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Teaching Children with Autism to Join In

Sarah Titherington
SUNY Plattsburgh, stith001@plattsburgh.edu

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Teaching Children with Autism to Join In

Sarah Titherington

State University of New York at Plattsburgh

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Approvals:

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Patricia Egan, Ph.D., Thesis Committee Chairperson
Associate Professor of Psychology

_____

Laci Charette, Psy D., Thesis Committee Member
Associate Professor of Psychology

_____

Andrea Martino, M.S. Thesis Committee Member
Adjunct Instructor of Psychology

Abstract

In order to develop and maintain interpersonal relationships, one must possess certain social

skills. Because children with an autism spectrum disorder have significant difficulty with social

skills, it is imperative to implement training programs to remediate these deficits. The current

study was designed to teach children with an autism spectrum disorder how to join in a

conversation or play situation that is already in progress. Video models were used to show

participants a five step (S.O.D.A.) strategy in a recreational program for children with autism

spectrum disorders. The results show that two participants immediately acquired the skill, but

their performance did not maintain when the intervention components were faded, even when a

reminder was given to "follow the SODA steps".

Teaching Children with Autism to Join In

Social skills are needed to function effectively within our environments, as our quality of life relies on maintaining positive relationships. Individuals with an autism spectrum disorder (ASD), however, often have difficulties with these specific skills. A deficit in social skills is one of the diagnostic criteria for an autism spectrum disorder according to the American Psychiatric Association (APA, 2013). More specifically, this can include difficulty with interpersonal relationships with family and peers; lack of understanding of abstract language, such as irony; and a general lack of willingness to initiate social interactions (APA, 2013). Bauminger, Shulman, and Agam (2003) found that adolescents with an autism spectrum disorder had half of the amount of social interactions compared to their typically developing peers. They also found evidence that adolescents with an ASD were more likely to experience loneliness compared to their typical peers. In light of this specific skill deficit and the possible adverse outcomes for children with an autism spectrum disorder, it is imperative that professionals find and use evidence-based programs to teach these skills.

The literature is flooded with various social skill programs, but most are multicomponent programs with limitations. Social skill programs have included interventions such as teaching children Theory of Mind skills (Gould, Tarbox, O'Hora, Noone, and Bergstrom, 2011; Hutchins & Prelock, 2008); teaching initiation of social interactions (Owen-DeSchryver, 2008); use of video modeling to teach a specific social skill (Cardon & Wilcox, 2010); and step-by-step instructions on how to improve the quantity and quality of interactions with others (Bock, 2001). The studies described below address some of the skills required to join in play or conversation already in progress.

Theory of Mind

Before reviewing interventions to teach specific social skills, it is important to understand why children with an ASD have difficulty with social interactions. As previously mentioned, the DSM-5 criteria included difficulty with interpersonal relationships and understanding abstract language (APA, 2013). This most likely is due to significant Theory of Mind deficits experienced by children with an ASD. That is, it is difficult for these individuals to understand what others are thinking and feeling during social interactions. More specifically, Howlin, Baron-Cohen, and Hadwin (1999) describe Theory of Mind, or "mind-reading", as a person's ability to make predictions about others' thoughts and feelings based on the other person's behavior. Similarly, Atwood (2007) describes theory of mind as a person's ability to anticipate what other people are thinking based on their behavior. This information is used as an indicator of what the other person is going to do or say in response to specific situations.

Theory of Mind skills enable a person to actively and appropriately engage in a conversation or social situation with others, a skill that is needed to maintain social relationships. Howlin et al. (1999) state that Theory of Mind skills include being able to recognize deception, show empathy, be self-aware, and reflect on one's own actions. As Atwood (2007) indicated, children with an autism spectrum disorder who lack these skills have difficulty reading others' facial cues due to lack of eye contact, and they have difficulty understanding figurative language. Often, individuals with ASD are perceived as awkward and even rude during social interactions. Although children with an ASD have Theory of Mind deficits, this does not mean these skills are non-existent or cannot be developed; rather, these skills might require more effort compared to typical peers their same age (Atwood, 2007). Therefore, targeted interventions aiming to improve this skill set could be beneficial.

