. Table 1 provides an overview of participant characteristics.

Setting and Arrangement

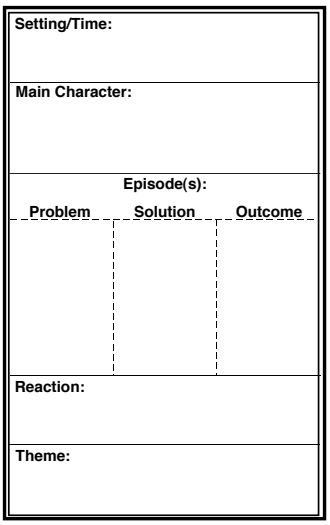
The study occurred in a special education resource classroom for students with mild disabilities. The intervention was scheduled during the last half of the students' daily reading time. Teaching sessions occurred at a kidney-shaped learning table located at the far end of a rectangular room. During the study, there were also students in the classroom who did not participate in the study. These students were typically engaged in one-on-one or a small-group instruction with a paraprofessional at the opposite end of the classroom. The

Table 1
Student Participant Information

Participant	Gender	Grade	Age	Full-Scale IQ*	Disability
Andrew	Male	3	9-6	96	SLD
Austin	Male	3	9-9	98	SLD
Beau	Male	3	9-11	90	SLD
Lauren	Female	3	9-10	98	SLD/ADD**
Jessica	Female	4	10-5	91	SLD
Chasiney	Female	4	10-7	93	SLD

*Student performance on the WISC-III was used to establish IQ scores.
**This student's primary disability label was SLD. She also had a medical diagnosis of attention deficit disorder (ADD).

Figure 1. Elements of story-grammar map.



students who did not participate had special education labels, including emotional/behavior disorders and other health impairments, and were instructed to direct all comments and questions to the paraprofessional during the intervention instruction rather than the teacher. Intervention sessions were conducted daily (Monday through Friday). If two or more students missed a session, the entire group repeated the session on the following day.

Materials and Instructional Procedures

Passages taken from the primer and first-grade basal reader series FOCUS: Reading for Success (Allington, Cramer, Cunningham, & Perez, 1985a, 1985b) were used across all conditions. Specific passages were selected that had an easily identifiable main character who experienced a problem or conflict of some sort. The teacher used a story-grammar map as a visual organizer and prompt for the information students were expected to identify in the passages they read. Prior to reading the story, the teacher used overhead transparencies of the story-grammar map during instruction to show students how to organize important story-grammar information. The map contained seven main areas for recording a narrative story's (a) setting/time, (b) characters, (c) problem, (d) solution, (e) outcome, (f) reaction, and (g) theme. Figure 1 depicts the story-map format used to teach story-grammar elements during instruction. Students completed a blank story-grammar map after reading their stories during each session.

During each instructional session, the teacher used a checklist to ensure consistency across participants and reliability within conditions, and to make sure that the appropriate information was conveyed. The checklist consisted of procedural items that the teacher performed during each instructional session, including (a) providing students with a purpose for using story maps, (b) presenting students with the appropriate passage, (c) prompting students to read with expression while attending to relevant features, (d) randomly calling on students to read once per session, (e) providing verbal feedback after reading (praise), (f) correcting errors (pronouncing words correctly), (g) using a transparency of the story map to record answers during baseline, (h) referring to each element at least once during each session, (i) beginning a new passage once criterion was met, and (j) administering the story map. As each element was addressed, the teacher checked it off.

Dependent Measure

Acceptable answers were pre-identified to assess student responses regarding story-grammar elements. After each teaching session, students were provided a blank story map to complete, which was then scored for the percent of items correct. On any given probe, there were eight possible correct answers for each student.

Design

A descriptive ABC design was used to examine the effects of story-mapping on reading comprehension performance. The research was implemented in three phases. During the baseline phase (Phase A), the teacher probed student performance on story-grammar elements without any instructional intervention. During the intervention phase (Phase B), the teacher delivered explicit instruction on story-grammar elements and modeled the use of a story-grammar map for recording those elements. During Phase C, the teacher discontinued all story-grammar instruction. Repeated probes were administered at the conclusion of passage reading to determine the extent to which students' correct identification of story-grammar elements maintained.

Baseline Procedures

During the first phase, baseline probes were administered daily for four days prior to intervention. One story was taught and completed per session. The instruction consisted of discussing relevant vocabulary and prior knowledge about the topic before reading and then randomly calling on students to orally read text of various lengths until the entire story had been read. Students received random verbal praise for reading aloud when asked to do so and following along in

the text as other students read. Once the entire story was read, students responded to a story map querying story-grammar elements. The teacher instructed the students to "try their best" but did not provide reinforcement (e.g., verbal praise or tokens) for a job well done and refrained from any negative comments for poor or inaccurate work.

Intervention Procedures

During the intervention (Phase B), the elements of story grammar were explicitly taught using a story map as a visual aid and an organizer for guided practice. Prior to reading each story, the teacher displayed a story-map transparency on the overhead projector and taught each story-grammar element individually. The teacher first asked students to describe what each element of the map meant and replied to student responses by summing up the meaning of each element. Finally, the teacher and students discussed examples of each story-grammar element. After instruction, students were called upon to read parts of the passage aloud. Once the passage was read, students completed their story maps independently.

The intervention continued daily with instruction on key story-grammar elements followed by new passages to be read and story maps for students to complete individually. The intervention was continued until each student had completed a story map querying key story-grammar elements with 90% accuracy for three consecutive sessions. Once all students had reached the criterion, the teacher discontinued story-grammar instruction with the group, and Phase C of the study was initiated.

