

Reading Comprehension Strategies

Reading Comprehension Strategies for High School Students With Autism Spectrum Disorder

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Mr. Wilkins is a special education teacher in a large suburban school district. His class consists of eight students in Grades 9 through 12 with autism spectrum disorder (ASD) and moderate cognitive disabilities. All the students have reading comprehension goals in their individualized education programs (IEPs), but Mr. Wilkins struggles to determine what method to use to help the students increase their reading comprehension skills. The decoding and reading comprehension levels of his students range from kindergarten to third grade, and the students also struggle with listening comprehension. As the students are reading well below grade level, Mr. Wilkins often uses elementary-level reading materials, however, he knows that the materials are not age appropriate and do not match the interest levels of adolescents. Mr. Wilkins wants to adopt evidence-based practices (EBPs) for developing his students' reading comprehension and vocabulary acquisition that include ageappropriate and highly motivating materials.

Ms. Henderson is a special education teacher in a small urban high school. She co-teaches in an inclusive English language arts (ELA) classroom and teaches several ELA resource classes for students in Grades 9 through 11 with ASD. Most of the students that she serves can decode at or above grade level but have difficulty demonstrating an understanding of what they have read. They struggle with citing textual evidence to support their answers and with answering implicit questions that require them to infer the author's intention or feelings of a character. To help improve their understanding of the assigned text, the students are given some time during class to "turn and talk" about the reading. However, with little structure provided, the students usually just restate information from the text and sometimes get off task. Ms. Henderson is seeking an EBP that will help her students learn reading comprehension strategies that can be applied across all of their content area classes.

Reading comprehension is important. Many students with ASD have difficulty with reading comprehension that persists as they enter high school. Conversely, high schools often fail to provide explicit instruction on reading comprehension. Common issues that contribute to this challenge include (a) lack of understanding of inferences and a literal interpretation of text (Bogdashina, 2005); (b) difficulty with perspective taking of others, including characters in fiction (Fleury et al., 2014); (c) confusion about the focus of

"wh- questions" (Bethune & Wood, 2013; Koegel & Koegel, 1995); (d) a focus on detail instead of the theme of text (Fleury et al., 2014); and (e) challenges with understanding meaning when pronouns are used (Tager-Flusberg, Edelson, & Luyster, 2011). These issues may persist throughout secondary school; however, once students enter high school, an emphasis on foundational literacy skills, including reading for understanding, is often replaced with a focus on college and career readiness (Morningstar, Bassett, Kochhar-Bryant, Cashman, & Wehmeyer, 2012).

Maintaining a focus on reading comprehension is essential for students with ASD, as some will still need to develop this skill during their high school years. Two evidence-based approaches for reading comprehension for high school students with ASD are Alternate Achievement Literacy (AAL) and Collaborative Strategic Reading: High School (CSR-HS). AAL provides adaptations and modifications to support access and comprehension of chronologically age-appropriate text for students with ASD (Browder, Thompson, & Fallin, 2014). Targeted for students "learning to read," the focus of AAL is for students to develop an understanding of text, rather than simply decoding functional sight words found in daily life. CSR-HS combines strategies of strategy instruction and corporative learning to improve reading comprehension throughout the reading process for individuals with ASD (Meadows Center for Preventing Educational Risk [MCPER], 2013). Students "reading to learn" use CSR-HS to work together to use evidence-based strategies to improve their ability to read text for understanding. This intervention is adapted from traditional CSR to be used with high school students with ASD.

Both AAL and CSR-HS were included as part of the Center on Secondary Education for Students With Autism Spectrum Disorder (CSESA), a comprehensive treatment package implemented and evaluated in a randomized controlled trial across the United States (Hume, Odom, Dewalt-Smith, Hall, & Kraemer, 2018). During CSESA's development phase, the two reading comprehension interventions were adapted for high school students

with ASD and embed EBPs that are effective for use with individuals with ASD (Wong et al., 2015). Both interventions are research based with published studies demonstrating effectiveness (Boardman, Klingner, Buckley, Annamma, & Lasser, 2015; Browder, Ahlgrim-Delzell, Flowers, & Baker, 2012; Browder, Trela, & Jimenez, 2007; Reutebuch, El Zein, Kim, Weinberg, & Vaughn, 2015).

