

Family Generated and Delivered Social Story Intervention: Acquisition, Maintenance, and Generalization of Social Skills in Youths with ASD

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Abstract: The purpose of this study was to examine whether (a) family members were able to learn to write a social story and deliver social story intervention to teach social skills to their children (age 12 to 16) with ASD, (b) youths with ASD acquired and maintained the targeted social skills and generalized these skills across novel situations. Multiple probe design across three dyads (family members-youths with ASD) was used. Results showed that family members were able to write and deliver social story intervention with high treatment integrity and youths acquired the targeted social skills. Also they were able to maintain the acquired skills over time and generalize them to novel situations. Family members reported positive opinions about using social stories and social comparison data showed that after intervention, the social skill performance of the youth with ASD was found to be similar to their peers. Based on the findings, future research needs and implications for practice are discussed.

Social stories (SS) are defined as the process of sharing structured stories describing specific social situations in which a child with autism will encounter and appropriate responses to the social stimuli that will be encountered in that situation (Gray & Garand, 1993). They should be brief and written with certain formats and rules (Barry & Burlew, 2004; Gray & Garand). The implementation of it requires two main steps: (a) writing a story and (b) implementing it (Gray, 2002). Research has shown that SS are effective in teaching new skills to and decreasing inappropriate behaviors of children and youths with ASD (Croizer & Tincani, 2006; Delano & Snell, 2006; Hagiwara & Myles, 1999; Kuoch & Mirenda, 2003). Teachers and therapists are the primary implementers and only in a few studies researcher-parent partnerships were

used (Adams, Gouvousis, Van Lue, & Waldron, 2004; Dodd, Hupp, Jewell, & Krahn, 2008; Kuoch & Mirenda). Either teachers or researchers wrote and implemented SS in these studies. These studies have emphasized that parents, siblings, and grandparents can successfully implement SS written by researchers and positive outcomes obtained in the children's behaviors. However, to the knowledge of authors there is no study investigating whether family members were able to write their own SS and implement them by themselves.

During the 1960s there was a lack of studies investigating the role of parents as teachers. Teachers/therapists were supposed to deliver intervention in clinical settings to children with ASD in teaching new behaviors and/or controlling their inappropriate behaviors. However, neither maintenance nor generalization effects of these interventions were obtained (Lovaas, Koegel, Simmons, & Long, 1973) during these years. Considering the limited effects of the interventions delivered by teachers in the clinical settings, it was deduced that training family members as teachers could be a model for obtaining positive outcomes regarding maintenance and generalization (Koegel, Schreibman, Britten, Burke, & O'Neill, 1982). Since then, many studies investigating the effects of parent-delivered intervention have revealed that

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TABLE 1

Demographics of the Participants

Youths with ASD						Family Members			
Youths	Age	Gender	Diagnosis	Gilliam's Score	Social Skill Score	Family Members	Relation to Youth	Age	Education Level
Ali	12	Male	ASD	110	75	Neriman	Mother	36	High school
Umut	12	Male	ASD	97	65	Ozge	Mother	18	College
Berkant	16	Male	ASD	107	N/A	Berra	Sister	19	High school

parents could deliver intervention successfully and teach their children (Becker-Cottrill, McFarland, & Anderson, 2003; Johnson et al., 2007; Tekin-Iftar, 2008).

When reviewing the studies focusing on parent-delivered intervention it was seen that parents were taught to use effective teaching strategies including discrete trial teaching (Charlop-Christy & Carpenter 2000; Weiskop, Matthews, & Richdale, 2001), pivotal response training (Symon, 2005), and community-based instruction (Tekin-Iftar, 2008) for teaching new skills and appropriate behaviors. The outcomes of aforementioned studies have shown that parents of children with ASD who have limited communication and social skills and repetitive/stereotypic behaviors should especially teach communication and interaction skills and deal with their behavioral problems. Among the studies on parent-delivered SS, no study investigated parent-written and delivered SS in teaching social skills to youth with ASD. In addition to that, the paucity of research investigating effective procedures in teaching youths with ASD is very well accepted. Considering these needs in the literature, we designed a study to test whether family members of youth with ASD could write and deliver SS intervention reliably and youths in the study could learn the social skills that they needed. Maintenance and generalization effects of this intervention were also examined. Furthermore, social validity was examined. Based on the purpose of the study we attempted to answer the following research questions: (a) Do family members learn to write SS for their children correctly and implement it reliably? (b) Is parent-delivered SS effective in teaching social skills to youths with ASD? (c) If youths with ASD learn social skills through parent-delivered SS, will they maintain these skills 1

and 4 weeks after intervention and generalize the acquired social skills across persons and settings? (d) Do family members maintain the acquired SS writing skills over time and generalize the acquired skills on writing new SS for different target behaviors? (e) What were the opinions of family members about the study? (f) Do youths with ASD have similar performance on the social skills taught by their family members as compared to social skill level of their typical peers?