Maintenance Procedures

During the final phase of the study (Phase C), the teacher discontinued explicit instruction on key story-grammar elements. As in previous phases, students took turns reading passages of various lengths. The teacher encouraged students to consider story-grammar elements and visualize the map (without referencing the elements specifically). After reading each passage, students were provided a blank story-grammar map to complete independently.

Reliability

Reliability data were collected across all phases to examine both fidelity of implementation (i.e., procedural reliability) and measures of students' academic performance (i.e., interrater agreement).

Procedural reliability. Procedural reliability was assessed by a paraprofessional in the classroom for 23% (3 out of 13) of the total sessions; it occurred in each phase of the study. These data provided a measure of the fidelity of implementation by comparing the number of intervention procedures implemented by the teacher with the number of procedures scheduled to be implemented. A point-by-point method was used to calculate a score for procedural reliability. A written description of planned procedures for each experimental condition was provided to an independent observer for comparison. A procedural recording form allowed the observer to record whether the teacher performed each step appropriately during conditions.

The instructional procedures that were measured included providing students with a purpose for using story maps, presenting students with the appropriate passage, prompting students to read with expression while attending to relevant features, randomly calling on students to read once per session, providing verbal feedback after reading (praise), correcting errors (pronouncing words correctly), using a transparency of the story map to record answers during baseline, referring to each element at least once during each condition, and beginning a new passage once criterion was met and administering the story map. Procedural reliability was calculated as the number of observed teacher behaviors divided by the number of planned behaviors. The mean percentage of agreement on the implementation of procedures was 98% (range of 95%-100%).

Interrater Agreement

Reliability data were collected across all phases of the study to examine how students' story-grammar responses were measured. An observer independently rated all student responses during 23% of the sessions. The overall mean agreement on the percentage of elements scored correct was 99% (89% to 100%). Table 2 provides a summary of the interrater agreement percentages for individual story-grammar elements.

RESULTS

The results of this descriptive study were examined in several ways. First, the performance of individual students across conditions was examined in order to determine whether the intervention had differential effects across participants. Second, the participants' mean performance across different elements of story grammar was calculated in order to examine whether instruction was more effective for teaching some elements than others.

Mean Percentage of Correct Story-Grammar Elements for All Participants

Figure 2 summarizes the mean percentage of total correct story-grammar elements for all participants. All six students exhibited low levels of story-grammar knowledge during baseline probes. Prior to instruction, their mean percentage correct was 31% with a range of 25% to 35%. During the intervention, their mean percentage correct increased to 84% with a range of 67% to 96%.

Table 2
Proportion of Interrater Agreement Checks Across Phases and Mean Interrater Agreement Percentages for Individual Story-Grammar Elements

Story-Grammar Element	Proportion of Interrater Agreement Checks			Mean Agreement Level
	Baseline	Intervention	Maintenance	
Setting	25%	17%	33%	100%
Time	25%	17%	33%	100%
Character	25%	17%	33%	100%
Problem	25%	17%	33%	88%
Solution	25%	17%	33%	100%
Outcome	25%	17%	33%	100%
Reaction	25%	17%	33%	100%
Theme	25%	17%	33%	100%

Andrew. Andrew's percentage of correct story-grammar elements is summarized in Figure 3. Prior to the intervention, his mean percentage correct was 31.5% with a range of 25% to 38%. Once instruction for mapping story-grammar elements was implemented, Andrew's percentage of correct story-grammar elements increased to 83% with a range of 50% to 100% and with no overlapping data points between conditions. Andrew continued to demonstrate knowledge of story-grammar elements during the maintenance phase with 84% correct elements, with a range of 75% to 88%. No overlapping data points were observed between the maintenance and baseline phases.

Austin. Figure 4 displays the percentage of correct story-grammar elements that Austin generated across in each phase of the study. Prior to instruction, his mean percentage of correct story-grammar elements was 25%. With the introduction of story-mapping instruction, his mean percentage of correct story-grammar elements increased to 100% during intervention. During the maintenance phase a mean percent correct of 92% across story-grammar elements was observed with a range of 88% to 100%. No overlapping data points were observed between the maintenance and baseline phases for Austin.

Beau. Beau's overall percentage of correct story-grammar elements are graphed in Figure 5. During baseline, his percentage of correct elements averaged 38% with a range of 25% to 50%. With the introduction of story-map instruction, his percentage of correct story-grammar elements increased to an average of 67% with a range of 63% to 88%. During the maintenance phase, Beau's mean percentage of correct elements was 75% with a range of 63% to 88%. No overlapping data points were found when comparing Beau's performance during baseline and maintenance phases.

Lauren. As depicted in Figure 6, Lauren averaged 41% correct story-grammar items during baseline with a range of 25% to 50%. During story-mapping instruction, her accuracy increased to an average of 94% accuracy with a range of 75% to 100%. Once the instruction was discontinued, Lauren's high percentage of correct story-grammar elements maintained with a mean correct of 96%, with a range 88% to 100%. There were no overlapping data points between maintenance and baseline phases.

Jessica. During baseline observations, Jessica's mean percentage of correct story-grammar elements was 35% with a range 25% to 50%. After she began receiving explicit story-grammar instruction using story maps, her accuracy increased to an average of 92% with a range of 63% to 100%. During the maintenance phase, Jessica's mean percentage of correct story-grammar elements dropped slightly when compared to Phase B, but

Figure 2. Mean percentages of correct story-grammar elements for all participants.