AAL and CSR-HS approaches have resulted in gains in students' reading comprehension. Specifically, when three teachers used a checklist to adapt literacy materials using the strategies of AAL, all six of their students increased the number of independent, or unprompted, correct responses to reading comprehension questions (Browder et al., 2007). When compared to elementary school students with severe developmental disabilities exposed to a site word approach, students participating in a multicomponent early literacy program with the same strategies as AAL had significantly higher mean literacy scores on standardized measures of vocabulary, nonverbal literacy, and early reading skills (Browder et al., 2012). In comparison to "business as usual" in a randomized controlled trial study, middle school students participating in the full CSR program in science and social studies classes scored higher on a standardized reading comprehension assessment (Boardman et al., 2015). Also, in a pilot study of CSR for high school students, there were increases in accuracy with reading comprehension from multiplechoice responses for two of the three participants with ASD, along with increases in social responding and decreasing in challenging behavior during CSR sessions for all students (Reutebuch, El Zein Kim, et al., 2015).

The CSESA implementation team noted that in many schools, teachers often struggled to provide reading comprehension instruction at the secondary level. Following at least one semester of coaching in both AAL and CSR, students with ASD made progress on individualized goals that included accurately answering wh- questions, identifying and defining key vocabulary words from a passage, effectively using a graphic organizer or other visual supports to identify or paraphrase the main ideas in a passage, and answering comprehension questions

Table 1 A Checklist for Meaningful and Accessible Content for Students With ASD

Access	Interest	Age appropriateness	
 Can the student read independently? Are the student's reading abilities at or near grade level? Does the student struggle with decoding or fluency? Does the student better access text when it is read to them? Does the student require visual supports for vocabulary, key facts, or overall plot development? 	 Has the student expressed an interest in this topic before? Did the student have a choice of material to read? Is the content novel to the student? Is this topic related to current content the student is learning in another class? 	 Is this material also being read in school by the student's peers? Is this topic of interest to individuals who are substantially younger than the student? 	

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correctly, including questions containing inferences and figurative language.

The Reading Comprehension Process

Improvements in reading comprehension for students with ASD are achievable through systematic instruction across the process of reading, which includes active engagement before, during, and after reading. Regardless of the strategies used, providing instruction in the reading comprehension process involves (a) previewing the text and accessing background knowledge (Oakhill, Cain, & Elbro, 2015, (b) developing vocabulary (Ford-Conners & Paratore, 2015; Nagy & Townsend, 2012), (c) actively engaging the reader in text while supporting the ability to understand and to synthesize knowledge (Boardman et al., 2015; Guthrie & Klauda, 2014), and finally, (d) assessing formatively and summatively to check for understanding of the text (Kamil et al., 2008; Oakhill et al., 2015).

The reading comprehension process includes three steps before the determination is made of whether a

student would best benefit from one of the two reading approaches. These steps benefit teachers as they develop their curriculum aimed at improving the reading comprehension abilities for their students with ASD, regardless if they are "learning to read" or "reading to learn."

Step 1: Select Content That Is Meaningful and Accessible to the Student

When selecting text, key considerations include access, interest, and age equivalency. For a student to have optimal access to the material, the complexity of the text should be determined by considering the student's challenges associated with ASD (e.g., difficulty with pronouns and perspective taking), decoding abilities, and phonemic understanding. Adaptations may also be necessary for access, and teachers may want to consider amount of text on page, use of technical language, and need for visual supports to support the student with ASD. Table 1 provides a checklist to guide teachers in making decisions about access to the material.

Considering student interest and providing opportunities for choice (Reutebuch, El Zein, & Roberts, 2015) are ways to motivate participation and maintain engagement. Investment in reading can be fostered by allowing and supporting students to select their reading material. Adaptable high-interest texts that may align to student interests or even expand their repertoire of topics are available. Consider texts from trusted, high-quality sources that not only are (or can be) made accessible to the individual student but also are contemporary and appealing to them. Table 2 lists suggested sources for texts that are age appropriate and of high interest to adolescents, including the Smithsonian publication Tween Tribune, a free online periodical consisting of articles based on current events, science, technology, and pop culture. In addition to its relatable content, attractive photographs, and supplementary media, Tween Tribune also provides content across multiple grade levels, allowing a teacher to adjust the Lexile level of a particular article to suit the access needs of an individual while maintaining the integrity of the article. This can allow students at multiple reading levels to

