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A Comparison Between Multiple and Single Presentation of Social Stories for Children with Autism Spectrum Disorder *

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Abstract

Individuals with Autism Spectrum Disorder (ASD) may exhibit social interaction and communication problems and demonstrate limited and repetitive behaviors. Individuals affected by this complex neurodevelopmental disorder can require different educational arrangements from those of typically developed individuals when developing communication skills, self-care skills, and other daily living skills. Many interventions have been developed for individuals with ASD to acquire social skills and other independent living skills. Social stories represent one of these treatments. The purpose of this research was to determine whether the single and multiple presentations of social story interventions in teaching individuals with ASD behaviors differed in terms of effectiveness and efficiency. The adapted alternating treatments design was used in this research, whose participants were composed of four boys between 9 and 17 years old who had been diagnosed with ASD. The dependent variables of this research were the acquisition level of skills of expressing thanks and participating in the invited activity. The study's independent variables were the single social story intervention, which involved writing and presenting one story for one target behavior, and the multiple social story intervention, which included writing and presenting more than one story for one target behavior. According to the findings regarding effectiveness, all four participants learned the skills of expressing thanks and participating in the invited activity through single and multiple social story intervention at a level that met the criteria. All participants were observed to demonstrate the skills that were acquired in both interventions and generalized them to the other situations. No difference was determined in terms of follow-up and generalization. When the findings of the two instructional interventions were compared, it was observed that the results didn't recur consistently for all participants. For two participants, it was determined that the single social story intervention was more efficient, while the multiple social story intervention was more efficient for one participant. For

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the other participants, two instructional interventions were found to be equally efficient. In this study, data about social validity were gathered from participants, their parents, and their teachers. The findings regarding social validity showed that the participants, their parents, and their teachers expressed positive opinions about the study.

Introduction

Autism spectrum disorder (ASD) is a complex neuro-developmental disorder frequently encountered by researchers and practitioners working in the field of special education (Kırcaali-İftar, 2007, 2012). According to the American Psychiatric Association, Diagnostic and Statistical Manual of Psychological Disorders (DSM-V) published in 2013, individuals diagnosed with ASD can demonstrate social communication and social interaction deficiency, display limited and repetitive behaviors, and struggle to develop life skills (American Psychiatric Association, 2013). According to the diagnostic criteria of the American Psychiatric Association (2013), social skills are one of the most significant areas in which individuals with ASD display deficiency. Social skills are acquired skills that help an individual avoid negative reactions within the community, facilitate positive interactions with other individuals, and engage in successful communication (Gresham & Elliot, 1984). Social skills such as having positive interactions and participating in leisure time activities are important for all individuals (Vuran, 2007). Social stories represent one of the interventions that is widely used in the teaching of social skills to individuals with autism, and their effectiveness has been proved by empirical research (Balçık & Tekinarslan, 2012; Litras, Moore, & Anderson, 2010; Sansosti, Powell-Smith, & Kincaid, 2004).

Social stories, developed by Carol Gray, are individualized short stories that offer information about how individuals should behave in social situations (Kırcaali-İftar, 2007; Kurt, 2012b; Wright & McCathren, 2012). Social stories are generally used to explain and teach social behaviors such as making changes in individuals' daily lives, communicating successfully, and taking turns. They are also used to explain the causes of behaviors; to teach academic skills, communication skills, and various adaptive skills; and to reduce disruptive behaviors (Barry & Burlew, 2004; Carbo, 2005; Gray, 2000; Sansosti, 2009; Scattone, Wilezynski, & Edwards, 2002; Scattone, Tingstrom, & Wilcyznski, 2006; Vuran & Usluer, 2012).

Social stories explain the target behaviors, including where and how they should be accomplished and by whom (Scattone et al., 2002). The process for the preparation of social stories consists of determining and describing the target behavior; collecting information on the frequency, intensity, and environment of the target behavior; and then writing the social stories in accordance with this information and the characteristics of the individual (Andrews, 2004). The social stories prepared through these stages are composed of different sentence types. The extant literature states that social stories consist of six different sentence types: descriptive, perspective, directive, affirmative, collaborative, and control sentences (Carbo, 2005; Gray, 2000; Gray & Grand, 1993). While descriptive sentences are defined as sentences that directly describe the target behavior (e.g., "When my class is being taught, sometimes my teacher asks a question"), perspective sentences describe the feelings and thoughts of the individuals and their beliefs (e.g., "My teacher and my family would be very happy if I raised my hand before I speak in the class"). Directive sentences are those in which the response of a situation and preferences of individual are determined (e.g., "I have answered my teacher's questions by raising my hand") (Gray, 2000). The affirmative sentence is defined as a statement focused on culture and values and that reinforces the meaning of the situation related to the target behavior (e.g., "Raising my hand and then talking in class is a very nice behavior") (Gray & Grand, 1993). In the 1990s, Gray added two types of sentences, collaborative and control sentences, to these sentence types (Carbo, 2005). The control sentence is a statement that contains statements about the recall of the targeted information that was intended for individuals to acquire from the story. In other words, the control sentence describes the appropriate behavior and reaction to the target behavior (e.g., "I'll try to remember to raise my hand before I talk in class). A collaborative sentence is the sentence type that explains how

individuals can help the student to exhibit the target behavior (e.g., "My teacher helps me by reminding me to raise my hand when I speak to the class") (Carbo, 2005). After writing the social stories, a suitable title for the social story is selected, and the story is ready to use.

According to Gray (2000), the process of presenting social stories consists of the presentation of social stories, the phase of revising, and the phase of fading. Social stories can be presented in an atmosphere in which the individual feels relaxed and can read using voice recording, video recording, or via computer (Mancil, Haydon, & Whitby, 2009; Sansosti & Powell-Smith, 2008). Following the presentation of social stories, questions are asked about whether the individual understands the story or not. After the story presentation phase, assessments are made to see if there is any need to make changes to the story, and changes are made if necessary. In the last stage, the fading phase, the social story begins. Fading can be done either by removing the directive sentence from the story or fading according to time (Gray, 2000).

The literature shows that social stories are effectively used to teach various social skills to individuals with ASD in different age groups. Research has shown that social story interventions can be used effectively in teaching communication skills such as responding to a conversation (Hanley-Hochdorfer, Bray, & Kehle, 2010), greeting others (Litras et al., 2010; Reichow & Sabornie, 2009), maintaining eye contact, smiling, and starting a conversation (Dudleston, 2008; Scattone, 2008). Some studies show that social stories are effective in teaching social skills such as sitting in an appropriate position in class (Chan et al., 2011), sitting in his/her place in class (Crozier & Tincani, 2007), granting a request, making a request (Delano & Snell, 2006;), taking orders (Washburn, 2006), performing a task (Wheeler, 2005), starting and maintaining a game (Balçık & Tekinarslan, 2012; Turhan, 2015; Turhan & Vuran, 2015), sharing toys, saying "hello" (Akgün Giray, 2015), requesting permission, offering help, introducing oneself (Acar, Tekin-İftar, & Yıkmış, 2017), giving a high five, using words of kindness (Olçay-Gül, 2012), joining a game, and copying with mockery (Sani-Bozkurt, 2016). Published research data shows that social story interventions are also effective in teaching self-management (Thompson, 2011), anger control (Bernard-Ripoll, 2007), and avoidance of strangers' attempt to lures (Kutlu, 2016). Research related to the effectiveness of the social stories in decreasing problem behaviors such as crying, tapping, and staring at others (Adams, Gouvousis, Van Lue, & Waldron, 2004; Mancil et al., 2009; Scattone et al., 2002) can be found in the literature.