In a study conducted by Gould et al. (2011), the authors chose to focus on perspective taking – a component of Theory of Mind skills. More specifically, Gould et al. (2011) taught children with an autism spectrum disorder a subskill of perspective-taking, the ability to recognize what other people are looking at. Three children, ages 3 to 5 years, previously diagnosed with an ASD, were included in their study. A multiple probe design was used across participants. The intervention took place in the participants' homes during their regularly scheduled therapy sessions, where all three were receiving behavioral support. The children were shown various stimulus cards that had a person in the center who was looking at an object either to the left, right, above, or below them. The cards were ordered with an arrow that pointed directly to the object and was then gradually faded as participants progressed through the study (e.g. the arrow would become shorter and eventually removed; Gould et al., 2011). Participants were to identify which object the person in the center was looking at. The percentage of correct responses was collected and reported. The results of the Gould et al. (2011) study showed that after direct instruction, participants improved their recognition of what others were looking at. In this demonstration, the authors show that separate perspective taking components can be taught to children with autism spectrum disorders.

Hutchins and Prelock (2008) used social stories and comic strip conversations to promote the improvement of Theory of Mind skills, in addition to reducing aggressive behavior and increasing the use of effective communication. Social stories are used to teach a specific skill; they are short stories that present children with a social situation and how to act in that particular situation. Comic strip conversations are similar, but involve the child in the development of the comic strip (e.g. drawing the pictures). The Hutchins and Prelock (2008) case study used an ABA design and was focused on a 5-year-old boy diagnosed with an autism spectrum disorder. Prior to intervention, the participant had difficulty staying calm during times of transitions and would often

become aggressive toward others. To address Theory of Mind, Hutchins and Prelock (2008) focused on improving the boy's understanding of how his behaviors impact those around him. The social story aimed to improve the participant's ability to effectively communicate how he felt in situations that led to his aggressive behavior. The comic strip conversations were developed to improve his understanding of how he and others think and feel in specific scenarios. They were presented several times over a course of five weeks. The participant's mother completed a rating scale that used a Likert system for measurement. The scale consisted of 10 points that ranged from "strongly disagree" to "strongly agree" and was used to rate the boy's change in behavior. Behaviors that were measured included staying calm, effective communication, and perspective taking (Hutchins & Prelock, 2008). It should be noted that the ratings by the participant's mother can be considered a limitation of this study, as she can be biased when rating her child's behavior.

The results of Hutchins and Prelock's (2008) study showed that the participant's ability to stay calm improved, as did his ability to effectively communicate during high-risk situations. Both behaviors were also maintained after completion of the intervention. His Theory of Mind skills (e.g. perspective taking) showed even greater improvement during the maintenance period compared to the intervention period (Hutchins & Prelock, 2008), which the authors attributed to the social stories and comic strips teaching the boy these skills.

Feng, Lo, Tsai, and Cartledge (2008) developed an intervention that combined Theory of Mind training and social skills training to improve the social interactions of an 11-year-old boy with an autism spectrum disorder. Three peers were included in the study to act as role models for appropriate behavior. Theory of Mind skills and social skills were trained simultaneously and specific skills were chosen based on the participant's needs. Skills included identifying feelings, controlling anger, and greeting others. Training took place during the school day and consisted of

watching a short animation (developed by the authors) and a verbal description of what was

watched. The participant was then asked several questions and provided with verbal praise upon

answering correctly. The participant and trainer would then role-play what they had just watched

and reflect on their session together. Once the participant completed the intervention with 80%

accuracy, he was then transitioned to a small group setting with his peers. The same intervention

protocol was used; however, peers would participate in the role-playing rather than the trainer (Feng

et al., 2008).

Feng et al. (2008) used several measures to determine the outcome of their intervention.

The participant was given a pre and post test to assess his Theory of Mind skills; percentage of

correct answers to questions about the animation were calculated; and qualitative statements were

recorded for social interactions (e.g. appropriate and inappropriate behaviors). The results showed

that the participant's scores improved across all three measures. He improved the percentage of

correct answers, displayed more appropriate social behavior, and increased his Theory of Mind

skills compared to his performance on the pretest (Feng et al., 2008).