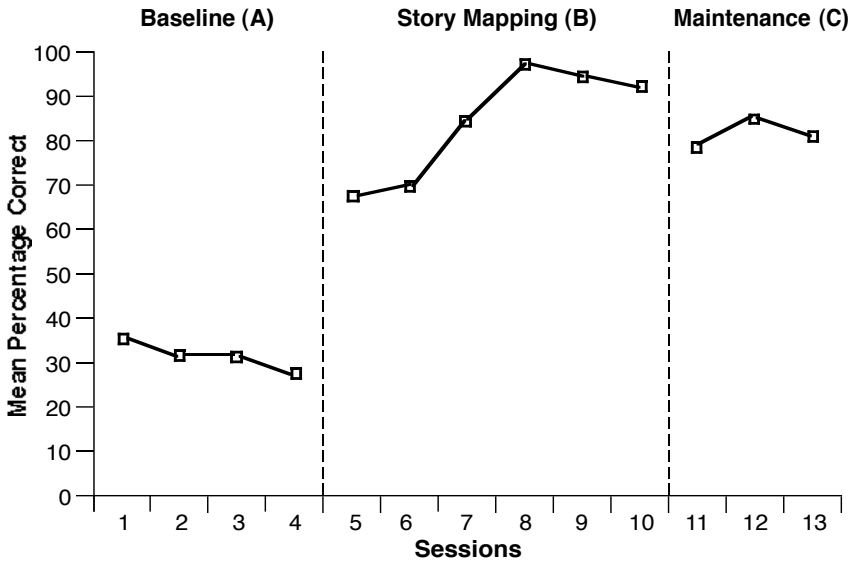


Figure 3. Percentages of total correct story-grammar elements for Andrew.

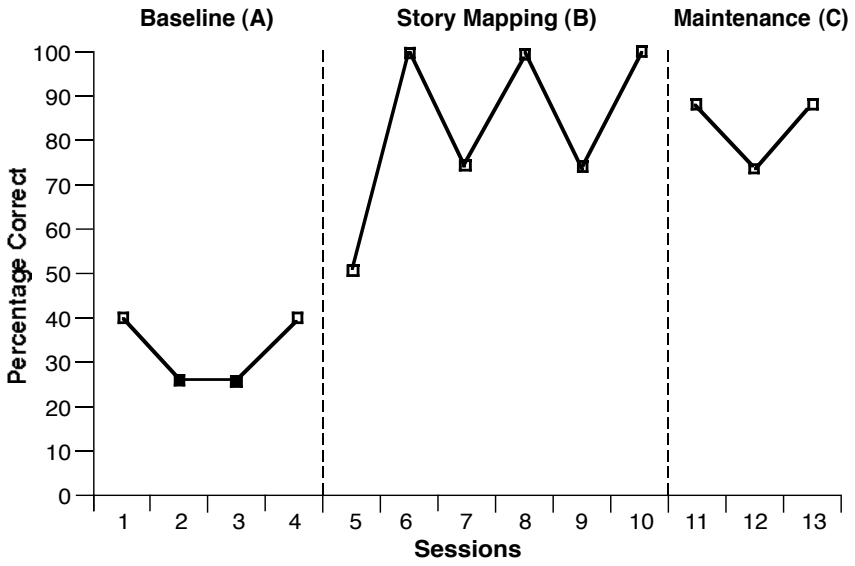


Figure 4. Percentages of total correct story-grammar elements for Austin.

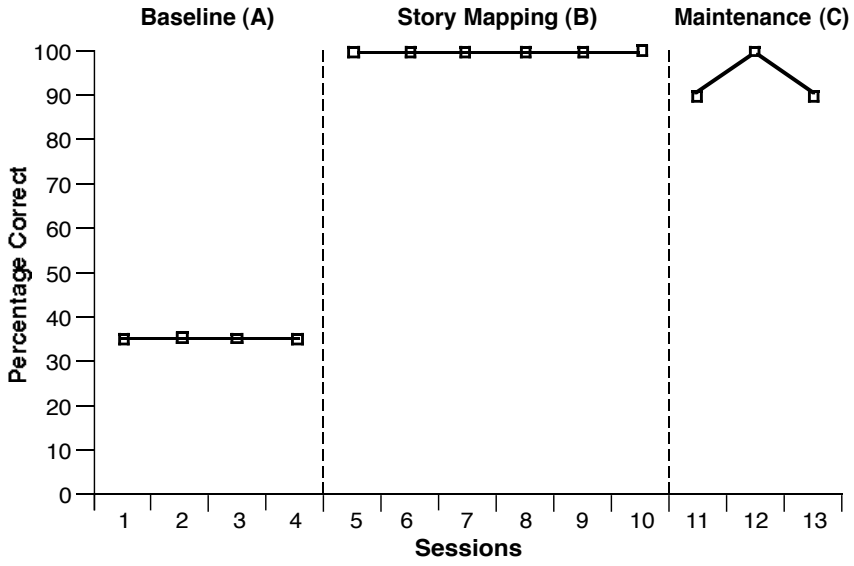


Figure 5. Percentages of total correct story-grammar elements for Beau.