Method

Participants

Three family members (one sister and two mothers) who have youths with ASD in their families and their children (Ali, Umut, Berkant) with ASD were the participants of the study. The first author interviewed the family members about participation in the study. The purpose and procedures of the study were explained and a contract was signed with those who were willing to participate. Then family member-youth dyads were formed. All participants received their ASD diagnosis at a hospital from a pediatric psychiatrist. Gilliam Autistic Disorder Rating Scale-2-Turkish Version (Diken, Ardic, & Diken, 2011) was used to confirm their autism diagnoses. In addition to that Social Skill Rating Scale (SSRS; Gresham & Elliot, 1990) standardized to Turkish by Sucuoglu and Ozokcu (2005) was used for describing their social skill performance. Ali and Umut were below average on SSRS and due to his age Berkant did not take this test. It is applicable to children whose ages are between 3 to 12 years old. Demographics for the family members are presented at Table 1. All participants have deficiencies in social skills.

Settings and Materials

Two different settings were used during the study. Family members' training sessions were conducted at a meeting room of a Private Special Education Rehabilitation Center where the first author of the study was working. The researchers developed a handbook describing how to write and implement SS with many examples and practices. SS intervention sessions were conducted at each dyad's own house. Social storybooks written by the family members were used in these sessions. Each sentence is placed on a separate page in the books. Books usually have eight to 10 pages including some visual cues and photos of the youths. Beside these settings, depending on the social skills taught, road from home to school for Ali, school, special education center, and home for Umut and several settings such as shopping malls and streets where target social skill was expected to be performed by Berkant were used as natural settings for testing social skills. A handycam camera was used during sessions throughout the study.

Experimental Design

A multiple probe design with probe conditions across dyads was used in the study. The dependent variable was percentage of correct responses on the performance of the social skill assigned to the youths with ASD. The effectiveness of the SS intervention was demonstrated when the youth was responding at or near to baseline levels during probe sessions and the criterion was reached only after the intervention was conducted.

Target Behaviors

Greeting skill (i.e., saying hello), expressing his happiness or needs appropriately in response to others' behaviors/comments (i.e., giving a high five, saying thank you, giving a hug, asking to participate in an ongoing activities/game etc), and asking permission for having snacks or various items which his elder sister brings to him (i.e., "May I have the candy bar") were selected as target skills for Ali, Umut, and Berkant respectively. These social skills were assessed by designing/con-

trolling their environments. For example, Ali's target behavior was defined as saying "Hello" to the familiar friends/adults coming across during the 10-minute walk to the school. Therefore, coming across five familiar persons on the 10-minute walk to the school was planned for Ali, five occasions which make Umut happy were planned for him, and leaving Berkant's sister's handbag open with a candy bar inside alone five times a day in different places for Berkant were planned. Controlled event recording was used during data collection.

General Procedure

Prior to baseline, training of family members was administrated in a group arrangement. Baseline, intervention, maintenance, and generalization sessions were conducted in a one on one instructional format in the study. Prior to intervention, a pilot study was administrated with a sequence of description, modeling, writing, and implementing SS intervention to see whether any modifications/adaptations needed on the program with an 11 year old male with ASD. Except modeling phase, no modification needs appeared during the pilot study.

