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Teaching Emergent Literacy Skills to Students With Autism Spectrum Disorder

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Abstract

This article provides six fundamental steps for using a task analysis to teach emergent literacy skills to young learners with autism spectrum disorder (ASD). Compared to general education peers, students with ASD score lower on reading measures and often have difficulty acquiring literacy skills via the instruction methods used in typical classrooms. An effective instructional technique for many students with ASD is systematic instruction via task analysis. Task analysis may be a useful tool for teachers of students with ASD to build literacy skills by aligning instruction in missing skills to the curriculum standards. The steps to consider when using a task analysis include what emergent literacy skills will be taught, defining expected steps and correct responses, the instructional method to be used, systematic prompting techniques, piloting and updating the task analysis, and teaching and collecting data. Considerations for implementation for practice are provided.

Keywords

task analysis, literacy instruction, autism spectrum disorder, inclusion

Ms. Diaz is a primary grade teacher (K–2) of students with autism spectrum disorder (ASD). Providing services for this population can be demanding for many reasons. Students with ASD have difficulty with developing social skills, communication skills, transitioning, and, depending on the severity of the disability, acquiring academic skills. Therefore, providing a quality education with proper supports is imperative for the continued success of her students. Ms. Diaz knows that she should be accessing the general education curriculum in her classroom, but it is extremely difficult to do so with students who are on different grade levels as well as abilities. Most of the students in Ms. Diaz’s class are nonverbal, have atypical behaviors, and will most likely be on the state’s alternate assessment when they are in the third grade. She wonders how (and sometimes why) she can (or would) teach academics when she can barely get them to sit in their seats for 5 minutes. In the past, with similar classrooms, Ms. Diaz did not place a lot of emphasis on teaching basic reading behaviors because she felt it was more appropriate to address desired social behaviors, particularly for her kindergarten students. When she did read with or to her class, she typically would have them sit in a

circle and informally ask simple questions. Ms. Diaz did not think to formally teach “using a story time format” until she went to a work shop on teaching literacy skills using a task analysis (see Note 1).

Students with ASD tend to score lower on reading measures compared to their same age peers (Minshew, Goldstein, Taylor, & Siegal, 1994; Nation, Clarke, Wright, & Williams, 2006). These deficits can be expected considering the overall difficulty students with ASD already experience due to the nature of their disability (Downing, 2005) and can be exacerbated due to the neglect or the inconsistencies of teaching foundational or emergent literacy skills (Connor, Alberto, Compton, & O’Connor, 2014). According to Lanter, Watson, Erickson, and Freeman (2012) students with ASD

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demonstrate broad language impairments that can affect their literacy acquisition. Moreover, emergent literacy development is correlated to oral language development. These early literacy skills have also been found to be later predictors of overall reading competence (National Reading Panel, 2000; Whitehurst & Lonigan, 1998) and are vital for the development of all preschool- and kindergarten-aged children. Emergent literacy skills can include print concepts (e.g., opening a book, turning a page, text pointing), alphabet knowledge, and phonological awareness (Browder, Ahlgrim-Delzell, Courtade, Gibbs, & Flowers, 2008; Browder & Spooner, 2006; Justice & Kaderavek, 2002).

Considering the importance of such skills, there is a need to develop and demonstrate methods in which emergent literacy skills are taught to students with ASD (Lanter et al., 2012). The differences that exist between emergent literacy acquisition for young children with ASD and their typically developing counterparts (Dydia, Lawton, Logan, & Justice, 2014) suggest that such skills should be more carefully planned by educators. Although many educators teach emergent literacy skills, it has been found that their references to print can be infrequent, particularly in earlier grades (Zucker, Justice, & Piasta, 2009). Such infrequencies may not provide the repetition of emergent literacy behaviors needed for students with ASD to build these necessary skills. In addition, the lack of these repeated practices and a systematic procedure for teaching can make assessment difficult. A simple way to break complex behaviors into smaller units of instruction and make assessment easier for instructors is through the use of a task analysis.

