Increasing Comprehension of Students with Significant Intellectual Disabilities and Visual Impairments during Shared Stories

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Abstract: Shared stories have been shown to help increase emerging literacy skills in students with significant intellectual disabilities. One important literacy skill is the development of listening comprehension. In this study, least-to-most prompt system was used to promote listening comprehension during shared stories for two students with significant intellectual disabilities and visual impairments. The procedure was evaluated via a multiple probe design across materials (i.e., books). Outcomes indicate that both students improved on the correct number of comprehension questions answered during all three books. In addition, Student 1 was able to generalize responses across people and settings as well as maintain results. Future research and implications for practical team implementation of the least-to-most prompt system to teach listening comprehension are discussed.

Literacy is one of the most important educational goals for all students because of the opportunities it provides to gain strategies for further learning and access to information about the world. For students with significant and complex disabilities, strategies for promoting literacy are difficult to identify. For example, in a comprehensive review of reading for students with significant disabilities, Browder, Wakeman, Spooner, Ahlgrim-Delzell, and Algozzine (2006) found most studies focused on students with moderate intellectual disabilities and sight word reading. When students have visual impairments, as well as severe intellectual disabilities, finding a model for literacy can be especially challenging.

This challenge may be the reason that 92% of teachers of students with visual impairments and multiple disabilities surveyed by Durando (2008) were interested in receiving additional training on literacy for this population. Fewer than half viewed reading as appropriate for all students and most relied on variables such as cognitive ability, communication skills, and functional vision to determine whether or not to teach literacy. While these variables have sometimes been used to determine eligibility for literacy instruction, an alternative perspective would be to give all students the opportunity for literacy learning even if all do not become fully literate. What is needed is a strategy for introducing this literacy instruction. Unfortunately, the research on how to teach literacy tends to focus on students who only have intellectual disabilities or visual impairments, not both (Browder et al., 2006; Corn & Koenig, 2002; Park 2004; van Kleeck, 2006).

Erickson and Hatton (2007) propose a conceptual framework specifically for students with visual impairments who are working on emerging literacy skills. Their framework focuses on three areas for learning: (a) oral language (i.e., narrative knowledge, vocabulary, and knowledge of the world), (b) metalinguistic skills (i.e., phonological awareness

and syntactic awareness), and (c) literacy knowledge (i.e., conceptual knowledge, functions of print, perceptions of self as learner, emergent reading in context, procedural knowledge, phonetic spelling, alphabetic knowledge, and letter-sound knowledge). By focusing on all three areas, students with visual impairments gain skills for beginning reading. Similarly, Browder, Gibbs, et al. (in press) proposed a conceptual model of literacy that emphasizes beginning reading skills for young students. This model also promotes the use of shared literature for all ages with the use of read alouds or other means to access text for students who are not independent readers.

Read alouds, also called "shared stories", are often used with young children to promote early literacy (Coyne, Simmons, Kame'enui, & Stoolmiller, 2004; van Kleeck, 2006). Shared story experiences can foster literacy concepts such as: (a) print awareness; (b) phonological awareness; (c) alphabet knowledge; and (d) metalinguistic awareness (Justice & Kaderavek, 2002). For example, Coyne et al. found benefits for using shared stories on literacy skills of students at risk for reading failure. Shared stories have also been shown to be effective in promoting increases in communication and literacy development for students with disabilities, (Al Otaiba, 2004; Crowe, Norris, & Hoffman, 2004; Justice & Kaderavek, 2002, 2003; Justice, Kaderavek, Bowles, & Grimm, 2005; Justice & Pullen, 2003) visual impairments, and blindness (Corn & Koenig, 2002; Park 2004; van Kleeck, 2006).

In a study specific to students with severe intellectual disabilities, Skotko, Koppenhaver, and Erickson (2004) used shared story activities with four girls diagnosed with Rett Syndrome at the pre-symbolic communication level (i.e., primarily used objects and vocalizations). The intervention consisted of the use of augmentative communication devices and opportunities to communicate (e.g., asking prediction questions). One important aspect of this study is that the interventionist did not wait for the participants to acquire "prerequisite" communication skills, but assumed and promoted understanding and expression in the context of the lessons. For example, the students gained meaning of AAC symbols by using them in the context of the story, rather than in isolation. Results indicated that an increase in communication and engagement with literacy materials was shown with all four participants.