Parent training. Parent training sessions were conducted in a small group teaching arrangement on a weekend day and took 6 hours. The researcher took pre-post test measures to assess their entry level to the program and acquisition level of writing a SS. The crucial steps for writing SS are presented in Table 2. Table 3 presents the skills needed for testing correct implementation of SS intervention. Presentation of the parent-training handbook took place at the beginning of training sessions immediately followed by asking questions to assess their comprehension level. After ensuring correct responses for each question from each family member, the researcher modeled writing and delivering SS intervention. Modeling steps had two phases (a) modeling for writing a SS and (a) modeling for delivering SS intervention. Family members were required to perform the steps for writing SS presented in Table 2 at 100% accuracy. The quality of the implementation was evaluated by recording the correct answers given by family members. If they did not

TABLE 2

Crucial Steps for Social Story Writing Skills

<i>Steps for Social Story Writing Skills</i>	<i>Yes</i>	<i>No</i>
1. Giving a title		
2. Building the structure with an introduction (description of the situation), a climax (mentioning the reason of the inappropriate behavior, definition of the appropriate behavior and the reinforce), and a conclusion (emphasizing the feelings and thoughts of others against the targeted behavior)		
3. Answering the 5W1H questions		
4. Writing from the point of view of youth		
5. Using descriptive, guiding, reflecting and/or confirming sentences		
6. Following the rules for rate of sentences		
7. Using positive expressions		
8. Writing clear enough for the youth		
9. Using appropriate sentences and expressions		

meet the criterion on writing a SS, modeling step was re-exposed and continued until they performed the steps of writing a SS with 100% accuracy. After that the process of planning the intervention was initiated. During this process, family members were asked to identify a social skill to be taught. Probe, intervention, maintenance, and generalization sessions for testing the effects of SS were administered by the family members. During these sessions family members were required to deliver five training or probe trials for each social skill and collect data during these trials. They were also expected to perform the steps presented in Tables 2 and 3 for writing a SS and delivering intervention. Writing a SS for a family

member took approximately 3 min and implementation of it took approximately 2 min (range: 1 min 59 s and 4 min 29 s). The cost of developing a SS was approximately 2 US dollars.

Probe sessions. Full probe sessions were conducted simultaneously with each participant prior to intervention and after meeting criteria in the intervention sessions. A probe session was conducted per day during full probe conditions. Daily probe sessions were conducted to test acquisition after reading the SS. Family members conducted full probe and daily probe sessions in a controlled baseline format. That is to say that the researchers planned/controlled occasions suitable for

TABLE 3

Steps for Implementing Social Story Intervention

<i>Steps for Teaching Skills Using the Social Stories</i>	<i>Yes</i>	<i>No</i>
1. Offering the story in appropriate time (Offering the story just before the targeted behavior can be demonstrated)		
2. Offering in appropriate settings		
3. Offering clues (Hi now it is time for reading the story titled which I have written for you. Are you ready?)		
4. Reading the story		
5. Evaluating whether the story is understood (Asking 4–5 5W1H questions)		
6. Reinforcing the child, if the story is understood		
7. Ending the process by heading to the milieu (Let's)		
8. Repeating the reading and evaluating process when needed		
9. If the child is not able to answer the 5W1H questions after reading the story three times, ending the process as a model to the correct answers		

evoking the target social skills during these sessions. For example five different persons who are familiar to Ali were asked to be ready on Ali's school walk way. Five occasions for making Umut happy and satisfied were planned to evoke his response as a consequence. Berkant's older sister was required to bring a candy bar in her bag and leave this bag open alone in different rooms or places at home. Except for reading a SS during intervention all variables were kept constant. For assessing the participant's performance level on their target behaviors, Ali was observed by the first author when he goes to school from home. Five persons familiar to Ali were asked to hang around on his way and whether he greeted these persons was recorded by the first author. Probe sessions were conducted at home, school, and the special education center for Umut. Occasions for him to feel happy were created and his responses to these occasions were recorded. Rooms at Berkant's house were used during probe sessions and whether he asks permission to have candy bar from his elder sister's handbag was recorded.

Social story intervention. SS intervention sessions were conducted just before occasions or opportunities set by the researchers in which target social skills were supposed to be performed. Intervention sessions took place at each participant's home. Any place including the youth's room at home where the participants felt comfortable was used as intervention settings. Youth with ASD and their family member sat face to face or next to each other. After delivering attentional cue (e.g., "Berkant, are you ready? Let's start reading your story."), the family member read the story and raised comprehension questions (5W1H questions). Correct responses resulted in social reinforcement and incorrect responses resulted in re-reading the story and re-providing the comprehension questions. If a story was read three times and the participant did not answer those questions correctly during a session, then the correct response was delivered verbally and the participant was asked to step into the settings where the target social skills were expected to be performed. Once the participant met the criterion, fading SS reading was initiated. Fading was conducted in the content and the timing of the reading. Fading in the content was implemented in three ways

(a) omitting the directive sentence in the story, (b) reading only the title and first-last sentences of the story, and (c) showing the social story book prior to entering the occasions evoking the target social skills. In addition, fading was also planned by increasing the duration between the story reading time and occasions, in which target social skills were anticipated.