Table 2 Reading Intervention Resources

Resource	Description	Website
News2you	Literacy program that uses a weekly newspaper format with daily activities and multiple levels of adaptation	www.ny2.com
Tween Tribune	Free resource from the Smithsonian Museum that offers articles of high interest with adjustable Lexile levels	www.tweentribune.com
Newsela	Instructional content platform that provides articles of high interest to students that provides teachers with real-time feedback on student reading	www.newsela.com
Teaching to Standards: English Language Arts	Age-appropriate novels for secondary students that aligns with Common Core, state, and national standards and provides three literacy levels: object/picture, concrete symbols, and written text	www.attainment company.com/ teaching-standards- english-language-arts
Achieve 3000	Cloud-based platform that offers differentiated nonfiction texts based on Lexile level for reading and writing.	www.achieve3000.com
Read 180 (multimedia)	Integrated program for Grades 4 and up to develop reading comprehension, writing, and vocabulary using printed books or an interactive multimedia platform	www.hmhco.com/ products/read-180/ family/

Commercially developed "grab-and-go" curricula, such as News2you, can be an option for students learning to read (see *Table 2*). These materials can support an emerging reader but should be used with a level of support related to the learner's needs. Using a preadapted curriculum by default for a struggling reader, without assessing his or her reading abilities and providing appropriate individualized adaptations, has less potential to effectively support reading comprehension. "Grab-and-go" curricula can be effective for struggling readers when they are intentionally used to meet specific learning needs of a student.

Step 2: Identify Supports Needed, if Any

When considering adaptations or modifications to the text, first determine how the student will be accessing the material (e.g., listening, following along, or reading independently) as well as the supports necessary to maximize independent participation (e.g., shortened text, picture supports, highlighted key facts). If adaptations or modifications are necessary, be sure that they are based on the student's reading ability and Lexile

level, so that no more than necessary supports are being provided (Mims, Hudson, & Browder, 2012). Ideally, all students should have access to grade-level text, and if not, consider what adaptations will be necessary to accommodate their specific reading or listening level. This means that optimal access to the text may be through listening to the material being read aloud as they follow along while also using pictures to support comprehension. For some students, if the process of decoding text is too cognitively demanding, having the text read to them will allow a greater opportunity for comprehension. For other students, simply summarizing a more complex text or decreasing the Lexile level will allow them to access the material with little difficulty. Additionally, modifications to the text may include shortening the length, reducing the amount of supporting detail provided, simplifying technical language, and streamlining the presentation of complex concepts.

Step 3: Determine if the Student Is Learning to Read or Reading to Learn

To identify how to best support reading comprehension, teachers must first gain

an understanding of how their student is interacting with text. Systematic reading instruction first begins by identifying if the student is still learning to read or is reading sufficiently enough to learn the content. This determination influences the entire process. Students learning to read have not yet achieved a functional level of reading. These individuals range from those working on photographobject association to those working on phonemic awareness and basic decoding. Students with fewer literacy skills may be working on identifying sight words or with making picture-word associations, such as matching character names to their photo, or identifying environmental labels.

Students who are reading to learn are typically adequate decoders but may struggle with comprehension across content areas due to difficulties with more complex text and vocabulary encountered in upper grades (Ciullo & Reutebuch, 2014; MCPER, 2013; Wanzek, Wexler, Vaughn, Ciullo, 2010). The students may be able to "read" a sentence by decoding the individual words but may have very little to no comprehension of what was read (O'Connor & Hermelin, 1994; Patti & Lupinetti, 1993). For teachers

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working with students who are still learning to read, like Mr. Wilson, the AAL strategy can be used. In contrast, teachers working with students with more advanced decoding skills, like those Ms. Henderson works with, the CSR-HS strategy may be the most effective.

AAL

AAL provides adaptations and modifications to support access to and comprehension of chronologically ageappropriate text for students with ASD (Browder et al., 2014). Targeted for students learning to read, the focus of this intervention is for students to develop an understanding of text, rather than simply decoding functional sight words found in daily life (Browder et al.). Possible text adaptations for AAL include highlighting key points from a chapter or using a peer or speech-to-text software to engage in a read-aloud to support listening

comprehension. For teachers to engage students in AAL, they must consider the following components.

Preteach Key Vocabulary

It is important to begin with identifying and teaching key vocabulary, or essential terms that one must recognize to gain an understanding of the material being read (Scammaca et al., 2007). Reviewing these key words at the start of a reading lesson primes students for comprehension because they gain a better understanding of the terms that are necessary to fully access the main ideas of the text. Selecting vocabulary for preteaching can provide needed focus on concepts that are more challenging for individuals with ASD, such as the use of pronouns, expressions of emotion, or idioms (Browder et al., 2007). Depending on the student, vocabulary can be represented using text, photographs, line drawings, or even actual objects. A response board can be created for an individual student that matches his or her ability to select the form of response and the number of choices in the array (see *Figure 1*).

