A Family-Centered Approach for Training Parents to Use Comic Strip Conversations With Their Child With Autism

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Family-centered services recognize the family as consumer; value the family’s beliefs, opinions, and priorities; and provide supports to achieve the family’s goals (Dunst, 2002; Wehman, 1998). Research has shown that family-centered intervention can help families to effectively address the social, communicative, and behavioral challenges that are characteristic of individuals with autism spectrum disorder (ASD; e.g., Girolametto, 1988; Kaiser, Hancock, & Nietfeld, 2000; Koegel, Bimbela, & Schreibman, 1996; Prelock & Hutchins, 2008). In a related vein, several studies have demonstrated the effectiveness of parent-training programs to enhance the functioning of children with ASD (e.g., Charlop-Christy & Carpenter, 2000; Drew et al., 2002; Gillett & LeBlanc, 2006; Moes & Frey, 2002; Seung, Ashwell, Elder, & Valcante, 2006). There is a need, however, to explore the feasibility of family-centered parent-training programs using telepractice to reach underserved populations in a cost-effective and resource-sensitive manner.

Telepractice (telehealth) has been described by the American Speech-Language-Hearing Association (ASHA) as

ABSTRACT: Purpose: There is a paucity of research examining the effectiveness of Comic Strip Conversations (CSCs) and the use of telepractice in family-centered practice to reach underserved populations. The purpose of this study was to examine the feasibility of a collaborative family-centered approach using a combination of face-to-face and telepractice service delivery models to train parents to implement CSCs successfully.

Method: A case-study method was employed. The participants were 2 parents and their 8-year-old daughter with autistic disorder. The parents participated in a 6-week training and implementation procedure involving weekly feedback from a research team to support appropriate implementation of the CSCs. Quantitative and qualitative data were collected via parent report to evaluate the process and outcomes.

Results: The parents were successfully trained to implement intervention in the conventional and recommended way (Gray, 1994). The use of CSCs in the home was deemed feasible and effective for addressing a range of social, communicative, and behavioral challenges. In addition, the parents reported other benefits of CSCs not previously explored in the research base.

Conclusion: The inferences that can be drawn from the case study are limited given the potential for threats to internal validity. However, this study offers tentative evidence for the feasibility of parent training to implement CSCs using a combination of face-to-face and telepractice techniques.

KEY WORDS: Comic Strip Conversations, autism, intervention, telepractice, parent-training
the application of telecommunications technology to deliver professional services at a distance by linking clinician to client, or clinician to clinician for assessment, intervention, and/or consultation. Telepractice may be used to overcome barriers of access to services caused by distance, unavailability of specialists and/or subspecialists, and impaired mobility. Telepractice offers the potential to extend clinical services to remote, rural, and underserved populations, and to culturally and linguistically diverse populations. (2005, p. 1)

Forms of telepractice may include, but are not limited to, telephone communication, Internet communication, videoconferencing, and digital video and/or document exchange. Parents and professionals have generally expressed high levels of satisfaction with telepractice, and this holds true in the field of speech-language pathology where telepractice has been used successfully as an alternative or complementary form of service delivery (e.g., ASHA, 2005; Crutchley & Campbell, 2010; Grogan-Johnson, Alvareas, Rowan, & Creaghead, 2010; Hill, Theodoros, Russell, & Ward, 2009; Kully, 2000; Mashima et al., 2003; Wilson, Onslow, & Lincoln, 2004). In fact, the use of telepractice has been demonstrated to be an effective service delivery approach that can be equivalent to face-to-face service delivery for the treatment of speech and language disorders (Georgeadis & Brennan, 2003; Grogan-Johnson et al., 2010; Harrison, Wilson, & Onslow, 1999; Waite, Theodoros, Russell, & Cahill, 2010). In light of the rising number of children being diagnosed with ASD (U.S. Centers for Disease Control and Prevention, 2010), the ability to provide effective services via telepractice has the potential to revolutionize practice, better meet the increasing demands for services, and address personnel shortages (Polovoy, 2008).

This study examined the potential use of Comic Strip Conversations (CSCs; Gray, 1994) as a home-based, parent-implemented intervention. With the paucity of research on the effectiveness of CSCs, it is instructive to first describe a similar story-based intervention known as Social Stories, which provides a theoretical framework in which CSCs are considered (Gray, 2010; Gray & Garand, 1993).

Social Stories

Social Stories (Gray, 2010; Gray & Garand, 1993) represent a popular and recommended intervention that can be used to support the social, communicative, and behavioral functioning of children with ASD (Hess, Morrier, Heflin, & Ivey, 2008; Reynhout & Carter, 2009). Social Stories have been used to address a wide range of challenges in pre-school and school-age children and adolescents with ASD who vary widely in their cognitive and linguistic profiles, although their efficacy for individuals with ASD and the most severe challenges remains an open question (Hutchins, in press; Scattone, Tingstrom, & Wilczynski, 2006).

Social Stories are individualized stories that objectively describe a social situation in order to facilitate social understanding and “theory of mind” (ToM; Gray, 1998, 2010). Gray (1998) argued that “theory of mind provides most people with access to a ‘secret code’: a system of unspoken communication that carries essential information; a system that eludes individuals with [ASD]” (p. 169). One important assumption underlying the use of Social Stories is that the social impairments of ASD do not lie solely within the affected individual but rather in the social space between people.