Beaumont and Sofronoff (2008) developed a program to improve social skills by developing

Theory of Mind skills in children. Participants included 49 children diagnosed with Asperger

Syndrome, who ranged in age from 7.5 to 11 years old. Participants were randomly assigned to

either the treatment condition or wait-list control condition. The researchers developed a computer

game, *The Junior Detective Training Program* to help this specific population improve their Theory

of Mind skills, in turn helping them improve socially. The children play the role of an investigator

whose goal is to identify how characters are feeling. As the investigator progresses through the

levels of the game, emotions become more complex, eventually leading to a mission. The mission

includes specific problems to which the child must respond; the outcome is dependent on their

response. Beaumont and Sofronof (2008) gave the example of the detective playing a board game

with another character who becomes frustrated at losing. The detective has to choose from a menu

of options on how that character is feeling in that particular moment. If the answer is correct, the

detective is awarded with various gadgets within the game. Group therapy sessions were also held

in addition to the computer game during intervention. Therapy sessions were used to further

reinforce the skills that were being taught within the video game. Participants were provided with

step-by-step instructions for various social skills and cards to take home. Participants assigned to

the treatment condition were exposed to the game and group therapy sessions. Parents also received

training that included information on what their children were learning.

Beaumont and Sofronof (2008) compared the treatment and control groups using pre- and

post- test measures using a social skills questionnaire, one completed by the parent and one by the

teacher, and emotion recognition tasks. The results showed that the majority of participants who

received the intervention, compared to those in the wait-list condition, were perceived by their

parents and teachers as significantly improved in their social skills after completing the program.

Additionally, participants' emotion recognition was significantly improved. The results of this

study are promising, however, Beaumont and Sofronoff (2008) bring attention to the fact that it is

not clear whether it was the game, group therapy, or both combined that had the most influence on

social skill improvement. While these interventions were specifically developed to improve Theory

of Mind skills to enhance social skills, others are focused on individual social skill responses, such

as initiating a conversation.

Social Initiations Interventions

The inability to "join in" has been cited as a characteristic of autism (Plavnick et al., 2015),

but unfortunately there are no evidence-based assessment or intervention methods to guide

practitioners to teach this set of skills. Many researchers have studied a related skill, social

initiations. Owen-DeSchryver, Carr, and Blakely-Smith (2008) define social initiations as

behaviors directed towards a peer that results in a social interaction. This could include offering a

greeting, asking a question, giving a peer a toy, or asking a peer to join in an activity. Morrison,

Kamps, Garcia, and Parker (2001) defined social initiations as any behavior (verbal or nonverbal)

directed toward a peer that is intended to elicit a response. A list, similar to the one that Owen-

DeSchryver et al. (2008) emphasized, was provided by Morrison et al. (2001) and included

greetings, asking questions, sharing, or any helping behavior.

Owen-DeSchryver et al. (2008) conducted a study to increase social initiations targeted

towards typically developing peers. For this particular study, the researchers used a multiple

baseline design across 3 participants who were diagnosed with autism spectrum disorder. Each

participant was matched with a typical peer. The typical peers for each student received training on

how to engage with their peer with autism. This included: (a) an explanation of why it is important

to develop friendships with children with disabilities, (b) identification of the individual strengths

and weaknesses of the 3 targeted students, and (c) strategies provided to the typical peers to use

when engaged in a conversation with their peer with ASD. The strategies included examples of

concrete topics that a child with autism would easily be able to understand and discuss, rather than

abstract ideas and concepts. The peers were then instructed to use these strategies during lunch and

recess. The results showed an increase in peer initiations from baseline; that is, typical peers

engaged more with their peer with autism after they received training (Owen-Deschryver et al.,

2008). This particular intervention, while effective at increasing interactions between children with

autism and their peers, provided no means for children with autism to initiate bids for reciprocal

interactions. Instead, children were completely reliant on their typical peers.

Morrison et al. (2001) used a multiple baseline across skills design in their study to increase

social interactions for children with autism. They taught each of the four participants with autism

spectrum disorder to use the following social skills: requesting, commenting, and sharing. As they

were being taught each skill the participants had to model/practice their new skill, as did their

typical peers who were included in the training as models. Participants were able to refine their

behavior based on peer feedback and personal feedback when watching their peers demonstrate the

same skills. Peer feedback was given when typical peers monitored and recorded the target

participants' behavior and provided tangible rewards anytime a newly taught skill was used.

Participants were also responsible for monitoring their own behavior by completing a checklist each

time they used a new target skill (e.g. requesting); trainers would then reward participants when

they used the skill and recorded it correctly. Morrison et al. (2001) observed participant initiations,

responses, and percentage of time engaged in a peer interaction. They also observed the three skills

and frequencies of inappropriate behaviors. The results showed that all four participants showed an

increase in social initiations, time engaged with their peers, and use of the targeted skills (e.g.

requesting, commenting, sharing). It should also be noted that results showed a decrease in

inappropriate behaviors, such as hitting or grabbing and stereotypic behaviors.

