Effects of Perspective Sentences in Social Stories™ on Improving the Adaptive Behaviors of Students with Autism Spectrum Disorders and Related Disabilities

Shingo Okada, Yoshihisa Ohtake, and Masafumi Yanagihara
University of Okayama

Abstract: This study examined the effects of adding perspective sentences to Social Stories™ on improving the adaptive behaviors of students with autism spectrum disorders (ASD) and related disabilities. In Study 1, two students with ASD read two different types of Social Stories: Social Story without perspective sentences (SS without PS) and Social Story with perspective sentences (SS with PS). ABC or ABCA designs were used, with an SS without PS presented in the B phase and an SS with PS presented in the C phase. A visual inspection revealed that Social Stories were likely to be effective in reducing inappropriate behaviors even without perspective sentences. In addition, adding perspective sentences appeared to have no impact on further improving the target behaviors. In Study 2, a perspective sentence was added, characterized as specific, valuable, and contingent to a Social Story in the SS with PS condition. An AAB’A’C”A’ design was utilized, with a permanent visual step poster in the A’ phase, an SS without PS in the B phase, and an SS with PS in the C phase for a student diagnosed with attention deficit hyperactivity disorder. A visual inspection revealed that adding a perspective sentence to a Social Story contributed to further improvement of the target behavior. Based on these findings component and parametric analyses on Social Stories are recommended in future research.

Social Stories™ is a highly appealing strategy for improving the adaptive behaviors of students with autism spectrum disorders (ASD, Sansosti, Powell-Smith, & Kincaid, 2004). Social Stories use an individualized written short story with illustrations to help individuals understand social situations where they often have difficulty due to failure to understand or misunderstanding important social cues (Gray, 2004).

The underlying belief is that many problems exhibited by students with ASD in social situations may be caused by their deficits in reading the social script or others’ thoughts and feelings that are embedded in a given social situation. Thus, if the situations are described in ways that they can understand, their problem behaviors are believed to decrease and their adaptive behaviors will increase (Myles, Trautman, & Schelvan, 2004; Sansosti et al., 2004). In other words, Social Stories are believed to serve as an interpreting bridge for students with ASD and related disabilities, delineating how people behave and people think, and what social cues should be attended to social situations where they frequently have had or are likely to have (Gray, 2004).

This study is based on a thesis submitted by the first author, under the supervision of the second and third authors, to the Faculty of Education at Okayama University for the master’s degree. We thank Dr. Brenda Smith-Myles, at the University of Kansas, for giving us useful resources and commenting an earlier version of the manuscript. Correspondence concerning this article should be addressed to Yoshihisa Ohtake, the Faculty of Education at the University of Okayama, 3-1-1 Tsushima-naka, Okayama-Shi, Okayama 700-8530, JAPAN. E-mail: ohtake@cc.okayama-u.ac.jp
Affirmative sentences emphasize a value underlying a particular fact. Directive sentences provide information about how to behave in the target situation. Control sentences consist of a description developed by the student to help retrieve important information in the target situation. And finally, cooperative sentences describe who will help the individual and how to succeed in the target situation.

In brief, Social Stories focus on describing social situations in which a target behavior occurs, but not on directing how to behave. This is the essence that distinguishes Social Stories from other strategies such as direct instruction, visual cue card, or role playing. Therefore, descriptive sentences, perspective sentences, or other sentences describing social situations should be predominantly used in a Social Story (Gray, 2004).

As the number of practitioners using Social Stories has increased, researchers have been prompted to determine if this strategy is truly effective. For example, Kuttler, Myles, and Carlson (1999) successfully applied a Social Story intervention to eliminate inappropriate vocalization and dropping to the floor by a child with ASD. In this study, an ABAB design was utilized to demonstrate the functional relationship between the Social Story intervention and improvement in the target behavior. Similarly, Hagiwara and Myles (1999), employing a multiple baseline across settings, demonstrated the effectiveness of a multimedia Social Story intervention for three children with ASD in terms of improving handwashing and on-task behaviors. Further, employing an ABAB design, Lorimer, Simpson, Myles, and Ganz (2002) presented empirical evidence showing that a Social Story itself was responsible for reducing vocalization, which interrupted adult conversations and was followed by tantrum, exhibited by a child with ASD.

In yet another study, using a multiple baseline across subjects design, Scattone, Wilczynski, Edwards, and Rabian (2002) demonstrated that Social Stories themselves contributed to decreasing chair tipping, staring girls, and shouting by two children and an adolescent with ASD. Finally, using an ABAB design, Bledsoe, Myles, and Simpson (2003) showed that a Social Story tailored for an adolescent who exhibited eating-related behaviors appeared to be responsible for reducing these problem behaviors.