To extend the research of Skotko et al. (2004), to students with visual impairments and severe intellectual disabilities it may be necessary to make two changes—adding objects and using systematic prompting. First, experts have recommended using real objects to add concrete information that will allow the learner to relate to the text and interact more with the story (Erickson & Hatton, 2007; Park, 2004). Second, students with severe intellectual disabilities may need systematic instruction including repeated opportunities to respond with prompting and feedback to use the objects in meaningful ways. Systematic instruction is a method for teaching discrete and chained skills to students with significant disabilities that has a strong research base (Westling & Fox, 2004). For example, in the literature review by Browder et al. (2006), systematic instruction was the most used evidence-based practice to teach vocabulary sight words (88 studies), vocabulary pictures (17 studies), comprehension (16 studies), and fluency (12 studies).

A specific form of systematic instruction that may be especially useful in teaching the exploration and use of objects to build meaning in stories is the least-to-most prompt system, also known as the system of least prompts (SLP). The system of least prompts is used after the target stimulus is presented and the student is provided with a chance to respond independently; if an error or no response occurs, the least intrusive prompt is delivered as well as another opportunity to respond. This is continued until the student responds correctly or the most intrusive prompt in the prompt hierarchy is delivered (Doyle, Wolery, Ault, & Gast, 1988). In a literature review of SLP, researchers found that 11 % of the studies used this strategy with students that had visual impairments (Doyle et al.). The SLP has often been used in combination with a task analysis. A task analysis is the process of breaking down a chained behavior into smaller components and teaching each small component one at a time (Collins, 2007).

Browder, Trela, and Jimenez (2007) ap-

plied systematic prompting and the use of a task analysis to teach shared stories to students with moderate and severe intellectual disabilities. In this study, they examined the effects of training teachers to engage students in a shared story using a book adapted from middle school literature. Results indicated an increase in participation in the reading activities. Although, this study implemented systematic instruction, adaptations would need to be made for students with visual impairments in both the adaptation of the book and mode for student responding (e.g., salient objects, touch response).

Browder, Mims, Spooner, Ahlgrim-Delzell, and Lee (in press) also applied systematic prompting and the use of a task analysis to increase participation and communication of students with significant multiple disabilities. In this study, they examined the effects of individualizing a task analysis to help increase student engagement in a shared story. In addition, books were adapted with salient objects as all participating students required the use of salient objects. Results indicated an increase in participation and communication in the shared story with all three participating students. Once again, this study demonstrates the importance of systematic instruction, but adaptations would still need to be made for students with visual impairments.

Although studies like those by Skotko et al. (2004) and Browder, Mims, et al. (in press) offer guidance for planning shared stories, there currently are no studies demonstrating their applicability to students with visual impairments and significant intellectual disabilities. An extension to this population is especially important because students who have both visual impairments and severe intellectual disabilities present multiple challenges to literacy learning. Due to the complex combination of disabilities and earlier views about "eligibility" for literacy, they may have had little to no prior literacy instruction. Because of this, they may not understand the most basic conventions of a read aloud like interacting with a book and responding to questions about text. These students may also need to build language concepts concurrently with literacy exposure and knowledge. For example, students may not understand even literal concepts presented in the book like "tree" or

"box." Finally, students may need many repetitions with a book to understand the story and be able to produce comprehension responses.

The purpose of this study was to evaluate a strategy for engaging students with visual impairments and severe intellectual disabilities in literacy instruction through the use of a shared story. Specifically, the study evaluated whether a least-to-most prompting system would increase the number of independent comprehension responses during a story-based lesson.

Method

Participants and Setting

Participants for this study included two students with significant intellectual disabilities who were visually impaired. Participating students were required to meet the following criteria: (a) classified by the school system as having a "severe or profound" intellectual disabilities (IQ and adaptive behaviors <55), (b) developmental levels below 1 year as measured by an adapted behavior scale, and (c) receiving services for visual impairments. Teachers in a large urban school system in the Southeast were asked to identify students who met these eligibility criteria. Student eligibility was then verified by reviewing information provided from the student's psychological evaluations.

Three students were initially identified who met the criteria to participate. Only two students completed the study as the third had competing self stimulatory behavior that interfered with making the literacy responses. Although this student began to show some interest in the stories, the competing behavior was not adequately reduced in the timeframe of the study to be able to prompt the comprehension responses.