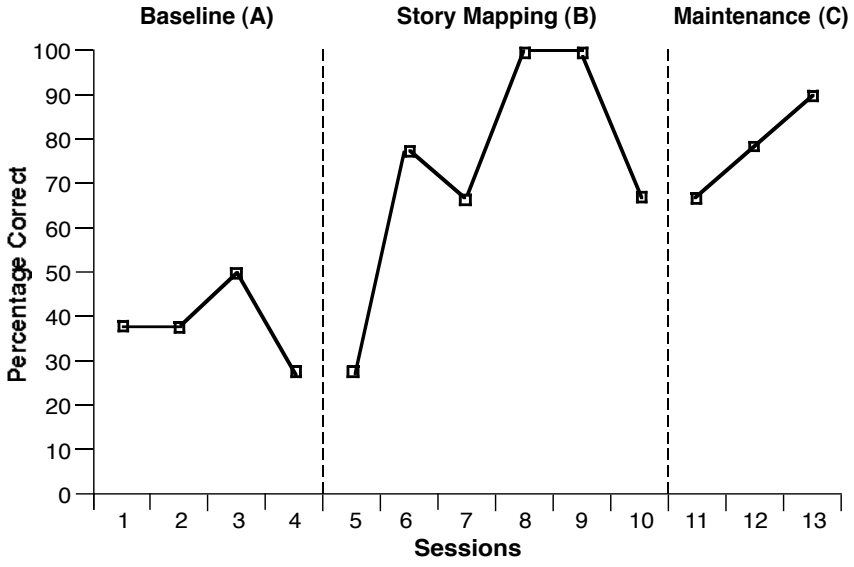


Figure 6. Percentages of total correct story-grammar elements for Lauren.

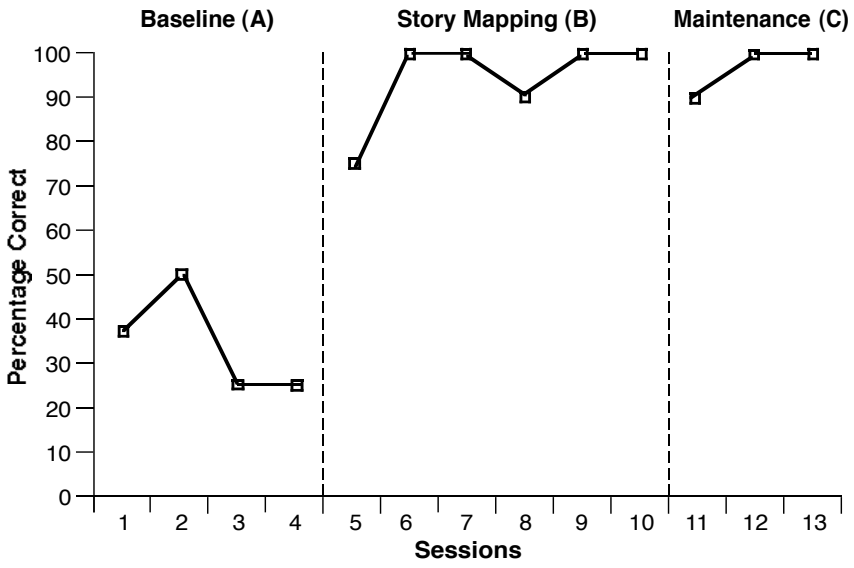


Figure 7. Percentages of total correct story-grammar elements for Jessica.

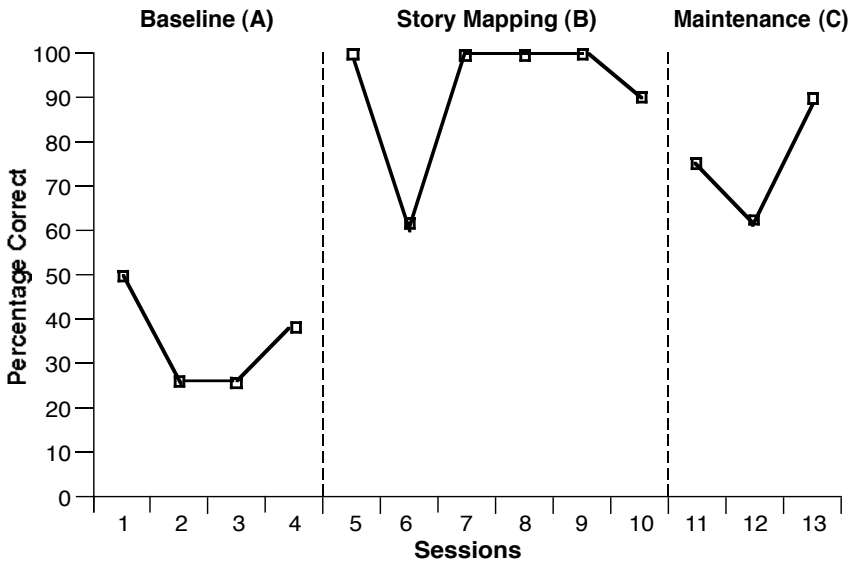
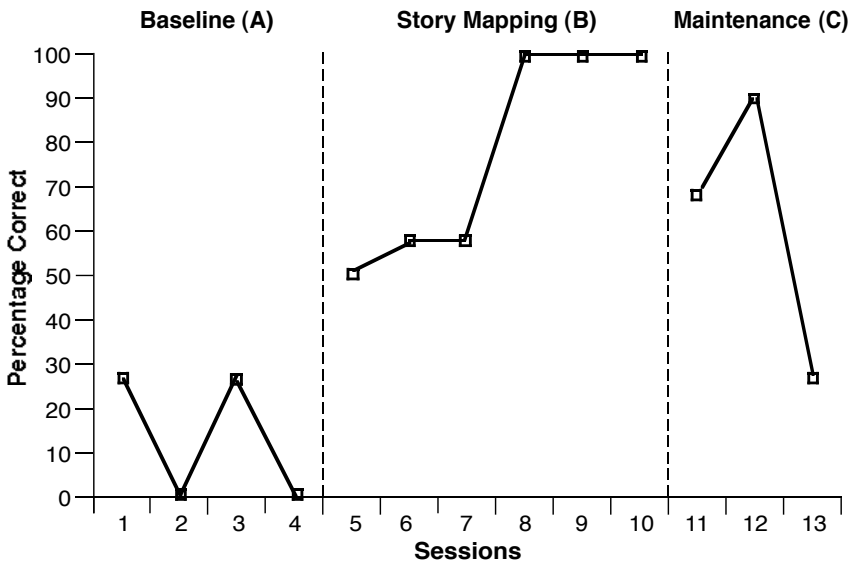