More recently, research has started addressing which components of Social Stories are important for changing target behaviors. For example, Knoch and Mirenda (2003) used an ACABA design, with a children’s storybook in the C phase and a Social Story in the B phase, to determine whether the content of Social Stories contributed improved social behaviors or increased adult attention following reading a Social Story with adults. Results suggested that the content of the story, rather than increased adult attention, contributed to improving children’s adaptive behaviors.

Together, previous studies have revealed that Social Stories themselves are effective in improving various types of adaptive behaviors of individuals with ASD. However, only one study has thoroughly examined which components of a Social Story intervention are responsible for improving adaptive behaviors. That is, no studies have addressed how each type of sentences (e.g., descriptive, perspective, affirmative, directive) contributes to the improvement of adaptive behaviors, or whether or not all components of Social Stories are necessary to achieve the goal.

This study focused on the contribution of perspective sentences. Typically, descriptive sentences are predominantly used in a Social Story to describe what happens in the given situation, when and how it happens, and why it happens. In contrast, very a few sentences are used to describe the perspectives of others. Therefore, it is unknown, for example, if adding a few sentences to a Social Story to describe the thoughts or feelings of others contribute to reduce problem behaviors or increase desirable behaviors in individuals with ASD or related disabilities.

The following two research questions were developed for this study:

(a) Is a Social Story effective in improving adaptive behaviors even though the story does not include any perspective sentences?
(b) Does a perspective sentence contribute to improving adaptive behaviors?
Study 1

Method

Participants

Two students, both of whom were enrolled in a same special school for students with cognitive disabilities, participated in Study 1.

Taro. Taro was a 12-year-old boy with moderate mental retardation. Although he had no referrals to a licensed pediatrician about a diagnosis of autism, his score on the Childhood Autism Rating Scale (CARS) administered by the primary investigator, was 30.5, indicating a mild to moderate level of autism.

According to his main special education teacher, Taro usually engaged in putting miniature cars in a line and singing a favorite phrase of a commercial song during free time. Although Taro made eye contact and initiated interactions with teachers, his teacher described that he always used the same phrases in a non-reciprocal manner. He used a verbal mode of communication to request and reject objects or social interactions.

According to his teacher, his reading and writing levels were equivalent to first grade. However, he rarely utilized a daily schedule with written words, specifically developed to help him move to the next activity smoothly and independently. Social Stories had been used to reduce his aggressive behaviors and to stay calm in an auditorium when this study commenced. His teacher reported that his problem behaviors did not occur when this strategy was implemented.

Kenji. Kenji was a 13-year-old boy with autism and moderate mental retardation. According to a Japanese version of the Adaptive Maturity Scale (Asahide-gakuen-kyoiku-kenkyusho & Nippon-shinri-tekisei-kenkyusho, 1980), the level of his adaptive behavior was equivalent to 7 years old. According to his former teacher’s records, he often had trouble with his peers because he did not know how to respond to their jokes. When he was not assigned a specific task, he tended to engage in repetitive behaviors such as hand-flapping and shoulder-patting. His main special education teacher noted that he sometimes talked about his favorite topics such as local cable TV or sign language. According to his teacher, his reading level was equivalent to the fourth grade. He did not use his personal schedule cards to regulate his behaviors. He took risperidone and fluvoxamine when this study was conducted.

Settings

Observations of the two participants took place in each of the students’ classroom. Both classrooms were physically structured so as to provide an individual work area, a group work area, and a meeting area. Each classroom had two special education teachers, who were in charge of five to six students.

Taro. The observational setting for Taro was an area surrounded by shelves on two sides and a wall and a closet for dressing on each of the remaining two sides. In the area, six desks with chairs for the students were arranged in a line. On the front wall, a visual reminder was posted to notify the “chair of the day.” During the morning meeting time, the chair of the day stood in front of the classmates asked them to tell the date, the day of the week, the weather, the schedule, and the lunch menu. The remaining five students sat in their chairs and responded to the directions or questions made by the chair. One of the teachers was close to the chair to provide necessary support. The other teacher sat behind the remaining students and helped them participate in the meeting.

Kenji. Kenji was observed during breaks when sitting in a sofa along a wall of his classroom. The sofa was 6 feet wide, so if one student lay down, there was no space left for other students to sit. During the break, the remaining five students typically engaged in independent work, changing clothes (They had two types of clothes; for commuting and for studying) and free play. The two teachers in the classroom rarely interacted with students, but provided support necessary for students to complete their own tasks.

Target Behaviors

The primary investigator contacted former and current teachers of the participating students to identify the behaviors about which they were the most concerned.
identifying several important behaviors, the investigator conducted direct observation to
determine which behavior occurred most frequently among the identified behaviors,
and this, in turn, was selected as a target behavior for the present study.