Demographic information for the two participating students is shown in Table 1. The two students attended two different public schools and received their instruction in self contained special education classrooms for students with severe disabilities. For Student 1, most assessments and interventions were conducted in a separate tutorial room for individualized literacy instruction; although, general-

TABLE 1

Student Demographic

Student	Age	Gender	Diagnoses According to School Records	Aids and Services	Communication And Literacy
Student 1	6	Male	Developmentally Delayed; Multihandicapped; Cortical Visual Impairment; Cerebral Palsy; Bronchopulmonary Dysplasia	Wheel chair; single switch; OT, PT, Speech, Vision Services	Inconsistent communication attempts; inconsistent response to objects; inconsistent responding during read alouds
Student 2	9	Female	Developmentally Delayed; Multihandicapped; Severe visual impairment/severe nearsightedness in each eye; Cerebral Palsy; Microcephaly; Seizures	Wheelchair; single switch; OT, PT, Speech, Vision Impairment Services	Laughs or screams to communicate mood; inconsistent response to object or pictures; inconsistent responding during read alouds

ization data were collected in the special education classroom and the cafeteria. For Student 2, all assessments and interventions were conducted in the student's elementary special education classroom. The first author, a doctoral student in special education and former licensed special education teacher with seven years of experience with students with multiple disabilities, served as the interventionist. In addition, all data collection, including procedural fidelity and inter-rater reliability, were conducted by the other members of the research team.

Materials

Three popular elementary picture books were used for the intervention. Each book was adapted to contain 5 specific concrete objects mentioned in the book. These objects were tactile representations of nouns embedded throughout the story (e.g., "flower"). Each object was attached to the page on which the noun would be read and could be removed (attached with Velcro). The same objects detached from the page, and distractor objects, were used for students to express comprehension responses. Five objects appeared two times in each book. Objects were selected and adapted for the maximum sensory distinctiveness possible (e.g., soft cloth, textured surface, distinct smell like an orange). The books were

also adapted to abbreviate text and add a repeated story line to promote understanding. Table 2 gives examples of the adaptations used for each book and a list of the objects used as noun referents.

Data Collection Procedures

Dependent variable. The dependent variable was the number of correct independent selection of one of two objects to answer comprehension questions asked throughout the read aloud of the story. The interventionist recorded the student's response to each of 10 preplanned comprehension trials during the read aloud (each object occurred twice). Although for purposes of instruction, the interventionist recorded the level of prompt the student required (e.g., verbal, model, physical), only responses scored as unprompted correct (+) were graphed.

Inter-rater reliability. Inter-rater reliability was measured by using an item-by-item formula. A second observer viewed videotapes of the sessions and independently scored each of the 10 comprehension trials. If item-by-item agreement was not 90% (9/10 trials), the two observers met to discuss the responses to be observed prior to the coding of the next video. Inter-rater reliability was calculated by taking the number of agreements and dividing it by

TABLE 2

Book Adaptations

Book	*Dirty Bertie* By David Roberts	*Alexander and the Terrible, Horrible, No Good, Very Bad Day* By Judith Viorst	*I Missed You Everyday* By Simms Tabak
Adaptations	*Book was shortened (pages removed and lines were cut from text), pages were laminated, 5 objects were velcroed into the text, added appropriate text to include a second appearance of the 5 objects.*	*Book was shortened (pages removed and lines were cut from text), pages were laminated, 5 objects were velcroed into the text, added appropriate text to include a second appearance of the 5 objects.*	*Book was shortened (pages removed and lines were cut from text), pages were laminated, 5 objects were velcroed into the text, added appropriate text to include a second appearance of the 5 objects.*
Repeated story line	*No Bertie, that's dirty Bertie!*	*Terrible, horrible, no good, very bad day.*	*I missed you every day.*
Objects used to promote listening comprehension.	*Stuffed dog, piece of candy, rubber worms, an orange, flowers.*	*Gum, candy bar, cereal box, shoe laces, pillow.*	*Ribbon, wrapping paper, envelope, pen, box.*

the number of agreements plus disagreements and multiplying by 100.

Procedural fidelity. Another member of the research team scored procedural fidelity during all checks of inter-rater reliability. Data was collected on the number of steps the instructor followed while implementing the story-based lesson. The steps included reading the story aloud until the text that was associated with the predetermined comprehension questions were reached. At this point the instructor would request for the student to "read with me" while placing the students hands on the correlating object. After reading the targeted line of text, the instructor would then ask the comprehension questions and progress through the least-to-most prompt system as necessary. The team member checked to see if each segment was present ($+$) or not present ($-$). The number of present items was divided by the total number of items and multiplied by 100 to obtain a procedural reliability score. In addition, procedural fidelity was collected on the implementation of the least-to-most prompt system and included a check of the delivery of the appropriate prompt hierarchy as well as the predetermined wait time of 5 seconds between prompt levels.