Published research aimed at determining the effectiveness of social stories reveal that social story interventions are usually performed by presenting only a story written for a determined target behavior (Olçay-Gül, 2012; Sansosti, Powell-Smith, & Kincaid, 2004; Wright & McCathren, 2012). However, more than one story will be presented to teach a target behavior, which can lead to more positive outcomes, such as a higher level of generalization and maintenance in target behaviors. In this study, teaching practices consist of writing and presenting a story for a target behavior, through a method called single presentation of social story intervention. In this study, the social stories, represented as single social story intervention, are repeatedly presented to each individual in each teaching session. They are composed of descriptive, affirmative, directive, and perspective sentences determined by Gray (2000). Social story interventions, as described by Schneider and Goldstein (2010) involve the reading of different social stories for a target behavior; this is called the multiple presentation of social stories in this study; it is carried out by preparing and presenting more than one social story for a determined target behavior. In the multiple social story intervention, the individual faces a different social story from the previous session in each session rather than presenting the same social story every day or every session. No published study comparing the effectiveness and efficiency of multiple and single social story interventions was found.

Effectiveness in the training process is defined as the force or practice that creates the desired effect in terms of the target behavior and skills (Tekin-İftar, 2012a; Wolery, Bailey, & Sugai, 1988). Efficieny in education is the provision of the most effective learning method with the least resources required (Dinçer, 2002). In other words, it is defined as an easier method of teaching compared to other, with shorter teaching time, with fewer student errors and less teaching and trial sessions in the process

(Tekin-İftar, 2012a; Wolery et al., 1988). To date, in published studies on effective and efficient teaching of individuals with ASD, the efficieny parameters are considered the number of sessions, the number of trials, the total number of sessions, and the number of incorrect student responses until the criterion is met (Genç-Tosun & Kurt, 2017; Kurt & Tekin-İftar, 2008; Kurt, 2011; Tekin-İftar & Kırcaali İftar, 2006). A number of published studies show that social stories can be used effectively in the teaching of various social skills to individuals with ASD; however, the number of studies carried out while using this teaching intervention efficiently is limited (Acar et al., 2017; Iliff, 2011; Kutlu, 2016; Mancil et al., 2009; Turhan & Vuran, 2015).

Almost all of the published studies on social stories are carried out by reading a single social story for a target behavior (Sansosti, et al., 2004; Scattone, et al., 2002; Schneider & Goldstein, 2010). However, the literature exhibits opinions expressing the need for investigations to examine the effectiveness and efficieny of using social stories in ways other than usual practice (Norris & Datillo, 1999; Schneider & Goldstein, 2010). Schneider and Goldstein (2010) indicate that no published research has examined the effectiveness and efficieny of using multiple social stories when teaching a target behavior. In this study, it was stated that the single social story intervention should be compared with multiple social story intervention in terms of effectiveness and efficieny. A study conducted by Norris and Datillo (1999) investigated the effectiveness of multiple social story intervention to reduce inappropriate behaviors of a girl with ASD. In that study, three different stories were read for a target behavior. The findings of the research show that social stories are effective in reducing the inappropriate behaviors of the participant. However, the study was conducted with only one participant. In addition, the AB model, which has limitations in terms of internal validity and external validity and does not allow for the establishment of a functional relationship between dependent and independent variables, was used in this research (Tekin-İftar, 2012a). Therefore, it may be considered that studies that examine the effectiveness and efficieny of multiple social story interventions are needed. There is also a need for studies aimed at determining whether there are differences in the effectiveness and efficieny between the single social story presentation used to achieve a target behavior and the interventions in which the multiple social story presentation is used.

Implementing social story intervention with more than one story could have some benefits. For example, using more than one social story for the same target behavior in teaching activities can help to generalize the acquired behavior at a higher level. In addition, the use of different social stories may reduce the participants' frustration and reluctance to engage in the study. It may be preferred by students and practitioners for this reason, and the intervention of multiple social stories could increase social validity. Therefore, this research investigated whether the single presentation of social stories and multiple presentation differed in terms of efficieny. In addition, the participants, the participants' families, and the participants' teachers' opinions about the single and multiple presentation of social stories were identified in this study. The answers to the questions listed were searched: (a) do the effects of single and multiple presentations of social stories in the teaching of social skills to individuals with ASD differ in the stages of acquisition, maintenance, and generalization? (b) Is there a difference between the two teaching interventions in terms of the number of sessions, the total amount of time, and the number of incorrect student responses until the criterion is met? (c) What are the views of participants, participants' teachers, and parents on intervention?

Method

Participants

This study was conducted with four male students with ASD who were students in a special education primary school and secondary school. Teaching sessions in this study were held every day between 9:00am and 3:00pm. Written permission for the participation of Alpay, Ali, Kemal, and Vefa (names have been changed) has been granted from the Provincial Directorate of National Education and their families. The participants were attending different classes in their schools with different classmates. In the classes in which the participants were attending continue their education, there were usually studies on literacy preparation, literacy training, communication, and social skills training. A session was held in which participants read a social story that was different from the social stories used in the research to determine whether they had the necessary prerequisite skills to participate in the study. At the end of this session, it was determined that the participants had the prerequisite skills of a) following single-step directions, b) focusing their attention on visual and auditory stimu for at least five minutes, c) understanding a text in a social story that is not used in the study but has similar features to the social stories prepared for the study, and d) answering questions about a text with at least 80% accuracy. The Gilliam Autistic Disability Rating Scale-2 Turkish Version [GOBDÖ-2 TV] (Diken, Ardıç, & Diken, 2011) was used to determine the level of possibility of autism in participants. The Leiter International Performance Scale (Leiter, 2005) was used to determine the level of intelligence of the participants in the study.

According to the information obtained from his family and his teacher, Alpay was 9 years old at the time of the study and was diagnosed with ASD by a child psychiatrist in the hospital when he was 3 years old. As a result of implementing the Gilliam Autism Disability Rating Scale-2 Turkish Version [GOBDÖ-2 TV], Alpay's GOBDÖ-2 TV score was 97. According to the Leiter International Performance Test result, Alpay's intelligence section score is 91. Alpay was participating in a special education and rehabilitation center after school for two days per week while attending a special education school for five days a week. Alpay was similar to his peers in terms of motor skills. It was observed that Alpay, who has difficulty with social and communication skills, was occasionally displayed echolalia behavior by making meaningless verbal repetitions. Alpay, could read establish two- to three-word sentences and continue to communicate using these sentences. Alpay could concentrate his attention on the activities he could engage in on his own, but he had difficulty attending the activities with his peers. Alpay could not respond to offers of help and to compliments from people around him.