**Taro.** For Taro, persistent and aggressive verbal behaviors were selected as a target behavior. A functional assessment revealed that these behaviors were related to his eagerness to be in the chair on Fridays. In his classroom, the chair of the day was rotated among the six students the five school days, Monday through Friday. Because the number of the students was not five but six, he was not allowed to be the chair every Friday. Throughout the days of the week when he was not allowed to be in the chair on Friday, his persistent and aggressive verbal behaviors dramatically increased, especially before and during the morning meeting. For example, he removed the picture of the classmate that was put up to indicate the chair of Friday, instead putting his picture up. In addition, he repeatedly said to the classmate who was Friday’s chair, “I’ll never make you the chair;” “You should be in the chair (the days other than Friday).” Sometimes, this verbal behavior escalated, culminating in calling the classmate’s name out loud and repeatedly saying, “You should not come to school,” or hitting the classmate.

Preventing aggressive verbal behaviors related to the chair on Friday was deemed effective in reducing hitting. Therefore, any of the following behaviors were targeted to prevent the escalated behaviors:

- utterances related to his eagerness to be in the chair on Friday (e.g., “I will be in the Friday’s chair,” “I will do it, I will do it, I will do it...”).
- utterances related to negative attitudes toward the classmate who was the chair of Friday (e.g., “[student’s name] is Boo [Boo represents a sound of buzzer, meaning incorrect],” “I will never make you the chair,” “Get out of here”).

**Kenji.** For Kenji, sitting neatly on a sofa was selected as a target behavior. He typically spent his free time sitting on a sofa. However, he tended to put his leg up on the sofa, to lie down there, or shake the sofa hard, blocking his classmates from sitting there. Although his teacher was not seriously concerned about this behavior, his mother had placed a high priority on working on changing this behavior.

His target behavior was recorded as occurring when one or more of the following behaviors were observed:

- placing his shoulder below the top line of the backrest on the sofa.
- placing either leg on the sofa.
- exhibiting repetitive behaviors such as locking or hand-flapping.

**Materials**

Two types of Social Stories were developed for each participant. One was a Social Story that did not include perspective sentences (hereafter referred to as SS without PS); the other was a Social Story that included perspective sentences (hereafter referred to as SS with PS). Gray’s Social Story guidelines do not eliminate the inclusion of the perspective of the individual from the concept of perspective sentences (Gray, 2004). However, Gray as well as the literature has emphasized the importance of understanding of perspectives of others. This study, therefore, used the term “perspective sentences” in ways that meant the thoughts and feelings of “others.”

Specifically, the perspective sentence included in the SS with PS for Taro was “When everybody complies with the turn, everybody feels good because everybody can be fairly in the chair.” For Kenji the statement “So many people in the hotel thought I am cool. Many people around me watched me do something and think I am cool” was included in the SS with PS. Both Social Stories were developed according to the guidelines proposed by Gray (2004), which includes but are not limited to (a) use of positive expressions, (b) a ratio of 2:1 or more between sentences describing social situations and sentences directing how to behave, (c) use of the terms “usually” and “about” to describe the target social situation as accurately as possible, and (d) delineating of the target social situation according to the functional assessment results. The text of the Social Story used for each participant is included in the Table 1.

For Taro, the SS without PS consisted of six panels, and the SS with PS consisted of seven panels. Each page included two panels; there-
fore, one Social Story consisted of three or
four pages. One or two sentences and one
illustration were included in one panel. For
Kenji, all texts in both types of stories were
printed on one page, with three illustrations
exhibiting a point of “cool sitting” for each.
The story for Taro was written by the pri-
mary investigator and modified based on feed-
back from his teachers and the second author,
whereas the story for Kenji was written by one
of his teachers and modified based on feed-
back from the primary investigator and the
second author. The teachers confirmed that
the complexity and length of the stories were
appropriate for the two students.
The text and illustrations of the Social Story
were printed on A4 white paper, which was
later laminated and bound by a metal ring on
the upper left-hand side. The text, developed
by PowerPoint 2002TM for Taro and by Ichi-
taro 2005TM for Kenji, was placed on the up-
per part of each panel. In the illustrations,
icons were developed by Hanako 2005TM and
digital photographs were retrieved from free
internet sites, with some modifications, using
Photoshop 6.0TM. The illustrations were
placed on the lower part of each panel for
Taro and of a page for Kenji.

Data Collection

Taro. For Taro, Voice TrekTM, an inte-
grated circuit (IC) recorder, was utilized to
record his persistent and aggressive verbal be-
haviors. The recorder was set by his teachers
in a closet, which was invisible to the student
but allowed the recorder to catch conversa-
tions effectively. The recorder was activated
soon after Taro entered his classroom each
morning. A 6-minute block was randomly se-
lected from a 15-minute record in each ses-
sion to be analyzed by the primary investi-
gator, using a 10-second partial interval
recording procedure. This observation was
conducted during only the weeks when Taro
was not in the chair on Friday.

Note. The italic parts are perspective sentences that are withdrawn in SS without PS and not withdrawn in SS
with PS.
For Kenji, all observation sessions were video-recorded. The camera was set in a basket on a teacher’s desk, which was invisible to the student but allowed the camera to view his behaviors effectively. The camera was activated immediately after Kenji sat on the sofa during a break. The video was reviewed by the first author, using a 10-second partial interval recording procedure to determine the level of inappropriate sitting behaviors. Each observation was conducted for 10 minutes, for 5 days a week, except when Kenji was absent from school.

