



Teaching Facial Expression Recognition to Children with Autism Spectrum Disorder

Kia Schilling, Mariah Yeager, and Kayla Lake
Department of Communication Sciences and Disorders

Vicki Samelson, Ph.D., Department of Communication Sciences and Disorders
University of Wisconsin – Eau Claire Eau Claire, Wisconsin



Background

- Difficulty interpreting facial expressions is a typical characteristic of individuals with Autism Spectrum Disorder (ASD).
- The Empathizing-Systemizing Theory suggests that children with ASD have difficulty empathizing, but have a compulsive need to classify, analyze, and construct nonhuman systems (Golan, et al., 2009). This could explain why social interactions are often difficult for children with ASD.
- According to the Hyper-Systemizing Theory, individuals with ASD prefer motion determined by physical patterns (Golan, et al., 2009).
- Research has shown that both video modeling and Social Stories have been successful in teaching social skills to children with ASD; however, data regarding which of the interventions is more effective and efficient in teaching facial expression recognition is lacking.
- This pilot study was designed to test whether a modified Social Stories intervention or a variation of a video modeling intervention (*The Transporters*) is more effective in teaching children with ASD to recognize facial expressions.

Social Stories

- Social Stories is a widely-used intervention to help individuals recognize, express, and understand emotions (Gray, 1999).
- Social Stories allow for human interaction, where the reader and listener are able to discuss important points of the story. Social Stories use both static images and text in order to explicitly explain previously-confusing situations to the individual for whom the story was developed.
- Our study utilized a modified version of Carol Gray's Social Stories that focused on facial expressions and emotions.

Transporters

- *The Transporters*, a DVD series, aims to improve facial expression recognition for children with ASD, by using animated vehicles with predictable physical patterns, which according to the Hyper-Systemizing Theory are preferred by children with ASD (Golan, et al., 2009).
- Children with ASD are attracted to vehicles that follow specific tracks and allow humans only limited ability to make decisions regarding the vehicle's path (Golan, et al., 2009).
- The vehicles in *The Transporters* stories follow specific predictable tracks, but model human facial expressions and emotions.

Participants

- Participant 1: Male, 6 years, 8 months old; diagnosis of mild-moderate Autism.
- Participant 2: Male, 6 years, 3 months old; diagnosis of mild-moderate Autism.

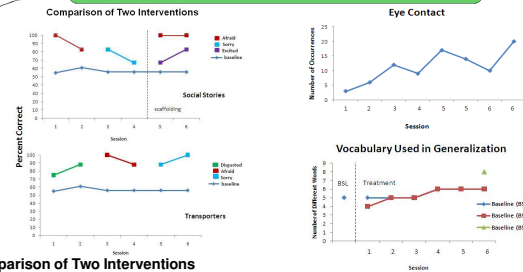
Interventions

- The *Transporters* is a DVD series of video modeling that incorporates the appeal of vehicles as systems to gain the child's attention. Children watched fifteen-minute episodes, followed by a DVD quiz that asked them to identify emotions and facial expressions.
- Social Stories were written to match the same emotions depicted in *The Transporters*. Each Social Story was illustrated with static cartoon pictures, followed by a set of questions asking participants to identify emotions and facial expressions.

Methods

- A language assessment was conducted during the baseline phase to determine whether participants had sufficient language development to benefit from the interventions.
- An initial baseline task identified facial expressions that the children were not able to label. Participants were shown one photograph at a time in a full-screen power point presentation and were asked "How is this person feeling?"
- Several facial expressions were targeted with each participant during the study.
- A Social Story was created for each of the facial expressions that the children were not able to label, with illustrations that highlighted facial expressions.
- The Social Stories and quiz questions were created to match the specific emotions, narrative structure, and language structures used in *The Transporters*.
- Progress for both interventions was tracked during each session with the quizzes and a repetition of the baseline task to measure generalization.
- Each child was seen for 6 intervention sessions. Presentation of the two interventions was counterbalanced.

Participant 1 Results



- **Comparison of Two Interventions**
 - Facial expression recognition did not improve in the generalization task but an increase in the percentage correct for some of the quizzes associated with each intervention was observed.
 - Afraid was targeted throughout the study and mastered at the end, indicating a need to spend more time on each emotion for both interventions.
 - Sorry was also targeted for four of the sessions and was mastered at the end, also indicating a need to spend more time on each target emotion.
 - Beginning with session 4, examiners decreased their pace and increased scaffolding while reading the Social Stories, resulting in increased quiz performance.
- **Vocabulary**
 - The number of different words used to label facial expressions increased over the course of the study (even though the words were not always correct), suggesting that this participant was acquiring new vocabulary.
- **Eye Contact**
 - The participant's eye contact with the examiner during the Social Stories increased steadily throughout the study.
- **Factors Affecting Results**
 - The participant may have experienced some confusion because we targeted more than one emotion per session.