Vocabulary instruction with AAL takes place using time delay, an errorless learning procedure that has been successful with teaching vocabulary to students with disabilities (Browder, Ahlgrim-Delzell, Spooner, Mims, & Baker, 2009). The steps for teaching vocabulary utilizing time delay are as follows:

Vocabulary instruction begins with a zero-second delay. After stating the question, the teacher provides the prompt and the desired response at the same time. For example, if the goal is to have the student identify sight words, with a zero-second delay, the teacher would state the word and point to the flashcard with the printed word at the same time. Once the student can consistently produce the correct

- response (i.e., point to the correct flashcard), the process continues.
- The next step is when the teacher inserts a consistent delay between asking the question and providing the prompt to allow time for the student to provide the correct response. For example, using a 5-second delay, the teacher would state the vocabulary word and wait 5 seconds before pointing to the sight word. Within that time, if the student does not respond or points to an incorrect flashcard, the teacher provides the prompt (i.e., repeats the word and points to the correct flashcard). If correct, they move on the next word. The key at this step is to keep the time delay consistent between trials.
- As the student demonstrates success
 with the initial delay, the teacher may
 increase the amount of time between
 the question and the prompt. However,
 once the student begins to consistently
 provide incorrect responses, the teacher
 must drop down to the previous delay
 or return to the zero-second delay. The
 goal is to support student success by
 correcting errors as they occur and
 gradually increasing the amount of time
 between when the question is asked and
 the prompt is provided.

Integrate Comprehension Questions

Monitoring progress as the student is reading allows the teacher to provide additional supports as areas of breakdown are identified. Chunking the material and integrating comprehension measures throughout the reading material decreases the cognitive load necessary to recall facts from the texts, setting up the student for success. Using this instructional strategy provides a better understanding of the student's comprehension, compared to simply asking a list of questions after the text is read.

Asking *wh*- questions (i.e., who, what, where, when, how, why) is a typical strategy that can be used to check for understanding. Teachers should consider the following:

 Before using wh- questions, it is important to assure that students know how to respond to the implicit aspect of the question. This is a skill that most successful readers take for

- granted. Teachers can explicitly explain that a *who* question indicates a response that is a person, a *where* question indicates a place, a *when* question indicates a time, and so on.
- Students struggling with understanding the implicit aspect of a *wh* question may require additional supports, such as response boards. Teachers can organize the board by each *wh* question. For example, the *who* board will contain all of the people or characters from the text, and the *where* board will contain all of the places and locations mentioned in the text. *Figure 1* depicts a response board created for a student reading the text *Slam!* (Myers, 1996).

For students utilizing AAL, ongoing assessment can occur by integrating comprehension questions after consistent segments of text and the use of a least-tomost prompting sequence, or initially using the least amount of assistance (Browder, Thompson, & Fallin, 2014). Incorporating comprehension questions into the actual section of text they are accessing allows students to make clearer connections to that material and to better identify key facts associated with that section of text. Moreover, a least-to-most prompting sequence can help students to identify exactly where the information is and teaches them how to answer such questions, instead of simply marking a question incorrect and moving on to the next item (Browder et al., 2012, 2016). For example, if a student answers an integrated comprehension question incorrectly,

- the teacher's initial response, or first level of support, is to reread three or four sentences where the answer can be found and then reask the same question.
- If answered correctly, the teacher continues reading the text.
- If incorrect a second time, the teacher now rereads one or two sentences where the answer can be found and ask the question again.
- If still incorrect, the teacher reads aloud a short phrase containing the answer to the student before reasking the question.
- Finally, if the answer is still not clear to the student, the teacher asks the question and indicates the answer to the student. Following this prompt sequence allows the teacher to reduce

the amount of information being presented to the student to support his or her comprehension while also providing just enough support to allow the student to maintain the highest level of independence.