Figure 8. Percentages of total correct story-grammar elements for Chasiney.



it remained markedly higher than her baseline performance with an average of 74% and range of 63% to 88%. There were no overlapping data points between Jessica's maintenance performance and her baseline scores. Figure 7 summarizes Jessica's performance across conditions.

Chasiney. During baseline conditions, Chasiney's mean percentage of correct story-grammar elements was 13% with a range 0% to 25%. Once the story-mapping intervention was implemented, her mean percentage of accurate elements increased to 80% with a range of 50% to 100%. During the maintenance phase her mean percent correct dropped to 59% with a range of 25% to 88%. One overlapping data point was observed between her maintenance and baseline phases. Figure 8 exhibits the percentage of correct story-grammar elements for Chasiney.

Mean Percentage of Correct "Setting" Elements

The effects of story-mapping on teaching story-grammar elements were also of interest in this study. Accordingly, the intervention effects for individual story-grammar elements were examined. Figure 9 summarizes the mean percentage of correct setting elements for all participants. As illustrated, students exhibited low levels of setting knowledge during baseline with a mean of 42% and a range 0% to 83%. During intervention, their mean percentage of correct setting elements increased to 92% with a range of 83% to 100%. Once story-grammar instruction was discontinued, the mean percentage correct decreased slightly to a mean of 89% with a range of 83-100%. Nonetheless, the mean percentage correct during maintenance was well above the baseline average, and there was only one overlapping data point when comparing baseline and maintenance phases.

Mean Percentage of Correct "Time" Elements

As a group, students exhibited varied levels of accuracy regarding a story's time during baseline conditions. The group's mean percentage correct during baseline was 75% with a range of 50% to 83%. During the intervention phase, their mean percentage correct increased to 86% with a range of 67% to 100%. Once the intervention was discontinued for the maintenance phase, their mean percentage of correct time elements increased slightly to 89% with a range of 67% to 100%. Although their mean performance during maintenance (89%) was higher than baseline (75%), there were three overlapping data points between the two phases. Figure

Figure 9. Mean percentages of correct "setting" elements for all participants.

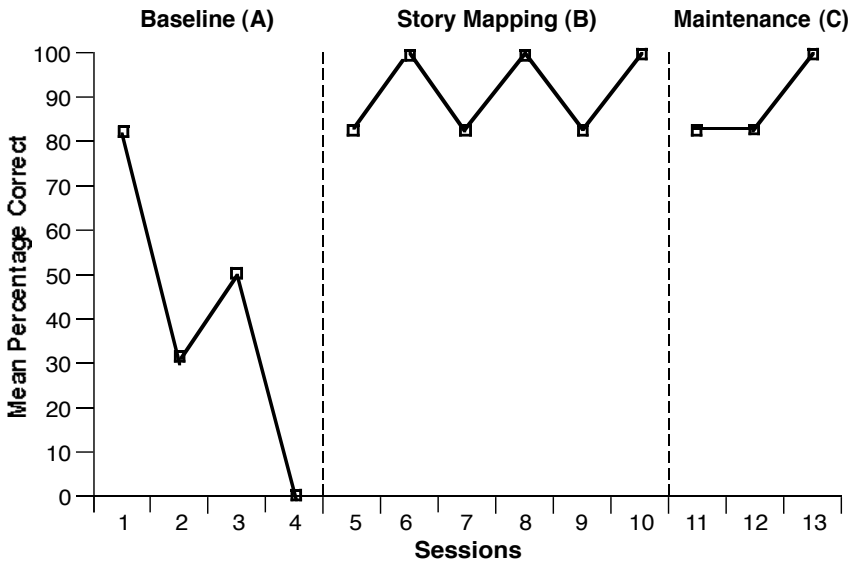
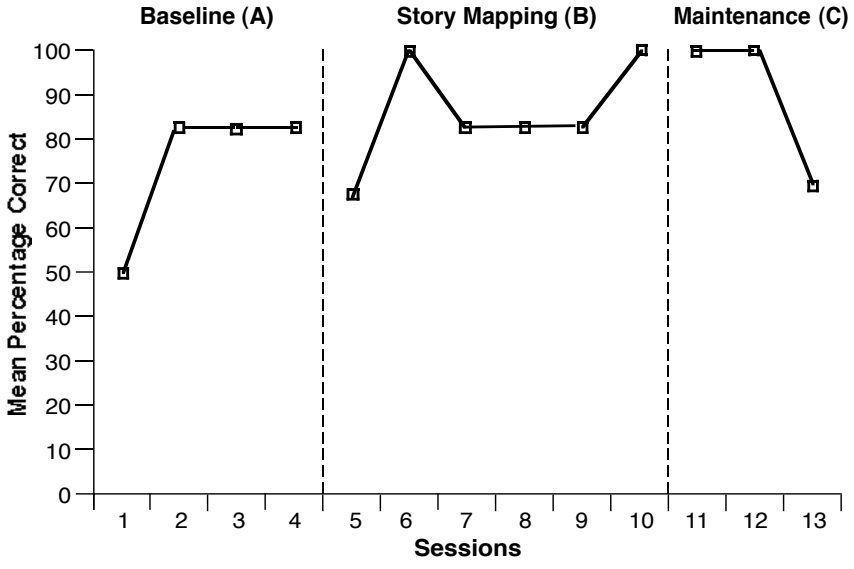


