



Developing Social Knowledge to Support Reading Comprehension in Elementary Students With ASD

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Mrs. Bryers has been working with Michael, a second-grade student in her class with autism spectrum disorder (ASD), on a variety of academic and nonacademic goals. He is showing great progress in his reading fluency but sometimes seems to have difficulty when he is asked comprehension questions, indicating that although he can read words well, he may not understand what he is reading. Michael seems to have a particularly difficult time with comprehension questions about characters' thoughts and feelings. Today, after a read-aloud of Wemberly Worried by Kevin Henkes, Mrs. Bryers asked Michael why Wemberly wasn't worried about going back to school on her second day. The story showed that Wemberly had made a friend the first day and that this friend had eased her worries about school. Michael was unable to articulate why Wemberly's feelings had changed, suggesting he was not comprehending key aspects of the story. Mrs. Bryers is looking for ways to help Michael with his comprehension, particularly when fictional texts include storylines that might be less accessible to Michael due to his difficulties with social understanding.

The ability to comprehend what one reads is crucial for overall academic success. When extracting meaning from text, readers construct a mental representation of the information conveyed in the story (van den Broek & Kendeou, 2017). This process involves basic language skills such as word decoding and syntactic knowledge but also requires higher level skills such as inference-making, comprehension monitoring, and perspective-taking (Elleman, 2017). As children progress through school, there is an expectation that with adequate instruction, they will acquire the necessary skills to be able read words and to think critically and comprehend text.

Readers connect to information they already know about the world and use that knowledge to make inferences and predictions about characters in a story (Smith et al., 2021). Good readers also know how to use repair strategies when they are not comprehending something that they are reading (Kim et al., 2018). For example, when reading comprehension breaks down because of a lack of background knowledge or a complex text structure, readers can draw on their bank of comprehension strategies to repair the problem and continue reading (Elleman, 2017).

For children with ASD, this process can be more complex. Individuals with ASD have impairments in social communication that are often characterized by difficulties with language and in interpreting the thoughts and behaviors of others (American Psychiatric Association, 2013; Bishop-Fitzpatrick et al., 2017). Additionally, children diagnosed with ASD may exhibit impairments in reading comprehension that persist as they get older (e.g., Solari et al., 2019). Even children with ASD who have grade-level decoding skills may have difficulty comprehending highly social texts (Brown et al., 2013). Data suggest that between 37% and 65% of children with ASD struggle with reading comprehension, a proportion much higher than the estimated 10% of children who do not have ASD who are identified as poor comprehenders (e.g., Estes et al., 2011; Hulme & Snowling, 2011; McIntyre et al., 2017; Solari et al., 2019). Furthermore, it appears that even when children with ASD have average IQ, they show more pervasive difficulties in reading when compared to their typically developing peers (Solari et al., 2019).

It is possible the social attributes of ASD may contribute to poor reading comprehension outcomes (Brown et al., 2013). Fictional texts require the reader to consider the characters' perspectives and how these affect their motivations and actions throughout the story (Mar & Oatley, 2008). Because children with ASD struggle with theory of mind, or the understanding that others have thoughts, beliefs, and feelings that may be different from one's own, they may have difficulties making social inferences about the characters in a story (Bishop-Fitzpatrick et al., 2017; Ricketts et al., 2013).

Many teachers indicate they are unsure of how best to address these reading needs in the classroom (Accardo & Finnegan, 2019) given that the limited number of evidence-based strategies available to schools for children with ASD generally focus on functional routines or social skills (Machalicek et al., 2008). To address the heterogeneous needs of their students, educators require instructional practices that consider the underlying reasons for poor comprehension in children with ASD, such as the associated difficulties in theory of mind and social communication.

There are a variety of reading strategies that directly target the cognitive characteristics of children with ASD, including activating social background knowledge (e.g., Smith et al., 2021), encouraging reading series and familiar genres (e.g., Rosenhouse et al., 1997), identifying figurative language (e.g., Whyte et al., 2013), and using graphic organizers to support perspective-taking (e.g., Finnegan & Accardo, 2018). These strategies are tailored to the underlying social difficulties that may be impeding reading comprehension in students with ASD. Narrative texts provide an opportunity for children to mentally simulate the social experiences of the characters in a story and to introduce social situations that students may not typically encounter in everyday life (Mar & Oatley, 2008). By encouraging discourse surrounding character emotions and motivations, instructors can target underlying social skills to improve students' reading comprehension (Henry & Solari, 2020; Solari et al., 2020).