Inter-Rater Reliability

The data recorded for Taro by the IC recorder in the baseline and Intervention 1 conditions were accidentally deleted prior to a reliability test was implemented. Therefore, no inter-rater reliability was computed for the two conditions. A graduate student served as a second coder. The primary investigator explained the definition of each target behavior and showed examples and non-examples of the target behavior until the second coder felt ready to code. After the primary investigator coded the data recorded by the IC recorder and videotapes, the second coder independently coded the data for 25.2% for Taro and 33.3% for Kenji of all sessions across conditions with the exception of the baseline condition and the Intervention 1 condition of Taro, as mentioned above. Percentages of inter-rater reliability were computed by dividing the number of agreements by the sum of agreements plus disagreements and multiplying by 100%. Reliabilities ranged from 83.3% to 97.2% for Taro ($M = 91.6\%$) and 93.3% to 100% for Kenji ($M = 97.8\%$) and, therefore, were acceptable.

Experimental Design

An ABCA design was used for Taro, and an ABC for Kenji, with an SS without PS in the B condition and an SS with PS in the C condition. Some studies suggest that Social Stories may result in irreversible learning (Kuoch & Mirenda, 2003; Scattone et al., 2002), which in turn prevents us from using a withdrawal phase to reverse data to a baseline level. Implementing C followed by B may not allow us to detect the effect of including a perspective sentence in a Social Story because understanding a social situation described by the Social Story that includes a perspective sentence may remain intact even after withdrawing the perspective sentence from the Social Story. Therefore, to be able to detect the impact of adding perspective sentence as clearly as possible, we decided to implement B followed by C. Due to time constraints (i.e., the school year ended), a withdrawal phase for Kenji was not implemented.

Procedure

The teachers for each participant were asked to deal with target behaviors as they did prior to this study. Anecdotal records taken weekly by the primary investigator about the teachers’ behaviors indicated that both students’ teachers behaved in the same ways contingent on the occurrence of the target behaviors regardless of conditions. That is, Taro’s teachers provided verbal reprimands when his verbal behavior escalated. Kenji’s teachers did not interact with him even when he exhibited inappropriate sitting. In addition, both teachers implemented Social Story interventions as planned.

Baseline. No instructions related to Social Stories were provided to the participants.

Intervention 1. This condition was identical to baseline with the exception that a Social Story was read. That is, an SS without PS was read by one of the teachers for each participant.

Before implementing Intervention 1, the primary investigator explained the teachers, with modeling, the following four points related to effective use of the Social Story: (a) the Social Story sessions should be implemented in a calm and safe atmosphere, (b) a teacher should sit side-by-side, but a little behind the student’s shoulder, (c) when the student asked a question about the story, the teacher could answer the question, (d) according to the progress of the student’s reading, prompts for reading should be faded out. The primary investigator then asked the teachers to engage in Social Story instructions to determine if they implemented the procedure correctly. After making sure the teachers correctly implemented the procedure, the pri-
mary investigator asked them to initiate the first session.

In the first of the four sessions in Intervention, Taro’s teacher read the SS without PS for him. Taro, then, took a turn to read the Social Story out loud. His teacher provided controlling prompt (i.e., modeling) when he read the story incorrectly. The teacher for Kenji read the SS without PS with giving examples and explaining the meaning of the each sentence. Starting with the second session, both students read the SS without PS out independently. A formal reading time for SS without PS was provided once each day, just prior to initiating observation of the target behavior. During the rest of the day, the Social Story book was placed on a shelf to be accessible to the student.

Intervention 2. This condition was identical to Intervention 1 with the exception that perspective sentences were added to a story used in Intervention 1. The teachers provided students an SS with PS and asked them to read the story. Because the content of the SS with PS was identical to that of the SS without PS, with the exception of a perspective sentence, Taro read the story with a few prompts at the beginning of the intervention phase, followed by no prompts from the second session. For Kenji, his teacher asked him to read the SS with PS, explaining the meaning of the added perspective sentence the first session of the intervention phase. He did not have any questions, and he read the story independently from the second session.

Baseline 2. Taro’s did not provide him any opportunities to access the Social Story book (SS with PS) throughout the day. No Baseline 2 was implemented for Kenji due to the termination of the semester.