Figure 10. Mean percentages of correct "time" elements for all participants.



10 summarizes the group's mean percentage of correct time elements.

Mean Percentage of Correct "Character" Elements

The participants' mean percentage of correct character elements during baseline was 71% with a range 50% to 83%. During intervention, their mean percentage of correct character elements increased to 100% and dropped during maintenance to 89% with a range of 83% to 100%. Two overlapping data points were observed between their maintenance and baseline performance. Figure 11 summarizes participants' mean percentage of correct character elements across conditions.

Mean Percentage of Correct "Problem" Elements

Student participants exhibited low levels of accurate "problem" elements during baseline probes. Their mean percentage of correct elements was only 9% with a range of 0% to 17%. During the story-mapping intervention, their mean percentage correct increased to 87% with a range of 67% to 100%. Once the intervention was discontinued during the maintenance phase, their mean percentage correct decreased to 61% with a range of 17% to 83%. One overlapping data point was observed between students' mean performance during maintenance and baseline conditions. Figure 12 summarizes the group's percentage of correct "problem" elements across the three phases of the study.

Mean Percentage of Correct "Solution" Elements for All Participants

During baseline, none of the six participants was able to identify the "solution" story-grammar elements from narrative text. Thus, the group's mean percentage correct during baseline was 0%. After explicit instruction in story-grammar instruction using story maps, their mean percentage correct increased to 67% with a range of 33% to 100%. During maintenance, their mean performance decreased to 56% with a range of 50% to 67%. However, their performance during maintenance remained markedly higher than baseline with a mean percentage increase from 0% to 56% and no overlapping data points. These data are summarized in Figure 13.

Mean Percentage of Correct "Outcome" Elements

None of the six participants was able to identify the "outcome" story-grammar element during any of the baseline probes. Thus, the mean percentage correct during baseline was 0%. During the intervention, their mean percentage of correct "solution" elements increased to 72% with a range of 33% to 100%. Their mean accuracy for outcome maintained once the inter-

Figure 11. Percentages of total correct "character" elements for all participants.

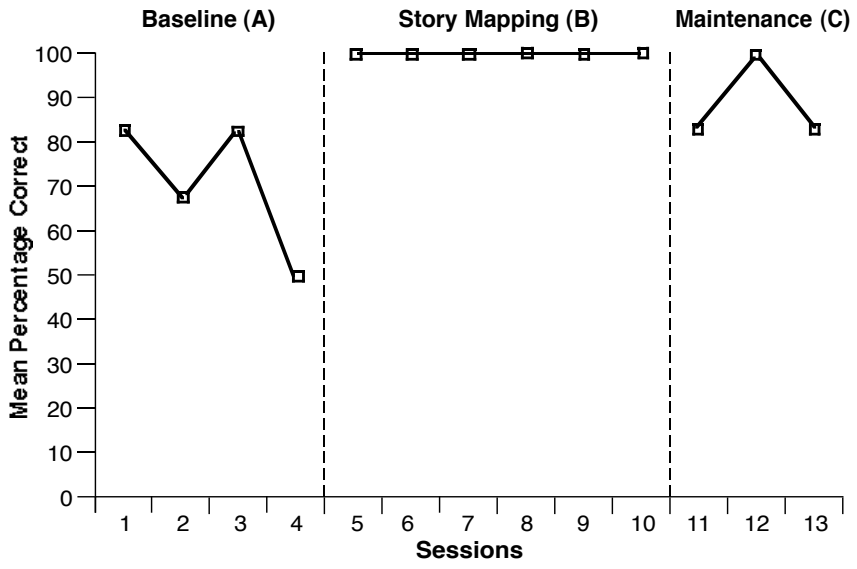


Figure 12. Mean percentages of correct "problem" elements for all participants.

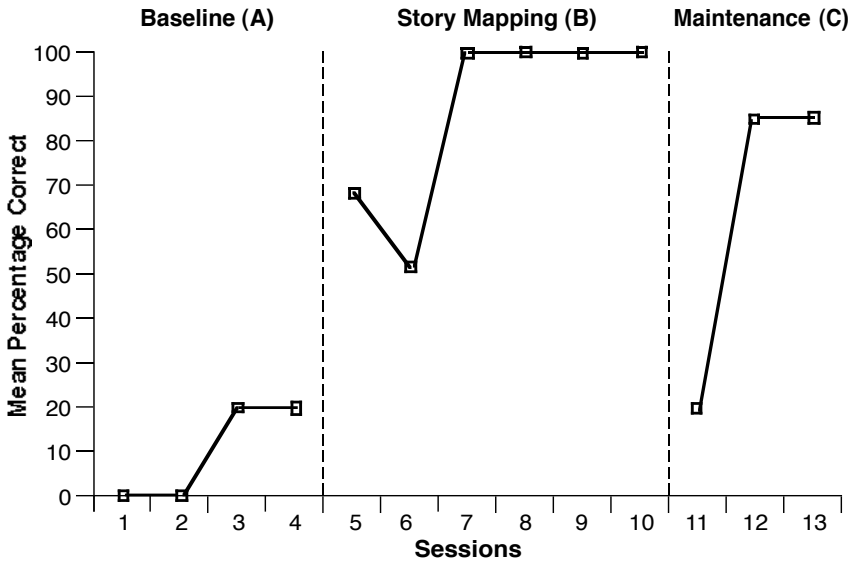


Figure 13. Mean percentages of correct "solution" elements for all participants.