Chaining and Task Analytic Instruction

Before a task analysis can be developed, an instructor must identify the targeted behavior and determine how this behavior can be broken into smaller units of instruction. This method is known as chaining. Chaining is an operant conditioning principle by which an individual's responses within a behavioral sequence are reinforced to produce complex behaviors such as reading. Each individual step within a sequence reinforces the completion of the previous step and sets the occasion for the subsequent step. A complex task, such as emergent literacy, can be broken down into a chain of more discrete steps that can then be used in a task analysis (TA) to produce small instructional sequences that can be easily taught and assessed. Once a behavioral sequence is broken into discrete steps, an instructor can choose three formats for teaching a chain of behaviors: (a) total task presentation, (b) forward chaining, and (c) backward chaining (see Table 1). Historically, TAs have been used as a way to teach chained functional skills to students with ASD and developmental disabilities (Hagopian & Farrell, 1996; Schuster et al., 1998; Schuster, Gast, Wolery, & Guiltinan, 1988; Spooner & Spooner, 1984); however, a recent review

of literature (Spooner, Knight, Browder, & Smith, 2012) has validated the use of TA instruction as an evidence-based practice for teaching academic skills to students with ASD.

The use of TAs in classrooms is and has been an important and valuable tool to consider when working with students with ASD, and some may argue can be a useful practice to assist students in the general education classroom (Browder, Ahlgrim-Delzell, Flowers, & Baker, 2012; Cannella-Malone, Konrad, & Pennington, 2015). Although TAs have been used across a variety of skill sets, Spooner et al. (2012) and Wong et al. (2014) have suggested that task analytic instruction can be an effective way to teach literacy skills. More specifically, research has demonstrated that TAs can be used to teach emergent literacy skills to students with ASD (Browder, Trela, & Jimenez, 2007; Spooner, Rivera, Browder, Baker, & Salas, 2009). This article discusses six fundamental steps, derived from the literature (Browder et al., 2007; Spooner et al., 2009), for using a TA to teach emergent literacy skills to young learners with ASD. Moreover, considerations for implementation and implications for practice are provided.

Steps to Consider

The following six steps will help teachers to plan and instruct emergent literacy instruction. Once the literacy behavior chain is determined, the teacher will (a) organize the correct responses, (b) consider the instructional presentation, (c) consider systematic prompting techniques, (d) pilot and update the TA, and (e) teach and collect data. These steps are discussed in more detail with an example vignette.

Determine the Behavior Chain to Be Used Within the Task Analysis

Analyze a targeted behavior a student is having problems with and determine the discrete steps needed to complete that behavior (Browder & Spooner, 2011). This process requires an instructor to simply analyze a particular task (e.g., locating the author, writing a sentence) and determine how many steps are needed to complete it. For educators, this is not a formal assessment process but one that requires them to think critically about, for example, the content that they are teaching and how that content could be broken down into smaller instructional units. Once a sequence of behaviors has been identified, a teacher can develop a TA to ensure the steps selected can be easily taught and implemented by other instructors in the classroom. See Figure 1 for an example of a teacher implementation TA. A benefit of decomposing complex behaviors is the revelation that some students may not have yet developed prerequisite skills needed to engage in the larger activity at hand. For example, Browder et al. (2007) noted that for students to participate in a shared story intervention they had to be able to identify

Table 1. Forward Chaining, Backward Chaining, and Total Task.

Instructional Technique	Definition	Examples of Use During Emergent Literacy Instruction
Forward chaining	Teaching the initial step in a TA to mastery before introducing the next step. Once mastery is achieved the next two steps in the chain are taught until mastery. This same procedure continues until all steps have been taught in their natural occurring order.	This technique may benefit some students, but can be time-consuming if one step proves to be incredibly difficult for the child to master. For example, the child may need to orient the book before continuing to the next step.
Backward chaining	A teacher performs all the steps within a TA except for the last step. The final step of the TA is taught until mastery. Afterward the same procedure is repeated and the teacher then teaches the last two steps in the TA and so forth.	This step has been effective in the instruction of functional skills (e.g., using an ATM). It may allow the students to know the natural reinforcement and the reason for completing the sequence of steps. When giving instruction in emergent literacy, the teacher may perform all steps within a TA and allow a student to complete the final step (e.g., answer a question after a story was read).
Total task	Teaching all of the steps of the TA in its naturally occurring sequence.	This technique may make the literacy process more natural. All of the steps are taught in their original sequence. The teacher can note whether the student completed the task independently or needed assistance (e.g., verbal, model, or physical prompt). Comparison studies indicate that total task chaining can be more effective and is aligned with real-life experience (McDonnell & McFarland, 1988; Spooner, 1984).

