AMERICAN JOURNAL ON INTELLECTUAL AND DEVELOPMENTAL DISABILITIES
2023, Vol. 128, No. 2, 145–163

DOI: 10.1352/1944-7558-128.2.145

Comparison of Two Interventions in Improving Comprehension of Students With Intellectual Disability

Goksel Cure and Serife Yucesoy-Ozkan

Abstract

The purpose of this study was to compare the relative effects of word reading and story component interventions in developing reading comprehension of narrative texts with four students with mild levels of intellectual disability. A multielement design was used in this study. The findings revealed that the story component intervention was more effective and efficient than the word reading intervention in developing students' reading comprehension of narrative texts, and also indicated that both interventions were significantly effective in enabling subjects to answer literal questions. Only the story component intervention was significantly effective related to inferential questions. Finally, the findings revealed that students could generalize their reading comprehension skills to stories of different lengths.

Keywords: intellectual disability, reading comprehension, repeated reading, story mapping

Reading Comprehension and ID

Although reading is essential for all individuals, studies reveal that students with intellectual disability (ID) have low reading success. For example, the Special Education Elementary Longitudinal Study found that the reading achievement of students with ID is, on average, 3 years below their grade level (Blackorby et al., 2005). Similarly, in another study, the reading skills of 88 out of 132 students with ID were below primer instructional level (Katims, 2001). Moreover, studies have revealed that students with ID have failures in reading and reading comprehension (Blackorby et al., 2005; Katims, 2001), which can cause them to experience limitations in reading to learn, improving their knowledge level, continuing secondary and postsecondary education, using employment opportunities, fully participating in the community, and living independently (Hernandez, 2011). This previous research emphasizes the importance of reading and reading comprehension studies for students with ID. However, systematic review of the literature indicates that there is limited research on improving reading comprehension skills of students with ID (Shelton et al., 2019) and that previously conducted studies mostly focus on sight word teaching (Browder et al., 2006). Thus, there remains a need for studies on the development of reading comprehension of students with ID. Several types of interventions are used to improve the reading comprehension of students with ID, two of which are word reading (Alqahtani, 2020) and story component interventions (Shelton et al., 2019).

Word Reading

Reading is defined as decoding and interpreting written symbols (LaBerge & Samuels, 1974). Therefore, for reading to occur fully, both the decoding and the interpretation of the decoded symbols are required. Accurate and rapid reading of words (i.e., decoding) is a prerequisite for developing interpretation of the decoded symbols (i.e., reading comprehension). Previous studies reveal that readers who cannot decode text automatically devote their cognitive resources to decoding instead of comprehension. In such cases, the reader cannot derive the meaning of the text well enough because the focus is on decoding (LaBerge & Samuels, 1974; Therrien & Hughes,

DOI: 10.1352/1944-7558-128.2.145

2008). Owing to the importance of word reading, word reading (WR) interventions have been frequently used to develop reading comprehension skills in students with ID, and their effectiveness has been demonstrated (Reichow et al., 2019). This type of intervention is based on reading accuracy and speed of written words by correcting reading errors and is applied by reading words individually or in a text depending on the time (Reichow et al., 2019). WR interventions based on the individual reading of words generally focus on sight word teaching. Systematic prompting techniques such as constant time delay and simultaneous prompting are often used in this teaching (Browder et al., 2006). Alternatively, text-based WR interventions focus on reading a text one or more times in a given period of time (Therrien, 2004). Auxiliary strategies such as modeling, error correction, and performance feedback are used in this reading process. Some examples of these interventions are continuous reading, listening passage preview, and repeated reading (Freeland et al., 2000; Hawkins et al., 2011).

Although WR intervention studies with students with ID have typically focused on sight word teaching, interventions based on reading texts have also been used to improve their reading comprehension skills. Among these interventions, the most prominent one in the literature for students with ID is repeated reading (Samuels, 1979). Repeated reading (RR) is a strategy that requires reading a short and meaningful text until reaching a certain number or a criterion or for a certain period of time to improve reading fluency and comprehension. The RR strategy generally recommends using texts that do not exceed 200 words that students can read with 85–95% accuracy (Samuels, 1979; Therrien & Hughes, 2008). The underlying philosophy of this strategy is based on the theory of automatic information processing, which assumes that a reader who decodes a text automatically (i.e., accurately and quickly) does not need to devote cognitive resources to decoding the text meaning and that cognitive resources are devoted to comprehension (LaBerge & Samuels, 1974). In accordance with this theory, when using the RR strategy, the reader is exposed to a text several times, and errors made during reading are corrected. Thus, the reader, who will decode the text automatically over time, can focus his or her attention on understanding the text (Therrien & Hughes, 2008).

Story Components

Story component (SC) interventions focus on teaching the story grammar in a story. Story grammar defines the components of a well-structured story, how these components are organized, and the relationships among these components (Cure et al., 2021). The story grammar of a story comprises: (a) the main character, (b) the main character's problem, (c) the attempts to solve the problem, and (d) the chain of events to achieve the solution. Moreover, story grammar requires analyzing the characters' reactions to the facts in the story and determining the story's theme (Boon et al., 2015; Stein & Glenn, 1975). By teaching these story elements that constitute the story grammar, the reader is freed from the unnecessary or detailed information in the story. Thus, the reader learns the necessary information to understand the story and draws the correct meaning from the text (Boon et al., 2015; Stringfield et al., 2011). Different strategies such as self-regulation, concept map, prompting, question generation, and story mapping can be used for teaching story grammar (Cure et al., 2021). There are many research findings in the literature suggesting that SC interventions improve the reading comprehension skills of students with ID in narrative texts (Shelton et al., 2019). One of the most prominent evidence-based interventions is the story-mapping strategy (Cure et al., 2021).

Story mapping (SM) is a strategy in which the important story components and the relations between these components are presented visually on a graphic organizer to provide a better understanding of the story (Boon et al., 2015). The SM strategy is based on schema theory, which assumes that a reader with relevant knowledge structures (i.e., schemata) about the text being read can make accurate inferences and, thus, understand the text better and more easily. Relevant knowledge structures represent a person's current knowledge about objects, actions, events, and other entities; therefore, having these relevant structures related to a particular text ensures that the information in that text is correctly assimilated and understood (Stein & Glenn, 1975).

Selecting Interventions

Previous research has revealed that instruction is more effective when interventions are tailored to student needs. For example, Parker and Burns

DOI: 10.1352/1944-7558-128.2.145

(2014) found that a modeling intervention was more effective when students had a reading accuracy of less than 93%, whereas a fluency intervention was more effective when students had a reading accuracy of greater than 93% in the development of reading fluency skills of the students. Another study determined that students with poor causal inference skills answered causal questions better than general questions when given training for making causal connections and that students with poor paraphrasing skills answered general questions better than causal questions when given training for making any text-based connections (McMaster et al., 2012). Therefore, accounting for individual differences in selecting the appropriate intervention for the skill aimed to be acquired is critical to ensuring that students benefit most effectively and efficiently from instruction. When we consider skill-by-intervention interaction in terms of reading comprehension, it can be argued that it is necessary to determine what types of reading interventions are more effective in the acquisition of reading comprehension skills of students with ID, who encompass a broad spectrum in terms of individual differences, to obtain the best instructional outcomes.

Research on the learning hierarchy has illustrated that interventions based on modeling and error correction are more effective than practice-based interventions in the acquisition phase of a skill (Parker & Burns, 2014; Szadokierski et al., 2017). WR interventions generally focus on reading accuracy and speed practice to improve reading comprehension (Reichow et al., 2019). In contrast, SC interventions focus on improving reading comprehension through high modeling and correction of comprehension errors (Cure et al., 2021). Comparing WR and SC interventions can help determine whether the most appropriate interventions to meet the needs of students with ID in acquiring reading comprehension skills are practice-based interventions focusing on reading accuracy and speed or modeling and error-correction-based interventions focusing on the explicit teaching of the meaning in the text. Therefore, it may be of value to compare them to explore whether accurate and rapid word reading is sufficient or whether interventions that focus directly on comprehension are necessary to improve the reading comprehension skills of students with ID. RR is one of the most potent strategies when it comes to accurate and rapid word reading (Therrien, 2004), whereas SM is an evidence-based and effective strategy for developing narrative text comprehension skills of students with disabilities (Cure et al., 2021). Therefore, comparing these two strategies can contribute to answering this question.