Table 1. Characteristic of Participants

Participant	Age	Gender	Diagnosis	GOBDÖ-2 TV	Leiter
Alpay	9	Male	ASD	97	91
Ali	12	Male	ASD	90	-
Kemal	17	Male	ASD	116	51
Vefa	9	Male	ASD	94	56

According to the information obtained from his family and his teacher, Ali was diagnosed with ASD by a child psychiatrist a hospital when he was 3 years old. An intelligence test could not be administered to Ali because he was indifferent to the test, and his intelligence section score could not be determined. Ali's GOBDÖ-2 TV score was 90. Ali was receiving special education five days per week and attending special education and rehabilitation center activities for two days per week after school. Ali's motor development was similar to typically developing peers. Ali had problems with social skills,

such as establishing and maintaining friendships, communication skills such as starting and finishing a conversation and making greetings, and playing with his friends; It was observed that he prefers to play alone. He also could not respond to help offers and compliments from other people. Ali was very interested in agricultural tools, could establish three four-word sentences together, communicates with adults, and maintains this communication when he needs an object or food.

Kemal, diagnosed at the age of 5 by a child psychiatrist, was a student at the age of 17.,Kemal's GOBDÖ-2 TV score was 116. According to the Leiter International Performance Test result, Kemal's intelligence section score is 51. Kemal was attending his special education class for five days per week and were attending a special education and rehabilitation center for two days per week after school. Kemal was able to read and write. Kemal was struggling with social skills, such as making and maintaining friendships, and communication skills, such as starting and finishing greetings. It was observed that Kemal sometimes exhibits echolalia.

During the study, Vefa was 9 years old and was diagnosed with ASD at a university hospital when he was 4 years old. Vefa's GOBDÖ-2 TV score was 94. According to the Leiter International Performance test result, Vefa's intelligence section score was set at 56. Vefa was attending a special education school five days a week and a special education and rehabilitation center two days per week. Vefa was learning to reading and writing and was able to recognize letters. Vefa had some social skills such as building friendships, maintaining friendships, and participating in group activities, and he was able to demonstrates communicating skills such as greeting others, starting conversations, maintaining a conversation. Vefa was occasionally demonstrating echolalia and had fluency problems (stuttering).

Selim participated in the study as a peer model for the photographs used in social stories. He was a male student at the age of 14 who had been diagnosed with mild intellectual disability. Selim was attending ninth grade at the school where the study was conducted.

Social stories in the study were prepared and presented by the first author. He was engaging in his doctoral studies in the field of special education while working as a research assistant in the special education department at a state university during the study. Prior to the study, the he had at least two years of experience providing systematic instruction to individuals with developmental disabilities. The first author had previous practice experience on social stories.

Settings and Materials

All participants of the study were students in different classes. The teaching sessions were conducted in environments as close to those of the classes of the participants as possible. The teaching seasons for Ali, Kemal and Vefa were conducted in the school guidance teacher's room, and the teaching seasons for Alpay were conducted in the school library. During the teaching sessions, there was no one present other than the researcher and the participant. In the probe sessions, the participants' class, art class, and school yard were used. All sessions were conducted with one on one instructional arrangement. During the instructional sessions, the researcher sat at a table next to the participant and read the social story. One participant, Alpay read social stories from the tablet computer himself. In the probe sessions, the researcher acted only as an observer.

In the preparation and presentation of social stories, a presentation program that can be used on a tablet PC, and a 7.9-inch (21 cm) screen tablet PC was used. Four social stories were written for expressing thanks and four social stories were written for participation in an ongoing activity. In total, eight social stories were written. For both target skills, one story was used in the single social story presentation, and three stories were used in the multiple social story intervention. All of the stories are composed of 5-6 sentences prepared in accordance with the basic sentence structures determined by Gray (2000). The slides prepared for the reading of the stories were designed as one sentence on each page and a visual that describes the sentence used. The visuals consist of photos of the students and teachers in the environment in which the study was conducted.

In order to collect reliability data in the study, video cameras were used. In order to test whether the participants acquire the skills of expressing thanks and participating in the invited activity, teaching aids and game materials such as picture papers, paint pens, mapping cards, volleyballs, soccer balls, basketballs, pencils, and erasers were used in this study.

Research Desing

This study compared the single and multiple presentations of social stories in teaching social skills to individuals with ASD in terms of effectiveness and efficiency. The adapted alternating treatments design was applied, which is a comparative single-subject research design that is used to compare the effects of two or more independent variables on two or more nonreversible dependent variables (Kurt, 2012a). Behaviors examined within this model should be independent of each other, functionally similar, and at the same level of difficulty (Blackhurst, Schuster, Ault, & Doyle, 1994; Holcombe, Wolery, & Gast, 1994; Kurt, 2012a; Wolery et al., 1988).

Dependent Variables

The dependent variables of the research were the skills of expressing thanks and participating in the invited activity. Expressing thanks was defined as verbal thank for being given an object that the participant needed, helping him on any grounds, or complimenting him in the probe sessions. The target behavior of participating in an ongoing activity was accepted as a correct response when the participant took part in an ongoing game in the school yard and in class or painted a picture with others. In determining the target behaviors, the Social Skill Assessment System (SBDS), developed by Gresham and Elliot (1990) and adapted into the Turkish language by Sucuoğlu and Özokçu (2005), was used. The target were preferred according to interviews with the participants' families and teachers. One of the most important reasons for acknowledging these skills is the expectation of parents and teachers that they will increase the children's social interaction. The parents and the teachers were excepting that these skills will have positive effects on the social acceptance of participants. Which target behavior will be taught by using single presentation and which will be taught by using multiple presentation was determined using the random sampling model.

In this study, four types of data were collected: effectiveness, efficiency, social validity, and reliability data. While the data were gathered in the study, the researchers took into account the number of correct and incorrect responses and percentages, the number of sessions conducted until the criterion was met, and the number of trials and the total duration of the training. The effectiveness data are presented in terms of the percentage of correct responses calculated using the participants' correct and incorrect responses. Data were collected about the number of sessions, the total number of sessions, and the number of incorrect responses until the criterion was met to determine whether the single and multiple presentations of social stories differed in terms of efficiency.

Independent Variables

The independent variables of the research are the single and multiple presentations of social stories. A single presentation of social stories is the preparation of a social story for a target behavior and presentation of the same social story in all sessions. Multiple presentations of social stories were defined as writing more than one social story for a target behavior and presenting one of them during the training sessions. In other words, in multiple social stories intervention, different social stories were presented in each teaching session to focus on the same target behavior. During the study, all variables except the variables specific to the independent variables were kept constant, both in the single presentation of social stories and in the multiple presentation of social stories. An equal number of teaching sessions were organized with two interventions for teaching both target skills, and the social stories used in both interventions were designed using a similar sentence structure, similar length, and similar visual style and presented on the tablet computer.

