Rhyming Storybooks
Address Safety for Children With an ASD

"Playground Safety: The Slide"

The playground's where we go and play
When we have recess every day
The big slide is my favorite part
I go there first when recess starts
When I go down the big slide here
I make sure that the bottom's clear
I will be safe when having fun
Or else I'll slide into someone
I will sit down each time I ride
Since that's how I should use the slide
If my friends would like to share
I'll let them slide too when I'm there

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Rhyming Storybooks

To Address Safety for Children With an ASD

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Safety awareness is an essential component of child development. Though all children are vulnerable to safety risks, children with disabilities are more susceptible to safety threats.[1] In particular, children with an autism spectrum disorder (ASD), may have difficulty spontaneously acquiring safety skills, understanding dangerous situations, and recognizing the hazards of unsafe behavior, thus compromising physical safety. Therefore, many parents and caregivers of children with ASD find safety to be a significant concern.[2,3] With this in mind, parents, educators, and professionals must educate children with an ASD about a variety of safety issues. For occupational therapy practitioners, safe and functional participation is a basic premise of supporting children.[4,5]

Identifying the most appropriate and effective intervention strategies to address safety in the ASD population is a unique challenge. This article proposes one such strategy—the use of rhyming storybooks.

SAFETY AND ASD
Children with an ASD have a different means of learning about, understanding, perceiving, and reacting to safety hazards than do typically developing children.[2,3] As such, some children with an ASD may not have the ability to judge safety risks in certain situations, and therefore require specific instruction to learn about safe behaviors.[6] By effectively instructing children with an ASD about safety awareness, these children may be able to engage in more positive experiences overall.[7–9] This instruction may also lead to less stress for families because of increased safety awareness, fewer fears and less anxiety, and better integration of their child into the community.

AOTA's *Occupational Therapy Practice Framework: Domain and Process, 2nd Edition*[4] identifies "safety and emergency maintenance" as an instrumental activity of daily living (IADL). Safety and emergency maintenance is the ability to prevent, recognize, and appropriately react to hazardous situations in order to preserve one's health and safety. For children, recognizing and reducing the threat of hazards can affect several other areas, such as social, educational, and play occupations. Although typically developing children may comprehend safety precautions after brief instruction, children with an ASD may require alternative strategies to help them understand certain safety information such as the dangers of sharp objects, electrical hazards, and toxic substances, as well as basic fire safety and water safety issues.[2] The rhyming storybook approach provides occupational therapy practitioners with a therapeutic option to target a multitude of safety concerns.

CHILDREN'S SAFETY DATA
As stated by Safe Kids Worldwide, "…accidental injury has surpassed disease to become the number one cause of death among children 14 and under."[10] Though this statistic supports the need for teaching safety awareness, it does not delineate between children with and without disabilities. This may be due to the lack of data pertaining to safety awareness for children with disabilities.[11]

By using the National Health Interview Survey (NHIS), researchers investigated nonfatal injuries among children with disabilities.[1] After interviewing children's adult family members, the researchers found that children with vision or hearing disabilities, as well as attention deficit hyperactivity disorder, had a significantly higher rate of injury occurrence than children without disabilities. A related study concluded that children with emotional or behavioral problems had a higher injury rate than children without disabilities; however, there was no statistically significant data to support that a child's type of disability had an impact on the characteristics of injury.[12] Although these two studies are not directly related to children on the autism spectrum, they may shed light on issues within the safety realm of the ASD population due to the similar underlying factors of decreased processing of sensory information, attentional issues, and emotional or behavioral concerns among the subjects.

Safe Kids Worldwide recognizes the need for safety awareness programs for children and has identified specific safety risk categories with which parents and adults should become familiar: airway obstruction, bicycle safety, car safety, falls, fire and burns, pedestrian safety, poisonous substances, and water safety.[13] In a survey designed to identify the most pressing safety risks for children with an ASD, parent respondents identified stranger awareness, traffic and pedestrian safety, emotional security, bullying, and hygiene to

Using rhyme and rhythm may help children with an ASD to retain safety information.