Results

Figure 1 shows the change of Taro’s persistent and aggressive verbal behaviors across Baseline, Intervention 1, Intervention 2, and Baseline 2. As illustrated, during the first baseline phase, the percentage of his inappropriate verbal behaviors was high, for an average of 49.1%, ranging from 19.4% to 86.1%. Following the implementation of SS without PS, his inappropriate behaviors showed a downward trend, for an average of 10.6%, ranging from 0.0% to 16.7%. It should be noted, however, that the difference in level between Baseline and Intervention 1 was not substantial. After
initiating SS with PS, the level of his inappropriate verbal behaviors remained low from Session 10 to Session 13 ($M = 6.6\%$), but rebounded in Sessions 14 and 15 ($M = 16.7\%$), resulting in an average of 9.7\%, with a range from 0\% to 16.7\%. Immediately after withdrawing the SS with PS in Baseline 2, no inappropriate verbal behaviors occurred.

Figure 2 presents the results of observations of Kenji’s inappropriate sitting across Baseline, Intervention 1, and Intervention 2. As illustrated, during the baseline phase, he frequently exhibited inappropriate sitting, for an average of 72.3\%, ranging from 52.5\% to 96.7\%. Immediately after sitting on the sofa, he initiated repetitive behaviors, followed by putting his leg on the sofa or lying down. In contrast, his inappropriate sitting behaviors disappeared immediately following introduction of the SS without PS ($M = 0.84\%$). Introducing the SS with PS was immediately followed by high percentage and low percentage of the target behavior alternately ($M = 23.9\%$, range = 0\% – 73.5\%).

**Discussion**

In Study 1, an ABCA or ABC pre-experimental design was used for two students with ASD to examine the effects of adding a perspective sentence on reducing problem behaviors. Visual inspection indicated that a Social Story was effective in improving adaptive behaviors even though the story did not include any perspective sentences. Adding a perspective sentence did not have any additional impact on improving the target behaviors.

“When everybody complies with the turn, everybody feels good because everybody can be fairly in the chair” was added as a perspective sentence to Taro’s SS without PS. “So, many people in the hotel thought I am cool. Many people around me watched me do something and think I am cool” were added as perspective sentences to Kenji’s SS without PS. This was done based on the belief that information was missing for each participant to understand why he needed to behave in a certain way and that consequently his inappropriate behaviors would improve when he obtained the information. However, the results were different from our expectation. One factor that may need to be addressed is motivation. In other words, it should be discussed whether or not the information conveyed by the perspective sentences can elevate the motivation of participants to the level that they want to change the behaviors.
To discuss the motivational issue of perspective sentences, introducing a framework of establishing operation may be helpful. The theory of establishing operation (Michael, 2000) explains that some antecedent events or stimuli contribute to changing behaviors because they change the value or meaning of the consequence of emitting the behaviors. Adding a perspective sentence to a Social Story would have impact on improving target behaviors of individuals with ASD and related disabilities if the perspective described by the sentence had the capacity to elevate the value of the consequence of engaging in appropriate behaviors. That is, if Taro obtained information about a contingency, “everybody feels good,” by reading the story that did not have a reinforcement value to him, he would not change his behaviors. Similarly, if Kenji obtained information about a contingency, “many people in the hotel thought I am cool. Many people around me watched me do something and think I am cool,” by reading the story, that was not a reinforcer to him, he would not change his behaviors.

The fact that adding perspective sentences did not have any impact on the participants’ target behaviors may be due partly to the lack of power of the sentence to enhance the value of the consequence. Based on this theory, when developing perspective sentences, it should be taken into consideration (a) not only what perspective is missing to explain why the individual needs to behave in a certain way but (b) also what perspective would enhance the value of the consequence contingent on engaging in the target behavior. Specifically, we hypothesized that the perspective selected is a strong determinator of the effectiveness of a perspective sentence. For example, “Everybody” or “Many people,” which were the terms used in this study, apparently were not deemed specific or relevant enough to the student to affect behavior.

In addition to the nature of the perspective sentences used in this study, drawbacks in the research design should be noted. We changed conditions prior to confirming the trend or stability of the data. We were forced to do so because the study did not start until the school year was almost over. As a result, we were not able to clarify the functional relationship between the two types of Social Story and decreased inappropriate behaviors. Second, and related to the first point, according to the anecdotal reports from the teachers of both participants, students’ daily routines totally changed at the time when SS with PS was initiated, specifically, prior to Session 10 for Taro and prior to Session 7 for Kenji. Because both students were in their graduation year, they were required to participate in practice for the graduation ceremony every day during Intervention 2. This irregular schedule reduced the length of recess and time for other activities that Taro was interested in, such as cooking, snack eating, and walking. For Kenji, the irregular schedule increased non-preferred activities (i.e., a practice for the graduation ceremony). This, in turn, likely contributed to increases in the target behaviors. It is unknown, however, why withdrawing Social Story instruction, which was implemented while the irregular schedule continued, resulted in complete suppression of Taro’s persistent and aggressive verbal behaviors.

These limitations and emerging hypotheses prompted us to conduct Study 2, which examined the effects of the following: (a) adding a perspective sentence that was likely to enhance the value of the consequence contingent on engaging in a target behavior, (b) keeping the same condition until the trend or stability was confirmed, and (c) conducting the experiment while a daily routine remained stable. Study 2 is described in detail below.