The social stories prepared for the target skills in the study were composed of descriptive, perspective, directive, and affirmative sentences, which represent the four basic sentence types as outlined by Gray and Grand (1993). All of the social stories used in the study consist of 4-6 sentences. Social stories, presented via PowerPoint, were prepared, and each slide consisted of a photo and a sentence. The photographs used in the stories were taken while the peer model was displaying the target behaviors at the school, in the school yard, on the basketball court, and in art class. Four stories were prepared for teaching expressing thanks and participating in the invited activity, and for each of the skills, one story was used in a single social story presentation; three stories were used in multiple social story intervention. The single and multiple stories differ from each other in terms of environment and thematically. For example, the first story of the multiple story intervention, designed for teaching expressing thanks, was edited in such a way that the participant's friend thanked the participant for his help in a context that arises in the classroom, while the other story was designed in which the participant thanked the teacher for the compliment. However, while the stories used in the intervention of multiple social stories are differentiated, consideration was given to keep the sentence structures, numbers, and sentence types of the narrators stationary, and the dimensions of the photographs used in the narratives are similar in terms of their characteristics. In summary, while the structural features of the stories used in the single and multiple social story interventions were similar, the stories used in the multiple social story intervention are differentiated in terms of the context in which the skills are performed. For example, social stories were designed regarding giving thanks for help, giving thanks for a compliment, participating in a table-top activity in the classroom, and participating in a game in the school yard.

Procedure

The experimental procedure included baseline, daily probe, intervention, follow-up and generalization sessions. Except for the teaching sessions in which the social stories were read in the study, all of the sessions were conducted in the natural environment in which one demonstrates skills of expressing thanks and participating in the invited activity. All teaching sessions were held by the first author with a one-to-one teaching arrangement. Opportunities in participants' natural environments were created in order to demonstrate the target behaviors. In other words, probe sessions designed to determine changes in participants' performances were carried out in the environments and times regarding the natural context of the target behaviors.

Probe Sessions

Two types of probe sessions were organized in the study. The controlled baseline probe sessions and daily probe sessions. Opportunities were provided for organizing probe sessions in the context of the nature of the target behaviors with the pre-planned events for participants. For example, first author set the stage for participating in the invited ongoing activity by providing an invitation from classmates

during a break. Another example is that, in probe sessions, the classmates invited the participant to participate in the games played with pictured cards or coloring/completion of the pictures that they made together in the classroom. Likewise, when testing thankful behavior, opportunities were created in a natural way for participants to display the target behavior. For example, the participant is expected to thank his friend or teacher for giving him a needed object. In some probe sessions, the participant was expected to thank his friend/ his teacher for a compliment (e.g., "This shirt looks great on you," or "Your shoes are so beautiful."). The baseline probe sessions were held until at least three sessions of stable data were obtained for both target behaviors. Daily probe sessions were conducted with a trial for each skill after each training session until the fading process has began. The procedure followed during the baseline probe sessions was similar to that of the daily probe sessions. In the daily probe sessions, immediately following the training session in which the social stories are read, the participant was brought to the place in which the target behavior can be demonstrated and where he could experience the opportunity to demonstrate the target behaviors, and the responses showed by the participant were observed and recorded.

Training Sessions

Firstly, an attentional cue was delivered in the training sessions (e.g., Are you ready to work together? We will read a story together for you now, then I will ask you some questions about the story, okay?). After the participant demonstrated an affirmative response, the social story was presented via the tablet computer. Then, questions about the story were asked to the participant, and he was expected to respond to all off the questions correctly (e.g., Who will help you in school, what do you do when your teacher or friends help you, how does your teacher or friend feel when you thank them?). The correct answers given by the participants were reinforced with verbal reinforcements such as "well done" and "very good." When the participant answered the questions incorrectly, the relevant sectionwas re-read and the question was asked again. If the participant responded incorrectly again, the training session was finished with the correct answer being modeled, and then the participant faced the setting in which he was expected to demonstrate the target behavior. The same procedure was followed in the sessions involving multiple social stories and sessions involving single social stories. The only difference between the two teaching interventions is that, in the practice of single social story intervention, the same story is read in each session, and in the multiple social story intervention, one of three different stories is presented in each session. After the stable level of data was obtained during the three sessions day after day in the daily probe sessions, the procedure of fading began. Due to the time-dependent fading principles in the fading process, the time between the training sessions and the probe sessions was increased. In other words, after the training sessions were put into practice, a fading session was arranged one day later.

Follow-up and Generalization

Follow-up sessions were conducted at 1, 2, and 14 weeks after the termination of the intervention. Generalization sessions were conducted by creating different opportunities from opportunities used in daily probe sessions to determine the level of generalization of target behaviors to persons or equipment within different environments (e.g., the equipment needed by the participant was changed, the type and location of the expected activity was changed). Generalization data were collected through the pretest-posttest generalization method. Pre-test generalization sessions were conducted following the collection of baseline data, and generalization post-test generalization sessions were conducted after meeting the criteria for each target behavior. Follow up and generalization sessions were conducted in the same way as probe sessions.

Social Validity

Social validity data were collected by using different social validity questionnaires prepared for the participants themselves, for their parents, and for their teachers. The questionnaire for parents consists of 12 multiple-choice and 2 short-answer questions, the questionnaire for the teachers consists of 17 multiple-choice and 2 short-answer questions, and the social validity question form for the participants consists of 10 multiple choice questions. The social validity data collection forms for the parents and teachers were given to the parents and teachers in a closed envelope, and they were asked to complete the forms and deliver them in closed envelopes to the first author. The social validity questionnaire for the students was completed by the first author upon asking the participants. The social validity data were collected from a total of 18 participants, including mothers and fathers (n = 8), six teachers, and four participants, and all of the data were analyzed through descriptive analysis.

Reliability

Inter-observer agreement and procedural reliability data were collected for at least 30% of all sessions from each experimental phase. Data were collected by graduate level student in the field of educational sciences. He was trained by the first author to collect inter-observer agreement and procedural reliability data.

Inter-observer agreement was calculated by using the point by- point method, dividing the number of agreements by the number of agreements plus the number of disagreements and multiplying by 100 (Erbaş, 2012; Kazdin, 1982). Inter-observer agreement was 100% for all sessions.

Procedural reliability was calculated by dividing the number of correctly performed steps by the total number of steps multiplied by 100 (Billingsley, White, & Munson, 1980; Erbaş, 2012). 100% level of procedural reliability was obtained for all sessions across all participants.