Maintain Engagement

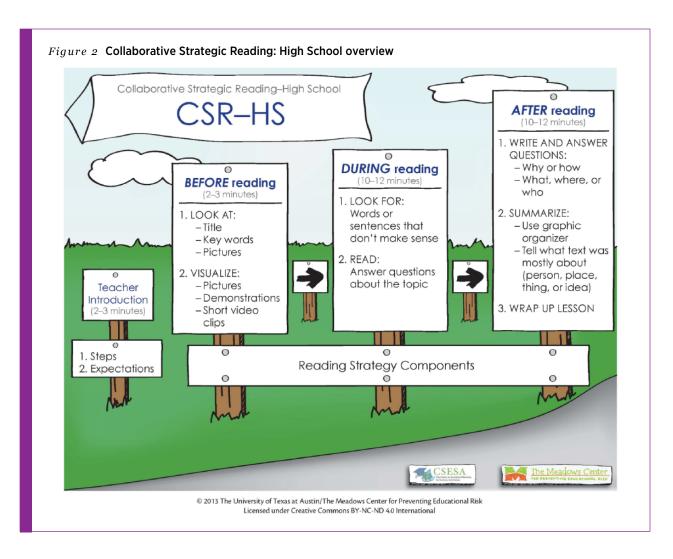
The ways students engage in the reading comprehension process are likely to vary depending on an individual student's level of reading proficiency and where those with ASD fall along the spectrum. For example, a student using AAL may follow along as the text is being read to him or her, focusing on key words and concepts that have been augmented with visual supports (Browder et al., 2014). For students using AAL to access information, the content can be extend beyond the text to include reading tables, charts, figures, or graphs or even having the students act out the content in a theater format. Technology can also be used to maintain interest and reinforce concepts. For example, after a chapter is read in class, students watch a brief clip from the movie that depicts the scene read from the text. Pairing the text with the movie provides engaging visuals of the actions taking place and reinforces the concepts being read.

Recall of Key Facts From the Text

After reading, follow-up activities can serve as assessment of how students are relating key facts to one another and how these facts contribute to the main idea of the text. With AAL, this can take place in the form of follow-up activities: sequencing events, identifying characters, or matching characters with actions. Graphic organizers can also help students organize information as they access the text. For some students, photo representations of components of the story are added to a graphic organizer to help them organize components of the text, for example, having columns to sort out characters, locations, and actions of the text or matching photos of characters to actions.

Information from the text can be synthesized using extension activities.

These activities can serve as an alternate means for students to express their understanding of the material or as a reinforcing means of assessment. Moving beyond paper-based activities, students can use theater or art expression to



communicate their key understandings of the content. This allows for an alternate means of expression in a way that students struggling with written or verbal communication can more effectively articulate their thoughts. Additionally, having a student identify a related resource and explain its connection and significance to the original work can serve as a measure of understanding that allows the student to move beyond the original work and make connections to other content.

After Mr. Wilkins begins using articles from the Tween Tribune with Lexile level and supports individualized for his students, the engagement in reading activities and their reading comprehension increases. He assures students work with meaningful and high-interest text by having them vote on the article topic each week.

Supplementary activities (e.g., math word problems on the topic or Internet research) are created that embed the topic of the article

selected into lessons addressing other academic content areas.

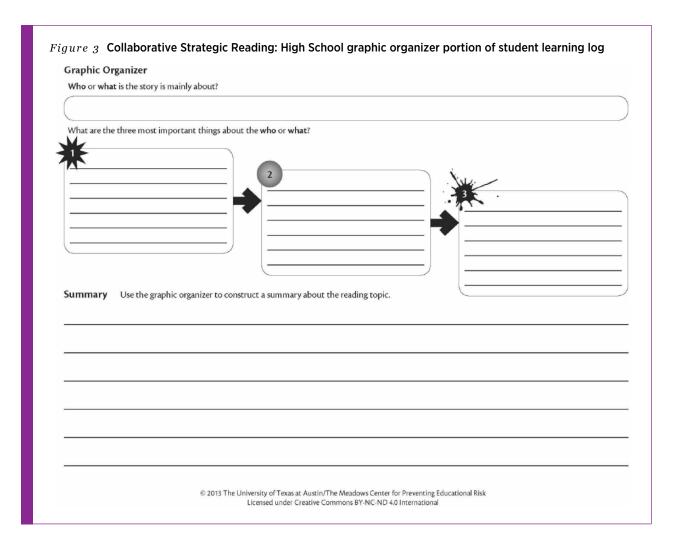
CSR-HS

In CSR-HS, students with ASD work with an assigned peer tutor under the guidance of a skilled implementer (e.g., teacher or other intervention staff) to use evidencebased strategies before, during, and after reading (see Figure 2). At least three times a week for 30-minute sessions, partners work through a preselected reading passage at the targeted student's instructional reading level to learn and practice strategies and peer supports to improve comprehension. Developers recommend implementing CSR-HS for a minimum of 16 lessons. Because the goal is for students to generalize the strategies to all reading, after students are comfortable and proficient with the strategies, teachers can fade the use of the learning log and partners.