Social Stories typically follow a storybook format and are composed of a title, simple sentences, and visual supports (e.g., illustrations, photographs) to reinforce the key messages and capitalize on the visual processing strengths of individuals with ASD. They are a positive behavioral intervention, and Gray (2010) recommends that no less than 50% of Social Stories applaud what an individual is doing well.

CSCs

A less well-known and infrequently researched story-based intervention is the CSC (Gray, 1994). CSCs are used to “visually ‘work through’ a problem situation and identify solutions” (Gray, 1994, p. 1). A set of conventions has been offered for constructing CSCs. These include introducing the child to a conversation symbols dictionary that provides symbols for basic concepts, including listening, talking, thinking, and interrupting (Gray, 1994). A location symbol is typically drawn in the upper left-hand corner of the work area to identify where the conversation is occurring (Gray, 1994). Information is gathered about the situation as the adult guides the child’s drawings “with questions that help to ‘complete the picture’” (Gray, 1994, p. 8). Questions might include: Where were you? Who else was there? What happened? What did you say? What did others say? What did you think? and What did others think? (Gray, 1994).

The child is also encouraged to define a sequence of events by using boxes that are enumerated in the order in which events occurred (Gray, 1994). CSCs conclude by identifying new solutions to a problem, which are written down. The child is then asked to discuss the “pros” and “cons” of each solution. “Solutions which are no longer considered feasible are eliminated, and the remaining solutions are numbered in the sequence in which they will be used or tried” (Gray, 1994, p. 11). Color may be used to represent emotional content (e.g., the color red may be used to represent anger). However, no research has examined the effectiveness of color, and our experience suggests that the use of color may actually distract from or confuse story content. Indeed, the links between color and emotion that typically developing adults understand (e.g., “I was so mad, I was seeing red!”) likely lack meaning for individuals with ASD because these links are culturally defined, metaphorical, and nonliteral.

Very little research has been conducted on the effectiveness of CSCs, although the available research has yielded encouraging results. Rogers and Myles (2001) were the first to offer their impressions of the effectiveness of CSCs. They reported that a combination of Social Stories and CSCs helped an adolescent with Asperger syndrome to interpret social situations in a school setting more accurately. In this study, a teacher introduced Social Stories for several days, which were followed by CSCs (the number of presentations and the duration of intervention are unclear). The
teacher practiced CSCs with the student for 15 min per day by focusing on a social situation that the student identified as problematic. Anecdotal data were offered to characterize change in the student’s ability to accurately interpret social situations. The authors noted that the student enjoyed CSCs; they hypothesized that CSCs “were most effective in helping [the student] interpret social situations” (p. 313), and they argued that CSCs lead to palpable improvements in behavior.

Pierson and Glaeser (2007) also explored the use of CSCs in a school setting. They reported on CSC intervention for three students with ASD who exhibited signs of loneliness. In this study, one special education teacher and two paraprofessionals implemented CSCs in a self-contained classroom for children with mild-to-moderate autism. The teacher and paraprofessionals were trained in a 1-day district training and also received additional training from the study’s authors. To evaluate the effects of treatment, the teacher and paraprofessionals kept daily journals of observations of all three children for 2 weeks before intervention and for 6 weeks during intervention. Qualitative and anecdotal data suggested a decrease in loneliness and an increase in social skills in all three students. These results suggest that CSCs can be implemented successfully in a school setting by educators who are trained in the intervention strategy.

Hutchins and Prelock also reported positive (2006) and mixed (2008) outcomes associated with CSCs using an ABA single-subjects design. Unlike the studies described thus far (i.e., Pierson & Glaeser, 2007; Rogers & Myles, 2001), Hutchins and Prelock (2006, 2008) did incorporate a family-centered approach to intervention. In this study, intervention procedures were carried out in the home following parental (and often teacher) interviews, observations of the child, and formal assessments of child functioning. A priority was placed on understanding the family and the child’s strengths and challenges and responding to parents’ priorities for intervention. Intervention materials and evaluation procedures were also developed in collaboration with families. Unfortunately, like Rogers and Myles (2001), Hutchins and Prelock also combined Social Stories and CSCs, making it impossible to evaluate the relative contribution of each. In addition, the procedures of Hutchins and Prelock, while family centered, did not seek to train parents as implementers of the intervention.

As stated previously, there is extensive literature demonstrating the effectiveness of parent-training programs to enhance the functioning of children with ASD. Training parents in intervention procedures that are deemed feasible and effective is of the utmost importance: Parents are enduring sources of influence on the developing child, they know their child best, and as such, they are perfectly situated to address challenges as they unfold over time and across situational contexts.

**Contrasting Social Stories and CSCs**

CSCs are similar to Social Stories in many ways. Both are personalized story-based interventions that take advantage of the visual strengths of individuals with ASD. They are positive behavioral interventions that address a wide range of social, communicative, and behavioral challenges. In addition, they are both designed to facilitate the child’s access to social information and to support advances in ToM. Like Social Stories, CSCs may be administered using repetition and can be saved and reviewed again as necessary (Hutchins & Prelock, 2006, 2008). They may be introduced to address single or multiple intervention targets. Although rarely explored in the CSC literature, it is possible that new skills and understandings may be taught in a single exposure or after several repetitions (Hutchins & Prelock, 2006, 2008). Thus, the number of presentations required to effect change (if change occurs) is expected to vary considerably.