Gena (2006) showed that teaching children with autism to initiate could lead to an increase

in wanting to be a part of a social group (versus one-to-one instruction). Participants were four

preschool-aged children diagnosed with an autism spectrum disorder attending an inclusive

preschool. The intervention included prompting by teachers to initiate a social interaction with a

peer. The teacher would provide the participant with a statement he or she could use to elicit a

response from a peer and then the teacher would prompt the participant to use the statement. There

were five themes of interactions taught to participants: asking questions, showing affection, giving

directives, providing information, and inviting others to join in an activity. A multiple baseline

across participants design was used. Data were collected for each participants' initiations towards

others and how participants responded to initiation bids from their classmates. A frequency count

was used for the number of initiations and responses to initiations were rated either positive or

negative. The results showed that all four participants increased their number of initiations, as well

as how they replied to others' attempts to initiate with them. It should also be noted that Gena

(2006) specified that prior to intervention, all four participants demonstrated avoidant behavior (e.g.

extreme behavioral outbursts) toward preschool and would rather receive their schooling at home.

Following intervention, anecdotal reports from the parents and preschool teachers reported that all

four participants preferred to attend their preschools, as they would want to attend despite not

feeling well. It could be hypothesized that children without the knowledge or skills needed to

interact socially may be deterred from entering social situations, thereby highlighting the value of

social skills training.

     As previously mentioned, a search of the literature revealed no documented results of

training programs to teach the "joining in" skill to children with autism, but there are many

recommendations for addressing this important skill. For example, Coucouvanis (2005) published a

social skills curriculum for children with Asperger Syndrome. The curriculum includes steps to

"joining in" and "entering a conversation". In order to enter a conversation that is already taking

place, children are taught to (1) listen to the conversation to find out the topic of discussion. The

next steps include: (2) watching the individuals and (3) waiting for a pause in the conversation.

Once there is a pause, the next steps are to: (4) smile and (5) speak briefly about the topic.

Coucouvanis (2005) also outlines steps to joining in with others. First, children are encouraged to

(1) move close to those they want to join. Next, children should (2) watch and (3) wait for a pause

in activity. Once there is a pause children should then (4) ask to join in. If the individual or group

says, "yes", then the child can join in; if the answer is "no" children are taught to find something

else to do.

Baker (2003) provided a step-by-step strategy that is similar to Coucouvanis's. His

strategies were also developed to address social communication difficulties for children with

Asperger Syndrome. In his manual, Baker (2003) provided steps to "joining a conversation". First,

those wanting to join in the conversation need to (1) listen to what is being discussed, (2) walk up to

the peers talking and (3) wait for them to acknowledge you or wait for a pause. To join in, (4) say,

"excuse me were you talking about…", and (5) ask or comment about the topic of discussion. The

manuals by Baker (2003) and Coucouvanis (2005) provide seemingly practical guidelines for

joining in, but to date, these programs have not been evaluated and disseminated in peer reviewed

journals.

Radley, Jenson, Clark, Hood, and Nicholas (2014) used a multi-component intervention to

improve social skills, specifically the amount of time participants are engaged with their peers.

Participants included two preschool aged children, one diagnosed with autism and the other with

pervasive developmental disorder, not otherwise specified. Both were exposed to a social skills

program, "Superheroes Social Skills", that included several components that could be easily

implemented within a school setting. These components included a typical peer modeling the skill,

video models, social stories, and self-monitoring strategies. Although the Superheroes curriculum

targets 18 social skills, 8 were chosen based on the participants' age. The selected skills included

"get ready, following directions, anxiety reduction, participation, generalized imitation, body basics,

expressing wants and needs, and joint attention" (Radley et al., 2014, pp. 24). Participants would

watch a short video that taught discrete steps for the targeted skill; they would then practice these skills during a game (e.g. *Musical chairs, Simon says, I spy, or Go fish*).

Radley et al. (2014) used *10 second* partial interval recording to measure social engagement time. They found that both participants spent more time engaged with their peers following the completion of the Superheroes program. Although it is difficult to discern which components of the program had the greatest impact on the participants' behavior change, it is an intervention that has been proven effective and may be worth replicating.