Efficiency

Instructional efficiency is achieving the best learning outcomes using no more time, effort, or resources than necessary (Konrad et al., 2011). More than one instructional approach can be effective in teaching a skill. In this case, when selecting an instructional approach for teaching, it is important to consider which approach is more efficient. Thus, unnecessary time, effort, or resources are not spent on the teaching process (Konrad et al., 2011). Both teachers and students spend tremendous amounts of time and effort in the teaching process, especially considering that students with ID need intensive instruction in the acquisition of any skill. The difficulty level of instructions required to increase student achievement creates intense pressure on teachers of students with ID (Cancio et al., 2018). Moreover, it causes a decrease in students' motivation to complete the task and the total amount of time they engage in the task (Konrad et al., 2011). Therefore, it is important to examine the efficiency and identify the specific strategy that will improve the reading comprehension of students with ID in the shortest time with the fewest errors so that students can benefit from instructional activities at the highest level and maximize the time and effort teachers spend on instructions.

Social Validity

In addition to effectiveness and efficiency, another critical factor in selecting interventions is social validity. Social validity refers to the social relevance and acceptability of intervention goals, procedures, and outcomes (Barton et al., 2018). Assessing these three types of social validation is critical to determining whether the interventions used lead to a socially significant change in the lives of the direct consumers of research. Studies have revealed that even an experimentally effective intervention that is not considered socially valid by consumers will not be used in real-world contexts and may elicit negative emotions from consumers of the intervention (McNeill, 2019). For example, in a study on paraprofessional

DOI: 10.1352/1944-7558-128.2.145

support, most students with ID working with paraprofessionals mentioned negative emotions such as loneliness, stigma, and embarrassment (Broer et al., 2005). Another study on the use of evidence-based practices revealed that special educators frequently used practices that they rated highly for social validity (McNeill, 2019). Hence, it can be argued that social validity is a necessary additional consideration in the selection of effective interventions.

Purpose and Research Questions

This study aims to identify the intervention that is more empirically and socially validated in developing the reading comprehension skills of adolescent students with ID to understand narrative texts. Therefore, the relative effects of WR and SC interventions were compared, and answers were sought to the following questions:

- Research Question 1: What are the relative effects of WR and SC interventions on improving the reading comprehension skills of adolescent students with ID?
- Research Question 2: What are the relative effects of WR and SC interventions on improving the accuracy with which adolescent students with ID can answer comprehension questions about story components?
- Research Question 3: To what extent do adolescents with ID rate the two interventions as acceptable?

Method

Recruitment Process

Inclusion criteria were as follows: (a) diagnosis of an intellectual disability, (b) ability to participate in instructional activities for 30 minutes, (c) ability to read the experimental text with 85–95% accuracy, (d) ability to write a text by copying or through dictation, and (e) scoring at a third-grade instructional level on an informal reading inventory. To determine whether participants met these criteria, the teachers at the schools designated for this study were interviewed. The criteria were explained, and information was provided about students who were likely to meet these criteria and who would not have any problems with voluntary participation and school attendance. A total of 16 students were nominated by the teachers and then assessed in one-to-one trial sessions by the first researcher. Of these students, six were excluded because they did not meet the reading accuracy criteria, two did not meet the writing criteria, and two did not meet the comprehension criteria. The remaining six students met all inclusion criteria; however, the parents of the two did not allow them to participate in the study. Therefore, the study was conducted with the remaining four students.

Diagnosis and Engagement in Instructional Activities

Medical diagnoses of all students were made by an independent hospital, and their educational diagnoses were made by the Guidance and Research Center, an independent agency. The criteria of participating in instructional activities for 30 minutes was evaluated through classroom observations. During these observations, the students' behaviors were noted, such as focusing on the speaker, following instructions, listening to the teacher, answering questions, reading a text quietly, or writing a given text.

Reading Accuracy

One of the texts to be used in the study was randomly selected to evaluate reading the experimental text with 85–95% accuracy, and each student was asked to read it aloud during the one-on-one trial sessions. Any omissions, substitutions, reversals, insertions, incorrectly or incompletely sounded out words, words that the student waited 3 seconds before reading or that the researcher provided, and words that the student failed to self-correct within 3 seconds were considered "read incorrectly." Any words read correctly, repetitions, and self-corrections made within 3 seconds were considered "read correctly." The students' reading accuracy percentage was calculated using the formula (number of words read correctly/total number of words in the text) x 100 (Jennings et al., 2014).

Writing Skills

To evaluate the criteria of writing a text by copying and dictating, the students' notebooks were examined. After determining that their writings were appropriately readable (i.e., correct letter formation, spelling, correct sentences, appropriate spacing), a text was selected randomly from the text pool and the student was asked to copy 10 sentences illustrated in the text and

DOI: 10.1352/1944-7558-128.2.145

thereafter, to write 10 different sentences that were dictated. If the student could write the texts with an accuracy of 90% and above both by copying and dictating, that student was considered to have met this inclusion criteria.

Reading Comprehension Level

The criteria of scoring at a third-grade instructional level was evaluated with the Informal Reading Inventory (IRI). The IRI was developed by Karasu, Girgin, and Uzuner (2012) specifically to assess word recognition and reading comprehension skills in the Turkish language. The IRI has been rated as demonstrating accepted content validity and inter-rater reliability (94% to 100%; Karasu et al., 2012). When evaluating reading comprehension skills using the IRI, three different methods can be used individually or in combination: filling in the blanks, retelling, and answering questions. As participants were only expected to provide verbal answers to reading comprehension questions in this study, only the "answering questions" method was utilized. A score of 50 or less was classified as frustration level, 51 to 89 as instructional level, and 90 or above as independent reading comprehension level (Karasu et al., 2012).

The student copy of the third-grade level narrative text was placed in front of the student, and a teacher copy of the same narrative text was present in front of the researcher. The researcher asked the student to read the text aloud and then asked questions about the text. The student's responses were written on the teacher's copy without making any additions. After all questions were completed, the level (independent, instructional, frustration) of the text was determined for the student. If the text was found to be at the instructional level (51–89 points out of 100), the process continued until the frustration level was reached by moving on to a higher-level text, and the evaluation process was ended.

Participants

The four participants selected to continue the research were Emel, a 13-year-old seventh-grader; Nimet, a 15-year-old eighth-grader; and Rana and Feride, 16- and 18-year-old eleventh-graders, respectively. All participants were of Turkish ethnicity and were diagnosed with mild levels of ID in early childhood based on the Stanford-Binet Intelligence Test, with IQ scores of 61, 51, 66, and 59, respectively. All participants attended special education schools catering to the needs of students with ID. Emel had been attending these types of schools for 8 years at the time of the study, Nimet for 10 years, Rana for 11 years, and Feride for 13 years. They belonged to families with low to mid-range socioeconomic statuses. The reading accuracy percentage for each participant was found to be 85% (Emel), 91% (Nimet), 89% (Rana), and 86% (Feride). All participants had reading comprehension at the third-grade instructional level (range = 55–70 scores) and fourth-grade frustration level (range = 30–45 scores) based on the IRI. Ethics committee approval was obtained for conducting the study, and also informed consent was obtained from parents for students' voluntary participation. All names of participants are pseudonyms.

Materials

Stories

Stories (texts) were selected from stories developed by Turkish researchers based on Stein and Glenn's (1975) story structure (Cora-Ince, 2007; Guzel-Ozmen, 2000). Each story comprised four parts: setting, introduction, body, and conclusion, included one plot and had an average length of 100 (± 10) words. The stories were narratives told in the third person, did not include any figurative expressions, and were based on realistic fiction that is true to life. The stories were printed with a double-spaced 14pt font size. In the generalization phase, stories with characteristics identical to those in the intervention phase were used, except they had an average length of 150 (± 10) words. The Readability Level for Turkish (RLT) software was used to determine the readability level of the stories (Bezirci & Yilmaz, 2010). In addition, the opinions of six special education teachers and three classroom teachers with at least 5 years of work experience were utilized. The readability level of the stories was determined by calculating the medians of the RLT values and teacher opinions. Consequently, it was found that the stories had a readability level between the third and fifth grades. In total, 59 stories were found to be suitable for use in the study and a story pool was created with these. Stories were randomly selected from this pool and used in the baseline and intervention sessions.

DOI: 10.1352/1944-7558-128.2.145

Story Map

A story map typically comprises the setting, introduction, body, and conclusion sections. Place, time, main character, and supporting character(s) components are noted in the setting section; the problem in the introduction section; the attempt in the body section; and the consequence and reaction in the conclusion section. The story map used in this study was developed using Stein and Glenn's (1975) story structure (see additional materials at https://drive.google.com/file/d/1sA2CNF9qet9VQI7uvClZoE3gBcCJRFSV/view for a sample story map).