On the other hand, CSCs are quite unlike Social Stories in several important ways. Whereas Social Stories entail passive reception of content, CSCs recruit the child as an active participant. With CSCs, the child is encouraged, to the fullest extent possible, to assume responsibility for the majority of the drawing, writing, and conversation that are major components of the activity. CSCs are dynamic, and their content relies on the child, who co-constructs them. As such, CSCs provide rich opportunities for parent and child to talk through a challenging situation, ask questions, and probe understanding. In this way, CSCs may be particularly potent for facilitating mutual social understanding.

Compared to Social Stories, CSCs are less well known, and whereas the use of Social Stories is routine among many professionals who work with children with ASD, our experience suggests that parents and other caregivers are unlikely to develop them. Barriers to the development of Social Stories by caregivers may include lack of training in how to construct effective Social Stories, limited time to write and prepare the necessary materials, and lack of financial and computer resources (e.g., BoardMaker) typically used to construct them.

By contrast, CSCs may be particularly well suited for use by caregivers in a home setting. Although training in how to construct CSCs is needed, CSCs do not require the software programs and preparation time that are associated with Social Stories. With adequate training, a paper and pencil and the investment of time to carry out a conversation are all that are needed. Because CSCs are practical and portable, this intervention may prove to be especially feasible for families to apply in day-to-day life as challenges are presented.

**Statement of the Problem**

Recent research (a) supports a family-centered approach to intervention, (b) has demonstrated that parents are valuable partners in the intervention process, and (c) suggests that telepractice can be equally effective compared to a traditional face-to-face service delivery model for providing speech and language services. Meanwhile, very little research has examined the effectiveness of CSCs for addressing the social, communicative, and behavioral challenges in children with ASD. Research has also failed to examine the feasibility of training parents to implement CSC intervention with their children with ASD. The purpose of this
study was to examine, for the first time, the feasibility of family-centered parent training in, and implementation of, CSCs using a combination of face-to-face meetings and telepractice procedures. A pre-experimental case study approach was chosen because CSCs are in the early stages of scientific inquiry, and the study is meant to be exploratory. Indeed, the case study approach “has contributed to clinical research and practice by providing a rich source of hypotheses” and by “serving as a place to develop and apply intervention techniques” (Kazdin, 1981, p. 183). As such, this approach is appropriate for refining training and intervention procedures and developing additional research questions and directions for future study.

Two overarching research questions were explored:
- Can parents be effectively trained to use CSCs using a combination of face-to-face and telepractice techniques?
- What are the subjective and qualitative impressions of parents regarding the feasibility and efficacy of CSC intervention for use with children with ASD?

**METHOD**

**Participants**

The participants in this study were two parents and their 8-year-old daughter “Sarah” (pseudonym), who had been diagnosed with autistic disorder at 4 years of age. According to parent report, a pediatric neurologist diagnosed Sarah at age 4 using several measures. These included, but were not limited to, a neurological examination, a structured parental interview, a series of parent informant measures, and the Autism Diagnostic Observation Schedule (ADOS; Lord, Rutter, DiLavore, & Risi, 1999). The family (Sarah, her parents, and her typically developing siblings ages 4 and 17 years) lived in rural Eastern Vermont. The parents reported a combined annual (gross) household income of ~$115,000 per year. The mother had completed 3 years of college and worked with children with developmental disabilities as a shared living provider in which she was part of a team providing services to individuals with ASD. The father had completed 4 years of college and was currently working toward a master’s degree.

Sarah’s behavioral problems included impulsiveness with aggression, tantrums, inflexibility, lack of awareness of the needs or feelings of others, and some minimal self-injurious behaviors (biting her fingers). In the past, the family had attempted to use time-outs and/or loss of privileges to modify her behavior, but both were ineffective. The family also researched the use of applied behavioral analysis and relationship development intervention therapies, but the high costs and travel requirements made these untenable, and they were not pursued. The school made efforts in the past to intervene by introducing Sarah to Social Stories. However, Sarah’s parents were uncertain about the effectiveness of Social Stories. They reported that Sarah may or may not have exhibited positive responses to Social Stories, but that any changes were best characterized as minimal.

**Measures to Establish Confidence in Diagnosis**

Two standardized measures were administered to establish confidence in Sarah’s diagnosis of autism: the Social Responsiveness Scale (SRS; Constantino & Gruber, 2005) and the Gilliam Autism Rating Scale, Second Edition (GARS–2; Gilliam, 2006). Sarah’s scores on both supported the diagnosis of ASD. Sarah received a standard score of 84 on the SRS. This score is described as falling in the severe range. It is strongly associated with a clinical diagnosis of ASD and suggests a severe interference in social interactions (Constantino & Gruber, 2005). Sarah obtained an overall standard score of 83 on the GARS–2. This score and standard scores from the individual subscales (i.e., stereotyped behaviors, communication, social interaction) are associated with a “very likely” probability of autistic disorder (Gilliam, 2006).

**Formal Measures of Child Functioning**

Several formal measures of child functioning were also administered to Sarah to provide an estimate of her baseline performance. Sarah obtained a standard score of 106 on the Expressive Vocabulary Test, Second Edition (EVT–2; Williams, 2007), indicating expressive vocabulary performance in the average range. She received a standard score of 95 on the Test of Nonverbal Intelligence—Fourth Edition (TONI–4; Brown, Sherbenou, &约翰森, 2010), which also falls in the normal range. For a well-validated measure of receptive vocabulary, the Peabody Picture Vocabulary Test, Fourth Edition (PPVT–4; Dunn & Dunn, 2007), Sarah obtained a standard score of 119, indicating above-average receptive vocabulary skills.