Social validity. Social validity was collected to measure procedures and outcomes by having each student's special education teacher take a survey. This was designed to recognize

the teachers perspective of the effect of the least-to-most prompting system on the number of correct comprehension questions answered throughout the story-based lesson.

Research Design

A multiple probe across materials (i.e., books) design with concurrent replications for two students was used to examine the number of correct comprehension questions answered (Tawney & Gast, 1984). Baseline data were collected on the two students to identify their current level of responses to the comprehension questions during story-based lessons with three different books. During baseline, the interventionist read the book aloud and provided objects to answer the comprehension questions, but did not prompt responding. Once a stable or decreasing baseline was seen, instruction was initiated with the first book. Once the students demonstrated a change in trend and/or level in their graphed data with the first book the second book was introduced. This continued until both students had been introduced to all three books with the intervention. Maintenance probes were conducted on Student 1 approximately 2 weeks after a functional relationship was determined, but could not be obtained for Student 2 due to the end of the school year.

TABLE 3

Comprehension Questions

Comprehension Questions	Dirty Bertie	Alexander and the Terrible, Horrible, No Good, Very Bad Day	I Missed You Everyday
Question 1	What did Bertie pick up off the ground and eat?	What did Alexander go to sleep with that got stuck in his hair?	What did she wrap herself with?
	Answer: Sucker	Answer: Gum	Answer: Wrapping Paper
Question 2	What did Bertie put up his nose and then try to eat?	What didn't Alexander find a toy in?	What did she tie herself with?
	Answer: Orange	Answer: Cereal Box	Answer: Ribbon
Question 3	What did Bertie go hunting in the garden for?	What didn't Alexander get in his lunch box?	What did she jump inside?
	Answer: Worms	Answer: Chocolate Bar	Answer: A Box
Question 4	Who would Bertie lick in the face?	What didn't Alexander get with his shoes?	What did she use to write your address with?
	Answer: The dog	Answer: Blue Shoelaces	Answer: A Pen
Question 5	What did Bertie try and eat after watching his cat?	What did Alexander's Brother take from him?	What was in the mailbag she jumped into?
	Answer: Flowers	Answer: Pillow	Answer: Envelopes
Question 6	What did Bertie learn not to eat because he got all wet?	What did Alexander eat that didn't get stuck in his hair?	What can you find her wrapped in?
	Answer: Flowers	Answer: Gum	Answer: A Box
Question 7	What did Bertie learn no to play with when his sister dumped them on his head?	What did Alexander find a toy in?	After paying the postman, what will be on their way?
	Answer: Worms	Answer: Cereal Box	Answer: The Envelopes
Question 8	What did Bertie learn not to eat off the ground?	What did Alexander get in his lunch box?	What does she need to be unwrapped from?
	Answer: Suckers	Answer: Chocolate Bar	Answer: Wrapping Paper
Question 9	After getting hair in his mouth, who did Bertie learn not to lick?	What did Alexander find with his shoes at the shoe store?	What should you not forget to untie?
	Answer: The dog	Answer: The Blue Shoe Strings	Answer: The Ribbon
Question 10	What does Bertie still put up his nose and then eat?	What did Nick give to Alexander?	What did she use to write the thank you letter?
	Answer: Oranges	Answer: Pillow	Answer: A Pen

Procedure

Baseline phase. During baseline, the instructor (first author) progressed through each story, provided objects affixed to the book pages, and asked the preplanned comprehension questions, as shown in Table 3, giving the student the object and a distractor to respond. The instructor did not prompt or provide feedback during baseline conditions. At the appropriate place in the story, the instructor asked the comprehension question, placed the objects by the student's hands on the table, and waited 5 s for a response. Be-cause of physical challenges, both students selected responses by sliding their arm across the table to touch one object. The instructor waited until all movement stopped to be sure that the student had made the selection and was not scanning the objects. At the end of 5 s, the instructor scored the response and continued reading the story up to the next comprehension question and so on until all 10 questions were asked. This was repeated for all three books across days until a stable or decelerating trend in the baseline data was observed.