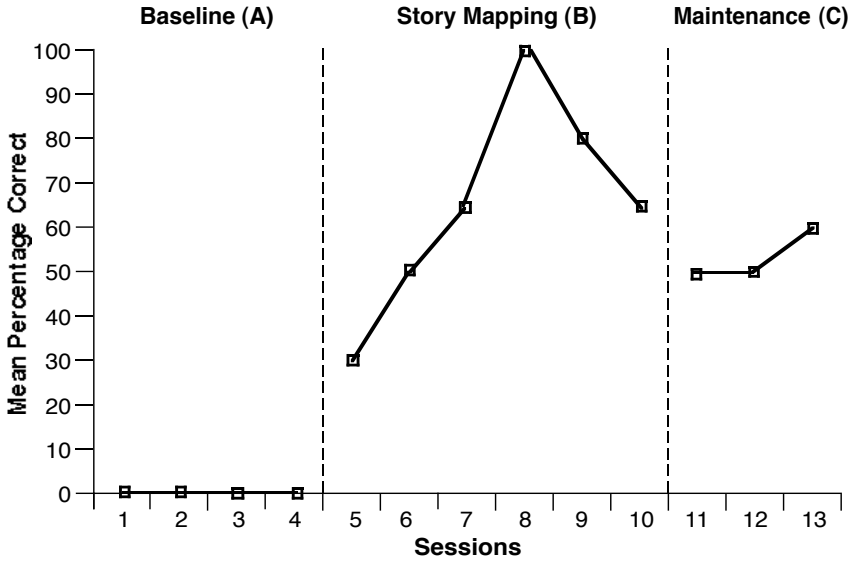
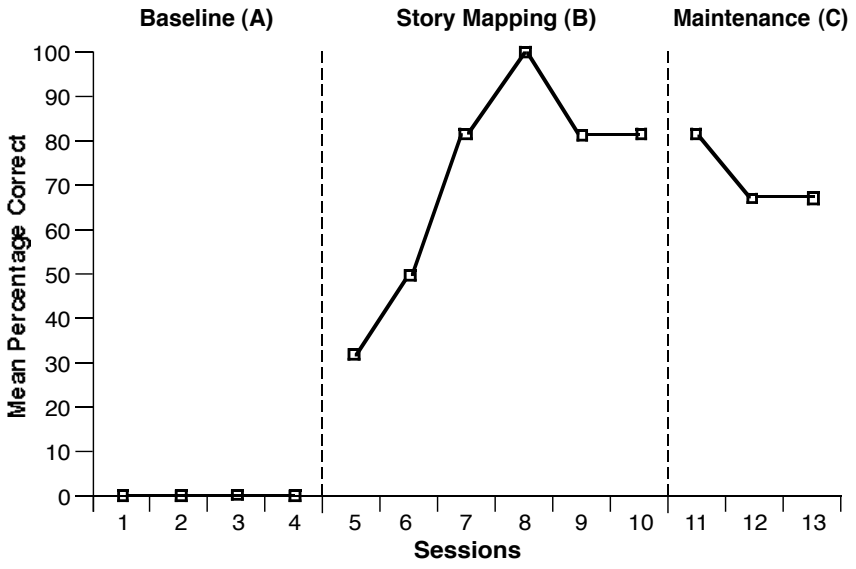


Figure 14. Mean percentages of correct "outcome" elements for all participants.



vention was discontinued with mean percentage correct of 72% and a range of 67% to 83%. No overlapping data points were found between any of the three phases of research. Figure 14 summarizes the group's mean percentage of correct outcome elements.

Mean Percentage of Correct "Reaction" Elements

Students exhibited low levels of accuracy when asked to identify the reaction of a story during the baseline probes. Thus, their mean percentage of correct reaction elements during baseline was 33% with a range of 17% to 50%. During the intervention, their mean percentage correct increased to 86% with a range of 67% to 100%. When the story-grammar instruction was discontinued, the group's mean percentage correct slightly increased to 89% with a range of 83% to 100%. No overlapping data points were found when comparing the group's mean baseline performance with intervention. Also, there were no overlapping data points between baseline and maintenance phases. Figure 15 depicts the group's mean percentage of correct reaction elements across all phases of the study.

Mean Percentage of Correct "Theme" Elements for All Participants

Student participants exhibited low mean percentages of correct theme elements during baseline probes. Their correct mean percentage was 13% with a range 0% to 33%. During intervention conditions, their mean percentage correct increased substantially to 83% with a range of 67% to 100%. During maintenance, their mean percentage correct for theme elements continued to increase to 94% with a range of 83% to 100%. No overlapping data points were found between the maintenance and baseline phases. Figure 16 summarizes the group's mean performance for theme across the study.