For the social skills portion of the Social Skills Rating System (SSRS; Gresham & Elliott, 1990), Sarah received a standard score of 90, which is in the low-average range. For the problem behavior portion of the SSRS, Sarah received a standard score of 134, placing her in the 98th percentile for her age (in this case, higher scores are associated with higher degrees of problematic behavior).

The Theory of Mind Inventory (ToMI; Hutchins, Prelock, & Bonezinga, 2011) is designed to assess child ToM development. The measure consists of 48 statements assessing a range of ToM abilities (e.g., “My child empathizes with others,” “My child can communicate to me that s/he wants something”). The ToMI was administered before and after intervention. At pre-intervention, Sarah’s score placed her in the 17th percentile (standard score = 85) when compared to other individuals on the autism spectrum.

Data for all scores are presented in Table 1. These data reveal that Sarah demonstrated strengths in the areas of receptive and expressive vocabulary and nonverbal intelligence but challenges in the areas of social skills, problematic behaviors, and ToM development.

**Materials**

*Text resource.* As part of the training, the parents were provided with a copy of the resource, *Comic Strip Conversations*.
This very brief booklet contains Gray’s (1994) basic instructions and recommendations for constructing CSCs.

CSC materials. The family was given a binder that included paper and pencils for implementing the CSCs. The paper size was 11 x 17 inches, which is typically large enough to accommodate all of the drawings that occur in a single conversation about a particular event. As per Gray’s (1994) recommendations, colored pencils were provided as an option for use during construction of the CSC. The family was also provided with a CSC log sheet to record the date(s) and topic of discussion for each CSC. Finally, the binder contained several copies of a fidelity checklist that described Gray’s recommended procedures for constructing CSCs. To support proper and consistent implementation, Sarah’s parents were asked to complete a fidelity checklist for each intervention session.

Post-intervention interview. The post-intervention interview was designed to assess the feasibility and efficacy of the intervention. The interview was developed in line with recommendations proposed by Westby (1990) and Spradley (1979), who described strategies to obtain information in a family-centered and culturally competent manner. Both “grand tour” questions to probe broad experiences and “mini tour” questions designed to identify more specific, detailed accounts of behaviors, thoughts, or events were used. Care was taken to ensure that the content of the interview avoided leading questions by offering both positive and negative possibilities (e.g., “Did [child’s name] want to do CSCs with you or did she resist?” “Would you recommend CSCs for other families with children with ASD or would you not?”).

Equipment

Flip camera. The family was offered a flip camera to record intervention sessions. The parents informed the researchers that they already owned a flip camera, and they opted to use their own camera for recording the intervention sessions.

Design and Procedure

This research used a case study approach that involved three major phases. Phase I was carried out in a face-to-face meeting at the family’s home that consisted of three components: formal assessment of the child’s functioning, an introduction to CSCs, and development of a plan for parent training and implementation. Phase II involved ongoing consultation with, and feedback to, parents via telepractice over a 6-week period. Phase III involved a face-to-face post-intervention assessment using the post-intervention interview described earlier.

Phase I.

Assessment. During the initial visit, parents were interviewed so that we might learn about Sarah’s strengths and

<table>
<thead>
<tr>
<th>Measure</th>
<th>Standardized score</th>
<th>Percentile rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peabody Picture Vocabulary Test—4</td>
<td>119</td>
<td>90th</td>
</tr>
<tr>
<td>The Social Responsiveness Scale</td>
<td>84</td>
<td>N/A</td>
</tr>
<tr>
<td>The Social Skills Rating System</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Social Skills</td>
<td>90</td>
<td>25th</td>
</tr>
<tr>
<td>b. Problem Behaviors</td>
<td>134</td>
<td>98th</td>
</tr>
<tr>
<td>Theory of Mind Inventory: 1st Session</td>
<td>85</td>
<td>17th</td>
</tr>
<tr>
<td>Theory of Mind Inventory: Final Session</td>
<td>100</td>
<td>50th</td>
</tr>
<tr>
<td>Test of Nonverbal Intelligence—4</td>
<td>95</td>
<td>35th</td>
</tr>
<tr>
<td>Gilliam Autism Rating Scale—2</td>
<td>83</td>
<td>13th</td>
</tr>
<tr>
<td>a. Stereotyped Behaviors</td>
<td>5</td>
<td>3rd</td>
</tr>
<tr>
<td>b. Communication</td>
<td>8</td>
<td>25th</td>
</tr>
<tr>
<td>c. Social Interaction</td>
<td>9</td>
<td>37th</td>
</tr>
<tr>
<td>Expressive Vocabulary Test—2</td>
<td>106</td>
<td>66th</td>
</tr>
</tbody>
</table>

Note. Peabody Picture Vocabulary Test—4 (Dunn & Dunn, 2007), Social Responsive Scale (Constantino & Gruber, 2005), Social Skills Rating (Gresham & Elliott, 1990), Theory of Mind Inventory (Hutchins, Prelock, & Bonezinga, 2011), Test of Nonverbal Intelligence—4 (Brown, Sherbenou, & Johnsen, 2010), Gilliam Autism Rating Scale—2 (Gilliam, 2006), Expressive Vocabulary Test—2 (Williams, 2007).
challenges and the family’s needs, concerns, and priorities for intervention. We then conducted a battery of pre-intervention measures (described above) to gather baseline data.