**Study 2**

**Method**

**Participants**

Tatsunori, an 11-year-old boy, participated in this study. Although he was enrolled in the same special school as the students in Study 1, the possibility of disrupting his daily routine was minimal because he was not in his graduation year. Due to family issues, he lived in a child-care facility. He was diagnosed with attention deficit-hyperactivity disorder (ADHD) and mild mental retardation (IQ 68, tested by Tanaka-Binet Intelligence Test) by a qualified pediatrician. Although he was capable of en-
gaging in complicated verbal communication, his reading level was equivalent to first grade. He often exhibited aggressive behaviors in response to directions or reprimands provided by his teachers. At the time of this study, he took carbamazepine in the morning and at night.

**Target Behavior**

Tatsunori’s target behavior was described as “Washing hands with water and soap after toileting without any prompts.” The selection process of the target behavior was identical to that of Study 1. That is, the target behavior was selected based on the interview with Tatsunori’s teachers and direct observations. Tatsunori’s teachers provided verbal prompts whenever they realized he did not wash hands after toileting. However, this procedure did not make a positive change of this behavior.

**Setting**

The observation of Tatsunori’s target behavior was conducted at the bathroom nearest to his homeroom. The sink where he was supposed to wash his hands was located closest to the entrance. Typically, one or two other students were using the bathroom with a teacher when Tatsunori used the bathroom.

**Materials**

As in Study 1, two types of Social Story were developed: one without PS and one with PS. The SS without PS consisted of six panels, whereas the SS with PS consisted of nine panels. The perspective sentences added to the SS without PS were “Ms. [teacher’s name] thinks the person is wise when the person washes hands after toileting. Mr. [teacher’s name] thinks the person is cool when the person washes hands after toileting. Ms. [teacher’s name] thinks the person is lovely when the person washes hands after toileting.” In these sentences, the names of teachers whom Tatsunori appeared to like and adjectives used frequently by these teachers were inserted. (The Table 1 shows the text part of both Social Stories.) The primary investigator wrote the Social Stories, with feedback from Tatsunori’s teachers and the second author. Tatsunori’s teachers confirmed that the level in complexity and length of the story matched his level of reading.

**Data Collection**

Tatsunori’s teachers took responsibility in data collection. Whenever he went to the bathroom and one of his teachers was available, observation was conducted. Because the teacher-to-student ratio was 2:6, the teachers were not always able to observe his hand-washing behaviors. Contingent on his toileting, the teachers classified his hand-washing behavior into one of four categories: 3 = wash hands with water and soup, 2 = wash hands with water only, 1 = wash hands with water and soup with verbal prompts, 0 = did not wash hands. One of the teachers (hereafter referred to as main teacher) recorded the data and sent them to the primary investigator.

**Inter-Rater Reliability**

When collecting functional assessment data, the primary investigator attempted to observe Tatsunori wash his hands in a bathroom. However, Tatsunori was extremely sensitive to be observed by the investigator, leading to verbally aggressive behaviors and more difficulty engaging in hand-washing. When one teacher followed him to the bathroom, the other was left alone to take care of the remaining students in the classroom. This kept him very busy and prevented another teacher from serving as a rater. Therefore, we had to totally rely on the data observed by one of the teachers.

**Procedure**

Tatsunori’s teachers were asked to deal with target behaviors as they had done prior to the study. Anecdotal records taken weekly by the primary investigator about teachers’ behaviors indicated that they behaved in the same way contingent on the occurrence of the target behaviors regardless of condition. In addition, the records indicated that both teachers implemented Social Story interventions as planned.

**Baseline.** In baseline, no Social Story interventions were implemented.
Baseline Dash. This condition was identical to baseline with the exception that a permanent visual step poster was added. In Session 15, the main teacher voluntarily developed a permanent visual support poster and posted it on the wall over the sink. The poster delineated each step of hand-washing, accompanied by words and illustrations. We classified this phase as Baseline Dash because adding the visual cue was not in our original plan. In addition, the main teacher thought that using a visual cue would be a natural and universal support and planned to use the poster continuously regardless of the Social Story interventions.

Intervention 1. This condition was identical to Baseline Dash with the exception that a Social Story was read. In this condition, the main teacher was asked to introduce an SS without PS. In the first session, the main teacher provided Tatsunori with an SS without PS and asked him to read the story. The main teacher found that Tatsunori independently read the story. When the teacher asked him if he understood the content of the story, he said, “I have no question.” Therefore, from the second session on, the main teacher sat a little behind the student’s shoulder and had no interaction with him, except for saying “it is time to read” at the beginning of the session. Although one Social Story session was scheduled daily, the story book was placed on a shelf that allowed Tatsunori to use it at any time.

Baseline Dash 2. In this phase, the main teacher stopped providing Tatsunori with sessions to read SS without PS. The teacher also eliminated the Social Story book from the shelf to prevent him from accessing the book at any time.