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be the most important safety concerns, whereas professional respondents (occupational therapy practitioners, school psychologists, special education teachers, speech pathologists, and paraprofessionals) identified stranger awareness, fire safety, playground safety, school bus safety, and car safety as most important.[14] These differences in safety concerns between parents and professionals demonstrate how the numerous safety needs of children with an ASD vary based on the children's environment.

STORIES AS APPROPRIATE INTERVENTION TOOLS

Storybooks are common tools used to educate and entertain children. Storybooks have been used in a therapeutic manner to help children reduce their stress, anxiety, or grief by identifying with the characters.[15]

Social stories, which use a story-like format to educate children with an ASD about proper social behaviors,[16] use a prescribed format for story construction.[17] Research has indicated, however, that the recommended social story format "is based on Gray's preferences rather than on specific theoretical or empirical rationale" (p. 219).[18] Some social stories aim to decrease undesired behaviors, whereas others attempt to increase desired behaviors. Several studies on social stories have shown positive results, although the research designs had limitations of small sample sizes and some difficulty controlling for confounding variables such as incidental teacher prompts.[19–22]

Additionally, investigators performed a literature review of 16 social story research studies[23–27] that used one or more inappropriately modified story (six stories total), meaning that the stories did not follow Gray's construction format. However, these six modified stories elicited a higher effectiveness score among participants than those using Gray's complete format. Recently, another such study with 45 participants concluded that other story formats were equally as effective

in improving game play skills in children with an ASD.[28] These suggest that alternatives to the uniform structure of social stories may also be effective for children with an ASD. Despite the lack of evidence to support a specific story format and the need for more empirical research, concise storybook interventions appear effective for promoting desired skills within the ASD population.

USING RHYME AND RHYTHM

Young children with and without disabilities are commonly exposed to rhymes during childhood. Nursery rhymes provide children with enjoyable ways to learn new information, while the beat, emphasis, and intonation of rhymes help embed patterns of information into their memory. While rhyming in general is believed to help children develop reading and writing skills and phonological awareness, other skills such as memory and communication are enhanced through rhyming as well. Rhymes can also facili-

tate cognitive, emotional, social, physical, and musical development, as well as allow children to feel patterns. The concept of patterning that is found in rhyme is thought to be relevant to the patterning found in math and reading.[29]

Though storybook interventions can be effective tools for children with and without an ASD, using rhythm and rhyme may allow a child to remember information more consistently and effectively, and stories written with elements of rhythmicity may increase attention to the information presented.[30] Additionally, metered rhyme provides a sense of predictability for the ensuing parts of the story,[17] and predictable events result in less confusion for children with an ASD.[31]

The use of therapeutic songs to enhance social skills in children with an ASD has also been explored.[32] In three case studies, songs were composed to help improve these children's behavior at home. Although study limitations occurred, the children's behavior improved after song implementation. In another study, a morning greeting song was composed for two children with an ASD in order to ease their transition into child care each morning.[33] Each child's performance improved with song implementation, and peer interaction improvements also were noted for one of the children.

Although not specifically applied to the ASD population, research on the Interactive Metronome (IM) also draws attention to the importance of rhythm and rhyme. IM is an electronic device that guides its user toward improving his or her timing and rhythmicity. One study supported the concept that IM planning may be effective in improving the motor and cognitive abilities of children with disabilities such as ADHD, ASD, Down syndrome, cerebral palsy, and learning disabilities, among others.[34] Because the IM trains the user's internal timing and rhythmic abilities, it may be an effective tool for improving a child's sequencing and motor planning skills.[30] Rhythmicity can also help improve neural organization of the central nervous system, thus facilitating increased motor and cognitive skills such as motor planning, concentrating, thinking, and interacting[35]—skills that are essential for an individual to attend and learn.

SUPPORT FOR RHYMING STORIES
The key principles of Albert Bandura's social learning theory support storybook interventions for communicating safety awareness

to children on the autism spectrum. Though Bandura stated that social behavior occurs through modeling and observation, he also recognized that coding this behavior through words, images, and labels helps the retention process more than observation alone.[36] Observations of social behavior need to be combined with other teaching strategies in order to solidify one's understanding of social concepts. For example, although a child may observe a person walking on a wet, slippery swimming pool deck, he or she may not understand that the person is walking (instead of running) as a safety precaution. Interacting with a safety-related storybook that explains the hazards of a slippery pool deck may help children with an ASD understand the risks associated with such an environment.