Intervention. Like baseline, each intervention session began with the instructor reading the book aloud and asking comprehension questions after each page. In addition, the instructor would ask the student to "read with me" when reading a page with an embedded object. To help the student "read with me," the instructor would place the students hand on the object that was attached to the page and then read the text that contained the noun the object depicted (e.g., "Alexander woke up with gum stuck in his hair." The book page had a pack of gum attached.). The instructor then placed the same object as in the book (e.g., pack of gum) beside a distractor object (e.g., one from another book) in front of the student's hands on the table. After asking the comprehension question, the teacher waited for an independent response or that is, for the student to slide an arm across the table to select one of the objects. If no response occurred, the instructor began to use the least-to-most prompt system. If the student made no response after 5 s, the instructor gave the first level prompt. For the first level prompt, the instructor said "Find the one that is like this" and placed students hand on page with tactile object). Again the instructor waited 5 s for a response. If a correct response occurred after the first level prompt, the student was praised. If the student once again made no response after 5 seconds, the instructor used a second level prompt. The instructor said, "Find the one that is like this" and placed students hand on page with tactile object, then placed students hand on the correct object, and then removed the student's hand while saying "You find it." The instructor then waited another 5 seconds for a response, a correct response resulted in praise. If no response, the instructor used a third level, fully physical prompt. The instructor said, "Find the one that is like this" and placed students hand on page with tactile object and then placed students hand on the correct object and said "This is the 'gum' (or whatever the object was)!" If at any time during the prompt hierarchy the student went for an incorrect response, the attempt was blocked and the student was physically redirected to the correct answer.

Maintenance and generalization. Maintenance probes were collected on Student 1 on all three books, approximately two weeks after the intervention ended. Generalization data were collected with Student 1 in two additional settings to demonstrate generalization across settings (i.e., the student's classroom and the empty cafeteria). In addition, a peer from the student's school who was nondisabled was recruited to conduct the intervention with Book 3 to demonstrate generalization across people.

Results

Agreement. Procedural fidelity for delivery of all steps of the intervention was 100% across all three books for both Student 1 and 2. Inter-rater agreement for scoring student 1 responding was 98% for Book 1, 100% for Book 2, and 93% for Book 3. For student 1, both procedural fidelity and inter-rater agreement data were collected for 29% of the sessions for Book 1, 47% of the sessions for Book 2, and 29% of the sessions for Book 3. Inter-rater agreement for scoring student 2 responding was 100% for Book 1, 100% for Book 2, and 100% for Book. For student 2, both procedural fidelity and inter-rater agreement data were collected for 36% of the sessions for Book 1, 27% of the sessions for Book 2, and 40% of the sessions for Book 3.

Student 1 data. Student 1 performance data are displayed in Figure 1. During baseline, Student 1 correctly answered a mean of less than one question (.75) of the 10 comprehension questions asked in Book 1, with a range from 0 to 3 questions. After intervention, the responses increased ($M = 5$, range from 1–9). During baseline for book 2, Student 1 also correctly answered a mean of less than one (.6) of the 10 comprehension questions asked, with a range from 1 to 3 questions. After intervention, the responses increased ($M = 6.5$, range from 3–8). For Book 3 during baseline, Student 1 correctly answered a mean of 1.3 of the 10 comprehension questions asked, with a range from 0 to 2 steps. After intervention, the responses increased ($M = 5.6$, range from 1 to 9).