Reading Comprehension Form

The reading comprehension form was developed to record participant answers to the reading comprehension questions in the baseline, daily probe, and generalization sessions. The literal questions were related to place, time, main character, and supporting character(s) components; in contrast, the inferential questions were related to the problem, attempt, consequence, and reaction components. Although there was only one literal question regarding the story components, the answer for which could be found directly in the text, the inferential questions were arranged to start with content-free questions and move on to content-specific questions. Some content-specific questions comprised a single question, but others comprised more than one question because more than one piece of information was required for the correct answer. Content-specific questions comprising more than one question were numbered with the same number (e.g., 1.1, 1.1.). When the participant could not answer the highest-scoring content-free question, the participant was asked a content-specific subquestion (see the previously mentioned additional materials for a sample reading comprehension form). For example, if a participant fails to answer a question related to the consequence component such as, "What is the consequence in this story?" (content-free question), the question would be rephrased as "What did Mehmet's mother do when Mehmet really wanted the shoes?" (content-specific question). When the responses of content specific questions for some story components required more complex sentences (e.g., for the reaction component, "How did Mehmet feel at the end of this story?", "What did Mehmet decide to do at the end of this story?"), more than one content-specific question was asked, and the participant was expected to answer each question correctly.

Correct answers were recorded in the "C-correct" column, and incorrect answers in the "I-incorrect" column. Cases in which participants only partially answered questions or were unsure whether their answers were correct were recorded in the explanation column. For example, if a participant was asked where the story took place and the response was only a partial answer, the statement "only some places mentioned (partly)" would be written in the explanation column. Likewise, if a participant provided an ambivalent answer, the response was written in the explanation section to be evaluated after the session. According to the analytical rubric, the answers given to the questions were scored when each probe session was completed.

Analytical Rubric

The analytical rubric was developed by the researchers following a six-stage process in accordance with the literature. These stages are (a) defining a topic, (b) identifying the key components of the topic of interest, (c) selecting a rubric format, (d) describing dimensions and leveling them from the best response to the worst response, (e) developing a scoring scale and creating a rubric template, and (f) taking expert opinions to revise the rubric (Moskal & Leydens, 2000). The initial rubric was sent to four faculty members who are experts in reading comprehension and designing rubrics. They were asked to assess the rubric in terms of its relevance to the study's measurement purpose, clarity, comprehensiveness, and meaningfulness. Based on their opinions, the rubric was revised and given its final form of eight items. Moreover, this stage allowed for confirmation of the content validity of the rubric from the experts (Moskal & Leydens, 2000). To evaluate the reliability of the analytical rubric, Cronbach's alpha coefficient was calculated from the rubric scores obtained by the participants for each item, and the value was found to be $\alpha = .80$ for the rubric.

In the rubric, the highest score for the components of the place, time, main character, and supporting character(s) was 2, and the lowest score was 0. Participants would receive 2 if all story components were answered correctly, 1 if some were answered correctly, and 0 if no correct answers were given. Among the story components

DOI: 10.1352/1944-7558-128.2.145

that require inference, the highest score for the problem, consequence, and reaction was 2, the lowest score was 0; the highest score for the attempt was 3, and the lowest score was 0 (see additional materials for rubric). If participants correctly answered content-free questions, they achieved the highest score in the rubric for each story component. If participants could not answer these questions but correctly answered the content-specific questions about the problem, consequence, and reaction, they would get 1 point. For the attempt, unlike the other components, participants would get 2 points if they answered the question, "What did … do to solve the problem in this story?" and 1 point if they gave the correct answer when the attempt was made into a question sentence. If participants could not answer any of the questions, they would get 0 points. The highest obtainable score on the rubric is 17, and the lowest score is 0. A score between 14 and 17 in the analytical rubric was determined as an acceptable reading comprehension level based on suggestion in the literature that correctly answering 80% or more of questions related to story components indicates comprehension (e.g., Boon et al., 2015; Gardill & Jitendra 1999; Stringfield et al., 2011).

Variables

The dependent variable is the reading comprehension level of the participants for understanding narrative texts. To evaluate the reading comprehension levels, questions were asked to participants based on the stories they read in each session of the study and the answers were recorded. These answers were later scored according to the analytical rubric. The scores obtained from this rubric were accepted as the reading comprehension level for understanding narrative texts. The study's independent variables are the RR and SM strategies.

Experimental Design

In this study, a single-case experimental design known as the multielement design was used (Riley-Tillman et al., 2020). To measure reading comprehension level of the participants, five consecutive sessions were planned for the baseline. Thereafter, the intervention was initiated, and the independent variables were applied to all participants simultaneously. Both independent variables were presented to participants on the same day, and it was ensured that at least 1 hour had passed between the two interventions (see the additional materials for the delivered sequence of RR and SM strategies in the intervention phase). When implementing the independent variables, the participants were told which independent variable was being used during the intervention session. Once the criterion was met (performance of 80% or above in three consecutive sessions [14–17 points]), the intervention condition was terminated, and the best intervention condition was begun. The best intervention condition was ended when the student performed the target behavior 80% or above (14–17 points) in five consecutive sessions and used the story map independently with 80% or higher accuracy.

General Procedures

The general procedures comprised baseline, intervention, best intervention, daily probe, and generalization sessions. The first researcher conducted all sessions during the spring term of 2018. The first researcher was a graduate student in an MA program in intellectual disability and a research assistant in the Department of Special Education at the time when the study was conducted. Furthermore, this researcher had 3 years of experience teaching students with ID. All sessions took place as one-on-one within individual study rooms of the schools attended by the participants. Two sessions were held for each participant, one using RR and the other using SM, between 9:10 a.m.–3:00 p.m. every weekday. The stories were randomly selected from a pool of 59 stories determined to be used in this study, and a different story was used in each session. However, texts with the same difficulty level were used in the RR and SM sessions on the same day. The readability level of the stories ranged from 3–4.5 in the baseline sessions, 3–5 in the RR sessions, 3–5 in the SM sessions, 3–4.5 in the best intervention sessions, and 3.92–5 in the generalization sessions.

Baseline Sessions

In the baseline sessions, the researcher gave the story to the participant and said, "Now, I want you to read the story. After reading this story, I will ask you questions about the story. Let's start!" Then gave the instruction, "Read the story aloud." After the participant read the story, the researcher removed the participant's copy of the story and

DOI: 10.1352/1944-7558-128.2.145

provided the participant with a copy of the reading comprehension questions and said, "Now, I will ask you questions about this story." If the participant answered the question as written on the reading comprehension form or differently with the same meaning, it was accepted as the correct answer; all other responses were considered incorrect. If the participant did not answer a question within 5 seconds, the question was repeated. If the participant still did not answer or provided an incorrect answer, the researcher moved on to the rephrased version of that question with a subscore, if any, according to the analytical rubric (content-specific question); otherwise, they moved on to the next question. If the participant started answering questions requiring more than one sentence and paused, the researcher prompted the participant with questions such as, "What else? What else happened? Then?" If the participant could not answer after 5 seconds or provided an incorrect answer, the researcher moved on to the rephrased version of that question with a subscore, if any, according to the analytical rubric, then moved on to the next question. The researcher only recorded the answers provided by the student in the relevant column on the form without giving any corrective feedback. After all the questions were completed, the researcher praised the student's participation and ended the baseline session.

Intervention Sessions

The intervention sessions comprised RR and SM. A previous meta-analysis on repeated reading found that RR was more effective on reading comprehension when the same text was read three times, an adult instructor provided corrective feedback, and the purpose of reading was made clear. Therefore, in this study, intervention sessions with RR were conducted with these components in mind (Therrien, 2004). The intervention sessions with SM used the modeling-guided-independent practice process, which has been reported in the literature to be an effective method. In addition, the criterion for moving from one stage to the next (i.e., from modeling to guided, from guided to independent) was established based on the literature (Boon et al., 2015).

Repeated Reading Procedure. In the RR intervention sessions, the participant was provided one copy of the selected story. The researcher used three copies of the same story to record any misread words during each reading. The researcher first told the student which strategy would be used in the session, then explained RR and its use. Finally, the researcher said "After reading this story three times, I will ask you questions about the story. So, read this story to understand it well. If you're ready, start reading the story aloud." Thus, clear prompts and instructions related to the purpose of reading were provided to the participant before starting the intervention. If the participant skipped a line while reading, the researcher indicated the line and asked the participant to continue reading. The researcher corrected any words that were skipped or that could not be read within 3 seconds, and indicated any other mispronunciations on the teacher copy of the story and corrected them at the end of the first reading. When making corrections during and after the reading, the researcher modeled the correct pronunciations of the words and asked the participant to repeat them. The modeling continued until the word was read correctly. Before the second reading, the researcher reiterated that the story should be read to be understood and gave the instruction to read aloud again. Again, any words read or pronounced incorrectly were corrected as in the first reading. The third and final reading again followed the same procedure. After the third reading and corrections, the daily probe session was started. Once all the questions had been asked, the researcher praised the student's participation and ended the session.