Maintenance. Maintenance probe sessions were conducted 1 and 4 weeks after the SS intervention. These sessions were conducted just like full probe sessions. Five probe trials were performed. Maintenance sessions were also administered 5 weeks after intervention for testing whether family members maintained writing and implementing SS.

Generalization. Generalization across settings and people sessions were conducted by pre-post test measures. Generalization across settings measures was taken for Ali when he was going to his special education center. Generalization data were collected in a shopping mall for Umut and with different persons and settings for Berkant. Pretest generalization sessions were conducted before SS intervention and posttest generalization sessions were conducted after the criterion was met by each participant. These sessions were conducted just like full probe sessions. Generalization was not tested for the participants but for the family members. Family members were asked to write a new SS for teaching different social skills.

Data Collection and Analysis

Data were collected to see whether family members would write SS correctly. The steps presented in Table 2 were used to estimate accuracy in writing a SS. The accuracy of writing a SS was estimated by calculating the percentage of correct responses (the number of correct response (step) / the number of total response $\times$ 100) presented in Table 2. Inter-observer agreement (IOA) and treatment integrity (TI) data were analyzed. Effectiveness data on acquisition, maintenance, and generalization were collected to examine whether SS written and delivered by family members were effective. Visual and graphical analyses were conducted to examine the effects of the SS intervention. Moreover, maintenance and generalization data for family members were

gathered in the study. Last but not least social validity data were collected to examine whether the aims, procedures, and findings of the study were socially valid. Social validity of the study was tested by social comparison and subjective evaluation. A norm group consisting of 10 males with typical development age 12 to 15 years was formed and their performance on the social skills aimed to teach the participants of this study were assessed. Subjective evaluation was administered to examine family members opinions regarding the study. The researchers developed a social validity question form including 14 closed-ended and four open-ended questions. Social validity data were analyzed by graphical and descriptive analyses.

Results

Findings about Writing SS Correctly

Family members' skills on writing SS were tested via collecting pre-post test data. Pretest sessions were conducted just before training them how to write SS and posttest sessions were conducted after training to write SS. They were asked to identify a prospective target behavior and write a SS for promoting/ changing it. Findings showed that family members were able to write SS with 22% accuracy in the pretest and 100% accuracy in the posttest.

Reliability Estimates

IOA and TI data were collected at least 30% of the sessions which were selected randomly. IOA data showed that at least 97% agreement was obtained across participants and sessions. TI data showed that family members were able to conduct probe, maintenance, and generalization sessions with 100% accuracy. Data also showed that intervention sessions were implemented 100% accuracy by Ali's and Umut's mothers and 86% (range = 80%–89%) accuracy by Berkant's sister.

Effectiveness Findings on SS Intervention: Acquisition, Maintenance, and Generalization

Figure 1 displays data for the effectiveness of family members who delivered SS in teaching

social skills to youths with ASD. Data revealed that youth with ASD were able to learn the social skills.

Ali performed his target behavior, saying hello to a familiar person, with 6.7% accuracy during baseline sessions. He met criterion at the third intervention session and showed 100% accuracy across three sessions. Sessions for fading the intervention started at the ninth intervention sessions. Umut performed his target behavior, saying thank you when appropriate, expressing his happiness appropriately, communicating his request kindly, giving a hug to a loved one in a normal magnitude, with 13.3% accuracy during baseline sessions. He met criterion at the seventh intervention session and showed 91% accuracy across the sessions. Sessions for fading the intervention started after having 93% correct performance across the last three intervention sessions. Moreover, he performed his target behavior with 6.7% accuracy during first full probe sessions and after intervention 100% accuracy across subsequent full probe sessions were obtained. Berkant did not perform his target behavior, asking permission to access desired objects/items, during baseline sessions. He met criterion at the eighth intervention and showed 90% accuracy across the sessions. Sessions for fading the intervention started after having 93% correct performance across the last three intervention sessions. He did not perform his target behavior during first two full probe sessions and after intervention 100% accuracy across subsequent full probe sessions were obtained. Fading sessions had three phases and they were terminated when the participants performed at criterion level.