Student 2 data. Student 2 performance data are displayed in Figure 2. During baseline, Student 2 correctly answered a mean of 1.75 questions of the 10 comprehension ques-
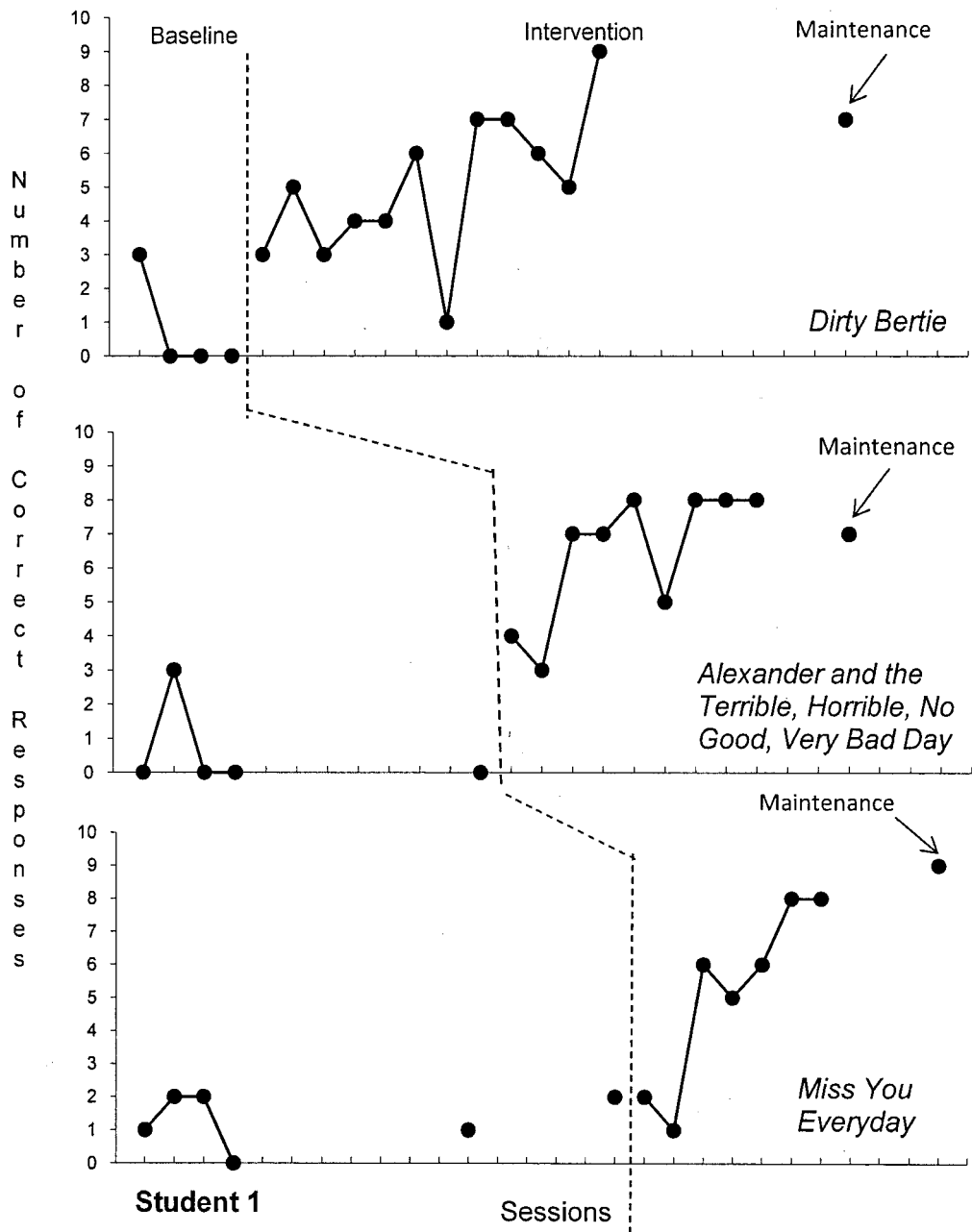
Figure 1. Number of correct responses across three books for participant 1.