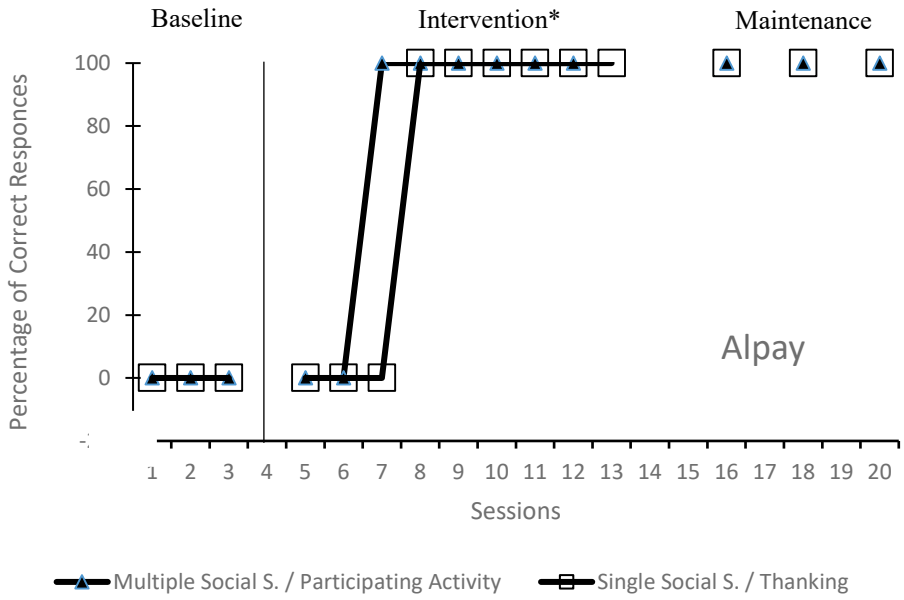
While collecting procedural reliability data for both interventions following behaviors were taken into consideration; a) preparing the materials, b) presenting an attentional cue, c) presenting the social story when the participant express that he is ready to work, d) presenting the social story in the appropriate environment free of distracting materials and stimuli, e) presenting the social story, f) testing the level of comprehension (asking questions about the social story such as who, what, where, how to), g) reinforcing collaborative behaviors of the participants in the study at the end of the session, and h) responding appropriately after the correct and incorrect answers to the questions. Also presenting different social stories for the multiple story intervention sessions was observed and recorded as a practitioner behavior when collecting procedural reliability data.

The following behaviors of the practitioner were taken into consideration when collecting procedural reliability data for the probe sessions; (a) preparing the materials to be used in the sessions, (b) preparing the environment in which the target behavior is expected to be demonstrated, (c) responding appropriately after the correct and incorrect responses.

Results

Effectiveness Data

Figures 1 to 4 show the percentages of correct responses during the baseline, intervention, and follow-up sessions for Alpay, Ali, Kemal and Vefa respectively, across instructional procedures.

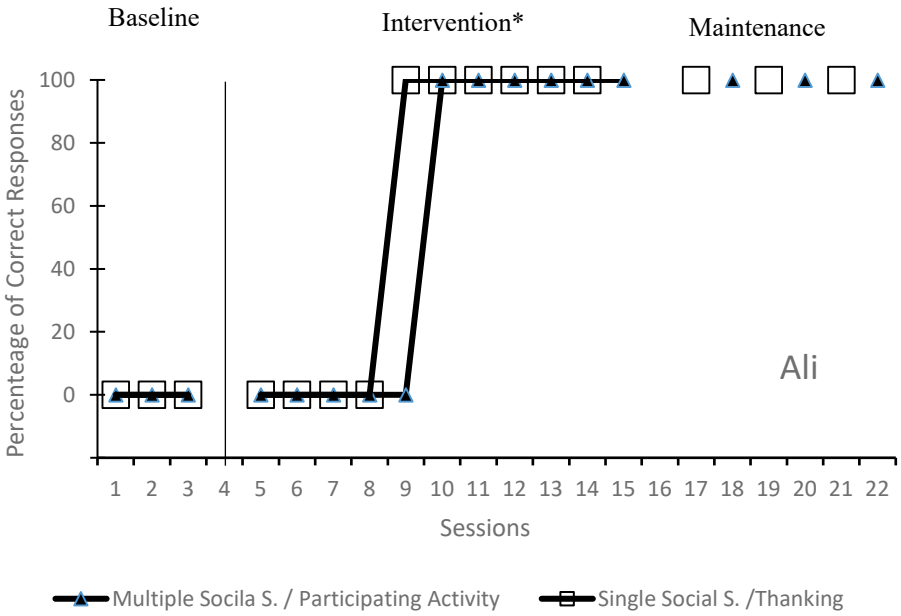


Both skills were passed to the stage of fading after the 3rd session, where stable data was obtained at the 100% level.

Figure 1. Percent of correct responses during baseline probe, intervention probe, and follow- up sessions for Alpay

It was seen that Alpay did not exhibit any correct response for both of the targeted behaviors of baselines sessions. After the start of the teaching sessions in which single and multiple social stories were presented, progress was seen regarding both skills, and Alpay responded correctly at the 100% level. It was observed in the follow-up sessions that Alpay's ability to participate in the invited activity and express thanks were maintained at 100% accuracy. In the pre-test generalization sessions, it was found that Alpay did not show a correct response to the ability to participate in the invited activity and express thanks. It has been observed that Alpay generalized the target behaviors at the level of 100% to the different environments and materials in the post-test generalization sessions.

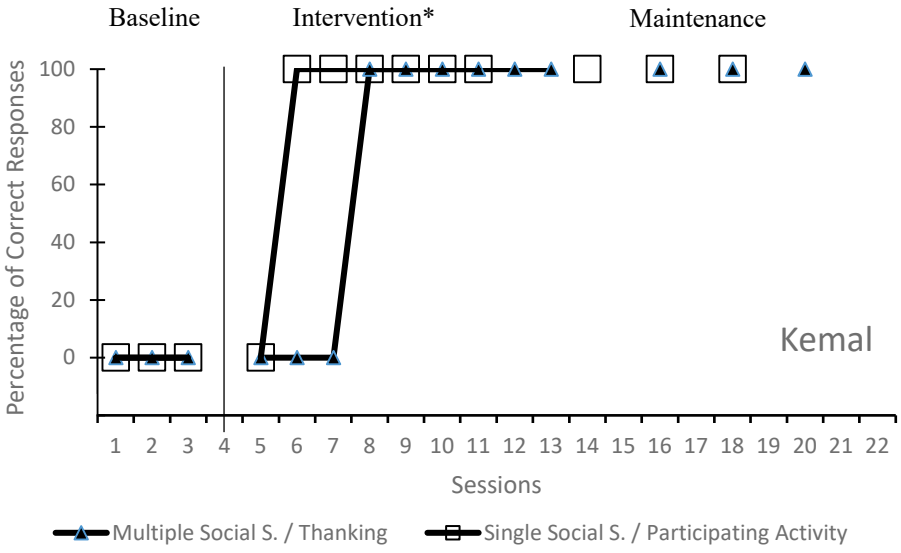
It was observed that Ali did not show any correct response for both the targeted behavior in baseline sessions.



* Both skills were passed to the stage of fading after the 3rd session, where stable data was obtained at 100% level.

Figure 2. Percent of correct responses during baseline probe, intervention probe, and follow- up sessions for Ali

According to the findings, Ali showed the correct response regarding the skills of participating in the invited activity with the multiple presentation of social stories in 11 teaching sessions and regarding the skill of expressing thanks with the single presentation of social stories in 10 teaching sessions at a level of 100%. It was observed that, Ali's ability to participate in the invited event and express thanks, which he learned previously, was maintained at 100% accuracy. Although in the pre-test generalization, Ali did not show any correct response, it has been observed that Ali generalized the target behaviors at the level of 100% to the different environments and materials in the post-test generalization sessions.