Note: TA = task analysis. It is important to understand the students' individual needs and learning styles when considering the instructional technique to teach the TA for emergent literacy for students with ASD.

a series of photographs. If students have difficulty with a particular step within the behavioral chain, additional instruction can be provided to facilitate acquisition of that skill (e.g., identifying certain pictures to better participate in a shared-story intervention; Browder et al., 2007).

During reading time, Ms. Diaz is going to introduce a new book titled *The Dirty Dog*. In her planning, Ms. Diaz first thinks through the order or sequence in which she will introduce the book so that she can consistently deliver the lesson with fidelity (see Figure 1). First, she wants to get the students interested in the book, so she brings each student a stuffed dog (i.e., attention getter). Also, since it is the beginning of the year and many of her students are new to her classroom, she wants to make sure that each student can orient a book correctly as well as locate the author and title of the book. She will then show the students four different pictures (e.g., a cat, a bird, a flower, and a dog) and ask them to point to the picture they think the book will be about. Following the reading, she will again show the students the photographs and ask them to point to the picture representing what the book was about, giving students the opportunity to confirm their earlier responses.

Organize the Task Analysis and Correct Responses Expected From the Student

Not all emergent literacy skills need to be targeted, although it is important to focus on those that are most important to the individual student and make the total task similar to the

typical expectation. For some students, it may be necessary to combine steps that target different skills (e.g., identifying all of the contributors to the book), while other students may need the skills broken down into smaller pieces (e.g., individually locating the author and illustrator). Related steps within the TA may be grouped into component sets that serve as a benchmark toward mastering the entire task. For example, in one study, a 12-step TA was broken up into three different skill sets (i.e., four steps per set) to teach emergent literacy skills to a culturally and linguistically diverse student with a developmental disability (Spooner et al., 2009). Because the student in the study was new to the literacy process, it was predetermined that the individual skill sets needed to be introduced at different times to promote complete independence of the total task.

As part of her planning, Ms. Diaz elects to write the shared-story TA found in Figure 1. She is confident that she will be able to complete the entire story and the comprehension questions of *The Dirty Dog* in 30 minutes. She also notes which steps may be difficult for certain students, so she can plan for the best instructional method (see Step 3).

Consider the Instructional Presentation

A TA can be taught three different ways: (a) forward chaining, (b) backward chaining, and (c) total task presentation (see Table 1). Past research has suggested that total task presentation may be most beneficial because students can see the progression of steps from beginning to end in their natural

1. Create or present an attention getter.
2. Ask, "How do we read?" Allow student(s) to orient the book.
3. Ask, "Where do we find the author/title?" Allow student(s) to point to or show author/title.
4. Ask a prediction question. For example, "After looking at the cover of the book. What do you think the book will be about?"
5. Review targeted vocabulary words. Choose 4 words to review before reading.
6. Ask, "How do we begin the story?" Allow student(s) to open the book.
7. Use a note reminder to allow the student(s) to text point (from left to right) while the story is read aloud.
8. Allow student(s) to read (verbally or through the use of assistive technology) a repeated story line.
9. While the story is read ask the student to "Point to ____"
10. Allow an opportunity to turn the page. At the end of the page ask, "How do we keep the story going?"
11. Confirm prediction. Once the story is complete. Ask, "We thought the story was about _____. Where we right?"
12. Review vocabulary words.
13. Ask a comprehension question about the main characters.
14. Ask a comprehension question about the plot.