The following sections will provide key information, relevant research, and instructional strategies to support reading comprehension for children with ASD. All strategies are summarized in **Table 1**.

Strategy 1: Activate Social Background Knowledge

Background knowledge plays a crucial role in students' reading comprehension, but children with ASD may not have the requisite social knowledge to understand some fictional stories. Teachers can support these students by activating relevant knowledge. If students do not have sufficient background knowledge, they will likely struggle to understand a text (Smith et al., 2021). Activating key background knowledge allows the reader to better identify important story elements and engage in higher order comprehension skills such as inferencing (van den Broek & Kendeou, 2017). It is especially important to activate background knowledge when a story's topic is less familiar (Kaefer, 2018).

Although typically developing children usually have sufficient background knowledge related to the content of narratives, children with ASD may need more support (Kluth, 2010). Children's books contain a great deal of social

Table 1 Strategies to Support Reading Comprehension for Children With Autism Spectrum Disorder

<i>Strategy</i>	<i>Directions</i>	<i>Example from Wemberly Worried</i>
Activate social background knowledge	<ul style="list-style-type: none"> Teacher considers the social knowledge needed to understand the plot of the story and activates this knowledge prior to reading. 	<ul style="list-style-type: none"> Before reading the story, the teacher discusses what it means to be worried about something. Teacher asks students to draw a time when they were worried.
Encourage series and familiar genres	<ul style="list-style-type: none"> Teacher encourages picture or chapter book series to allow students to engage with familiar characters and genres. 	<ul style="list-style-type: none"> After reading the story, the teacher encourages students to read other Kevin Henkes books with characters like Wemberly.
Identify figurative language	<ul style="list-style-type: none"> Teacher identifies figurative expressions that may be confusing, such as metaphors, similes, hyperbole, or idiomatic expressions. Teacher provides explicit instruction in figurative language and/or encourages students to use context clues to identify the expression. 	<ul style="list-style-type: none"> Teacher highlights the exaggerated language the author uses in the story, such as Wemberly's fear of shrinking in the bathtub. Teacher asks students to think about whether Wemberly's worries could happen in real life or whether they are exaggerated fears.
Use graphic organizers to support perspective-taking	<ul style="list-style-type: none"> Teacher provides graphic organizers for students to compare the perspectives of different characters. Teacher encourages students to make connections between themselves and the characters in the story. 	<ul style="list-style-type: none"> Teachers asks students to fill out a graphic organizer comparing their worries to Wemberly's worries. Teacher builds connections by leading a discussion of how students' worries are similar or different to Wemberly's.

content because they frequently center on interactions between people or personified animals. Children with ASD are more likely to demonstrate difficulties in the ability to understand and interpret what will or could happen in common social situations. These impairments in social cognition may be disrupting students' opportunities to rehearse their understanding of how social events unfold and what they mean (Losh & Capps, 2003). Therefore, for children with ASD, the "shared knowledge" of the world that is so often assumed may need to be explicitly activated during prereading activities.

Instructional Examples of Activating Social Background Knowledge

Teachers can enhance the comprehension of stories for students with ASD by activating and establishing background knowledge prior to reading (Gately, 2008). These activities can be simple, such as having students brainstorm what they know about a topic or asking them to

identify an event from their lives that is relevant to the story's themes (Cervetti & Hiebert, 2018). Activating relevant knowledge prior to reading is important for children with ASD to make connections between their experiences and the experiences of the characters they will encounter in a text and allows time to provide scaffolding before reading. For example, consider the underlying social themes of *Ruby the Copycat* by Peggy Rathmann (1991), a story about a new girl at school named Ruby who begins to copy the style and behaviors of Angela, another girl in her class. To comprehend this story, the reader must understand that Ruby is likely copying her classmate because she is nervous about her new school and is trying to fit in and that Angela is upset about her mimicry because she wants to receive credit for her own accomplishments. Prior to reading this story, it would be useful to prompt students to think about times when they admired someone and wanted to be like them or instances when a younger sibling may have imitated their words or actions. Activating this background knowledge

will allow students to connect with both Ruby and Angela and think about how these characters might be feeling throughout the story.