*Both skills were passed to the stage of fading after the 3rd session, where stable data was obtained at 100% level

Figure 3. Percent of correct responses during baseline probe, intervention probe, and follow- up sessions for Kemal

It was seen that Kemal did not show any correct response for both the targeted behaviors in baseline sessions. With the start of the teaching sessions during which single and multiple social stories were presented, after a while, progress was seen in both skills, and Kemal responded correctly at the 100% level. Kemal's ability to participate in the invited activity and express thanks was maintained at 100% accuracy. According to the findings, Kemal showed the correct response regarding the skills of participating in the invited activity with the single presentation of social stories in 11 teaching sessions and for the skill of expressing thanks with the multiple presentation of social stories in 10 teaching sessions at a level of 100%. Although in the pre-test generalization sessions, Kemal did not show any correct response, it has been observed that Kemal generalized the target behaviors at the level of 100% to the different environments and materials in the post-test generalization sessions.

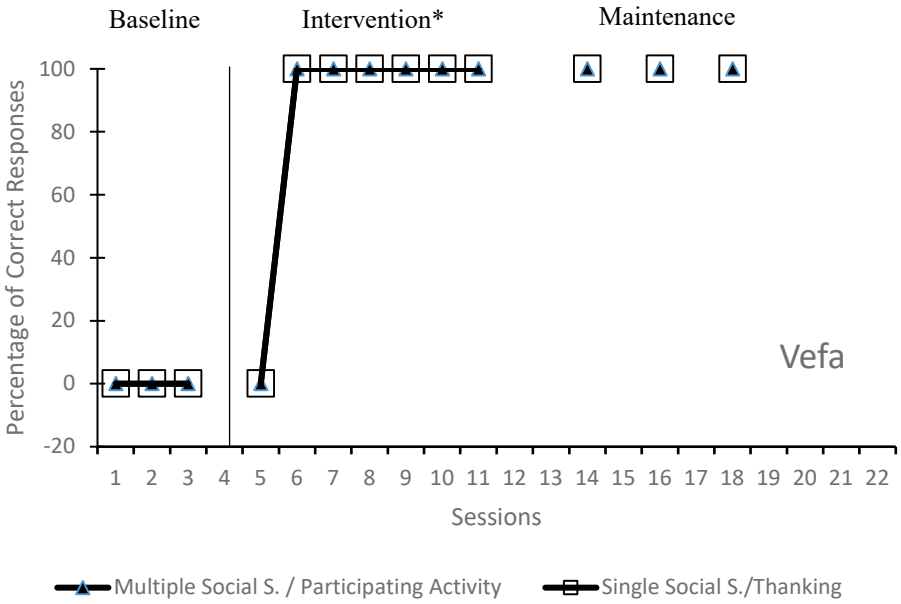


Figure 4. Percent of correct responses during baseline probe, intervention probe, and follow- up sessions for Vefa

It was observed that Vefa did not show any correct response for both the targeted behaviors in baseline sessions. Following the start of the teaching sessions during which social stories were presented, progress was seen in both skills, and Vefa responded correctly at the 100% level. It was been observed that, during the follow-up sessions. Vefa's ability to participate in the invited event and express thanks, which he had learned previously, is maintained at 100% accuracy. According to the findings Vefa showed the correct response regarding the skills of participating in the invited activity with the multiple presentation of social stories in 7 teaching sessions and regarding the skill of expressing thanks with the single presentation of social stories in 7 teaching sessions at a level of 100%. Vefa did not show any correct response in the pre-test generalization sessions. It was observed that Vefa generalized the target behaviors at the level of 100% to the different environments and materials in the post-test generalization sessions.

Efficiency

To determine whether the single social story and the multiple social story interventions differ in terms of efficiency data were collected for the number of sessions and trials conducted, the number of incorrect responses, the total duration of teaching time until the criteria were met, b) the number of trials that took place until the criteria were met, c) the number of wrong responses to the criteria met, and d) the total duration of teaching time until the criteria were met. Table 2 presents the data for efficiency parameters for all participants across instructional arrangements.

Table 2. Efficiency Data on Single and Multiple Presnetation of Social Stories

Participant	Intervention/ Skill	Number of Sessons	Number of Trials	Number of Wrong Responses	Time Min.:Sec.
Alpay	MSS- PA	8	8	2	31
	SSS -T.	9	9	3	37:2
Ali	MSS.- PA.	11	11	5	30:36
	SSS -T.	10	10	4	27:16
Vefa	MSS- PA.	7	7	1	19:11
	SSS -T.	7	7	1	23:12
Kemal	MSS - T.	9	9	3	28:16
	SSS - PA	7	7	1	27:47

MSS= Multiple Social Story SSS=Single Social Story
PA= Participating A T= Thanking

According to the table, Alpay responded with 100% accuracy in terms of his ability to participate an activity the result of 8 teaching sessions with presentations of multiple social stories. Eight trials were conducted to teach the skill of participation in an activity until Alpay responded to at criterion level, teaching sessions took 31 minutes in total. Alpay responded with two incorrect responses until the criterion was met for the skill of participating in an activity. Alpay responded with a 100% accuracy level for the ability to thank as a result of 9 single social story teaching sessions. Teaching sessions with the presentation of single social story for the teaching of expressing thanks took in total 37 minutes 2 seconds, and 9 trials were conducted during these sessions. Alpay demonstrated three incorrect responses for the ability to express thanks until the criterion was met.

Ali responded with 100% accuracy in his ability to participate in an activity as the result of 11 teaching sessions with presentations of multiple social stories. Eleven trials were conducted to teach this skill until Ali responded at the criterion level; teaching sessions took 30 minutes 36 seconds in total. Ali showed five incorrect responses until the criterion was met for participating in an activity. Ali responded at a 100% accuracy level for the ability to express thanks as a result of 10 single social story teaching sessions. Teaching sessions with the presentation of single social story for the teaching expressing thanks took 27 minutes 16 seconds in total, and 10 trials were conducted in these sessions. Ali showed four incorrect responses for expressing thanks until the criterion was met.

Vefa responded with 100% accuracy in his ability to participate an activity as the result of 7 teaching sessions with presentations of multiple social stories. Seven trials were conducted to teach this skill until Vefa responded to the criterion level; teaching sessions took 19 minutes 11 seconds in total. Vefa responded with two incorrect responses until the criteria was met for the skill of participating in the activity. Vefa responded at a 100% accuracy level regarding the ability to express thanks as the result of the presentation of 10 single social story teaching sessions. Teaching sessions with the presentation of single social stories for teaching the skill of expressing thanks took in total 23 minutes 12 seconds, and 7 trials were conducted in these sessions. Vefa shows an incorrect response for the ability to express thanks until the criterion were met.

Kemal responded with 100% accuracy regarding his ability to express thanks the result of 9 teaching sessions with the presentation of multiple social stories. Nine trials were conducted to teach the skill of expressing thanks until Kemal responded to the criterion at a satisfactory level; teaching sessions took 28 minutes 16 seconds in total. Kemal responded with three incorrect responses until the criterion was met. Kemal responded at a 100% accuracy level regarding the ability to participate in an activity as the result of the presentation of 7 single social story teaching sessions. Teaching sessions with the presentation of single social story for teaching the participating in an activity took in total 27 minutes 47 seconds, and 7 trials were conducted during these sessions. Kemal showed the incorrect responses for the ability to express thanks until the criteria were met.