Introduction to CSCs. Parents were provided several materials (Gray’s booklet [1994], relevant articles, and a videotaped example of a CSC on DVD) to support their understanding of the rationale behind CSCs as well as the recommendations for implementing them. The videotaped example featured a child with ASD constructing a CSC with his clinician and was provided as an additional model the family could use for reference after the research team had left. During this visit, the parents asked how often CSCs should be completed to address a particular topic. Parents were informed that, although there is limited research in this area, extant data suggest that the number of repetitions needed to establish positive outcomes is expected to vary considerably across children, targets, and contexts. In order to direct their decision making, it was suggested that parents be guided by their intuition and that CSCs be considered similar to any other conversation that the parents might have with their children: at times, several conversations around the same topic may be deemed appropriate, and at other times, a single conversation may be all that is needed. We also suggested that the parents integrate affirmative CSCs to acknowledge and celebrate what Sarah was already doing well, and that such a topic would be an excellent idea for a first CSC.

A CSC was then modeled for the parents by the second author, who is a researcher with experience in implementing CSC intervention. The topic of the CSC (“Trouble at Bedtime”) was determined in collaboration with the parents, who were asked to identify a challenging situation that occurred in the home. The researcher introduced the CSC to Sarah in the family’s dining room. Sarah was seated next to the researcher at a table. Sarah’s parents were asked to observe the CSC and to offer input during the conversation when information was lacking or imprecise. It was important to demonstrate that all CSC content be relevant, meaningful, and accurate. A rationale was offered to explain to Sarah that drawing while talking can be helpful in thinking through problems and coming up with solutions. All of the key components described in this paper’s introduction were incorporated (e.g., the use of a comic symbols dictionary, location symbol, drawing and writing conventions, identification of solutions, summary). The CSC took ~30 min to complete.

Planning for training implementation. At the conclusion of the initial visit, the family was asked to use CSCs with Sarah for 6 weeks, with continuous support from the researchers. Due to their location (~2 hr from the university), it was decided that training would be best facilitated through the use of a variety of communication modes including mail, e-mail, and telephone. The option of using Skype, a privatized YouTube channel, or other Internet resources were explored; however, the family was unfamiliar with this technology and reported that they felt adequately supported by mail, e-mail, and telephone.

Phase II.

Parent implementation of CSCs. Phase II was carried out over 6 weeks following the initial visit. Both parents participated in the training and implementation of CSCs. For implementation, parents took turns doing CSCs with Sarah. In line with our recommendations, the parents decided that their first CSC would focus on a positive situation (i.e., making Valentine’s Day cards). The parents subsequently engaged Sarah in several CSCs focusing on a diverse set of challenging situations (in the home, school, and community), but they often returned to a variety of affirmative CSCs (e.g., getting star stickers at school) to acknowledge Sarah’s successes and encourage her participation in CSC intervention. A schedule of the CSCs by topic is presented in Table 2. Parents reported that they often returned to the topic of a previously introduced CSC by posing simple questions (e.g., “Do you remember the CSC we did about…”) to remind Sarah of the key themes in the stories (review dates are given in parentheses). Sometimes, the CSC was also retrieved to facilitate these conversations, but this was relatively infrequent as the parents reported that it was typically not needed to remind Sarah about the content of the conversation.

The nature and degree of support that we provided fluctuated over the course of the study and was guided by the parents’ questions, commentary, and need for continuing guidance. Early on, the parents reported that Sarah sometimes objected to the videotaping despite the parents’ reassurances that the purpose of video recording was to evaluate the parents’ (as opposed to Sarah’s) performance. Nevertheless, the parents were able to record the first three CSCs (two carried out by the father and one carried out by the mother), which they mailed (along with the fidelity checklists) to the researchers for review.

Review of the videotapes and intervention fidelity checklists suggested that the parents did a good job of implementing the CSC intervention. The parents were applauded for their conscientiousness surrounding the recommendations and conventions for implementing CSCs. More specific feedback typically acknowledged the parents’ effective approach to conversation. The parents’ ability to deliver CSCs (even those dealing with extremely challenging situations) in a relaxed and nonthreatening manner was notable. The parents were successful in posing questions to Sarah that probed her understanding. They helped her make connections between the causes and consequences of behaviors. They also guided her in constructing a coherent narrative that incorporated the interpretation of events from multiple perspectives.

A few considerations were offered for future CSCs. For example, we recommended that the parents encourage Sarah to incorporate more talking and thinking bubbles to show what people say and think. We also suggested that the parents ask Sarah to write down a number of possible solutions, evaluate the solutions, and indicate which solutions would be tried first. A comparison of CSCs in the first and final weeks of intervention demonstrated that the parents made adjustments in response to the first two suggestions (see Figure 1). We also observed that the use of color seemed to distract Sarah from the salient topics of conversation while also noting the potential for the use of color to enhance Sarah’s interest and engagement in CSCs. We recommended that the parents weigh these possibilities and...
make a determination as to whether the use of color should be continued. The family chose to retain the use of color throughout the course of study.

**Phase III.**

**Postintervention assessment.** At the conclusion of the training and implementation, the first author met with the family for a final visit. The family was offered the opportunity to meet in their home, but because they were planning to travel to the vicinity of the researchers, a time was scheduled to conduct the final visit at the University of Vermont. During this face-to-face visit, the post-intervention interview was conducted to assess the feasibility and effectiveness of CSCs. The interview took ~30 min to complete. The interview was audio recorded for later transcription.

During the final visit, the ToMI was readministered to Sarah, and the parents were provided a complete report of the results of the assessments that were conducted at the initial meeting. The principal investigator made copies of all of the CSCs and returned the originals to the family. The family requested to keep the original CSCs so they could use them with Sarah. They also planned to train school personnel, family members, and other service providers to use CSCs with Sarah.