DISCUSSION

The results of this study suggest that story-grammar instruction improved the participants' identification of story-grammar elements via story-mapping when reading narrative text. This finding is consistent with previous literature on story-mapping (Davis, 1994; DiCecco & Gleason, 2002; Dimino et al., 1995; Gardill, 1999; Idol, 1987; Idol & Croll, 1987; Katayama & Robinson, 2000; Vallecorsa & deBettencourt, 1997).

The primary purpose of this descriptive research was to replicate the use of story-mapping with students with LD. Six students were provided explicit instruction in story grammar using story maps to record individual story-grammar elements for narrative text. Each

Figure 15. Mean percentages of correct "reaction" elements for all participants.

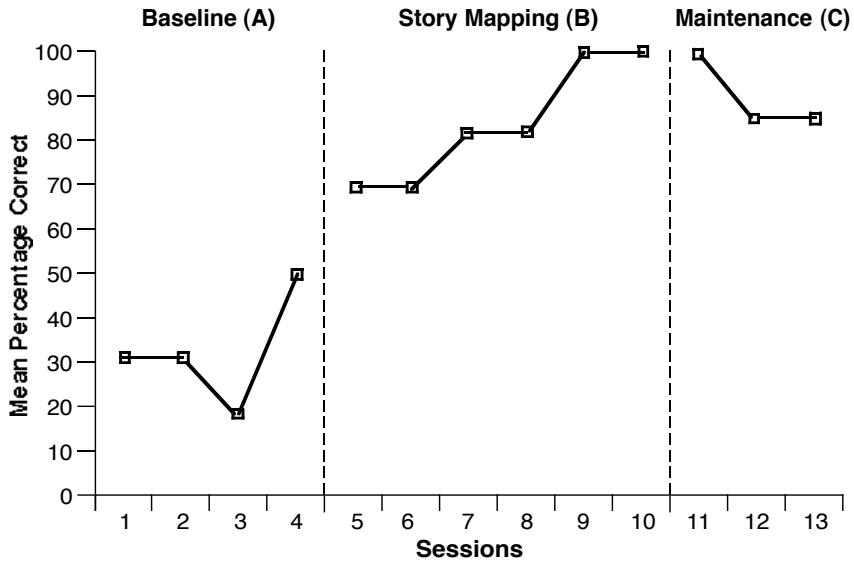
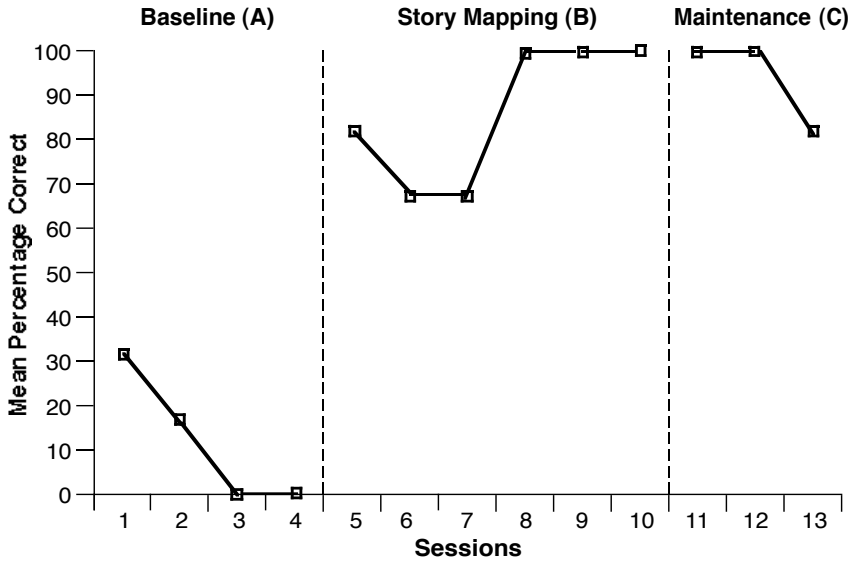


Figure 16. Mean percentages of correct "theme" elements for all participants.



participant's percentage of correct story-grammar elements increased from baseline to intervention conditions. The effects of the story-mapping procedure also appeared to maintain once instruction was terminated. In addition, an examination of the intervention by reviewing accuracy levels of individual story-grammar elements suggested that the intervention during this research was effective for teaching all of the story-grammar elements, and sufficient to maintain student performance for many of them.

Limitations and Areas for Future Research

There are several limitations to this study. In particular, the design was descriptive, and functional relationships could not be established between story-mapping and performance. Although the increases in student performance were substantial once instruction was delivered, studies applying an experimental design should be conducted to confirm a functional relationship between story-mapping instruction and student performance. Another limitation was the small number of students involved. Because there were only six participants, generalizations to the larger population of students with LD must be made with caution. In addition, a potential limitation of this study is the way the dependent variable was measured. Since fluency was not a factor in the study, participants were allowed to complete the story-grammar response form without reference to time. A time requirement could have yielded substantially different results. A final limitation was the absence of global measures of comprehension. The study could have been strengthened by adding some dependent measures that were norm-referenced with established technical adequacy.

CONCLUSION

Students with LD often have significant reading comprehension difficulties. This study replicated prior research substantiating the effects of story-mapping instruction and offers encouraging results to support this intervention's use with students with LD. Despite the limitations, the study adds to the growing research documenting story-mapping and story-grammar instruction as an effective means of increasing narrative text comprehension for students with LD.

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