When designing prereading activities regarding background knowledge, ensure activities are specific to social themes that will be encountered in the text rather than indirectly related topic areas. Activating irrelevant background knowledge prior to text reading may have a negative impact on comprehension (Kaefer, 2020); it is possible this would be more impactful for students with ASD. For example, leading students in an activity about sea creatures prior to reading *The Rainbow Fish* by Marcus Pfister (1992) will not help students comprehend the book's larger themes of friendship and generosity. Be cautious about simply instructing children in social themes that will be present in a text and instead focus on activating preexisting knowledge from students' own experiences (Cervetti & Herbert, 2019; Kaefer, 2020). Due to social exclusion, children with ASD may not have the requisite experiences to make connections to their own lives (Kluth, 2010), so it may

be necessary to encourage connections to characters encountered in television shows, books, or movies.

Also consider whether a target text contains story vocabulary about emotions or social situations that may be potentially confusing to a child with ASD. It is sometimes difficult for children with ASD to discriminate among affective states such as anger or frustration or understand the subtle gradations of such feelings. Therefore, be prepared to provide direct instruction in social vocabulary words prior to text reading. For example, before a read-aloud of *Wemberly Worried* by Kevin Henkes (2000), remind students that *worried* is not always the same as *scared*. It might also be useful to have students fill out a graphic organizer to help them decipher *fear* from *worry* using examples from their own lives (e.g., you are scared of spiders, but you are worried about forgetting your lines in the school play). Other books that highlight social and emotional vocabulary include *My Mouth Is a Volcano* by Julia Cook (2005), *Today I Feel Silly & Other Moods That Make My Day* by Jamie Lee Curtis (1998), and *The Way I Feel* by Janan Cain (2005).

Mrs. Bryers realizes that Michael may not have the social background knowledge needed to understand Wemberly Worried. The following day, she asks Michael to think about a time when he was worried about going to a new place and what made him feel more comfortable about going there a second time. Michael explains that he had been worried about going to the dentist because he had thought that he might be blinded by the overhead light or the procedure might hurt. When the office secretary gave him headphones to listen to music during the appointment and sunglasses to protect his eyes, he'd felt much better, and the tooth cleaning hadn't hurt at all. Mrs. Bryers asks him to remember how he felt at the dentist when they read through Wemberly Worried for a second time.

Strategy 2: Encourage Series and Familiar Genres

Children with ASD may respond better to familiar stories and characters because this decreases the cognitive load associated with learning new characters or genres. Children benefit from books with well-known characters and familiar plotlines (Dwyer & Neuman, 2008; Rosenhouse

et al., 1997). Rosenhouse et al. (1997) examined how read-alouds of different types of books impacted the reading skills of first graders in Israeli classrooms. Children were read one of three text types: isolated stories by different authors, isolated stories by a single author, or a book series written by the same author. Compared to the other two groups, children who were read a book series showed greater gains in pleasure reading and in reading comprehension skills. Exposure to serialized stories allows children to accumulate knowledge about the series world and the characters within it. As more books in the series are read, children develop an ongoing connection to the characters and are interested in what happens to them (Nolen, 2007). For children with ASD, familiar characters and settings might promote greater engagement and interest in a story (Fergus et al., 2014; Ghanouni et al., 2020).

Instructional Examples to Encourage Series and Familiar Genres

One way to encourage students to read new books but stay within a familiar context is by encouraging book series. Serialized books are a way for children to repeatedly experience and engage with their favorite characters. If a student is more familiar with the characters and their personalities, he or she will be able to devote cognitive resources toward understanding the plot of the story rather than getting bogged down in learning new information about each of the characters. When engaging in familiar genres or books, the relevant information is already activated in the brain, which frees up cognitive resources by reducing the need to process novel stimuli (Sweller, 2011).

Series can also be beneficial in transitioning to other books within the same genre and may make students more interested or motivated to read other books with similar themes (Nolen, 2007). This can be particularly useful for children with ASD, who may get “stuck” on a particular topic or may be resistant to branching out to other authors or series. For example, a child that is interested in mystery and detective series might enjoy *A to Z Mysteries* by Ron Roy (2009), the *Cam Jansen* series by David

Adler (2004), or *Clubhouse Mysteries* by Sharon M. Draper (2011).

After reading Wemberly Worried, Michael asks Mrs. Bryers if Wemberly was able to stop worrying about things that might happen to her. Mrs. Bryers encourages Michael to borrow another Kevin Henkes book featuring Wemberly so Michael could bring his familiarity with the social universe to new readings and see what happens next in Wemberly's story.







Strategy 3: Identify Figurative Language

Many popular children's books contain rich figurative language (Colston & Kuiper, 2002). Children with ASD may offer more literal interpretations of text content that includes figurative language, so teachers may need to provide contextual framing or explicit instruction in idioms and other figurative expressions.