In addition to these findings, all of the participants maintained their target behavior with 100% accuracy 1 and 4 weeks after intervention. Regarding generalization, none of the participants had any correct responses during pretest sessions and after intervention they generalized the acquired target skills with 100% accuracy across persons and settings.

Trend and level analyses were conducted in the study. Immediate effects of the intervention were conducted by subtracting the first data point of the intervention sessions from the last data point of the baseline session. The immediate effects of the intervention were 60

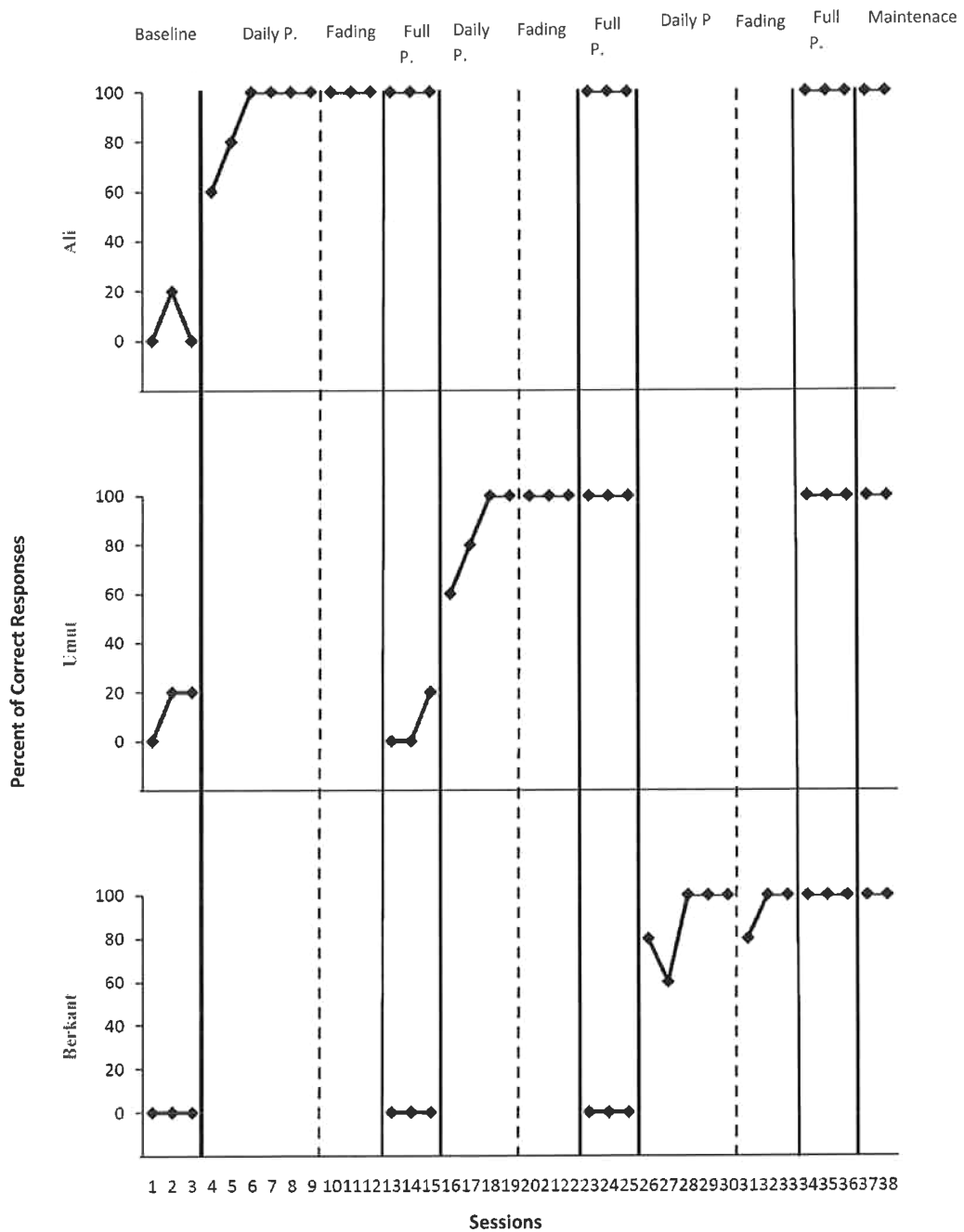


Figure 1. Percentage correct for youths during full, daily, and maintenance probe sessions.