These sessions might be scheduled during intervention, tutoring, or study skills time and are meant to supplement classroom reading comprehension instruction. CSR-HS may be a good fit for the student with ASD who (a) reads and writes far below grade level, (b) lacks experience working with peers in a more traditional classwide setting, (c) needs to build social and communication skills, and (d) is very distractible or anxious in classwide settings.

Peer Support for Students With Autism

Peers can serve as a natural support for a student as they have the potential to be more accessible, relatable, and even more approachable than an adult. Students without disabilities are selected as peer partners based on their availability, willingness, and potential to work well with the target student. Counselors, other



knowledgeable educational professionals, and the students themselves should be involved in making partnering decisions. Guidelines for selection of and preparations for partners are detailed in the CSR-HS implementation manual (MCPER, 2013). In general, successful partnerships are built upon mutual respect and the ability of both students to contribute to the completion of reading comprehension tasks.

Steps to CSR-HS

Teacher introduction. The implementer begins every session by telling the partners the topic of the daily lesson ("Today's passage is on..."), ensuring partners are ready to work together using CSR-HS strategies and have the needed materials, including (a) a preselected reading passage, (b) a learning log that includes a graphic organizer (see

Figure 3) meant to help document key ideas and develop a summary, and (c) question stem prompts (e.g., "What are...?" "How did...?" "Why is...?").

Before reading. Prior to asking peers to begin, an implementer follows four steps: (1) provides a brief statement about the purpose of the day's reading and the tasks to be completed by the students; (2) prompts students to preview the text by scanning the title, headings, pictures, and charts or tables in the selection; (3) introduces two or three key vocabulary terms with high utility that are neither too familiar nor too rare (Beck, McKeown, & Kucan, 2002) and provides information on the definition and meaning of the words prior to introducing reading materials; and (4) activates or builds background knowledge using a picture, demonstration, or short video clip on the reading topic.

During reading. Once students begin to read the assigned text, they are encouraged to engage with the text. Instead of plowing through a passage, students are encouraged to stop and discuss words and phrases that do not make sense. While reading the text, partners might offer the following supports:

• Clarify any misunderstood information. The partner with ASD might indicate on his or her learning log that a phrase from the text, such as "feet was quite an achievement," does not make sense. The peer partner, upon review, might say, "That word is feat, an achievement, like running a marathon. You are thinking of the word feet, what we use to walk. Look back at the word on page 7: It is feat, one of our key words."

- Highlight key words that were introduced at the start of the lesson. Peer partners can help each other by pointing out when key words appear in text being read and can help remind each other of the meaning of the words. For example, one partner might say, "Look at that word, code, in bold. Ms. Henderson taught us the definition. I recall that code means "systems or rules in place." Do you agree? Let's each use code in a sentence."
- Ask one another for definitions of words encountered and to use selected vocabulary words in a sentence. For example, with the word *enhance* (to improve or make better), students could be asked to discuss "how could the cafeteria enhance the food served?"

At teacher-determined points in the text, the students stop and each partner formulates a true-or-false question to test one another on the content. This type of comprehension monitoring allows students to check for their understanding of the text they just read. The students are encouraged to identify key facts from the text to use for their questions. For example, in the text about George Washington Carver, a student might create a question about what Carver studied in college, for example, "Carver studied bugs in college" (false; he studied plants). True-or-false statements can be created and posted on the board or added to the learning log. If the statement is false, students discuss why and correct it to make it a true statement.

After reading. Once partners have read through the text, students review the important ideas using two strategies: first, generating questions and discussing them with a partner, and second, summarizing what they read using a the graphic organizer portion of the learning log. Readers use prompts, if needed, to check their own understanding as well as that of their partner with who, what, where, when, and how questions specific to the assigned text. Each student directs a question to his or her partner, and the latter provides an answer after looking back in the text.

Next, using the graphic organizer, the students identify the main idea of the text by responding to the question, "Who or what is the story about?" This is followed up with identifying three key facts from

the text by answering a second question: "What are the three most important things about the *who* or *what?*" Both partners record information and use it to generate a summary. The visual support provides a way to help the students organize information and also serves as a permanent product that teachers can then use as a tangible representation of the students' work (Reutebuch et al., 2015).

After the summary is completed, the teacher leads a wrap-up. The purpose is to highlight what was accomplished during the session and to facilitate connections students can make between the day's reading, other readings, and the real world. During the wrap-up, the teacher does the following: (1) restates the purpose of the day's reading, (2) reminds students what they accomplished, and (3) provides brief feedback about student performance and behavior.