tions asked in Book 1, with a range from 0 to 4 questions. After intervention, the responses increased (M=5.14, range from 2–7). During baseline for book 2, Student 2 correctly answered a mean of 2 of the 10 comprehension questions asked, with a range from 1 to 4 questions. After intervention, the responses increased ($M = 6.5$, range from 4–9). For Book 3 during baseline, Student 2 correctly answered a mean of 2.8 of the 10 comprehen-
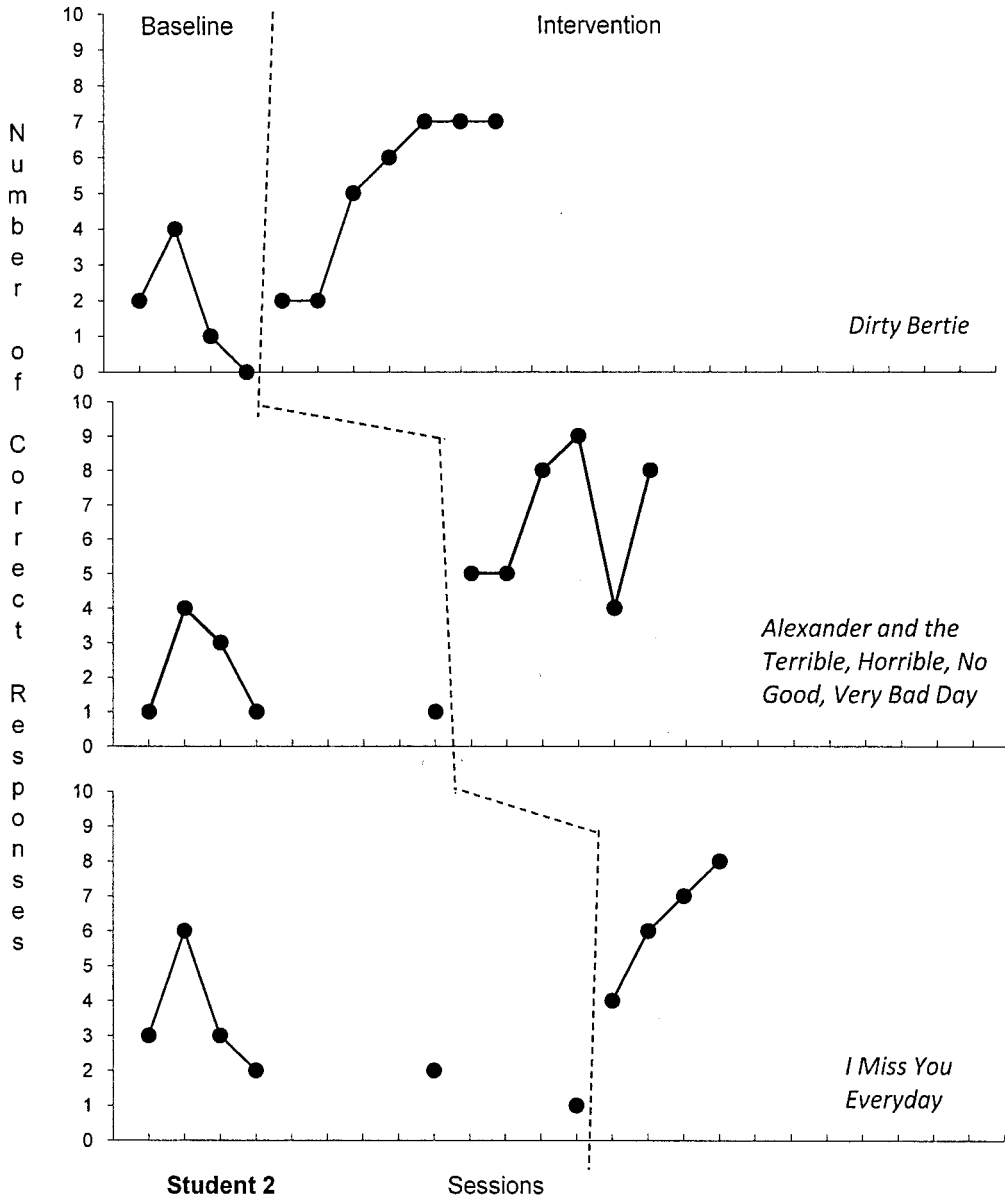
Figure 2. Number of correct responses across three books for participant 2.

sion questions asked, with a range from 1 to 6 steps. After intervention, the responses increased ($M = 6.25$, range from 4 to 8).

Social validity. Both classroom teachers participated in a follow-up survey that measured both the procedures and the outcomes. Both teachers reported strongly agreeing that the comprehension items se-

lected were appropriate, important, and cost effective. In addition, the teachers strongly agreed that the system of least prompts, the prompt hierarchy used, as well as the wait time between prompts were appropriate for this student. The teachers reported that they strongly agreed to use this prompt procedure again in the future for

additional skills as well as in future comprehension skills with additional students. Finally, the teachers reported strongly agreeing that the students overall comprehension increased as a result of the intervention and that overall the student had increases in meaningful participation in literacy activities as well as other academic and functional activities.

Maintenance and Generalization. Student 1 was able to maintain all skills by maintaining comprehension of all three books. Maintenance data were collected about two weeks to a month after the end of intervention for each book. Maintenance data were not collected for student 2. Student 1 generalized the comprehension responses across settings (i.e., separate literacy room, classroom). Student 1 was not able to generalize the skill to a third setting (i.e., cafeteria), as he became extremely distracted by this environment. In addition to generalization across settings, student 1 was able to correctly answer 7 out of 10 questions asked during story 3 (i.e., *I Missed You Every Day* by Simms Tabak) read by a peer. Generalization data across settings and people as well as maintenance were not collected for Student 2 due to time constraints with the school year ending.

Discussion

Student 1 was able to show increases in comprehension across all three books. In addition, the intervention was replicated with another student and maintained across time. Student 2 was also able to show increases in comprehension across all three books. These outcomes add to the literature that shared stories promote comprehension skills for young children (Bus, van Ijzendoorn, & Pelligrini, 1995; Coyne et al., 2004; Justice & Kaderavek, 2003; Senechal, Thomas, & Monker, 1995; Vacca et al., 2006), including those with visual impairments (Erickson & Hatton, 2007). Shared stories also have been used in a few studies with students with severe intellectual disabilities (Browder et al., 2007; Browder, Mims, et al., in press; Skotko et al., 2004). The unique contribution of the current study was to demonstrate how using objects that were noun referents could be used to promote comprehension responses during shared stories. By

attaching the object to the page, the student gained understanding that the page of the book itself contained the information. The student then used the same object as a means to communicate understanding of a comprehension question.