Intervention 2. This condition was identical to Intervention 1, except that the teachers read a Social Story from Intervention 1 to which a perspective sentence had been added.

Baseline Dash 3. After confirming the positive effect of SS with PS on Tatsunori’s target behavior, the main teacher withdrew the Social Story intervention, returning to the condition identical to Baseline Dash 1 and 2.

Experimental Design

A reversal design (AA’BA’CA’) was employed, with a baseline in the A Condition, a permanent visual step poster in the A’ Condition, an SS without PS in the B Condition, and an SS with PS in the C Condition, to examine the influence of a perspective sentence on the occurrence of the target behavior.
Results

The results of the Social Story intervention are presented in Figure 3. As illustrated, in the first baseline condition, Tatsunori never washed his hands with water and soap without prompts ($M = 1.1$, Range = 0 - 2). When introducing a permanent visual step support, he independently washed his hands for two consecutive times. However, his behavior was not stable ($M = 1.3$, range = 0 - 3), and he did not engage in hand-washing even with the teacher’s prompt in the last two sessions. Initiating the SS without PS appeared to have some impact on improving his hand-washing. Certainly, the average of his correct behavior was improved ($M = 1.9$, Range = 0 - 3); still the last two sessions showed a downward trend. After withdrawing the SS without PS, Tatsunori’s behavior was stable, averaging 2.2, with a range from 2 to 3. His behavior was much more improved immediately after the SS with PS was initiated. In almost all trials, he independently washed his hands with soap, averaging 2.8, and ranging from 0 to 3. This effect was maintained even after withdrawing the SS with PS ($M = 2.7$, Range = 1 - 3).

Discussion

In Study 2, we examined the effect of adding a perspective sentence on the target behavior of a student with ADHD, with consideration of the following three things. First, we created a perspective sentence that described a consequence that immediately followed the occurrence of a target behavior and was likely to enhance the value of the consequence contingent on engaging in the target behavior. Second, we included sufficient sessions for each condition to clarify the trend or stability of the data. Third, we implemented the experiment when the daily routine was not disrupted by school events.

A visual inspection revealed that although the Social Story without a perspective sentence contributed to improving Tatsunori’s hand-washing, his target behavior did not constantly occur until a perspective sentence was added. The fact that positive and stable behavior change occurred immediately after an SS with PS was introduced seems to prove that adding a perspective sentence was responsible for the behavior change. Anecdotal reports from the main teacher showed that Tatsunori said “Shut up! You always tell me to wash hands” in the last session of Intervention 1. However, in the first session in Intervention 2, he voluntarily informed his teacher that he had engaged in hand-washing. This episode suggests that he recognized that engaging in hand-washing was followed by positive feeling of his teacher toward him, which may have functioned as a reinforcer. This, in turn, suggests that we successfully selected a perspective sentence that had capacity to enhance the value of consequence of hand-washing.

General Discussion

Previous research has used Social Stories themselves as the independent variable, but failed to determine the effect of the components of the story. Considering that Social Stories include several types of sentences (e.g., descriptive, perspective, directive), the strategy itself can be called “multi-component.” Unless we demonstrate empirical evidence of what is important among the components to better change of a target behavior, we are not able to develop better Social Stories.

In this study, we conducted a preliminary component analysis to narrow the gap between the Social Story practices and existing empirical evidence. Specifically, we examined the effect of adding perspective sentences (i.e., sentences describing the thoughts and feelings of others) on improving the adaptive behaviors of students with ASD and related disabilities. The results in Study 1 suggest that Social Stories may have positive impact on reducing problem behaviors even if they do not include perspective sentences. The results of Study 2, using more rigorous design, corroborate the suggestion in Study 1. However, Study 2 presented one more suggestion: adding a perspective sentence boosted the improvement of the target behavior if some parameters of the perspective sentence were changed.

Specifically, in Study 2, the perspective sentence was chosen by taking into consideration that the sentence not only described why Tatsunori needed to engage in hand-washing but also that the sentence was likely to raise the value of a consequence contingent on engag-
ing in the target behavior. To raise the values of the consequence, we identified the persons who were relevant to or had established rapport with Tatsunori, and then described the feelings they might experience when he engaged in appropriate behaviors, using the phrases that they typically used. Retrospectively, we changed three parameters in the perspective sentence from Study 1 to Study 2: a specificity parameter, a time parameter, and a likeability parameter.

A specificity parameter has a continuum, ranging from a specific perspective to a general perspective. Specific perspective sentences include the thoughts and feelings of an individual specific and relevant to the student. For example, Scattone et al. (2002) used “Ms Ann will be happy if I do not holler” (p. 542) in their perspective sentences. Kuoch and Mirenda (2003) used “(Interventionist) will be very happy to see everyone playing games and having fun” “Mom will be happy if Henry eats the food” (p. 227).