Additional Considerations

The goal of implementing CSR-HS is for the reading comprehension strategies to become habitual. By having a peer support a student with ASD to use CSR-HS, social interaction opportunities are created as pairs work to discuss, clarify, and synthesize information being read. As peers continue to work together, their interactions have the potential to become more fruitful and productive. Once partners become more familiar with one another, they are likely to gain a better understanding of each other's likes and dislikes, areas of strength, and areas where more support may be needed to further enhance reading comprehension.

When Ms. Henderson changes her practice from repeatedly asking the same questions to students who consistently make errors to creating peer pairs who create questions about the content and support each other to find where in the text the information could be found, she notices that students are more engaged and more confident in their comprehension skills. By providing a structure for the reading activity, Ms. Henderson notices that the students with ASD appear more relaxed when reading, remind their peer about the structure of the process if a step is missed, and find the visual support of the graphic organizer very helpful. Once the students with ASD have structure, they can focus on the aspects of reading comprehension they find most challenging, such as identifying the point

of view or emotional reactions of characters in fiction texts.

Conclusion

It is not uncommon for high school students with ASD to continue to struggle with reading comprehension. This article describes a systematic approach to supporting the development of reading comprehension for students with ASD who may be "learning to read" or "reading to learn." Using the strategies described before, during, and after reading has the potential to yield gains in reading comprehension when characteristics of ASD are taken into consideration and support needs are individualized. Providing students with options related to the selection of the content and how they demonstrate understanding can lead to increased enthusiasm for and engagement in the overall literacy process.

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REFERENCES

- Beck, I., McKeown, M. G., & Kucan, L. (2002). Bringing words to life: Robust vocabulary instruction. New York, NY: Guilford.
- Bethune, K. S., & Wood, C. L. (2013). Effects of wh-question graphic organizers on reading comprehension skills of students with autism spectrum disorders. *Education and Training in Autism and Developmental Disabilities*, 48, 236–244. doi:10.1007/s10803-006-0206-y
- Boardman, A. G., Klingner, J. K., Buckley, P., Annamma, S., & Lasser, C. J. (2015). The efficacy of Collaborative Strategic Reading in middle school science and social studies classes. Reading and Writing, 28, 1257–1283. doi:10.1007/s11145-015-9570-3
- Bogdashina, O. (2005). Communication issues in autism and Asperger syndrome: Do we speak the same language? London, UK: Jessica Kingsley.
- Browder, D., Ahlgrim-Delzell, L., Flowers, C., & Baker, J. (2012). An evaluation of a multicomponent early literacy program for students with severe developmental disabilities. *Remedial and Special Education*, 33, 237-246. doi:10.1177/0741932510387305
- Browder, D., Ahlgrim-Delzell, L., Spooner, F., Mims, P. J., & Baker, J. N. (2009). Using time delay to teach literacy to students with severe developmental disabilities. Exceptional Children, 75, 343–364. doi:10.1177/001440290907500305
- Browder, D., Gibbs, S., Ahlgrim-Delzell, L. E., & Lee, A. (2016). *Early Literacy Skills Builder* (*ELSB*). Verona, WI: Attainment Company.
- Browder, D. M., Thompson, J. L., & Fallin, K. (2014). Alternate Achievement Literacy manual. Charlotte, NC: Center for Secondary Education of Students With Autism.
- Browder, D., Trela, K., & Jimenez, B. (2007).
 Training teachers to follow a task analysis to engage middle school students with moderate and severe developmental disabilities in grade-appropriate literature.
 Focus on Autism and Other Developmental Disabilities, 22, 206–219. doi:10.1177/10883576 070220040301
- Ciullo, S., & Reutebuch, C. K. (2014). "Now it makes sense!" Best practices for reading comprehension in Grades 6-12. In M. Hougen & S. Smartt (Eds.), Fundamentals in literacy and assessment (pp. 6-12). Baltimore, MD: Brookes.
- Fleury, V., Hedges, S., Hume, K., Browder, D. M., Thompson, J. L., Fallin, K., Vaughn, S. (2014). Addressing the academic needs of adolescents with autism