When using figurative language (e.g., metaphors, similes, idiomatic expressions, or hyperbole), speakers mean something other than the words they are literally saying (Gibbs & Colston, 2012). Therefore, to comprehend figurative language in a story, the reader must use contextual information to understand the author's intention.

A number of studies have shown that individuals with ASD have difficulty understanding figurative expressions (e.g., Kalandadze et al., 2018; Mashal & Kasirer, 2011) and are more likely to provide literal meanings than their typically developing peers (Norbury, 2004). These difficulties may become even more pronounced when the premise of a story relies on a metaphor or idiomatic expression. For example, in the book *Pigsty* by Mark Teague (1994), a young boy with a messy bedroom finds himself with pigs for company. At first, he cohabits nicely with the pigs, but they start to become a nuisance when they chew up his baseball cards and ruin his comic books. Eventually, he enlists the pigs' help in cleaning his room, and the animals vacate the now-clean room in search of dirtier pastures. To comprehend the basic plot of this story, the reader must understand the literal and figurative interpretations of the word *pigsty*. A *pigsty* is a literal pen for pigs, but it also can be interpreted as a place that is dirty or slovenly. Teachers may have to provide

Figure 1 Classroom chart of idiomatic expressions encountered in texts

Book	Idiom	Context Clues	Literal Meaning	What It Really Means
<u>More Parts</u>	"it broke your heart"	Toy truck fell apart, boy is crying		
<u>My Teacher Likes to Say</u>	"ants in your pants"	Boy is squirming and wiggling around		
<u>Amelia Bedelia Bakes Off</u>	"takes the cake"	Amelia Bedelia's cake won first prize		

an explicit breakdown of these different meanings.

Instructional Examples of Identifying Figurative Language

Typically developing children often use a story's contextual clues to determine the meaning of idioms and other figurative expressions. However, children with impaired language, such as children with ASD, may benefit considerably less from using contextual information (Norbury, 2004). When teachers draw students' attention to contextual clues and ask them targeted questions, children with ASD are better able to interpret figurative phrases (Whyte et al., 2013). There are several children's books that provide explicit opportunities to explore idioms, such as *Butterflies in My Stomach and Other School Hazards* by Serge Bloch (2009), *The World Is Your Oyster* by Tamara James (2010), and the *Amelia Bedelia* book series by Peggy Parrish (1963). These books provide humorous demonstrations of the ways figurative language can be misunderstood and how idioms are used in everyday life. To help children learn about nonliteral language, teachers can create a classroom anchor chart of

idiomatic expressions or metaphors encountered in text. Students can add to the chart as they encounter new figurative expressions, including context clues from the story that helped them figure out the true meaning of the phrase. **Figure 1** shows a completed chart of idiomatic expressions that were encountered in the story *Parts* by Tedd Arnold (2000), *Amelia Bedelia Bakes off* by Herman Parrish (1963/2010), and *My Teacher Likes to Say* by Denise Brennan-Nelson (2004).