Story-Mapping Procedure. The SM procedure was conducted by following a three-phase process according to the direct/explicit instruction: modeling, guided practice, and independent practice. In the modeling phase, the researcher told the participant which strategy they would work with and explained SM and its use. Thereafter, the researcher explained the story components on the story map and asked the participant to read the story aloud. As the participant came across each story component while reading, the researcher stopped the participant and explained which story component they had come across with reasons. After explaining, the researcher modeled writing the story component on his map and asked the participant to do the same on his/her map. Once the whole story was read in the same manner, the intervention was concluded, and the participant was asked to review their story map one last time. After the review process was completed, the researcher took the

DOI: 10.1352/1944-7558-128.2.145

story and the story map from the student and informed the participant that he would start asking the reading comprehension questions, which constituted the daily probe session. The researcher refrained from providing the student corrective feedback during this questioning stage. After asking all the questions, the researcher praised the student's participation and ended the session. Once the participant achieved a rubric score of 70% or above from their highest score in the baseline phase for at least three consecutive sessions, and could fill in the story map with an accuracy of 80% or above, the guided practice phase was initiated.

In the guided practice phase, the participant was asked to read the story and fill in the story map independently. Participants were advised that if they could not complete any part of the story map independently, the researcher would provide assistance. The researcher confirmed that participants found the correct story components or corrected the incorrect story components by explaining why they were wrong. In this phase, participants were permitted to read the story aloud or silently. After reading was completed, participants were asked to review their story maps. Thereafter, the researcher took the story and the story map from the participants and commenced the daily probe; once the participant could achieve a score between 14–17 points in three consecutive sessions in the guided practice and was able to complete the story map independently with an accuracy of 80% or above, the independent practice phase was initiated.

During the independent practice phase, participants were asked to read the story and complete the story map. Participants were permitted to read the story aloud or silently and could complete the story map during or after reading. After the story had been read, the researcher evaluated whether the story map had been completed correctly, corrected any mistakes, and asked the participant to review the story map for the last time. Thereafter, the researcher took the story and story map and conducted the daily probe session. Once the participant could achieve a score between 14–17 points in five consecutive sessions in the independent practice phase and completed the story map independently with an accuracy of 80% or above, SM was terminated.

The Best Intervention Sessions

When the data obtained from the intervention sessions were analyzed visually, it was observed that SM was the first strategy that led to the achievement of acceptable reading comprehension levels. Furthermore, in the last three sessions of the intervention phase, the data paths of the SM and RR strategies were clearly and consistently separated (Figure 1). Therefore, the best intervention sessions were conducted using SM, which was more effective in improving the reading comprehension performance of students with ID. In the best intervention sessions, participants were asked to fill in the story map and answer the reading comprehension questions as in the independent practice phase. As with previous data collection, the researcher refrained from providing feedback while asking comprehension questions. The best intervention phase was concluded when participants scored 80% or above (14–17 points) in five consecutive sessions and completed the story map independently with at least 80% accuracy.

Daily Probe Sessions

Daily probe sessions were conducted by asking reading comprehension questions at the end of each intervention and best intervention session. In these sessions, the researcher sat next to the participant. The sessions were conducted in the same manner as the baseline sessions with the only difference being that the questions were asked about the stories presented in the intervention and best intervention phases.

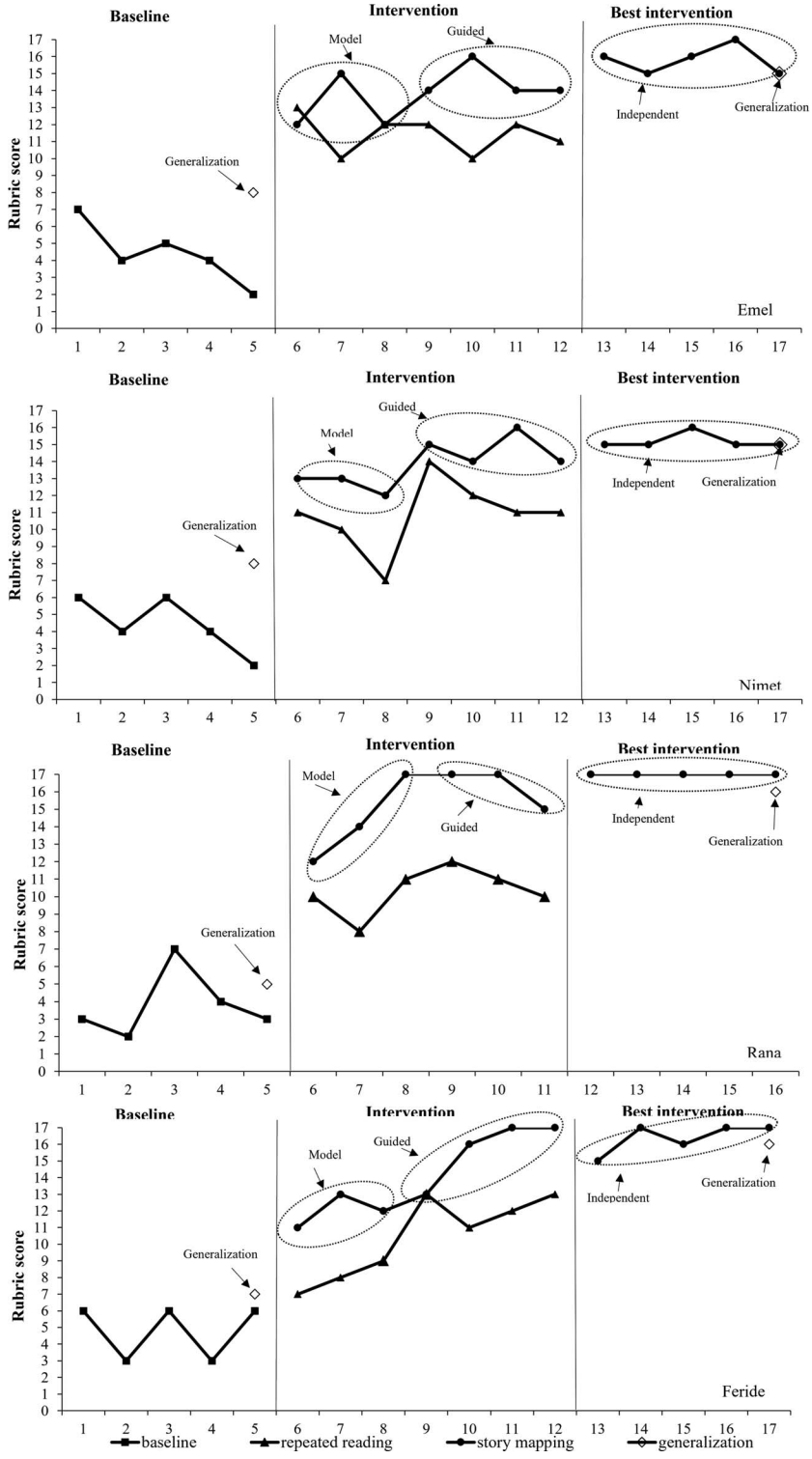
Generalization Sessions

The generalization sessions were planned to determine whether participants could generalize the reading comprehension developed with stories with 100 (± 10) words to stories with 150 (± 10) words using RR and SM. Generalization sessions were conducted in a pre-test and post-test. The pre-test sessions were similar to the baseline sessions. The post-test sessions were conducted using only SM, as RR did not develop reading comprehension skills to the targeted criterion level during the intervention phase. The post-test sessions were similar to the independent practice phase of intervention sessions. The only difference was that the researcher did not make any instructional interventions (e.g., giving corrective and confirmative feedback, asking participants to

DOI: 10.1352/1944-7558-128.2.145

Figure 1

The Analytical Rubric Scores of Emel, Nimet, Rana, and Feride in Baseline, Intervention, and Best Intervention Sessions for Repeated Reading and Story Mapping Strategies



DOI: 10.1352/1944-7558-128.2.145

review their story maps), and participants used the strategy independently.