Video Modeling

Video modeling is a technique that can be used to teach social skills to children with autism (Ganz, Earles-Vollrath, & Cook, 2011). Cardon and Wilcox (2010) conducted a study to assess whether reciprocal imitation training (RIT) or video modeling was more effective in teaching imitating to children with autism spectrum disorder. There were six participants, ages 20 to 48 months, that were paired up based on several matched characteristics. Random assignment was used to determine which intervention each group member would receive. Cardon and Wilcox (2011) used a multiple baseline design across participants and conditions. Within the RIT condition, the researcher would play with toys (modeling what to do) and then try to elicit a response from the child. The video modeling condition was similar to the RIT condition but also included a video of the researcher playing with toys. Once the video was stopped, the child was encouraged to imitate what he or she had just watched on the video. The results showed that participants in both conditions improved their number of imitations. However, it was noted that those in the video modeling condition improved their skills quicker compared to those in the RIT condition, where skills were observed to gradually improve over a longer period of time (Cardon & Wilcox, 2011).

Plavnick, MacFarland, and Ferreri (2015) used video modeling in their study to teach children with an autism spectrum disorder social skills. More specifically, they focused on initiations that included sharing a toy or joining in with a peer or peer group. Participants were three preschool aged children who were previously diagnosed with an autism spectrum disorder and had difficulty with social interactions. Several 20 to 30 second videos were created for the study using an iPad and edited using the iMovie software. Clips focused on either a model sharing a preferred item with a peer or the model asking a peer with a preferred item to join in the play. The participants were shown the videos in a small group and then prompted to use the targeted skills. Corrective feedback was provided immediately following peer interactions, if needed. Plavnick et al. (2015) used a ABCBC design in order to compare the two different video conditions: sharing versus joining in. The results showed that all three participants did not show improvement in their social interactions until the joining in phase, which proceeded the sharing phase. They speculated that this may be due to the combination of the video models and re-teaching of skills following the sharing condition.

SODA Strategy

Bock (2001) developed a learning strategy for social interactions targeted at children with autism spectrum disorder. The strategy provides a set of rules and guidelines for specific social situations. Students would receive an individualized plan tailored to their specific needs. Bock (2001) used the acronym SODA as the name of her strategy, which stands for Stop, Observe, Deliberate, and Act. Students were given a card with icons representing each of the four SODA steps and individualized questions and statements the students should ask/say to themselves prior to interactions with peers. Once students are taught this strategy, the author suggests practicing their methods by watching videos to role play or use in in vivo activities to practice their new strategy.

Following the development of the SODA strategy, Bock (2007b) went on to test its

effectiveness. The first study included four male participants between the ages of 9 and 10 years

who had been previously diagnosed with Asperger Syndrome. All four participants attended a

social skills program for the year preceding their participation in this study; their instruction focused

on improving Theory of Mind deficits. A multiple baseline across settings design was used, which

included 4th or 5th grade social studies cooperative learning activities, recess, and lunch. Prior to

each of the three activities, participants would read SODA stories and then discuss it with their

teachers. Bock (2007b) measured the percentage of time each participant was engaged in each

activity with his peers. The results showed that each participant improved his time engaged with

peers during each activity. This behavior was maintained following the completion of the SODA

training, as each participant's percentage of time engaged was significantly higher compared to

baseline. It should also be noted that each of the four participants were matched to a randomly

selected peer without a disability in his class.

Bock (2007a) conducted another study to replicate her findings; the participant was a 12

year old boy in middle school, previously diagnosed with Asperger Syndrome. Similar to the

previous study, the student received training in Theory of Mind skills for one year prior to the study.

The researcher used a multiple baseline across settings design, which included 7th grade English,

lunch, and activity period. The student had three individualized SODA stories, one for each setting

that he would read before each period (e.g. English, lunch, or activity period). Bock (2007a) again

measured the percentage of time engaged with peers during each period. The results showed that

the participant's time engaged increased during SODA training and his behavior was maintained

following the completion of training.

The results from the Bock (2007a, b) studies are promising, however, are limited to these individual children. Additionally, the research itself on the SODA strategy is limited and further replication studies need to be conducted to validate its efficacy. The purpose of the current study was to apply the SODA strategy (Bock, 2001) with modifications to determine whether two children with an autism spectrum disorder could learn to join in a conversation or play situation.