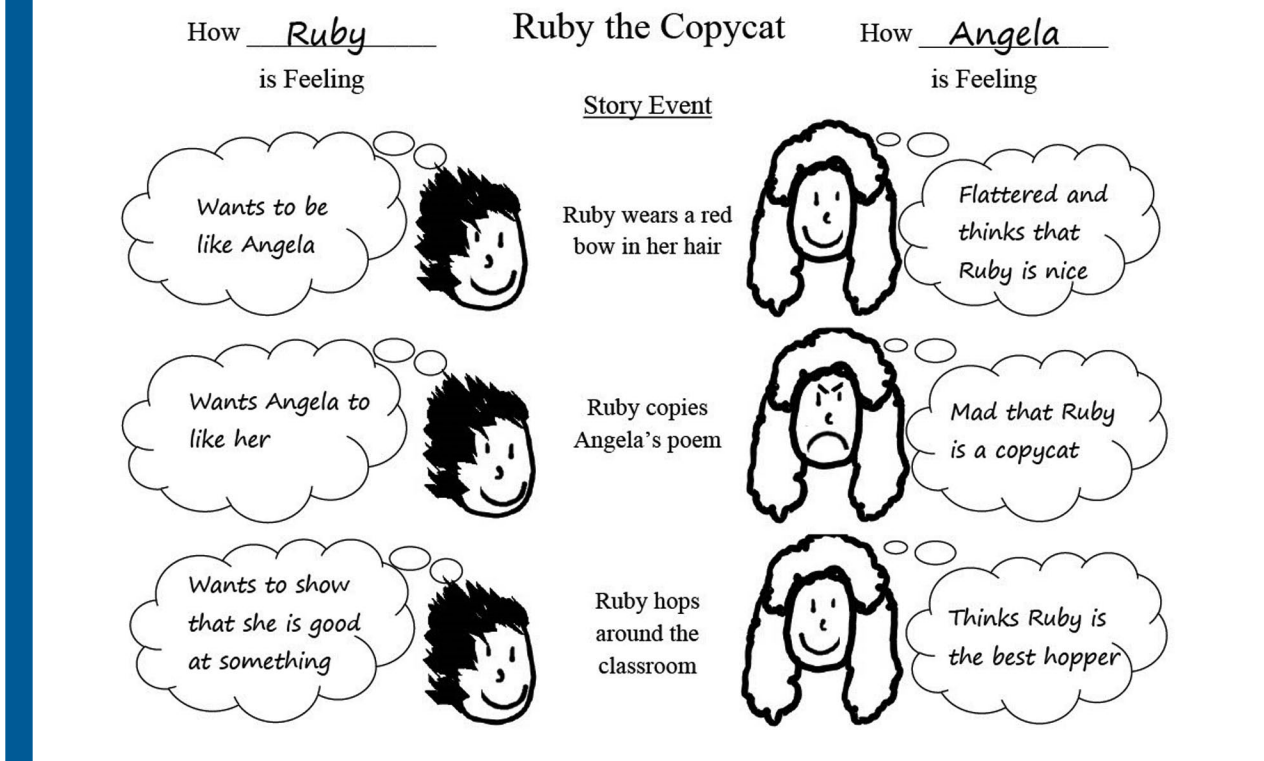
Mrs. Bryers encourages her class to think about the figurative expressions encountered in Wemberly Worried. She explains the author sometimes uses exaggerated language in the story to show how Wemberly's worries were unfounded, such as her fear about shrinking in the bathtub. She asks her students to think about Wemberly's other worries and whether they could happen in real life. Together, they fill out a class chart about "real" or "exaggerated" worries. Michael raises his hand and notes that Wemberly was worried about snakes in the radiator. Mrs. Bryers asks him if he has ever heard of snakes living in radiators. When he shakes his head no, she writes "snakes in radiator" under "exaggerated worries."

Strategy 4: Use Graphic Organizers to Support Perspective-Taking

Graphic organizers can help support students with ASD in thinking critically about fictional characters and how they might have different perspectives on the events that occur within a story. Perspective-taking is an important predictor of deep reading comprehension because recognizing different points of view is imperative to understanding characters' motives and actions and in evaluating conflict that may arise between characters.

Asking readers to think about characters' perspectives while engaging with fictional texts can improve comprehension (McTigue et al., 2015). However, because children with ASD struggle with adopting different characters' viewpoints and in shifting between them, they may need additional structure or scaffolding to understand varying points of view (Finnegan & Accardo, 2018; García-Pérez et al., 2008). There is evidence that providing direct instruction in perspective-taking ability through discussion of characters' emotions and mental states and influencing story

Figure 2 Point-of-view story map for *Ruby the Copycat*



events can help students with ASD retell stories from the perspective of multiple characters (Dodd et al., 2011).

Instructional Examples Using Graphic Organizers

One way to target these skills is by using graphic organizers that help students identify how characters' feelings change throughout the story. Modified story maps (Stringfeld et al., 2011) may be one way to illustrate how characters feel throughout the story and can allow children to compare the perspectives of two different characters in a story (Emery, 1996). **Figure 2** depicts a modified story map helping students think about how the two main characters in *Ruby the Copycat* (Rathmann, 1991) feel at the beginning, middle, and end of the story. Each character feeling is aligned with a specific event to allow for easy comparison.

Graphic organizers also help students with ASD recognize the causal links between characters' actions and the reactions of other characters in the story. For example, the same action in *Ruby the Copycat* (Rathmann, 1991) provoked two

very different responses from the main characters. Ruby mimicked Angela's poem because she admired Angela and wanted to earn her approval, but Angela was angry and thought that Ruby should have come up with her own ideas for a poem. This graphic organizer can help the students realize Ruby had good intentions and she wanted to be friends with Angela but was unsure of the best way to go about it.