Reliability

In the study, for each participant and in 40% of each condition, the interobserver agreement (IOA) for the dependent variable; the procedural fidelity (PF) data for the baseline, daily probe, generalization conditions; and the treatment fidelity (TF) data for the independent variables were collected by a graduate special education student experienced in systematic instruction and collecting data with students with ID. When collecting IOA data, the formula [(agreement/agreement + disagreement) ×100] was used (Barton et al., 2018). The observer was informed about collecting the IOA data, however, was blind to the study and the conditions. To collect the IOA data, the observer watched randomly selected video recordings. He recorded participant answers to reading comprehension questions on the form and then scored them using the analytical rubric. The mean IOA data for the baseline, intervention, best intervention, and generalization conditions were 98%, 98%, 98% (range = 96%–100%), and 100%, respectively. PF and TF data were collected to determine the extent to which the first researcher conducted each experimental condition as intended. Data collection forms and informative text explaining how to collect PF and TF data were given to the observer. The observer was asked to watch the video recordings to record whether the first researcher fulfilled the planned behaviors for each condition. The formula [(observed instructor behaviors/planned instructor behaviors) ×100] was used to collect the PF and TF data (Barton et al., 2018). The PF for all conditions was 100%. Similarly, the TF for the intervention condition conducted with the RR and SM strategies and the best intervention condition conducted with SM was 100%.

Data Analysis

The effectiveness data were analyzed using visual analysis and effect size calculation. For visual analysis, the analytical rubric scores were examined in terms of trend, level, variability, and immediate effect. When performing the effect size analysis, Tau-*U* was used. The comparison between intervention conditions included data points from RR and SM in the intervention phase. The data from the best intervention phase was not included in the analysis. When comparing the conditions, SM, which was found to be more effective through visual analysis, was considered the intervention condition, and RR was considered the baseline condition. A web-based calculator was used to calculate the Tau-*U* (Vannest et al., 2016). Tau-*U* values fall between 0 and 1 with 0 to 0.20 indicating a small effect, 0.20 to 0.59 a medium effect, 0.60 to 0.79 a large effect, and 0.80 to 1.0 a very large effect size (Rakap et al., 2020).

The efficiency data were collected in terms of the number of mistakes made during the intervention session with both independent variables and the total instructional time and were analyzed and compared descriptively. A descriptive comparison was conducted by comparing the total number of mistakes made in the RR and SM intervention sessions and the total instructional time in the RR and SM sessions. In this way, it could be determined which of the two strategies required shorter instructional time and enabled participants to make fewer comprehension errors. In addition, the error rate was calculated to assess the number of incorrect answers relative to instructional time. This rate was calculated by multiplying the total number of mistakes by 60 seconds and dividing it by the total instructional time in seconds. Thus, the error rate per minute of instruction was determined. Generalization data were analyzed by comparing the mean scores obtained by participants from the analytical rubric in three pre-test and post-test sessions on a line graph. To determine whether participant levels of answering the literal and inferential questions differed according to the RR and SM strategies, the average percentages of correct answers for each story component in the baseline and intervention sessions were plotted on a bar graph. The data processed in the bar graph were analyzed by comparing the average scores obtained for each story component in the baseline and intervention sessions. Finally, social validity data were collected from students through a subjective assessment in which participants were verbally asked questions about the strategies and analyzed descriptively.

Results

Data were collected on the effectiveness, efficiency, and generalization to answer the first research question, on the average correct answer percentage for each story component to answer the second

DOI: 10.1352/1944-7558-128.2.145

research question, and on social validity to answer the third research question.

Effectiveness

The effectiveness findings of the RR and SM strategies are presented in Figure 1. In the baseline condition, Emel scored 2–7 ($M = 4.4$), Nimet 2–6 ($M = 4.4$), Rana 2–7 ($M = 3.8$), and Feride 3–6 ($M = 4.8$). The scores for all participants had low variability; however, Emel and Nimet's scores tended to decrease, Rana's score tended to increase, and Feride's stayed flat. Emel scored 10–13 ($M = 11.42$), Nimet 7–14 ($M = 10.85$), Rana 8–12 ($M = 10.33$), and Feride 7–13 ($M = 10.42$) in the RR intervention sessions; in the SM intervention sessions, Emel scored 12–16 ($M = 13.85$), Nimet 12–16 ($M = 14$), Rana 12–17 ($M = 15.33$), and Feride 11–17 ($M = 14.14$). In the level change analysis, the values obtained for Emel, Nimet, Rana, and Feride were 7, 5, 5, 4 in RR and 8, 9, 8, 8 in SM, respectively. These values indicate that both strategies had an immediate effect on their performances. The Tau-*U* scores for SM for Emel, Nimet, Rana, and Feride were 0.79, 0.81, 0.97, and 0.34, respectively, when the intervention conditions conducted with the RR and SM strategies were compared. These values indicate that the SM had a very large effect for Nimet and Rana, a large effect for Emel and a medium effect for Feride. As described in the previous section, the SM was used in the best intervention condition. In these sessions, Emel scored 15–17 ($M = 15.8$), Nimet 15–16 ($M = 15.2$), Rana 17 ($M = 17$), and Feride 15–17 ($M = 16.4$). All participants could independently fill out the story map with an accuracy of 80% or above in all the best intervention sessions. The scores obtained from the analytical rubric reveal that all participants performed at the desired criterion level in the best intervention condition.

Efficiency

To determine the efficiency of the RR and SM strategies, data on the total number of mistakes, the total instructional time, and the error rate were collected during the intervention condition. The total number of mistakes refers to the items for which participants received "0" points from the analytical rubric, and the total instructional time is the sum of the intervention and daily probe sessions in the intervention condition. The total number of mistakes for all participants in the intervention sessions using RR is between 12 to 14, the total instructional time is between 36 minutes 52 seconds to 1 hour 06 minutes 17 seconds. The total number of mistakes for all participants in the intervention sessions using SM is between 4 to 5, the total instructional time is between 1 hour 12 minutes 08 seconds to 2 hours 36 minutes 02 seconds. The total number of mistakes all participants made was significantly higher in the intervention sessions using RR compared to SM. However, the total instructional time was less with RR for all participants. The error rates for Emel, Nimet, Rana, and Feride in the RR intervention sessions were 0.18, 0.21, 0.38, and 0.19, respectively; the errors rates in the SM sessions were 0.03, 0.03, 0.05, and 0.03, respectively. These error rates demonstrate that participants made fewer mistakes per minute of instruction in the SM intervention sessions compared to the RR intervention sessions (see the additional materials for the efficiency table).