### Table 2. Topic of Comic Strip Conversations (CSCs) and dates they were introduced. Affirmative stories are indicated in bold.

<table>
<thead>
<tr>
<th>CSC title (general topic of conversation)</th>
<th>Date CSC introduced (revisited)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trouble at bedtime (finding better solutions than crying and yelling at bedtime) (modeled by researcher)</td>
<td>2/12/11 (3/6/11; 3/9/11; 3/15/11)</td>
</tr>
<tr>
<td><strong>Making valentines with my brother</strong> (a positive interaction between Sarah and her brother)</td>
<td>2/13 (3/3/11)</td>
</tr>
<tr>
<td>Phone call from school (getting an out of class time-out)</td>
<td>2/14/11 (3/11/11; 3/13/11)</td>
</tr>
<tr>
<td>The thinking chair (how to avoid talking back to the teacher)</td>
<td>2/16/11</td>
</tr>
<tr>
<td><strong>Star sticker</strong> (earning stars for good behaviors)</td>
<td>2/17/11</td>
</tr>
<tr>
<td>Being called names (getting bullied on the bus)</td>
<td>2/21/11</td>
</tr>
<tr>
<td><strong>Home with my sister</strong> (making plans to stay home with her big sister)</td>
<td>2/22/11</td>
</tr>
<tr>
<td>Going to Aubuchon (going where you need to even when it’s no fun)</td>
<td>2/23/11 (3/15/11; 3/19/11)</td>
</tr>
<tr>
<td>Being offered food you don’t want (what to say in this situation)</td>
<td>2/25/11 (3/19/11)</td>
</tr>
<tr>
<td><strong>Math</strong> (Mom comes to school to help out)</td>
<td>3/2/11</td>
</tr>
<tr>
<td><strong>Getting along</strong> (about positive interactions with her brother)</td>
<td>3/3/11 (3/6/11)</td>
</tr>
<tr>
<td>A bad idea (telling brother to do something he shouldn’t do)</td>
<td>3/9/11</td>
</tr>
<tr>
<td>Using your expressions (how to talk to others about your feelings)</td>
<td>3/11/11 (3/13/11; 3/23/11)</td>
</tr>
<tr>
<td>Punching is bad (avoiding hitting friends at school)</td>
<td>3/13/11 (3/15/11; 3/19/11; 3/23/11)</td>
</tr>
<tr>
<td>Being grumpy (finding better ways to talk to mom and dad)</td>
<td>3/15/11 (3/19/11; 3/21/11)</td>
</tr>
<tr>
<td><strong>Brother is ill and I care</strong> (expressing compassion)</td>
<td>3/17/11</td>
</tr>
<tr>
<td>Being yucky when asked to do something (responding to requests)</td>
<td>3/19/11 (3/21/11; 3/34/11)</td>
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<tr>
<td>Doing things I don’t want to do (learning how to negotiate)</td>
<td>3/21/11 (3/24/11)</td>
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<tr>
<td>Getting an out of class time-out (how to avoid time-outs at school)</td>
<td>3/23/11</td>
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<tr>
<td>Doing a CSC with [personal care assistant’s name] (how to communicate with a new personal care assistant)</td>
<td>3/24/11</td>
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Figure 1. Comic strip conversations from the first and final weeks of intervention.
Findings

Quantitative assessment of ToM. At the initial meeting, Sarah received an average ToMI score of 8.27 (possible scores range from 0 to 20, with higher scores indicating greater perspective-taking abilities), putting her in the 17th percentile (standard score = 85) when compared to other individuals on the autism spectrum. When the assessment was re-administered at the final interview, Sarah received an average ToMI score of 9.91, placing her in the 50th percentile (standard score = 100), which is almost exactly 1 SD above her initial score.

Qualitative assessments of feasibility and effectiveness. To assess the feasibility and effectiveness of the intervention, the post-intervention interview was transcribed from the audiotape to facilitate interpretation and reporting of the parents’ experiences surrounding the training and intervention. We also examined the content of e-mail correspondences over the course of the study, and these are reported when relevant. Examination of the parents’ testimony revealed a set of interrelated themes. These involved the parents’ impressions of (a) the service delivery and data collection procedures, (b) the feasibility of CSC interventions, (c) the effectiveness of CSCs to promote more appropriate behaviors, (d) the potential to use CSCs to address challenges across settings, and (e) the effectiveness of CSCs to enhance social understanding.

Service delivery and data collection procedures. Sarah’s parents expressed an overall satisfaction with mail, e-mail, and phone communication. The mother described the use of telepractice as “a benefit to reach out. We felt like if we had any questions, we could e-mail or call you at any time. We felt completely comfortable.” The parents noted that they would have preferred to videotape the CSCs more frequently; however, this was difficult as Sarah sometimes refused to participate.

Feasibility of CSCs. Sarah’s parents communicated that CSCs were a feasible intervention. The mother described how the CSCs were ideal in that they were “quick, easy, and simple.” The parents also viewed CSCs as an intervention that could be used flexibly. They were pleased with the way CSCs fit into their schedule, and though they had not yet used CSCs outside of the home, they anticipated doing so in the future. As the father recounted, “I could imagine that there will be opportunities for more spontaneous use...we can just grab a napkin at a restaurant or something and maybe not even make it three steps you know, but just have like one little comic to be like what’s going on right here kinda thing.” In a related vein, the mother explained that she had already recommended the use of CSCs to two other families with children with autism who did not seem to enjoy drawing. She described “how it could be a discussion and the parents could be more the vehicle that draws. In that way, there is still that same ability to get out there and talk...They can certainly do that and take turns and have the son write instead of draw if they wanted.”