In contrast, general perspective sentences describe the perspectives of people in general (e.g., friends, we, people, everybody) who are not specific or relevant to the student. For example, Thiemann and Goldstein (2001) used “Friends like to show each other what they are doing,” “This means they want to show me something, and they like it if I look” in a Social Story (p. 432). Similarly, Ivey, Heflin, and Alberto (2004) used “Usually people like to have a party to celebrate” in their Social Story (p. 170). Between the two loci of the continuum, “my friends” “my teachers” or “my neighbors” are placed. For example, Brownell (2002) included “If I say things that I heard on TV, my friends might not know what I’m talking about” (p. 128).

With respect to a time parameter, two types of perspectives may be used: non-contingent perspective and contingent perspective. A non-contingent perspective uses others’ perspectives that might exist regardless of the occurrence of a target behavior. For example, Thiemann and Goldstein (2001) used “Friends like playing with different toys and games,” “Friends like to show each other what they are doing” (p. 432) in their perspective sentences. These perspectives may exist regardless of the occurrence of contingent responses, securing attention, initiating comments, and initiating requests, which were selected as target behaviors. Similarly, a Social Story used by Lorimer et al. (2002) included “Adults like to talk” (p. 56) as a perspective sentence. These perspectives may exist regardless of the occurrence of interrupting vocalization or tantrum, which was targeted to be reduced.

In contrast, contingent perspectives describe others’ perspectives that emerge immediately following the occurrence or non-occurrence of target behaviors. For example, Adams, Gouvousis, Vanlue, and Waldron (2004) used “Mom and Dad are sad when I get upset,” “When I use my quiet voice, Mom and Dad are happy” for a perspective sentence. In this study, crying, screaming, falling, and hitting were selected as target behaviors. Similarly, Kuoch and Mirenda (2003) used “It makes people very sad when Andrew doesn’t share” in their perspective sentences. For this participant, aggression, yelling, and crying were selected as target behaviors, which often followed sharing objects.

Finally, a likeability parameter shows a continuum of a reinforcement value of the person whose perspective is described in a Social Story, ranging from least to most valuable. Logically, the perspectives of people who are not specific to the individual are likely to be of less valuable to him or her. However, even among persons specific to the individual, the value of perspective varies, depending on whose perspective it is.

For Taro, we used a perspective sentence (“When everybody complies with the turn, everybody feels good because everybody can be fairly in the chair”) that described the perspective of people who were not highly specific (specificity parameter) and not highly valuable (likeability parameter), and that emerged contingent on the occurrence of his target behaviors (contingency parameter). For Kenji, we used perspective sentences (“So, many people in the hotel thought I am cool. Many people around me watch me do something and think I am cool”) that describe the perspective of people who were highly general (specificity parameter) and not highly valuable (likeability parameter), and that existed regardless of the occurrence of his target behaviors (contingent parameter).

In Study 2, we used a perspective sentence (“Ms. [teacher’s name] thinks the person is wise
when the person washes hands after toileting. Mr. [teacher’s name] thinks the person is cool when the person washes hands after toileting. Ms. [teacher’s name] thinks the person is lovely when the person washes hands after toileting”) that included a perspective of others who were specific (specificity parameter) and valuable (likeability parameter) to Tatsunori and that emerged contingent on engaging in his target behaviors (contingency parameter).

Theoretically, the perspectives of others who are specific and valuable to the student are more likely to be meaningful. Furthermore, describing others’ perspectives that occur contingent on a target behavior are much more helpful in understanding the meaning of the behavior being exhibited (Gray, 2004). Therefore, using a perspective sentence describing a specific, valuable, and contingent perspective is more likely to be effective in improving target behaviors. However, the negative side needs to be noted, too. For example, using the perspective of a person specific to the individual may hinder generalization of behavior change. Therefore, if the goal of the intervention is to enable the individual to use a skill in a variety of situations, using a perspective of a person less specific to the individual may be appropriate.

It cannot be emphasized enough that we did not demonstrate the effectiveness of the parameter change in this study. In addition to changing the parameters of Social Stories, we changed participants from Study 1 to Study 2. Taro and Kenji in Study 1 were diagnosed with or scored in a range of autism, whereas Tatsunori in Study 2 was diagnosed with ADHD. Adding a perspective sentence may have changed Tatsunori’s hand-washing, not because the parameters of the perspective sentences were changed to be specific, valuable, and contingent but because he was more motivated by others’ perspectives than Taro and Kenji, who was diagnosed with or considered to have autism. Many more participants with autism spectrum disorders and related disabilities need to be studied to determine if using a sentence including more specific, valuable, and contingent perspective is effective in improving any type of adaptive behaviors in any situations. Not only component analyses (e.g., the effect of perspective sentences) but also parametric analyses (e.g., the effect of specificity, contingency, and likeability parameters) warrant future research.

References


Received: 20 May 2006
Initial Acceptance: 22 July 2006
Final Acceptance: 22 December 2006