Generalization

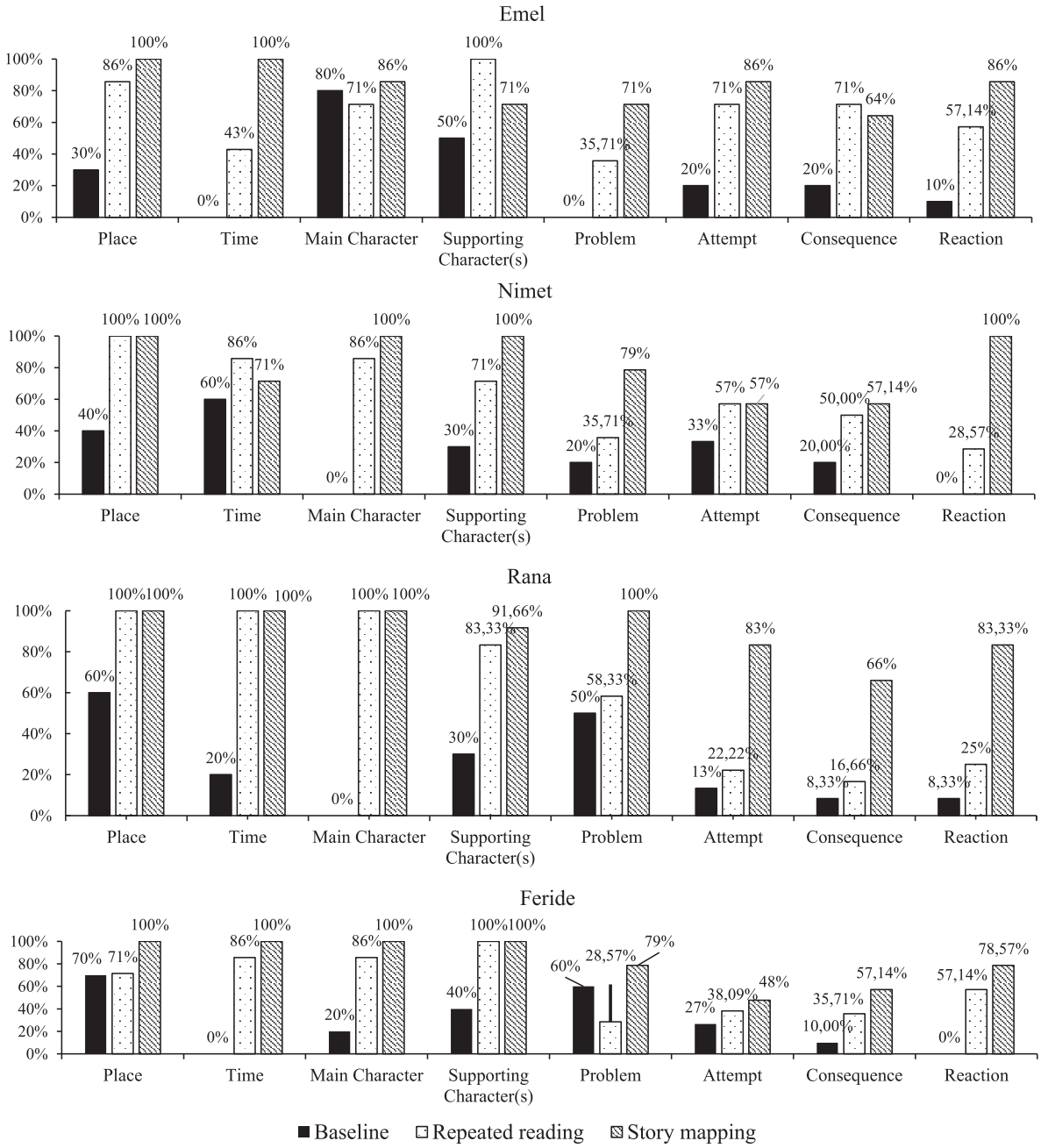
The score averages for the generalization pre-test and post-test sessions are provided in Figure 1 with a tetragon shape. Emel, Nimet, Rana, and Feride received an average of 8, 8, 5, and 7 points in the pre-test sessions and 15, 15, 16, and 16 points in the post-test sessions, respectively, demonstrating that all participants could generalize the reading comprehension skills developed with stories of 100 ($\pm$ 10) words to stories of 150 ($\pm$ 10) words using SM.

Correct Answer Percentage of Each Story Component

As seen in Figure 2, in RR intervention sessions, Nimet, Rana, and Feride had an increase in literal question answers related to story components compared to the baseline. Emel had an increase in all story components except for main character. In SM intervention sessions, the average correct answer percentage for literal questions for all participants increased compared to the baseline. Emel and Feride had a slight increase in all story components except for supporting character(s), Nimet in main character and supporting character(s), and Rana only in supporting character(s) with SM compared to RR. The percentages of all participants correctly answering inferential questions regarding problem, attempt, consequence,

©AAIDD
DOI: 10.1352/1944-7558-128.2.145

Figure 2
Correct Answer Percentage of Each Story Component for Emel, Nimet, Rana, and Feride



and reaction increased after intervention sessions with both strategies compared to the baseline level. Only Feride's percentage for the problem component decreased compared to the baseline in the RR intervention sessions. When the RR sessions were compared with the SM sessions, it was observed that SM provided a more significant increase than RR in all story components except the consequence for Emel, in all story components except the attempt for Nimet, and in all story components for Feride and Rana.

Social Validity

All participants had positive opinions on the ease of use of both strategies and their contribution to their reading comprehension. Emel, Feride, and

DOI: 10.1352/1944-7558-128.2.145

Rana stated that learning to use both strategies was important for them, that they could understand what they read better, and that they wanted to use these strategies in future learning. Some students stated that completing the story map (Feride), reading the text three times, and having their reading errors corrected (Emel, Nimet, Feride) were important in the reading comprehension process. Providing better comprehension (Emel), correction of reading errors, and repeating stories three times (Feride) were indicated as positive aspects of RR, whereas ease of use (Rana) and better comprehension by finding and writing down the components of the story separately in the story map (Nimet) were indicated as positive aspects of SM. Regarding the enjoyable aspects of the study, using RR (Emel), answering reading comprehension questions, reading stories (Nimet) or reading a story repeatedly, correction of pronunciation mistakes, and better comprehension owing to the mapping of the story components (Feride) were mentioned. As for the unpleasant aspects of the study, only Rana stated that she did not like having to read the stories three times (see additional materials for all social validity findings).

Discussion

The current study examined the relative effects of WR and SC interventions in developing the reading comprehension skills of adolescent students with ID. The findings reveal that both interventions improved the reading comprehension skills of students with ID; however, SC intervention was more effective and efficient than WR intervention. Furthermore, the findings reveal that students with ID could generalize their reading comprehension skills to stories with 150 (± 10) words using SC. Both interventions were significantly effective for all participants in answering literal. However, SC was more effective than WR in answering inferential questions. Finally, the social validity findings reveal that all students had a positive view about the acceptability of the interventions and the significance of the results. These findings are discussed further in the following sections.

The Effectiveness of Interventions

The findings of this study support the findings of previous research indicating that the WR and SC interventions are both effective in the development of reading comprehension skills for students with special needs (Boon et al., 2015; Escarpio & Barbetta, 2015; Hawkins et al., 2011; Stringfield et al., 2011; Therrien & Hughes, 2008). Moreover, it can be stated that the current study contributes to extending the limited amount of research that indicates that the WR and SC interventions are effective in developing the reading comprehension skills of students with ID (Alqahtani, 2020; Isikdogan & Kargin, 2010). However, the findings of the current study differ from those of previous studies in that they reveal that SC is more effective and efficient than WR in improving the reading comprehension skills of students with ID. It is possible to explain this difference with (a) the types of questions asked to evaluate understanding, (b) the underlying theory of both interventions, and (c) the learning hierarchy.

Types of Questions

Considering the extent to which reading comprehension has been evaluated in studies conducted with the WR and SC interventions, it can be seen that in all studies but one using SC, participants were expected to answer both literal and inferential questions (Cure et al., 2021). In research using WR, participants were typically only asked literal questions (Escarpio & Barbetta, 2015). However, in some WR research, both literal and inferential questions were posed (Freeland et al., 2000; Hawkins et al., 2011; O'Connor et al., 2007; Therrien & Hughes, 2008). In these studies, it was found that SC was effective in enabling participants to answer both literal and inferential questions (Cure et al., 2021). WR was found to be effective in answering literal questions in all previous research (Escarpio & Barbetta, 2015; Freeland et al., 2000; Hawkins et al., 2011; O'Connor et al., 2007; Therrien & Hughes, 2008), but it was not found to be effective in answering inferential questions in some studies (Freeland et al., 2000; Therrien & Hughes, 2008). These studies indicate that SC can be effective on reading comprehension regardless of the type of question asked in the assessment, and WR is less effective/ineffective on reading comprehension when inferential questions are asked in the assessment. In this study, participants were expected to answer literal and inferential questions and the scores obtained from both were evaluated as a whole. Therefore, one of the reasons why SC was found to be more effective than WR in this study

DOI: 10.1352/1944-7558-128.2.145

may be related to the extent to which reading comprehension was evaluated, or the targeted reading comprehension skills.

Theories

Looking at the underlying theories of both interventions and the features developed on the basis of these theories, SC intervention, which is based on the schema theory (Stein & Glenn, 1975), allows the reader to focus directly on the important information (story components) in the text and the relationships between these components. Moreover, it enables the reader to correct mistakes in background knowledge about important information in the text, complete any deficiencies with new information, and make appropriate inferences about the text. From this viewpoint, SC aims to improve reading comprehension completely. Alternatively, WR intervention, which is based on the automatic information processing theory (LaBerge & Samuels, 1974), aims to improve reading comprehension by exposing the reader to information directly in the text multiple times without separating the important information from the unimportant and expecting for the reader to direct their attention to what they read. Therefore, SC allows the reader to learn both direct and inferential information about the text, and WR focuses the reader on direct information. Consequently, it can be argued that WR is more effective when targeting direct information in the text because it does not fully emphasize nor directly target inference (Therrien & Hughes, 2008), whereas SC is effective in both because it targets both direct and inferential information in the text (Idol & Croll, 1987).