Effectiveness of CSCs to address challenging behaviors. Both parents reported that CSCs “definitely helped” to facilitate more appropriate behaviors in Sarah. One example the mother provided was in reference to the CSC (“trouble at bedtime”) that had been modeled for the parents during our initial face-to-face visit.

Sarah had this concrete memory of new people coming in, and taking an interest, and she showed a strong drive to want to do what was right, where her normal pattern might have been one of extreme quick agitation. She held back a bit, so it was nice to see. She needed a new direction also and she was embracing it as much as we were.

In fact, the parents reported that they had not seen improvement in some of Sarah’s behaviors for years (e.g., going to bed). Therefore, the father described the improvement as “noteworthy.” “I think it’s pretty remarkable that there is any improvement in 6 weeks. You know like the bedtime thing, within a week or two, we could notice that there was a change.”

The mother also saw value in CSCs as a preventive strategy.

I definitely felt that it had merit and if we saw signs that we were going downhill, it’s a really good tool to engage in more discussion with her...It helps us and her to de-escalate and defuse so we found it really positive. I don’t think it changes the core deficits, but it felt proactive which was really helpful for us. It doesn’t feel like we’re just sitting back watching something that we can’t participate in. It gives us more hope to help her understand other people’s feelings and thoughts and perspectives and our hope is that we keep doing it and she’ll start to have, you know, that bank in her mind, some ideas to pull from that’s kind of black and white in her memory of possibilities.

The parents further related the importance of affirmative stories to ensure success with CSCs:

Mother: “Because she’s aware otherwise and it would make it more daunting.”

Father: “In fact, we even brought that up to the school because it seems like all of the dialogue is about a reaction to a negative event so it just sort of fosters focus on that stuff. It would be nice to occasionally balance it out.”

Mother: “It would be more effective, more neutral, and get more genuine, positive results.”

Father: “Right, and less of a sense of ‘oh boy’ here we go again with another conversation about something that went bad.”

Potential to use CSCs to address challenges across settings. Sarah’s parents conveyed how they viewed CSCs as a valuable tool with the potential to address any challenging behaviors of Sarah’s across settings. For example, the parents had been confronted with a difficult situation at school, and CSCs afforded them the opportunity to discuss it with Sarah, find a solution, and describe their needs to the school. During the first week of intervention, the mother e-mailed:

I have spent a good deal of time agonizing over where [Sarah] was falling through the cracks at school and here we sit down together for one CSC and it came together so easily for me. I just needed you to know how much it has helped already. You have my devoted attention at this point, I feel like we are making some MAJOR progress so quickly.
The mother elaborated on this theme during the post-intervention interview, reporting that:

We have received so many notices home about bad behavior at school. The great news is that we aren’t totally despondent; we’re not going in with our tail between our legs, we feel like we can go in positively and say “we’re working, we’re doing this at home, its helping, let’s try to come together and help each other work through this. It’s really helped us.”

The mother further explained that she hoped to train school personnel to use CSCs:

We would like to see some of the staff trained to do this with her, like in the resource center, they know enough to send a child out to a timeout, but if they’re not diffusing them in a way that the child’s comfortable and is able to participate in figuring out what they did, what they could do differently next time, it’s not really that helpful. That’s what we were thinking we could present as a solution, because they don’t have one currently, so it’s been helpful.

Effectiveness of CSCs to enhance social understanding. When asked whether or not Sarah’s social understanding was enhanced through the use of CSCs, the mother responded:

I think in this small amount of time it’s marginal, but I think positively about it knowing her that in the future over a longer period of time, I actually think we would see a measurable difference.

The father also underscored the importance of repetition and review to advance Sarah’s understandings. “At first the material may not stick…. So there are opportunities for growth and improvement just through repetition of understanding how other people perceive being yelled at or hit or kicked or whatever.”

In a related vein, CSCs were described as a tool to help adults develop a more accurate understanding of the child’s perspective. When asked, “Do you think you have a better understanding of [Sarah] or no?” the mother replied, “Way better.” She offered the following example. During the course of study, there was an incident at school when Sarah threw a piece of paper on the floor and was sent to an out-of-class-timeout. Her mother explained:

I didn’t want to go [to the school] and say you’re doing something wrong and not have a solution. I didn’t fully understand [what happened], I had a gut feeling it wasn’t ok but I didn’t know how to verbalize it and I didn’t know where to look to find what was wrong. It was overwhelming and when we sat and worked this out, it was so incredibly clear to me how [the school] was failing, and it made it so much easier to say why it’s not working. It gave us a very clear piece to go in with confidence and say, “we need help with this, let’s change some things.”

DISCUSSION

The purpose of this study was to examine the feasibility and effectiveness of a family-centered parent-implemented intervention using CSCs in the home. Recall that two general research questions were explored:

• Can parents be effectively trained to use CSCs using a combination of face-to-face and telepractice techniques?

• What are the subjective and qualitative impressions of parents regarding the feasibility and efficacy of CSC intervention?