Although the above studies have shown success at teaching children with autism spectrum disorder Theory of Mind and specific social skills, there are several limitations that need to be highlighted. Most of the studies had small sample sizes, ranging from one to four participants (Plavnick et al., 2015; Radley et al., 2014; Gould et al., 2011; Feng et al., 2008; Bock, 2007a & 2007b); therefore, it would be difficult to determine the effectiveness with other individuals with an ASD. The results of the study conducted by Beaumont and Sofronof (2008), Hutchins and Prelock (2008) and Bock (2007a & 2007b) were limited to parent and teacher reports that may have skewed the data in a positive manner due to personal biases. With little follow-up, it is difficult to determine long-term effects of an intervention (Owen-DeSchryver et al., 2008; Gena, 2006). Additionally, most of the studies did not provide generalization probes to determine effectiveness within other settings (Plavnick et al., 2015; Feng et al., 2008; Owen-DeSchryver et al., 2008; Gena, 2006). The studies that used multi-components (e.g. video modeling and teacher instruction) make it difficult to decipher which component of the intervention had the most impact on the results, which will make it more difficult during replication studies to focus on the component that had the greatest effectiveness on a participant (Plavnick et al., 2015; Radley et al., 2014; Beaumont & Sofronof, 2008). The current study is an application of a step-by-step strategy to teach children with an autism spectrum disorder to join in a conversation or play situation already in progress. A

video modeling intervention was used, along with a self-instruction acronym, SODA (Stop, Observe, Decide what to do, Act) to train the participants to join in.

Method

Participants

Participants from this study were recruited from a Saturday Social Skills/Recreation program at a state university in a small city in upstate New York. Children between the ages of 5 and 16 with an autism spectrum disorder diagnosis attended this program. Participants for the current study were nominated by college fieldwork students who worked individually with the children during their Saturday program. Each college student nominated 2-3 students who might benefit the most from learning a social skills strategy. The children who had the most nominations were included in the current study.

A total of three participants were accepted for the current study; however, one participant moved to a different state before he began. Consequently, only two children participated. Participant 1 was a 14-year-old high school boy who did not interact with peers, preferring instead to interact with the adults during the program. Participant 2 was a 10-year-old, 5th grade boy. Participant 2 would burst excitedly into groups of children who were engaged in play or a conversation, or he would address the entire group by shouting loudly that those interested could watch him play his game tablet. Both participants were diagnosed with Asperger Syndrome prior to entering the Social Skills/Recreation program.

Materials

All sessions were conducted within a classroom used by the Saturday social skills program. Two observation sessions were conducted each week during this program, one at the beginning of

the 2.5 hour Nexus program and one close to the end of the session. Both occurred during a

minimally structured "play time", when participants chose board games and crafts, and were

encouraged to play with peers. Observation and data recording lasted 15 minutes. Materials during

the intervention phases included 3-4 videos for each participant. Each video was recorded using an

Apple iPad and edited using Apple's iMovie software. The video models were research assistants

and the videos were filmed on campus at the local university. The experimenter and research

assistants made videos during weekly research meetings. The videos were approximately 15 to 30

seconds long. During the video, each individual step (e.g. "stop") appeared as text at the bottom of

the screen, as the video model was engaging in that particular step. Participants watched the videos

on an iPad in a separate location from their peer group.

Experimental Design

An ABACB design was used for Participant 1 to test the effectiveness of the presented

strategy under two conditions (with and without the videos). An ABACAB design was used for

Participant 2. Event recording was used to assess each time a participant joined in a conversation or

play situation and whether or not he completed the presented steps accurately. Observers recorded

whether a participant accurately completed each of five steps in the SODA strategy. On a data

sheet, observers circled "yes" for each step completed and "no" for steps not completed correctly.

Procedure

Baseline

During baseline, participants were observed during game time. At this time, all students had

access to several board games and craft items and were encouraged to use these items with their

peers.

Intervention: Video Models and Verbal Explanation

The SODA strategy, adapted from Bock (2001), was used in addition to video modeling. Participants were verbally informed of the steps of the SODA strategy, then immediately watched short videos tailored to each individual participant. The first step was for the participant to "**S**top" himself prior to entering a social situation. Next, they "**O**bserved" their current environment. The third step was to "**D**ecide" what to do; this could be deciding to join-in or move on to something or someone else. Once the student decided, he or she then "**A**cted" on what he or she has decided. For example, if a group of children were playing a board game, the target student might stop to think about his options, observe that the round was almost complete, decide he wants to play in the next round, and act by asking the group if he could join in.