Learning Hierarchy

Studies on learning hierarchy have revealed that high modeling and error correction are more effective than practicing in the acquisition of a skill. Simultaneously, it has been found that selecting intervention appropriate for the skill provides better instructional outcomes (McMaster et al., 2012; Parker & Burns, 2014; Szadokierski et al., 2017). To develop comprehension skills, SC interventions heavily use modeling and correcting comprehension errors, whereas WR interventions use reading the same stories repeatedly and correcting the reading errors. From this perspective, it can be said that the reason why SC was more effective than WR is because the type of intervention better matched with the comprehension skills of students with ID is based on high modeling and correction of comprehension errors than practice. Thus, this study confirms that matching skill-by-treatment is critical for improving learning outcomes (McMaster et al., 2012; Parker & Burns, 2014; Szadokierski et al., 2017).

The Efficiency of WR and SC Interventions

In this study, although the instruction carried out with RR was shorter compared to that of SM, many mistakes were made by participants in these sessions, and no participant could reach the desired criterion level. Alternatively, in the SM sessions, few mistakes were made, and the desired criterion level was reached by the end of 6 to 7 sessions. When considering the importance of learning more with fewer mistakes in a shorter time in the efficiency calculation (Konrad et al., 2011), it is possible to state that SC intervention was more efficient than WR intervention in developing the reading comprehension skills of participants in the study. This finding is important in terms of illustrating that SC interventions can be effective and efficient for improving reading comprehension skills. In addition, it provides a practical contribution to the field of special education by demonstrating an efficient intervention that special education teachers can use to improve their students' reading comprehension skills.

Generalization and Social Validity

Because very few studies have revealed that SC interventions have an effect on generalization (Gardill & Jitendra, 1999; Idol & Croll, 1987), it is considered that the finding of the present study indicating that SM, which is an SC intervention, is effective in the generalization of reading comprehension skills makes a significant contribution to the relevant literature by increasing the external validity of previous studies. The social validity findings of this study are also important. Some participants stated that SM improved their reading comprehension by "writing important information on the story map" and RR by "doing a repeated reading three times." Simultaneously, some participants preferred SM because "finding and writing down the story components in the story map separately helps understand what was read"; others preferred RR because

DOI: 10.1352/1944-7558-128.2.145

"each word they read incorrectly was corrected, and the story was read three times." These findings reveal that students were aware of the characteristics of the RR and SM strategies to improve their reading comprehension and how their own reading comprehension skills developed during the study. Moreover, this confirms that both types of interventions improved the reading comprehension skills of the participants and, thus, increases the significance of the results obtained in the study.

Limitations

This study had several limitations. The foremost of these is that the readability levels of all stories did not match the participants' reading comprehension levels. Although the reading comprehension levels of the study participants were at the third-grade instructional level, the readability levels of the stories were between the third and fifth grades. Therefore, some of the stories may have been difficult for the participants in terms of readability, which could have affected their reading comprehension skills. However, it can be stated that the participants were not significantly affected by the readability level of any story as it was found that they could read the stories with 85–95% accuracy in the pre-study evaluation.

The second limitation is related to writing skills, which were a prerequisite to be included in this study. This prerequisite was determined because participants were expected to fill in the blanks on the story maps by writing during the SM intervention sessions. However, the story maps could have been filled in by the researcher if the participants told him the story components to be written on the map. The reason writing skills were used as a prerequisite was that in most studies conducted with SM, the story maps were filled in by the students (Cure et al., 2021). Therefore, writing skills were an important factor in revealing the effectiveness of SM in the literature. Furthermore, a recent meta-analysis study revealed that writing about the material read had an impact on comprehension (Graham & Hebert, 2011). Because this study aimed to determine which intervention was more effective, it was decided that writing skills would need to be a prerequisite. However, this limited the findings of this study, as it caused the exclusion of participants with poor writing skills. Therefore, it can be said that the writing skills prerequisite limited the generalizability of the findings of the research.

The third limitation is related to the IRI used to assess the participants' "third-grade instructional level reading comprehension performance" in the prerequisite assessment. There was no standardized measurement instrument developed in Turkish that could be used to assess reading comprehension skills at the time the study was conducted. Hence, an IRI whose validity and reliability had been assessed was used. However, the literature points out that IRIs have problems in correctly determining reading levels (Spector, 2005). Thus, the use of the IRI may have resulted in an inaccurate determination of reading comprehension skills, which was an inclusion criterion for the study. However, it can be said that the stories used in this study were suitable for the comprehension levels of the participants considering that there was a significant improvement in the levels of their correct answers to the questions asked about the stories after the intervention sessions conducted with both interventions.

The fourth limitation is related to the corrective feedback given during the use of strategies. Although comprehension errors were corrected during the SM sessions, reading errors were not. Additionally, in the SM sessions, participants were given the option to read silently; therefore, whether reading errors were made or not remained unknown. The fact that no corrective feedback was provided on reading errors in these sessions could have had a moderate effect on the effectiveness of the SM strategy. Therefore, it can be said that this was a confounding factor affecting the results of this study.

In light of the findings of this study, recommendations can be made to special education teachers to use SM to improve student reading comprehension skills for narrative texts. However, instruction can be conducted with RR when the sole aim is to teach literal questions. Moreover, story maps can be used with students with poor writing skills if teachers ask students to find the requisite information in the story and then teachers write the answers in the story map. For future studies, the same strategies can be compared to investigate the degree of generalization of the findings obtained in this study, to evaluate students' reading comprehension skills during comparison with different measurement tools (e.g., asking to retell, asking multiple-choice questions), to aim to develop student abilities in answering literal questions or inferential questions, or to aim to develop reading comprehension skills

©AAIDD
DOI: 10.1352/1944-7558-128.2.145

in informative texts or in longer texts that do not contain a regular story structure. In addition, in future studies, the strategies used in this study can be combined with other reading comprehension strategies to create multicomponent strategy packages, and the effectiveness of these strategy packages in developing reading comprehension skills can be examined. Moreover, when comparing the two strategies, the effect difference between the strategies can be evaluated using both nonoverlapping and mean difference-based effect size methods. Finally, because only an informal measurement tool developed by the researchers was used in this study, the extent to which teaching strategies improve reading comprehension skills or general reading success in standard achievement tests can be examined.

Conclusion

The results reveal that both the WR and SC interventions significantly contribute to the development of comprehension skills related to narrative texts for students with ID. However, when comparing the two interventions, the SC intervention was found to be more effective and efficient. Deficits in the reading skills of students with ID have been frequently emphasized in the related literature and have been revealed in some studies. However, limited research has been conducted on strategies that can improve these skills. As evidenced by this research, traditional strategies such as RR and SM can improve the comprehension skills of students with ID. However, using interventions that focus on correcting comprehension errors rather than word reading errors is more effective in improving the comprehension skills of students with ID. Moreover, attention should be paid to using strategies that allow students to learn with fewer mistakes in a shorter amount of time in the teaching process and enjoy this process. Therefore, future research on this subject should continue to make efforts to find effective strategies that teach students quickly, with fewer mistakes, and give pleasure. This can ensure that students with ID get more benefit from reading, such as reading for learning and reading for enjoyment.

References

Alqahtani, S. S. (2020). iPad and repeated reading to improve reading comprehension for young adults with intellectual disability. *Research in Developmental Disabilities*, *103*, 1–9. https://doi.org/10.1016/j.ridd.2020.103703

Barton, E. E., Meadan-Kaplansky H., & Ledford, J. R. (2018). Independent variables, fidelity and social validity. In D. L. Gast & J. R. Ledford (Eds.), *Single case research methodology: Applications in special education and behavioral sciences* (3rd ed., pp. 209–237). Routledge/Taylor & Francis Group.

Bezirci, B., & Yilmaz, A. E. (2010). A software library for measurement of readability of texts and a new readability metric for Turkish. *Dokuz Eylul University Faculty of Engineering Journal of Science and Engineering, 12*(3), 49–62.

Blackorby, J., Wagner, M., Cameto, R., Davies, E., Levine, P., Newman, L., Marder C., & Sumi, C. (2005). *Engagement, academics, social adjustment, and independence: The achievements of elementary and middle school students with disabilities*. SRI International.

Boon, R. T., Paal, M., Hintz, A. M., & Cornelius-Freyre, M. (2015). A review of story mapping instruction for secondary students with LD. *Learning Disabilities: A Contemporary Journal*, *13*(2), 117–140.

Broer, S. M., Doyle, M. B., & Giangreco, M. F. (2005). Perspectives of students with intellectual disabilities about their experiences with paraprofessional support. *Exceptional Children*, *71*(4), 415.