- spectrum disorder in secondary education. *Remedial and Special Education*, *32*, 68–79. doi:10.1177/0741932513518823
- Ford-Connors, E., & Paratore, J. R. (2015). Vocabulary instruction in fifth grade and beyond: Sources of word learning and productive contexts for development. *Review of Educational Research*, 85, 50–91. doi:10.3102/0034654314540943
- Guthrie, J. T., & Klauda, S. L. (2014). Effects of classroom practices on reading comprehension, engagement, and motivations for adolescents. *Reading Research Quarterly*, 49, 387–416. doi:10.1002/rrq.81
- Hume, K. A., Odom, S. L., Dawalt-Smith, L., Hall, L. J., & Kraemer, B. (2018, February). A comprehensive approach to supporting students with ASD in high school. Paper presented at the Council for Exceptional Children Conference and Expo, Tampa, FL.
- Kamil, M. L., Borman, G. D., Dole, J., Kral, C. C., Salinger, T., & Torgesen, J. (2008). Improving adolescent literacy: Effective classroom and intervention practices. A practice guide (NCEE 2008-4027). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. Retrieved from http://ies .ed.gov/ncee/wwc/pdf/practice_guides/ adlit_pg_082608.pdf
- Koegel, R. L., & Koegel, L. K. (1995). Teaching children with autism: Strategies for initiating positive interactions and improving learning opportunities. Baltimore, MD: Brookes.
- Meadows Center for Preventing Educational Risk. (2013). Collaborative Strategic Reading-High School: Implementation manual. Austin, TX: Author.
- Mims, P. J., Hudson, M. E., & Browder, D. M. (2012). Using read-alouds of grade-level biographies and systematic prompting to promote comprehension for students with moderate and severe developmental disabilities. Focus on Autism and Other Developmental Disabilities, 27, 67–80. doi:10.1177/1088357612446859
- Morningstar, M. E., Bassett, D. S., Kochhar-Bryant, C., Cashman, J., & Wehmeyer, M. L. (2012). Aligning transition services with secondary education reform: A position statement of the division on career development and transition. Career Development and Transition for Exceptional Individuals, 35, 132–142. doi:10.1177/2165143412454915
- Myers, W. D. (1996). *Slam!* New York, NY: Scholastic.

- Nagy, W. E., & Townsend, D. (2012). Words as tools: Learning academic vocabulary as language acquisition. *Reading Research Quarterly*, 47, 91–108. doi:10.1002/RRQ.011
- Oakhill, J., Cain, K., & Elbro, C. (2015). *Understanding and teaching reading comprehension: A handbook*. New York, NY:
 Routledge.
- O'Connor, N., & Hermelin, B. (1994). Two autistic savant readers. *Journal of Autism* and *Developmental Disorders*, 24, 501–515. doi:10.1007/BF02172131
- Patti, P. J., & Lupinetti, L. (1993). Brief report: Implications of hyperlexia in an autistic savant. Journal of Autism and Developmental Disorders, 23, 397–405. doi:10.1007/BF01046228
- Reutebuch, C. K., El Zein, F., Kim, M. K., Weinberg, A. N., & Vaughn, S. (2015). Investigating a reading comprehension intervention for high-school students with autism spectrum disorder: A pilot study. Research in Autism Spectrum Disorders, 9, 96–111. doi:10.1016/ irasd 2014 10 002
- Reutebuch, C. K., El Zein, F., & Roberts, G. J. (2015). A systematic review of the effects of choice on academic outcomes for students with autism spectrum disorder. *Research in Autism Spectrum Disorders*, 20, 1–15. doi:10.1016/j.rasd.2015.08.002
- Scammacca, N., Roberts, G., Vaughn, . S., Edmonds, M., Wexler, J., Reutebuch, C. K., & Torgesen, J. K. (2007). Interventions for adolescent struggling readers: A meta-analysis with implications for practice. Portsmouth, NH: RMC ResearchCorporation, Center on Instruction.
- Tager-Flusberg, H., Edelson, L., & Luyster, R. (2011). Language and communication in autism spectrum disorders. In D. G. Amaral, G. Dawson, & D. H. Geschwind (Eds.), Autism spectrum disorders (pp. 172–185). New York, NY: Oxford University Press.
- Wanzek, J., Wexler, J., Vaughn, S., & Ciullo, S. (2010). Reading interventions for struggling readers in the upper elementary grades: A synthesis of 20 years of research. *Reading and Writing*, 23, 889–912. doi:10.1007/s11145-009-9179-5
- Wong, C., Odom, S. L., Hume, K. A., Cox, A. W., Fettig, A., Kucharczyk, S., . . . Schultz, T. R. (2015). Evidence-based practices for children, youth, and young adults with autism spectrum disorder: A comprehensive review. *Journal of Autism and Developmental Disorders*, 7, 1951–1966. doi:10.1007/s10803-014-2351-z

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