Figure 1. An example of an emergent literacy task analysis for teachers. An instructor's task analysis promotes consistency of instruction.

sequences (Spooner, Weber, & Spooner, 1983; Yu, Martin, Suthons, Koop, & Pallotta-Cornick, 1980). Spooner and Spooner (1984) suggested that total task presentation should (a) show every step to be completed, (b) occur in a natural sequence, and (c) guide students through the difficult steps to proceed to the next step in the chained sequence. They concluded that the total task procedure allows educators to make better use of instructional class time. However, it is important to note that the presentation of a TA may vary due to student needs. For instance, although presenting all steps in a TA allows for a natural sequence, the number of tasks that a student must complete may be overwhelming, indicating that forward or backward chaining may be more appropriate.

Ms. Diaz determines that total task chaining would effectively address the varying needs of her students because all students would be able to review all the steps in her shared-story task analysis, providing necessary repeated practice. With that instructional method in mind, she now needs to plan for and practice the type of prompting technique she is going to use to facilitate instruction of each step of the shared-story lesson.

Consider Systematic Prompting Techniques

The use of prompting strategies (e.g., most-to-least, least-to-most prompts; Browder & Spooner, 2011) can aid an instructor in providing additional supports students may need to complete target skills. When teaching a discrete skill within a TA and using prompting to facilitate instruction, a prompt comes between the stimulus presented and the desired behavioral response. The prompt acts as a bridge, allowing a student the assistance needed toward a specified behavioral response. There are several prompting strategies that have been used successfully with students with ASD. Two prompting strategies that are have been used for this population follow (Browder, Wood, Thompson, & Ribuffo, 2014).

The first prompting strategy, most-to-least prompting, refers to the level of support that a teacher will provide to a student during a prompting sequence. Most-to-least may use the following order to promote independence: (a) physical prompts (e.g., hand-over-hand assistance), (b) model prompts (e.g., teacher demonstrates the task then the student copies), and (c) verbal prompts (e.g., teacher states the next step for the student to complete).

The second prompting strategy, least-to-most, is similar but would follow a less intrusive approach: (a) verbal prompt, (b) model prompt, and (c) physical prompt. When least-to-most prompting is used with a TA, a teacher may present the first step within the TA and if the student does not perform the task correctly the least intrusive prompt, a verbal prompt for example, may be provided. If the student still demonstrates difficulty providing a correct response, then the next intrusive response (i.e., model prompt) may be provided. This procedure continues until the most intrusive prompt has been applied and the student provides the correct response. The same procedures would then be replicated for the remaining steps in the TA until the student can complete all steps (e.g., total task presentation) without any prompting. This systematic use of prompting provides students consistent feedback that allows them to move closer to completing the targeted goals. See Collins (2012) for more information on prompting procedures.

Ms. Diaz decides to use least-to-most prompting with her students during the shared-story lesson. When they reach Step 3 of the TA, she asks the question, "Can you point or tell me the title of our story?" and waits for the student to respond. If the student has not responded within 4 seconds, Ms. Diaz will give a verbal prompt such as "Point to or tell me the title of the story." If the student still does not respond appropriately, Ms. Diaz will say, "Point to the title" while she points to the title of the book (i.e., model prompt). If the student still does not complete the step, she will take and guide the student's hand to the book (i.e.,