for Ali, 40 for Umut, and 80 for Berkant. These findings showed that social story intervention had positive effects for promoting positive change in the target behaviors. Percentages of nonoverlapping data (PND) were

calculated for each participant. For all participants, the PND for the target skills was 100%. These findings showed that family delivered SS intervention had positive effects in promoting change in youths with ASD. Change in

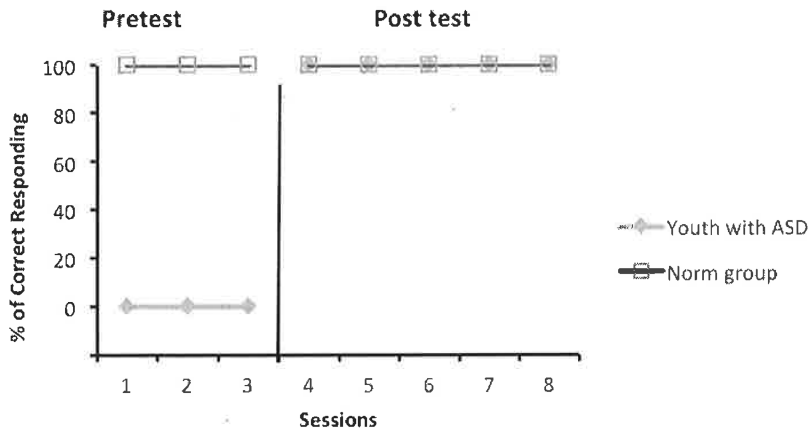


Figure 2. Social comparison data for youths with ASD and their typical peers on the social skills before and after social story intervention.

trend direction was evaluated visually in the study and was seen an accelerating change across to adjacent conditions (probe and intervention conditions).

Maintenance and Generalization Findings for the Family Members

Maintenance and generalization of SS implementation skill were tested in the study. Maintenance sessions were conducted five weeks after intervention. Data showed that Ali's and Umut's mothers maintained SS implementation skill with 100% accuracy and Berkant's sister maintained the same skill with 86% accuracy. Generalization skills were tested by asking family members to write a new SS for teaching different target behaviors and results showed that family members were able write it with 100% accuracy.

Social Validity Findings

Two types of social validity data were collected and analyzed. Youths with typical development age 12 to 15 years were tested on the skills that were planned to teach in this study. Pre-post test data collected from typical youths showed that they performed these skills with 100% accuracy. They were tested on the skill of saying "Hi" to a familiar person on different occasions, saying "Thank you, Oley etc." in the state of being happy, and giving a hug to someone in a normal magnitude, and asking

permission to access some desired objects. Data showed that youth with ASD had significantly lower pretest performance than their peers during pretest on the skills they were supposed to learn. However, after introducing SS intervention their performance seemed to be very similar to their peers. These data are presented in Figure 2.

Subjective evaluation of the opinions of the family members about the aims of the study, the appropriateness of the SS intervention in teaching social skills, and the importance of the findings in their lives were assessed. These data were analyzed descriptively. Overall, family members reported positive opinions on the parameters of the social validity described above.

Discussion

Findings showed that not only family members were able to learn writing SS 100% correctly after attending family members training sessions but also they were able to learn to implement SS intervention reliably. Data also showed that SS delivered by them were effective in teaching social skills to youths with ASD, maintaining the acquired skills over time, and generalizing these acquired skills to different people and settings. Regarding social validity of the study, social comparison data revealed that youths with ASD showed similar performance on social skills after SS intervention. Moreover, family members re-

ported their positive opinions regarding the aims, procedures, and the findings of the study. Based on these findings the following points need to be discussed.

To the knowledge of the authors only one study was designed for teaching three teachers of children with ASD to write SS and to implement it on decreasing inappropriate behaviors of their students (Quilty, 2007). Findings showed that although two teachers were able to implement SS intervention with 100% accuracy, the other teacher was able to implement it with only 67% accuracy. A decrease on the inappropriate behaviors was obtained as the effectiveness findings. Besides this study no study was found in teaching parents, siblings, or teachers to write SS to their children/students for the purpose of teaching social skills or controlling their behaviors. There are several studies that were conducted under researcher-parent collaboration. The researchers wrote stories and parents were asked to implement them to their children (Adams et al., 2004; Dodd et al., 2008; Kuoch & Mirenda, 2003). Considering the findings of all these studies, it can be concluded that parents are able to deliver SS intervention reliably and it was effective not only for teaching social skills but also for controlling and/or decreasing inappropriate behaviors. The findings of the present study are consistent with the findings of the previous studies. Therefore this study adds to the literature with its findings. Moreover, when considering the fact that parents wrote SS in this study, a significant contribution is added to the literature.