Participants were taken aside by the director of the Social Skills/Recreation program and/or the experimenter with his one-to-one adult assistant. One-to-one adult assistants were undergraduate or graduate fieldwork students enrolled at the university. Participants were verbally described the steps of the SODA strategy, and then watched two to three short (15-45 second) videos on an iPad that had been tailored to their individual interests (e.g. crafts or playing on a game pad). Upon completion of watching their videos, participants were then told to use the steps they had just learned during game time.

Intervention 2

The same method used in Intervention 1; however, videos were removed and only the verbal reminder was provided to participants.

Data Collection

Participants were rated on the following 5 steps: stop; wait 3 seconds; observe peers (look at one peer's face); decide whether the context was appropriate for joining in; and act by using an appropriate question or statement. Each of the 5 steps were rated either yes or no (see appendix for

data sheet). Total number of steps correct were recorded for every interaction each participant engaged in during the 15-minute observation period.

Observers were research assistants enrolled at a local state university. They were trained by the program director during weekly research meetings prior to the Saturday program. The experimenter and program directors were available each week to assist with any troubleshooting and answer any questions during data collection. Interobserver agreement (IOA) was collected for both participants. Two research assistants simultaneously collected data on each participant; their results were then analyzed and compared.

Results

In order to analyze the effectiveness of the SODA strategy intervention, a visual interpretation of the graphs was completed. It should be noted that IOA data points are represented by "x's" in each figure. Participant 1 had 5 sessions of IOA data collection; both observers agreed 100% for all 5 sessions. Participant 2 had 2 sessions of IOA data collection; the two observers agreed 100% for both sessions. Participant 1 did not engage in any of the SODA steps during baseline. Upon implementation of the first intervention phase, he completed all steps correctly during all but one session. When all components were withdrawn in the reversal phase, Participant 1 immediately stopped responding, with the exception of the second day of reversal, which may have been due his desire to join a preferred activity. Following reversal, a "reminder" condition was instated, whereby only a reminder to the SODA strategy was given. This condition had no effect on his responding.

Participant 2 did engage in some of the joining in steps during the baseline phase. These included stopping before entering a conversation or play already in progress, waiting at 3 seconds before speaking/acting, waiting for the appropriate time to join in, and using an appropriate

statement or question to do so. In the first intervention phase, he immediately completed all steps.

In the first reversal phase, he continued to complete some steps (e.g. stopped before entering the

situation and used an appropriate statement or question to join in) even in the absence of all

intervention components. After an initial recovery of skills in Session 23, his performance

gradually declined. Intervention was then resumed and Participant 2 had great success joining in.
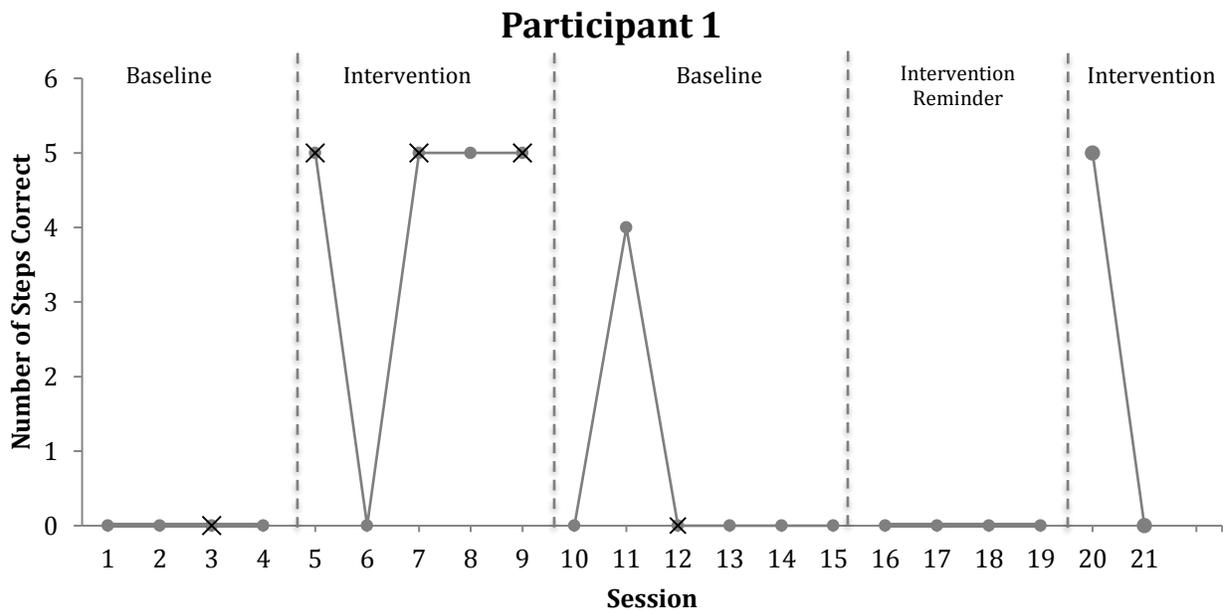
Participant 1