Person-Environment-Occupation Model (PEO). This client-centered model focuses on the intersection of the child with an ASD, the setting in which a safety hazard might be present, and the occupational activities in which a child might be engaging.[37] Factors affecting the child with an ASD might be his or her understanding of safety norms; memory or attention capabilities; and communication, cognitive, physical, and psychosocial skills. Factors affecting the environment may include the time of day, physical location, level of familiarity with the location, surrounding barriers, and people involved. Finally, the child could be participating in a range of occupational activities, from school-based tasks such as using rubber cement for gluing, to home-based tasks such as locating a butter knife in the kitchen. All of these examples demonstrate how personal, environmental, and occupational factors can influence how safely a child engages in his or her occupations.[38] By understanding how the person, environment, and occupation influence safety, one can better determine the necessary factors that should be addressed within a rhyming story.

Sensory integration (SI) and sensory motor. To an extent, the concept of rhyming stories is embedded with theoretical underpinnings of the SI frame of reference.[39] Stories written in metered rhyme may appeal to a child's internal rhythm, thus increas-

Children with an ASD
may require alternative strategies to help them understand certain safety information such as the dangers of sharp objects, electrical hazards, and toxic substances, as well as basic fire safety and water safety issues.

"School Bus Safety"

After school there are a lot of us
Who need to get onto the bus
There are important bus rules though
These rules are very good to know:
Keep my body in my seat
Keep my schoolbag nice and neat
I can talk—it is my choice
But I will use my "inside voice"
I'll keep my hands inside the bus
These bus rules are for all of us

ing his or her attention.[30] Additionally, some children with an ASD have demonstrated a unique affinity to music[24,40]; therefore, a similar rhythmic format, such as metered rhyme, may also appeal to children with an ASD. Lastly, studies on IM training[34,35] have indicated that rhythmicity may help improve attention, sequencing, and motor planning. Both of these factors, the affinity towards music and the benefits of rhythmicity, support the concept that stories written using rhyming and rhythmic sentences may be well received by children on the autism spectrum.

CONCLUSION

Although all children need help developing their ability to recognize safety hazards and emergency situations, children with an ASD require more individualized strategies to help hone such skills. As occupational therapy practitioners attempt to support this area of functioning, one strategy can be the use of rhyming storybook interventions. Practitioners may find these storybooks to be effective preparatory tools before practicing safety skills on the school bus, on the playground, in the classroom, and so forth. Rhyming safety books may also serve as a consistent interdisciplinary intervention tool among teachers, occupational therapy practitioners, and speech-language pathologists; for example, exposing a child to the same repetitive format may ease his or her transitions to differ-

ent settings where safety awareness is required. One other possible benefit of the rhyming storybooks could be carryover into the home setting. The rhyming nature of the storybook may also help create an enjoyable bonding experience for parents and children.

The reviewed literature supports the therapeutic benefits of instructional stories, as well as rhyme and rhythm. Helping a child with an ASD identify and acknowledge safety risks, as well as communicate safety threats to an adult, could be appropriately addressed via rhyming storybooks. To address the most important safety concerns as identified by parents and professionals, several rhyming stories were developed for children with an ASD.[14] Though this research has identified some of the most significant safety concerns parents and professionals have for children with an ASD, future research is needed to determine the effectiveness of these rhyming stories within the ASD population. For professionals interested in creating their own rhyming stories similar to the samples provided, it is recommended that directive (telling the child what to do or what is expected) or descriptive (explaining or describing the setting or the situation) rhyming sentences be used. Sentences should only use positive language (i.e., refrain from using words such as "don't," "should not," "never," etc.), and the child may be more receptive if the story is written in the first person from his or her point of view. For more

samples of these stories and for the suggested intonation for reading these stories to children with ASD, please visit the OT Practice Magazine Forum on OT Connections (www.otconnections.org). ∎

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