The following contributions of this study will be discussed by considering the effectiveness findings of the study. As said earlier, one of the most distinguished aspects of this study is about asking family members to write, deliver, and monitor their own SS intervention. In this respect, this study shows that parents can write SS and implement it reliably. This is especially important since it is very well documented that children with autism need intensive and continuous training in their lives. Giving a role to the parents in this respect has valuable contributions in their lives. The other positive aspect of this study is about the ages of the participants of the study. Youths with ASD took part in this study and there is a need in the literature for conducting research with

participants who are adolescents. Except for Washburn's (2006) study with three adolescents with Asperger Syndrome, there is no other study with adolescents.

Social validity assessment was used for testing clinical significance of the study. We used social comparison and subjective evaluation. The findings for both evaluations were highly positive and consistent with each other. Social comparison approach has not been widely used in the literature. Therefore, this study extends the literature on the clinical effectiveness of SS in terms of using social comparison analysis as well as subjective evaluation. Moreover, the findings of subjective evaluation and social comparison supported each other. Another aspect of this study related to the way of fading the SS intervention. The content as well as the timing of the SS intervention were faded in the study. Some sentences in the study were omitted as soon as the participants met the criterion. Also, the duration between reading the story and providing the occasions for the target behavior was increased after the criterion. During the intervention family members read the story just before providing the practice for the social skills and also when criterion was met, fading process took place on the day rather than between the days. The family members read the story at least three hours earlier than when providing the practice. Fading process included three phases in the study and this authentic fading plan can be taken as a contribution to the related literature. One of the points observed during fading process is worthy for discussion. In addition to observed quantitative changes in the performance in the target behaviors of the participants, qualitative changes have also been obtained in the study. During intervention sessions, Ali performed greeting behavior in a feeble voice without using his gestures/mimics; he performed this social skill not only by using verbal greetings but also by using a normal tone of voice and gestures/mimics. Umut used more natural body language and tone of voice when expressing his state of happiness during fading process. The same quality difference was observed in the performance of Berkant as well. He used a normal tone of voice and performed appropriate permission asking behavior during fading process.

Graphical analyses for the experimental sig-

nificance of the intervention were conducted by analyzing level and trend of the data within and between conditions. Within the findings of these analyses, special attention to level analysis is needed. Level change analysis showed that immediate effects of SS intervention are highly positive. This means that as soon as introducing the SS intervention, the level of data across participants has a significant rise towards criterion. The possible reasons for obtaining or at least facilitating these positive changes in the participants can be interpreted by considering the following parameters. First of all, participants do not have intellectual disabilities. Second, the participants might like to use their photographs in the SS book. This could be a motivator for them to read the book and comply with its content. Third, family members were able to identify the target behavior and write SS with high accuracy. Moreover, the most important parameter for explaining high level of behavior change in the participants can be due to the fact that family members were able to deliver SS intervention with a high reliability. On the other hand the characteristics of SS by itself should have a potential power for obtaining behavioral changes. Individuals with ASD perform better in predictable situations, are able to understand and process visual stimuli and prompts and need prompts in order to be socialize with their environment. In light of these characteristics it could be argued that SS allow them to use visual stimuli, include clear messages and define the target behaviors and possible occasions where target behaviors are supposed to be performed.

Data for the maintenance effects of this intervention have positive outcomes. Participants were able to maintain the acquired social skills at criterion level. Maintenance effects of the SS intervention in the previous studies have positive outcomes (Croizer & Tincani, 2006; Kuoch & Mirenda, 2003; Quilty, 2007). The present findings are consistent with the findings of the previous studies.