Graphic organizers can also help students recognize the similarities and differences between themselves and the characters in the book. For example, when reading *Alexander and the Terrible, Horrible, No Good, Very Bad Day* by Judith Viorst (1987), students may fill out a graphic organizer that compares a "bad day" that they experienced to the one described by Alexander in the book. This visual comparison, depicted in **Figure 3**, allows students to understand how their experiences can be similar (or different) to characters in a book. Although the events that happened on a student's bad day might look different than Alexander's, the way that they felt about those days could be the same. Additionally, these types of

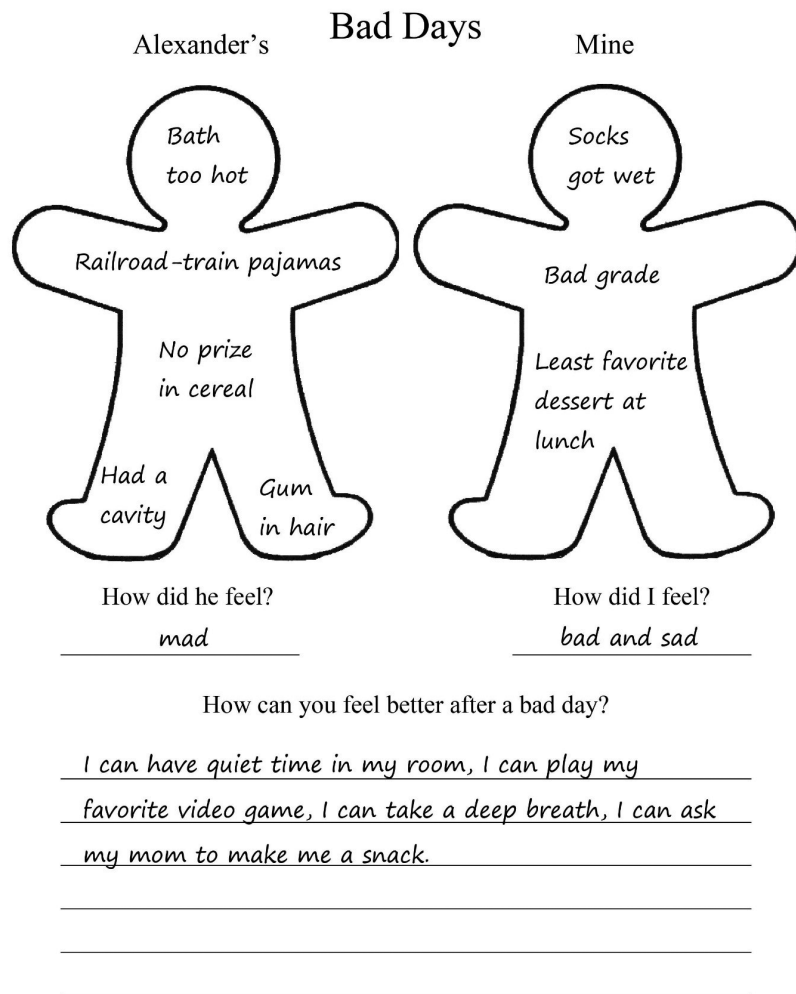
graphic organizers allow students to think about what they would have done and how they might have reacted differently than the character in the story.

Mrs. Bryers gives each student in her class a compare chart and tells them to write down what Wemberly had been worried about prior to her first day of school. On the other side of the chart, she prompts her students to recall a time they had been worried about something. She asks them to share their completed charts with a partner. Michael remembers his previous discussion with Mrs. Bryers about his dental appointment and writes about his encounters and how his fears had not come to pass. He shares his chart with his partner, who had written about her first time at swim lessons and how she had been afraid of getting in the water. After comparing his experiences to Wemberly's and to his partner's, Michael is better able to understand Wemberly's feelings in the story and why she wasn't worried about the second day of school.

Conclusion

Many children with ASD struggle to comprehend highly social, fictional texts (Brown et al., 2013). Teachers can

Figure 3 Compare chart for *Alexander and the Terrible, Horrible, No Good, Very Bad Day*



support these students by (a) activating key social background knowledge, (b) encouraging students to explore series and familiar genres, (c) identifying and providing explicit instruction in figurative expressions, and (d) using graphic organizers to support perspective-taking. The vignette demonstrates how one teacher can use these techniques to support a student with ASD in her classroom, but this approach may be helpful for many different types of learners and can be applied to whole-group, small-group, and one-on-one settings. By using these strategies, teachers can help all children, including those with ASD, comprehend fictional texts and draw conclusions about how characters in the story are thinking and feeling.

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