Selected References:

The Transporters (2006). London, UK: Changing Media Development. Available from: <http://www.thetransporters.com/index.html>

Gray, C. (1994/2000). *The new social story book; illustrated edition*. Arlington, TX: Future Horizons.

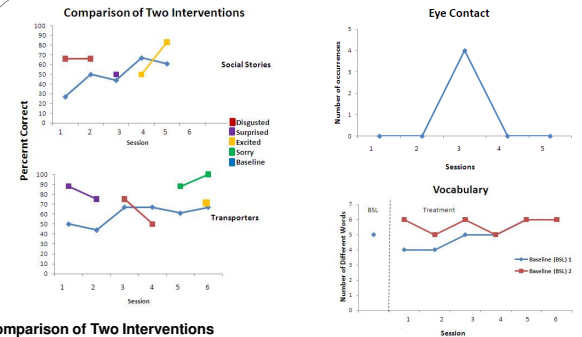
Gray C. (1999). From Both Sides Now: Teaching Social Understanding with Social Stories and Comic Strip Conversations.

Golan, O., Ashwin, E., Granader, Y., McClintock, S., Day, K., Leggett, V., Baron-Cohen, S. (2009). Enhancing Emotion Recognition in Children with Autism Spectrum Conditions: An Intervention Using Animated Vehicles with Real Emotional Faces. *Journal of Autism and Developmental Disorders*, 40, 269-279. DOI: 10.1007/s10803-009-0862-9

Tottenham, N., Tanaka, J., Leon, A.C., McCarry, T., Nurse, M., Hare, T.A., Marcus, D.J., Westerlund, A., Casey, B.J., Nelson, C.A. (2009). The NimStim set of facial expressions: Judgments from untrained research participants. *Psychiatry Research*, 168(3), 242-249.

Contact Kia Schilling: schillkl@uwec.edu

Participant 2 Results



- **Comparison of Two Interventions**
 - Results for this participant were variable. There was a notable change in the participant's facial expression recognition during the generalization task for Social Stories, although quiz scores did not reflect this learning. More intervention sessions might facilitate learning.
 - In the final two sessions, participant 2's performance increased on the quizzes for both interventions, also indicating that more intervention sessions for each target emotion might facilitate learning.
- **Factors Affecting Results**
 - Participant 2 experienced significant routine changes while this study was being conducted.
 - It was noted that he experienced irregular sleeping patterns throughout the study.
 - He received two Wisconsin Early Autism Project (WEAP) sessions the same day he attended each of our sessions; he was brought to sessions by various caregivers.
 - His Speech-Language Pathologist indicated that "wh"-questions were one of his IEP goals, which might have influenced his ability to comprehend the quiz questions for both interventions. He did show improvement on the baseline generalization task, which only required comprehension of "How is he/she feeling?"

Discussion/Future Research

- This study illustrates the uniqueness of each child with ASD. It also indicates a need for further research in order to determine which interventions are more effective and efficient for children with ASD. There are many factors in teaching/learning the complex task of facial expression recognition, so there are many directions for future studies to take.
- This study demonstrated the need to utilize a slower pace and include scaffolding while reading Social Stories in order to improve quiz scores.
- **Future Directions:**
 - Larger-scale study with children who have a range of severities of ASD, that also includes a control group.
 - Increase the number of intervention sessions for each intervention and emotion.
 - Include a condition where emotion vocabulary is used in multiple contexts, to facilitate generalization.
 - Experiment with the types of illustrations used in Social Stories.
 - More-closely evaluate the effect of gaze-direction (eye contact) on facial expression recognition.
 - More-closely evaluate the types of photographs used for the baseline measure.

Acknowledgements:

SPOTS House, Chippewa Falls
 Karen Schilling CCC-SLP, Prairie du Chien Schools
 Nina Tottenham: Nimstim photos
 Shannon Jehn, Social Stories Illustrations
 UWEC IRB and Office of Research and Sponsored Programs
 UWEC Center for Communication Disorders
 Our participants and their families