Browder, D. M., Wakeman, S. Y., Spooner, F., Ahlgrim-Delzell, L., & Algozzinexya, B. (2006). Research on reading instruction for individuals with significant cognitive disabilities. *Exceptional Children*, *72*(4), 392–408. https://doi.org/10.1177/001440290607200401

Cancio, E. J., Larsen, R., Mathur, S. R., Estes, M. B., Johns, B., & Chang, M. (2018). Special education teacher stress: Coping strategies. *Education and Treatment of Children*, *41*(4). https://doi.org/10.1353/etc.2018.0025

Cora-Ince, N. (2007). *Teaching reading comprehension skills to mentally retarded students via cooperative learning-based teaching program and studying the effectiveness the of the program* [Unpublished doctoral dissertation]. The University of Ankara.

Cure, G., Batu, E. S., & Gulboy, E. (2021). Effectiveness of the story-mapping strategy in students with disabilities: Meta-analysis of single-case experimental design studies. *Reading and Writing Quarterly*, *37*(6), 513–534.

DOI: 10.1352/1944-7558-128.2.145

https://doi.org/10.1080/10573569.2020.1858211

Escarpio, R., & Barbetta, P. M. (2015). Comparison of repeated and non-repeated readings on the reading performances of students with emotional and behavioral disorders. *Journal of Emotional and Behavioral Disorders, 24*(2), 111–124. https://doi.org/10.1177/1063426615574337

Freeland, J. T., Skinner, C. H., Jackson, B., McDaniel, C. E., & Smith, S. (2000). Measuring and increasing silent reading comprehension rates: Empirically validating a repeated readings intervention. *Psychology in the Schools, 37*(5), 415–429. https://doi.org/10.1002/1520-6807

Gardill, M. C., & Jitendra, A. K. (1999). Advanced story map instruction: Effects on the reading comprehension of students with learning disabilities. *The Journal of Special Education, 33*(1), 2–17. https://doi.org/10.1177/002246699903300101

Graham, S., & Hebert, M. (2011). Writing to read: A meta-analysis of the impact of writing and writing instruction on reading. *Harvard Educational Review*, *81*(4), 710–744. https://doi.org/10.17763/haer.81.4.t2k0m13756113566

Guzel-Ozmen, R. (2000). *6-8 yaş çocukları için okuduğunu anlama seti öğretmen kitabı* [Reading book set for 6-8 years old children]. Yayınları.YA-PA

Hawkins, R. O., Hale, A., Sheeley, W., & Ling, S. (2011). Repeated reading and vocabulary-previewing interventions to improve fluency and comprehension for struggling high-school readers. *Psychology in the Schools, 48*(1), 59–77. https://doi.org/10.1002/pits.20545

Hernandez, D. J. (2011). *Double jeopardy: How third-grade reading skills and poverty influence high school graduation*. The Annie E. Casey Foundation.

Idol, L., & Croll, V. (1987). Story-mapping training as a means of improving reading comprehension. *Learning Disability Quarterly, 10*(3), 214–229. https://doi.org/10.2307/1510494

Isikdogan, N., & Kargın, T. (2010). Investigation of effectiveness of story-map method on reading comprehension skills of students with mental retardation. *Educational Sciences: Theory and Practice*, *10*(3), 1509–1527.

Jennings, J. H., Caldwell, J. A., & Lerner, J. W. (2014). *Reading problems: Assessment and teaching strategies* (7th ed.). Pearson.

Karasu, H. P., Girgin, U., & Uzuner, Y. (2012). Assessment of reading skills of hearing- and hearing-impaired students with informal reading inventory. *Anadolu Journal of Educational Sciences International*, *2*(1), 65–88.

Katims, D. S. (2001). Literacy assessment of students with mental retardation: An exploratory investigation. *Education and Training in Mental Retardation and Developmental Disabilities, 36*(4), 363–372.

Konrad, M., Helf, S., & Joseph, L. M. (2011). Evidence-based instruction is not enough: Strategies for increasing instructional efficiency. *Intervention in School and Clinic*, *47*(2), 67–74. https://doi.org/10.1177/1053451211414192

LaBerge, D., & Samuels, S. J. (1974). Toward a theory of automatic information processing in reading. *Cognitive Psychology*, *6*(2), 293–323. https://doi.org/10.1016/0010-0285(74)90015-2

McMaster, K. L., Van den Broek, P., Espin, C. A., White, M. J., Rapp, D. N., Kendeou, P., Bohn-Gettler, C. M., & Carlson, S. (2012). Making the right connections: Differential effects of reading intervention for subgroups of comprehenders. *Learning and Individual Differences*, *22*(1), 100–111. https://doi.org/10.1016/j.lindif.2011.11.017

McNeill, J. (2019). Social validity and teachers' use of evidence-based practices for autism. *Journal of Autism and Developmental Disorders*, *49*(11), 4585–4594. https://doi.org/10.1007/s10803-019-04190-y

Moskal, B. M., & Leydens, J. A. (2000). Scoring rubric development: Validity and reliability. *Practical Assessment, Research, and Evaluation, 7*(10), 71–81. https://doi.org/10.7275/q7rm-gg74

O'Connor, R. E., White, A., & Swanson, H. L. (2007). Repeated reading versus continuous reading: Influences on reading fluency and comprehension. *Exceptional Children, 74*(1), 31–46. https://doi.org/10.1177/001440290707400102

Parker, D. C., & Burns, M. K. (2014). Using the instructional level as a criterion to target reading interventions. *Reading & Writing Quarterly*, *30*(1), 79–94. https://doi.org/10.1080/10573569.2012.702047

Rakap, S., Yucesoy-Özkan, S., & Kalkan, S. (2020). Effect size calculations in single-case experimental research design: An investigation of nonoverlap methods. *Turkish Journal of Psy-*

DOI: 10.1352/1944-7558-128.2.145

chology, *35*(85), 61–64. https://doi.org/10.31828/tpd1300443320181023m000015

Reichow, B., Lemons, C. J., Maggin, D. M., & Hill, D. R. (2019). Beginning reading interventions for children and adolescents with intellectual disability. *Cochrane Database of Systematic Reviews*, *12*. https://doi.org/10.1002/14651858.CD011359.pub2

Riley-Tillman, T. C., Burns, M. K., & Kilgus, S. P. (2020). *Evaluating educational interventions: Single-case design for measuring response to intervention* (2nd ed.). The Guilford Press.

Samuels, S. J. (1979). The method of repeated readings. *The Reading Teacher*, *32*(4), 403–408.

Shelton, A., Wexler, J., Silverman, R. D., & Stapleton, L. M. (2019). A synthesis of reading comprehension interventions for persons with mild intellectual disability. *Review of Educational Research*, *89*(4), 612–651. https://doi.org/10.3102/0034654319857041

Spector, J. E. (2005). How reliable are informal reading inventories? *Psychology in the Schools*, *42*(6), 593–603.

Stein, N. L., & Glenn, C. G. (1975). *An analysis of story comprehension in elementary school children: A test of a schema*. Washington University, US Department of Health, Education and Welfare National Institute of Education (ERIC Document Reproduction Service No. ED 121 174).

Stringfield, S. G., Luscre, D., & Gast, D. L. (2011). Effects of a story map on accelerated reader postreading test scores in students with high-functioning autism. *Focus on Autism and Other Developmental Disabilities*, *26*(4), 218–229. https://doi.org/10.1177/1088357611423543

Szadokierski, I., Burns, M. K., & McComas, J. J. (2017). Predicting intervention effectiveness from reading accuracy and rate measures through the instructional hierarchy: Evidence for a skill-by-treatment interaction. *School Psychology Review*, *46*(2), 190–200.

Therrien, W. J. (2004). Fluency and comprehension gains as a result of repeated reading: A meta-analysis. *Remedial and Special education*, *25*(4), 252–261. https://doi.org/10.1177/07419325040250040801

Therrien, W. J., & Hughes, C. (2008). Comparison of repeated reading and question generation on students' reading fluency and comprehension. *Learning Disabilities: A Contemporary Journal*, *6*(1), 1–16.

Vannest, K. J., Parker, R. I., Gonen, O., & Adiguzel, T. (2016). *Single case research: Web based calculators for SCR analysis* (Version 2.0) [Web-based application]. Texas A&M University. singlecaseresearch.org

Received 4/18/2021, accepted 7/5/2022.

Authors:
Goksel Cure, Anadolu University, Türkiye; and **Serife Yucesoy-Ozkan,** Osmangazi University, Türkiye.

Correspondence concerning this article should be addressed to Goksel Cure, M.A., School of Education, Anadolu University, Eskisehir, Türkiye (email: gokselcure@hotmail.com).