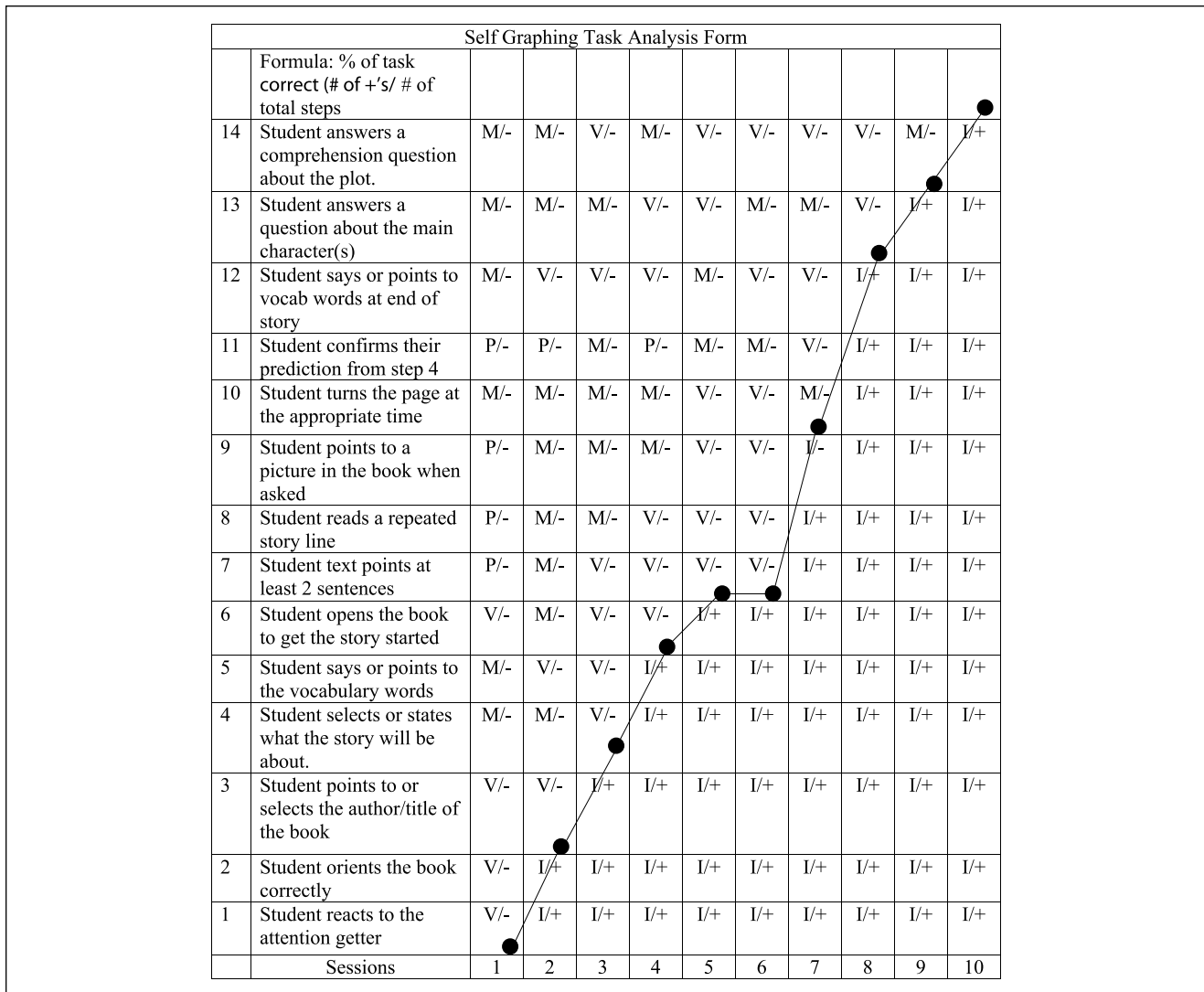


Figure 2. An example of one student’s task analysis form and response data from Ms. Diaz’s class. Data are provided as an example of how task analyses can be used to make data-based decisions and give instructors, families, and friends a clear visual of gains. I = independent response; M = model prompt; P = physical prompt. + indicates the step was completed correctly; – indicates the step was not completed correctly or needed additional assistance.

physical prompt) and say, “Point to the title.” She will continue to use this systematic prompting strategy for each step of the TA. It may take Ms. Diaz some time to feel comfortable teaching each step using the prompt sequence, however, she will eventually become more confident and will see an increase in her students’ independent responses.