The focus on listening comprehension also makes an important contribution to the growing research on using shared stories with students with intellectual disabilities. For example, in Browder et al. (2007) and Browder, Mims, et al. (in press) comprehension was only one component of a series of responses to engage with the text. In these prior studies, the dependent variable was a task analysis of participating in a read aloud (e.g., turning pages, repeating a story line). In contrast, the current study focused only on the comprehension responses and thus provided a stronger demonstration that students were gaining meaning from the read aloud. The instruction also included more opportunities (10) to make comprehension responses. In fact, the student answered a comprehension question after the reading of each page.

Besides using objects as referents and providing multiple opportunities to make comprehension responses, a third feature of the intervention was the use of least-to-most prompting. Although prior studies used prompting (e.g., Browder et al., 2007), the current intervention was uniquely designed for students with visual impairments and for gaining meaning from the object in the story. Each level of the prompt hierarchy helped the student return to the page to find the object of reference similar to the way a sighted student might review the text on the page to find the answer. By the end of the first book, the students were beginning to grasp how to locate the answer. For example, Student 1 was much more likely initiate a response in the second and third books because of the familiarity of the structured routine of objects embedded in the book and the same object being used in the response options for the comprehension question.

Another consideration is the context for instruction. Student 1 responded well to a peer read aloud after becoming familiar with the third book. What is unknown is whether the student would have acquired the responses with peer tutoring. What was deter-

mined is that this student needed a quiet room to focus on the book in early instruction. In the quiet room, the student was able to build the auditory discrimination needed to hear the text read and select the correct object. Once the student became familiar with the book, he was able to generalize the responses to his classroom context. In contrast, it is unknown whether this generalization would have occurred for a new book. For Student 2 all instruction occurred in the student's self-contained classroom, but all sessions were conducted during a time that the other students had "quiet time." In planning replications of this research, consideration should be given to whether students have the level of quiet needed to focus on the read aloud of the text during initial instruction and how to fade this back into typical classroom contexts.

Although results of this study were encouraging, some limitations should be noted. First, the intervention was conducted by a member of the research team rather than the classroom teacher due to some of the logistics of the context (e.g., time to implement three 1:1 read alouds). Future research should consider having the special or general education teacher serve the role of the interventionist which might be feasible with small group instruction. A second limitation is that instruction was provided in a one-to-one format. Whether in a general education or self contained class, students often receive literacy in a group format. In contrast, students with both intellectual and visual impairments may need some 1:1 instruction during early acquisition of skills for listening comprehension. A question for future research is whether the students would be able to acquire these responses in a small group format if the context were quiet. For example, the student might participate in a mixed ability group in a general education class. Prior research (Kliewer & Landis, 1999; Ryndak, Morrison, & Sommerstein, 1999) suggests that including students who are nondisabled in small group literacy experiences can be beneficial. In a mixed ability group, the students would use response options appropriate for them (e.g., objects to represent the answers, saying answers aloud, writing responses, etc.).

In applying this intervention to practice, the first step would be to identify literature appropriate to the student's age, grade, and interests. Consultation with a media specialist, general education teachers or same age peers may help identify books that have the appeal needed for early literacy instruction. As needed, these books can be modified as described in Table 2, or the team may be able to use computer software with digitalized text for ease of access. Next, the instructor determines the comprehension questions to ask during the shared story. In the beginning, these may be simple recall questions. Future applications should target higher level comprehension questions (e.g., sequencing, cause and effect). Third, the instructor determines the prompt hierarchy and wait time to use during instruction. Each level of prompt should return the student to the page of the book to locate the correct answer. In addition, an error correction procedure and reinforcement procedures should be determined before instruction begins. Finally, independent correct responses should be the targeted outcome, but it may be helpful to monitor progress on the prompt needed during instruction. This will allow the teacher to monitor that students are using less prompting over time.

In conclusion, this study adds to the growing research on using shared stories to promote literacy skills for students with significant intellectual disabilities. Students with significant intellectual disabilities and visual impairments are underrepresented in the research on literacy instruction. This is one of the first demonstrations of the use of shared stories and comprehension with this population. While more research is needed to build an evidence base for the use of shared stories with this population, this may be viewed as a promising practice for increasing comprehension for students with limited communication in the literature of their age group.

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