With regard to our first research question, the parents’ reports surrounding the service delivery model (a combination of an initial face-to-face meeting and subsequent use of telepractice) were generally positive. They reported feeling adequately supported, with minor challenges involving the ability to videotape their child, who was sensitive to the presence of the camera. When children object to the use of videotaping via conventional means, it may be worthwhile to explore the potential to use Skype or other interactive web-based technologies. This particular family preferred not to use Skype; however, an introduction to the technology during our initial visit may have encouraged the parents to consider this alternative. This underscores the importance of the initial face-to-face visit for developing family-centered plans to conduct telepractice. The face-to-face visit also was important in establishing rapport and for modeling the first CSC with the child, where it is recommended that the adult and child be seated next to each other so that they can jointly attend to the writing and drawing of the story. Because we combined telepractice with an initial face-to-face visit, however, it is not clear whether a strict telepractice-only approach would have been effective for this family. Future research to develop ways to effectively engage parents and children through the use of telepractice only are worthwhile and have the potential to further enhance access to services.

We imagined that because CSCs are practical and portable, they may prove to be especially feasible for families to apply in day-to-day life. Support for this position was found in the parents’ stories. They described how they might use CSCs to address a variety of challenges, and they proposed adapting procedures in ways that were sensitive to the demands of the situation and the needs of their child.

To address our second research question, the parents reported on the effectiveness of CSCs to promote more appropriate behaviors and emphasized the potential of CSCs to address challenges across settings. CSCs were seen as a practical tool that had great utility from the perspective that it empowered the parents to engage in problem solving with service providers so as to implement more positive and promising interventions. Enabling parent participation in a child’s education can positively affect the way parents work with service providers and has the potential to enhance the parents’ and service providers’ understanding of their child’s strengths and challenges in the broader context. This is supported by the ecological framework of family-centered care, which posits that a child’s development is influenced by interactions among settings as well as the formal and informal social structures that affect the child (Wehman, 1998).

Sarah’s parents characterized Sarah’s advances in ToM as marginal in a short 6-week period, and this is consistent with the modest increase in scores observed on the ToMI, which was administered both before and after intervention. Of course, it is not possible to attribute a change in scores
to treatment as there are a number of threats to internal validity (e.g., history, maturation) using a single case study (Kazdin, 1981). Furthermore, any change associated with intervention could reflect advances in the child’s ToM or changes in parents’ understanding of the processes behind a child’s thinking. This is consistent with the parents’ report that they gained a better understanding of Sarah’s perspectives. Gray (1998) suggests that Social Stories and CSCs are effective because of their potential for enhancing ToM and because the deficits of ASD do not lie solely within the affected individual but rather in the social space between people. Thus, the benefits of CSCs may not only involve the effects they can have on the child, but also the effects they can have on the adult(s).

There was evidence to support the notion that the number of repetitions to support positive outcomes should be expected to vary, and this is consistent with the limited previous research in this area (Hutchins & Prelock, 2006; 2008). For this reason, it is advisable to repeat a CSC several times before abandoning it as adjustments or additional dialogue may be needed to secure desirable outcomes. In a related vein, we found support for the use of affirmative CSCs. Like affirmative Social Stories (Gray, 2010), affirmative CSCs may be potent because they add meaning and detail to praise. As such, an affirmative CSC appears to be an excellent topic for a first story, and the regular use of affirmation CSCs may be important, even essential, to maintain the child’s motivation to engage in CSCs and secure positive outcomes.

This study tentatively suggests that it is possible to train parents to use CSCs effectively using a combination of face-to-face and telepractice methods, and this is consistent with previous research examining telepractice to deliver speech and language services (e.g., Georgeadis & Brennan, 2003). This gains importance in light of the increasing number of individuals who are diagnosed with ASD and the increasing demand for services. To replicate or expand this study, telepractice methods should be guided by the needs and desires of individual families using a family-centered approach. Of course, this will require a degree of flexibility on the part of the research team or service providers to employ a range of methods (e.g., video conferencing, video transfer services, telephone, e-mail, conventional mail).

It will also be essential to examine whether there are certain participant characteristics that predict success with CSCs. Sarah is an extremely bright child with age-typical verbal and cognitive skills. She is friendly, she seeks social interaction, and she is eager to please her parents and others around her. In the opinion of the research team, Sarah’s parents are tremendously skilled, responsive, and sensitive caregivers who were motivated to learn new ways to support Sarah’s development. At present, it is unclear whether there is a requisite level of child verbal and cognitive abilities and parenting resources and skills that are necessary to achieve good outcomes using CSCs. Based on the paucity of research on CSCs, it also unclear when and how CSC procedures may be effectively adapted and when additional supports should be recommended.

In closing, we underscore the notion that when interventions are accessible and feasible for families, parents are valuable partners in this process. They know their child best; they have the opportunities to observe how treatment outcomes are expressed (or not expressed) over a wide range of contexts and settings; and they are often available to address social, communicative, and behavioral challenges as they arise. Overall, the results of this study provide support for future research on parent-training paradigms as well as the use of CSCs to remediate the core deficits of ASD. We found preliminary evidence that parents can be trained to use CSCs effectively and that a combination of face-to-face and telepractice methods can be an efficient and effective way to reach families with limited access to services.

Parent-implemented CSCs may also be an effective way for families to address a wide range of intervention targets, although rigorous experimental designs are needed to address questions of internal validity as a number of threats (e.g., history, maturation) are inherent to our case study approach (Kazdin, 1981). In addition, behavioral data that can be observed reliably are necessary to establish confidence that the Impressions of parents are not influenced by placebo or demand characteristics. Finally, systematic replications would be useful for understanding the generalizability or any effect revealed. Indeed, the conditions under which parent training using CSCs can be expected to yield positive results is expected to be highly variable, and this presents an important direction for future study.

REFERENCES


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