Pilot and Update the Task Analysis as Needed

Teaching emergent literacy is no small feat and should be continually modified. Research has shown time and time again that such skills can be taught to students with an array of developmental disabilities such as ASD (Browder et al., 2007; Spooner et al., 2009), yet a critical step is to understand whether a TA measures the specific task to eventually

promote independence. Piloting the TA with the student(s) will help the instructor determine if there are additional steps, modifications, and/or adaptations that need to be added. The teacher may also consider piloting the TA with a colleague or with themselves. It is very likely if the teacher cannot follow the steps, then students are not going to be able to either. Notice that the example TA (see Figure 2) shows the steps *upside down*. Using this format can help instructors monitor the progress students are making on completing the TA. The instructors may use a graph (as seen in the example) to make data-based decisions on the appropriate accommodations and/or adaptations needed to promote continued student success.

Now that she has her plan in place, Ms. Diaz practices the shared-story lesson with her paraprofessional, Ms. Cera.

This allows Ms. Cera to provide feedback to Ms. Diaz as well as give her the opportunity to see the steps of the lesson demonstrated. With this training, Ms. Cera could implement the lesson in the future or help with data collection. Ms. Diaz makes some slight adjustments to the process and is able to establish more comfort in the use of systematic prompting and the steps of the lesson. After a few practice rounds, Ms. Diaz is ready to try the lesson with her students.

Teaching and Collecting Data

A primary benefit to TAs is that the list of steps within the chain may also serve as a fidelity-of-implementation checklist for paraprofessionals or peer tutors to follow (see Figures 1 and 2). Procedural integrity may be maintained through intermittent checks (i.e., sometimes daily) to ensure that each step of the TA has been followed. Task analyses can also pinpoint specific steps to be addressed through appropriate prompting and fading techniques. Using this tool, educators are better able to identify which steps of the procedure the student can perform independently, and which steps need facilitation. In addition, prompt hierarchies can be applied to each step for fine-grained intervention and analysis. To show progress toward mastering the emergent literacy skill, the number of TA steps completed by the learner can be divided by the total number of steps to yield a percentage score. As the student learns to complete more and more steps of the TA independently, the data can approach 100%. Ongoing data collection can demonstrate progress over time toward mastering each step of the TA until the entire chain can be performed independently.

Armed with her well-practiced plan and her data collection materials, Ms. Diaz implements her shared-story lesson. Ms. Diaz is able to make individualized adjustments for students who need more intensive supports because the implementation plan is clear and a tool for progress monitoring is in place. As students in her class progress to 100% mastery, she introduces different stories to help with generalization of these foundational literacy skills. With her systematic and consistent instruction, her students make important academic gains and are actively engaged in classroom learning. As the students progress with emergent literacy, Ms. Diaz can then begin to collaborate with the general education teachers to include her students during English language instruction.

Conclusion

Task analyses have been deemed an evidence-based practice (Spooner et al., 2012; Wong et al., 2014) and have been used to teach literacy (Spooner et al., 2009), functional skills (Mechling, Gast, & Fields, 2008; Mechling & Gustafson, 2009), behavioral and language development (Jameson, Walker, Utley, & Maughan, 2012), math, and science

(Courtade, Browder, Spooner, & DiBiase, 2010; Jimenez, Browder, & Courtade, 2008) to students with ASD and other developmental disabilities. Teaching foundational emergent literacy skills to students with ASD, as well as all students, is beneficial to their overall academic and functional success in school. The TA not only assists the teacher by providing a checklist but also helps students anticipate the steps, thereby providing familiarity. Once the tasks are acquired, the teacher and the student are able to generalize the tasks.

The use of TAs when teaching literacy skills provides consistency through systematic instruction. As always, it is important to assess students on the skills that need to be developed and to make appropriate decisions based on the individual needs of the student. In addition, it is important to make adaptations based on the collected data to assist with individual classroom needs. Finally, when planning to use TAs for academics, educators may consider ways that a TA may align to the common core standards that need to be taught to all students.

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Note

The included vignette is a fictionalized account drawn from several of the authors' experiences and placed into an aggregated scenario. The vignette does not represent any one scenario, and all proper names are pseudonyms.

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