Social Validity

All of the participants' parents acknowledged that social skills such as expressing thanks and participating in the invited activity were important for their children and that their behavior changed as a result of learning these target behaviors, resulting in a positive change in the lives of their children. All of the parents of the participants stated that they were satisfied with the social stories prepared especially for their children and presented to them in an individual environment. All of the parents of the participants wanted the social stories to be used to teach other skills to their children. However, two mothers and fathers expressed that they did not consider teaching other skills to their own children using social stories. Two mothers and fathers stated that they would like to teach their children different skills with social stories. All of the participants' parents expressed that their children continued to display the skills they learned in different environments and in the presence of different people, and they also expressed that, as a result of the teaching of these skills, behavioral changes in their children satisfied the people around them. When the participants' parents were asked what they liked about this work, they expressed that the social skills teaching increased the social acceptance of their children. A mother expressed her view on this issue, saying, "I am very pleased that learning social skills has increased the acceptance of my child among his friends." Parents said that, after their children learned the skills to participate in the activities and to express thanks, the differences from other friends decreased. Another participant's mother said, "My child's learning of social skills will reduce the difference with others." When asked what they didn't like about this study, the participants' parents expressed that they were not satisfied that the work is limited to only two skills: "I think it's not nice to study with limited two skills." A mother expressed the limited content (limited target behaviors and limited places) of work as a negative point, stating that "the content of the work could be expanded."

When the opinions of the participants' teachers about the social validity of the research were examined, it was observed that all of the teachers were impressed that the social skills of expressing thanks and participating in an invited activity are important competencies. All of the teachers of the participants stated that the social stories were effective and that they would use this method in the future to teach other skills and would recommend them to other teachers. All of the teachers stated that the intervention of social stories is easy to use and produces results in a short time. They also all expressed that the skills of expressing thanks and participating in an invited activity led to a positive change in the lives of their students, and they were satisfied with the usage of situations and environments in which the participants could display the skills during the study. All of the teachers expressed that the participants maintained the skills they learned in different environments and in the presence of different people and that the behavioral changes in the students were satisfactory to the people around the students. When asked what aspects of this study the participants' teachers liked, they expressed that they were satisfied that the teaching procedure was short, quick, and effective and that the presentation of social stories on an tablet computer increased the motivation of the students, and contributed to the socialization and communication of the students. When asked what they did not like about this work, the participants' teachers expressed that they were not satisfied with the limited number of students. When asked which intervention they prefer to use, single or multiple social stories, four teachers expressed that they prefer the multiple social story intervention. They said, "I would prefer to use multiple social stories, because I think that multiple social stories intervention enhances the

motivation of students, encountering different stories will make students happier," and "I think using different social stories would increase the generalization of behavior, so I would prefer to use multiple social stories." Two teachers stated that they would prefer to use single social story intervention. "I think the preparation of multiple social stories is more difficult than a single story, why would I write three stories instead of writing a story for the same target behavior? For this reason, I prefer single social story " one teacher said. Another one stated, "When we think of things that are loaded onto our profession, I think it would be difficult for us to prepare more than one story to teach with multiple social stories; for that reason, I would prefer the single social story intervention."

The students who participated in the study expressed that they liked the social stories used in the study. They even expressed the desire to rejoin a similar study in the future. They expressed that they were happy about expressing thanks and painting and playing games with their friends. Participants expressed that, when they played games with their friends and thanked them, their friends were happy, and they continued these behaviors in their life outside school.

In addition, three of the participants expressed satisfaction with the intervention of multiple social stories. One of them expressed satisfaction with single social stories when they were asked whether they were satisfied with teaching with multiple social stories or with teaching using single social stories.

Discussion

This study investigated whether the effectiveness and efficiency of the single and multiple presentation of social stories differed in teaching the skills of participating in the invited activity and expressing thanks among individuals diagnosed with ASD. The findings of the research show that the effectiveness of single and multiple presentations of social stories in teaching the target skills to the individuals with ASD did not differ. It was observed that the use of single and multiple social stories in teaching skills of expressing thanks and participating in the invited activity is equally effective. The findings of the research show that, for all participants, the effectiveness of the single and multiple presentations of social stories was similar to that of the maintenance and generalization sessions as well as the intervention phase.

Findings from the comparison of single and multiple presentations of social stories in terms of efficiency show that they were similar to each other, and the findings were not consistently repeated for all participants. It was observed that the teaching intervention made by the single presentation of the social stories is more efficient for two of the participants. In terms of the number of sessions, the number of trials, the duration of the intervention, and the number of incorrect behaviors, teaching intervention implemented by using multiple presentation of social stories became more efficient for one participant. On the other hand, for the other participant, it was determined that the teaching intervention carried out by both single and multiple presentations of social stories were equally efficient in terms of efficiency parameters evaluated in the study. In terms of the total duration of the teaching sessions for this participant, teaching sessions with multiple social story intervention was found to be more efficient, with minimal difference. Findings could be interpreted to suggest that there is no significant difference between teaching interventions in terms of the efficiency parameters measured in this study.

There have been no published studies comparing the effectiveness and efficiency of single and multiple presentations of social stories for individuals with ASD. However, in one study, the use of more than one story for a target behavior was called a multiple presentation of social stories, and the effectiveness of this intervention was examined. Norris and Datillo (1999) examined the effectiveness of multiple social stories in order to reduce the inappropriate social interaction behavior of a girl with autism at lunch. The research findings emphasized that the intervention of multiple social stories reduces the number of inappropriate behaviors of the partcipant.

In this study, the multiple presentation of social stories was accomplished by acquiring the target behaviors at the criterion level. Therefore, the findings of this study show consistency with the findings of the study conducted by Norris and Datillo (1999).

The findings of this study comparing the effectiveness and efficiency of the intervention of social stories in two different forms are consistent with the findings of studies that show the effectiveness of social stories in the literature (Balçık & Tekinarslan, 2012; Kim, Blair, & Lim, 2014; Süzer, 2015; Wright & McChatren, 2012). However, the findings of the research revealed that the single and multiple presentations of social stories did not differ in terms of effectiveness and efficiency. While it was thought that multiple social story interventions would have more positive results in terms of effectiveness and/or efficiency parameters with the idea that participants would set the stage for meeting more and different situations, research findings show that both interventions were equally effective and efficient (Tekin-İftar, 2012b; Wolery et al., 1988). Possible reasons for this situation can be discussed as follows. Firstly, only the thematic differentiation of the stories used in single and multiple social story interventions, sentence types, the ratios of the sentences within the story, and the use of visuals in stories as equally as possible in terms of equating the distribution between the two independent variables for experimental control might be one of the explanations for this situation. In other words, descriptive, perspective, directive, and affirmative sentences used in the single social story intervention were used equally in the intervention of multiple social stories. Furthermore, no differentiation was made in the form of presentation of social stories during the differentiation of social stories. All stories were presented on a tablet computer and none of the social stories were presented in printed form. The lack of any difference in the effectiveness and efficiency of teaching interventions may be due to the fact that the participants were limited with only in school and that other environments to which participants are exposed were not included in the study. In further research, the single and multiple presentations of social stories can be compared again by adding these sampled changes to multiple social stories.