Two types of generalization data were collected. Generalization was tested on the behavior of family members and youths. Family members were asked to identify a new target behavior for their children and write a SS for obtaining desired change in the target behavior. Generalization for writing new SS for dif-

ferent behavior was tested by pre-post test measures as well. Generalization effects of the SS intervention on the behaviors of the youths were tested in pre-post test measures. In these measures generalization of the acquired social skills to different persons and settings were examined. Findings showed that both family members and the youths were able to generalize their acquired behaviors at 100% accuracy. These findings are supposed to strengthen the external validity of the study. External validity and generalization of the findings of a study can be considered as a significant concern in single subject research designs (Kazdin, 1982). External validity of the findings was obtained through replicating SS intervention within and between youths by introducing and withdrawing SS intervention. Conducting direct replication is another option for strengthening external validity of the findings. Direct replication was conducted by collecting repeated measures within and between youths over time.

Difficulty in generalizing the acquired behaviors is a well-documented problem in training children with ASD. Here, intervention was conducted in the natural settings of participants and in the presence of different people in study. In the past, there was a tendency to teach the behavior and then hope for generalization. But now, it is very well known that systematic planning for promoting/facilitating maintenance and generalization should be developed in the intervention plans. Generalization of the acquired social skills was very high in this study. The possible reason behind this performance can be explained by the settings and persons used in the study. Each social skill was taught in the natural settings where the social skill is supposed to be performed. Also, training sessions were conducted with the presence of different persons that are around the youth with ASD normally. These two points might have positive effects on the generalization performances of participants.

As mentioned earlier, data of this study was evaluated in terms of clinical significance via social validity analyses. Appropriateness of the aims, procedures, and results of the study was investigated through subjective evaluation. Positive outcomes were obtained as a result of these analyses. During this process family

members were asked to share which social skills they would like to teach their children. They preferred to teach the social skills that facilitate their social lives and provide access to the activities and events available around them. The social skills taught in the study were identified based on these opinions. Therefore, it can be hypothesized at the beginning of the study that these social skills may contribute to their daily lives. Hence, social validity of the study in terms of aims and significance of choosing these social skills was established. At the end of the study social validity results showed that family members still reported that teaching these social skills are important in their lives and had positive effects in their quality of life. Furthermore, social validity was tested by social comparison analysis. In order to do that data were collected from same age youths with typical development. As mentioned earlier, initially there was a significant difference between these two groups; however, after introducing SS intervention, their performances looked like each other. When reviewing the previous SS intervention studies in terms of the social validity assessment approach it is seen that 15 studies out of 17 used subjective evaluation (i.e., Adams et al., 2004; Croizer & Tincani, 2006).

In the present study, the performance of the social skills of participants was compared to the performance of the same behaviors of peers with typical development. Ten youths with typical development were tested on pre-post test measures. A dramatic difference was found during pretest measures and after introducing SS intervention posttest measures resulted in same level of performance. Although there seems to be some differences in collecting social comparison data from study to study, the main purpose of these studies is to determine whether participants perform/ behave in normal range after intervention. The social comparison findings of the study showed that after the intervention the performance level of the youth with ASD increased to the level of performance of their peers with typical development. Analyzing the social validity of the present study by subjective evaluation and social comparison and obtaining positive outcomes from both findings about

the social validity can be regarded as one of the strengths and contributions of this study.

Based on the findings and observations the following recommendations can be suggested. Schools and private clinicians can develop parent education programs similar to one used in this study for enabling them to provide intervention at home to teach social skills. SS intervention can be taught in these programs to parents and/or other caregivers. This strategy, teaching parents as teacher, can help to close the gap between school and home. In addition to that it can help to generalize the skills taught at the schools. The promising outcomes of this study allow us to suggest that the same study can be designed to see the effectiveness of SS intervention in different settings. Also, peer/sibling delivered SS intervention can be planned in the future research. This study is limited with teaching social skills to youths with ASD, and the effects of SS intervention in teaching skills from different developmental areas such as self-care, daily living, and independent living can be planned to examine. The effects of providing SS from mobiles or computers can be investigated. SS were presented in one-on-one arrangement in this study. Future researchers may look at the effectiveness of SS presented via group arrangement.

When reviewing the findings of the previous and present study the following conclusion can be made: (a) Family members were able to learn to write SS correctly and implement it reliably; (b) They were able to maintain these behaviors over time and generalize to write new SS to teach new behaviors; (c) SS delivered by family members are effective in teaching social skills to youth with ASD and also can generalize the acquired social skills across novel situations and maintain it after the intervention; (d) The development and implementation of SS intervention takes a short time and is cost effective; (e) Positive interaction between family members and youths was observed during intervention.

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