The GOBDÖ-2 TV and Leiter International Performance Tests were applied to all participants. Alpay's GOBDÖ-2 TV score was 97 and intelligence section score was 91; Kemal's GOBDÖ-2 TV score was 116 and intelligence section score was 51. Vefa's GOBDÖ-2 TV score was 94 and intelligence section score is 56. Ali's GOBDÖ-2 TV score was 90. Ali's intelligence section score could not be determined because of his indifference to the test. It can be stated that the participants have high GOBDÖ-2 TV scores. In addition, the scores of the participants on the intelligence section are also very low, except for Alpay. When the participants' characteristics are considered, it seems that multiple social stories were more efficient for the participants who have a higher intelligence scores. Furthermore, although the participants' language skills had not been measured by a standard scale, the researcher's subjective observations revealed a similar situation for Alpay, in which multiple social stories is more efficient. According to the findings, Alpay's intelligence score was 91, which is seem to be more fitting for multiple social stories. Alpay read social stories himself during the teaching sessions. This suggests that the multiple social stories might be more efficient for students whose language development and literacy skills are more advanced. According to the findings of the study, the intelligence section score of Kemal was 51 and single social stories were observed to be more efficient for him. Ali's intelligence section score could not be determined because of his indifference to the test. It could be considered that Ali and Kemal's intelligence scores were lower than that of Alpay, as well as their linguistic and verbal skills, which could have been a factor leading to this result. For this reason, it could be considered that single and multiple social story interventions may have different results in terms of effectiveness and/or efficiency among individuals with different characteristics. Therefore, there might be a need for further research aiming to examine the effects of single and multiple social story interventions on participants with different characteristics in terms of variables such as language development and intelligence score.

There were no significant differences between the single and multiple presentations of social stories in terms of generalization. Findings have not confirmed the expectations of researchers that multiple social stories could produce more positive results in generalizing target skills. In the study,

data were collected in various parts of the school for the target behaviors that were taught with both teaching interventions, by holding probe sessions in various contexts with the participation of various people. This might have raised the level of generalization for both independent variables, single social story intervention and multiple social story intervention, and might have prevented the emergence of a favorable outcome for multiple social story intervention. Therefore, it can be considered that, if all sessions are organized in the same environment and if the generalization is tested separately after completing the intervention phase, the generalization findings might favor the intervention of multiple social stories. Therefore, further studies can be planned in the future to determine the generalization effect of multiple social stories more clearly compared to single social stories.

According to the findings of this research that compared the social stories with the effectiveness and efficiency of single and multiple presentation of social stories, it can be said that there is no significant difference between the two interventions. Therefore, researcher can use the single and multiple social stories according to their preferences. Nevertheless, it might be useful to consider a few points. The process of preparing social stories consists of determining the target behavior, collecting information about behavior, writing social stories, and preparing the images according to needs of the learners and the target skills (Andrews, 2004; Carbo, 2005; Gray, 2000; Scattone et al., 2002). Several stages of this process should be repeated several times for multiple presentations of social stories. Multiple social stories require more practitioner preparation. In addition, the cost of the intervention can also increase if the social stories are presented with the printed material instead of on a tablet computer. Therefore, it may be possible for practitioners who intend to use social stories as a teaching intervention to prefer the intervention of a single social story by taking into account the preparation process and cost of the social stories.

When choosing an intervention, it is not enough to consider only the parameters related to the effectiveness and efficiency of this intervention; participants and their relatives should be satisfied with the changes that occur with the intervention and whether the target behaviors and the intervention are socially significant and acceptable are also considered (Horner et al., 2005; Kazdin, 1977; Kennedy, 2005; Kurt, 2012a; Sönmez, 2012; Wolf, 1978). In other words, social validity should be examined as well as whether an application is effective and efficient. The literature indicates that the more data collected from people, the better social validity will be determined (Kurt, 2012c; Schwartz & Baer, 1991). One of the strengths of this study is the findings of social validity. Social validity data were gathered from the participants, participants' mothers, fathers, and teachers in the study.

This study demonstrated several strengths. In the study, social validity data were gathered from the participants' mothers and fathers and also their teachers. The social validity findings of the study showed that participants, their parents, and their teachers expressed positive opinions about the study and were pleased with the intervention of teaching with social stories. The research findings are consistent with the literature on social stories, and it expands the understanding of the social validity of social stories (Acar et al., 2017; Balçık & Tekinarslan, 2012; Chan & O'Reilly, 2008; Cihak, Kildare, Smith, McMahon, & Quin-Brown, 2012; Olçay-Gül, 2012; Turhan & Vuran, 2015).

There are other positive aspects of the research as well as the findings of effectiveness and social validity. Firstly, participants encounter various people and environments during the study, therefore they generalized the target skills to different conditions. Subjective observations of the first author reflect that the participants increased their social competences within the school. For example, in one of the school days, Kemal took a soccer ball from a school staff member not involved in this study in a staff room, and then he thanked the school staff member. It was also observed that, during this interaction, the school staff unwittingly provided social reinforcement to the participant. The positive atmosphere between the staff and the participant was observed by the researcher and another teacher participating in the study. It could be taught that this study positively affected the social lives of participants outside the school, as the target skills acquired in this study were considered to have been generalized in other situations. For example, during the study, the researcher observed that, in the rehabilitation center, the participant Alpay approached a teacher and a student who were playing table tennis in the gymnasium,

and he expressed his desire to play with them. Another aspect of study is that all social stories used in the study were prepared on an tablet computer. Computers and their components can be used as effective teaching tools in the field of special education (Mancil et al., 2009; Sansosti & Powell-Smith, 2008). For example, a study conducted by Doody (2012) expressed that social stories presented on an iPad were effective in teaching target behaviors for three students diagnosed with ASD. It is thought that the use of computer-aided interventions in the preparation and presentation of social stories increases student motivation (Sansosti & Powell-Smith, 2008). In addition, the tablet computer's features such as taking pictures can facilitate social stories in the preparation process and reduce the cost of story preparation.

The target behaviors of this study were the skills of participating in the invited activity and expressing thanks, which the participants might need in their homes, schools, and other social environments. However, all sessions held during the research were conducted at the participants' school. The fact that all sessions were conducted in the participants' school can be considered as a limitation of the study. In addition, the fact that all people in the study were chosen among the participants' teachers and friends may have created a limitation on the generalization of learned behaviors to different people. Another point that can be considered as a limitation is that the themes used in the intervention of multiple social stories were only differentiated thematically; they were not differentiated in sentence ratios and genres, and the printed stories were not included in multiple social story intervention.

Considering the findings and limitations of the study, some suggestions can be made for further research. Firstly, similar research is needed to compare the findings based on single and multiple social story presentations in order to generalize the findings obtained from this research. In similar studies different skills can be taught to individuals with different characteristics. In future research, it is possible to make changes in sentence types and numbers as well as thematic characteristics of the stories to be included among multiple social stories. Multiple social story interventions can be performed using printed and video-social stories as well as social stories presented on tablet computers.

In conclusion, although there were no significant differences in the effectiveness and efficiency between single and multiple presentations of social stories in the teaching of target behaviors in this study, some of the participants and the teachers stated that they would prefer the intervention of multiple social stories more, and others would prefer the intervention of the single social story. Therefore practitioners can use the form of teaching they prefer, taking into account the preparation procedure of the multiple social stories.

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