Figure 1: The above graph shows the results for Participant 1.
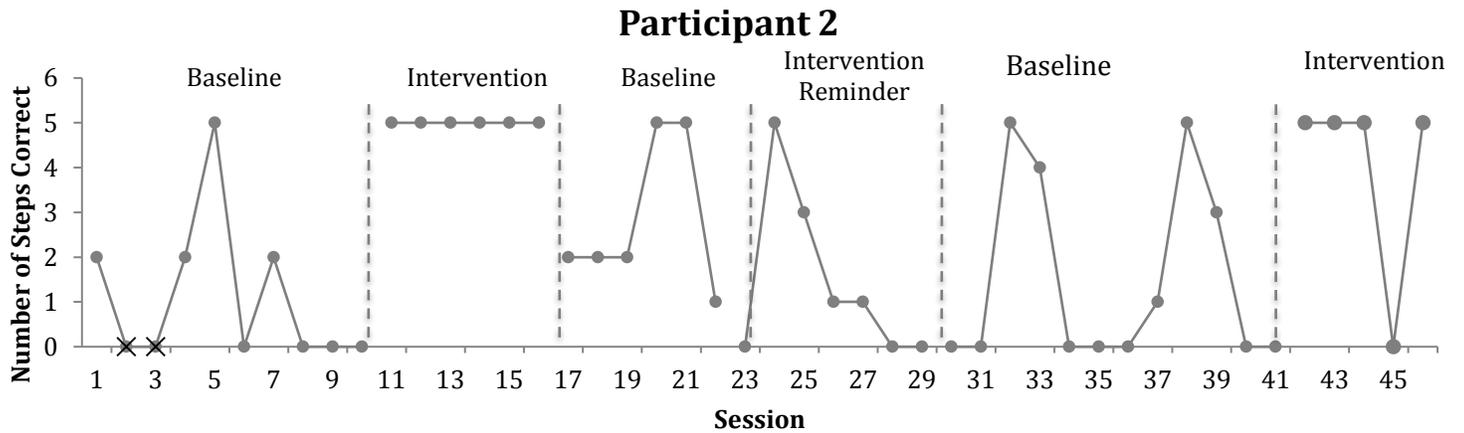
Participant 2

Figure 2: The above graph shows the results for Participant 2

Discussion

The current study was one of the first to address the need for children with an autism

spectrum disorder to be taught how to join in a conversation or play situation. Participants were

taught a step-by-step strategy for this specific skill. As noted within the previously mentioned

manuals (Baker, 2003; Coucouvanis, 2005), there are several steps required to complete an

appropriate and successful social interaction. The SODA strategy was chosen due to the appeal

of the acronym as simple and easy to remember, despite the absence of literature on this strategy,

other than the originator's research (Bock, 2001, 2007a, & 2007b).

Both participants who took part in the study were students who preferred to interact with

adults rather than their peers. During the social skills program, they would engage in

conversation with college students, but would not join in with their peers. At times, both

participants were prompted to interact with their peers, however, they would mostly find

activities that they could do independently (e.g. drawing).

Motivation most likely plays a part in the fidelity of implementation by students using

self-management strategies. For the duration of the study, both participants did interact with

same-aged peers during the intervention and intervention reminder phases. As their data show,

they did demonstrate some success during intervention. However, it should be noted that both

participants no longer wanted to watch the videos, stating they remembered it. Although they

made this claim, however, the data show they would not necessarily use the steps they were

taught to join in with their peers. For example, Cardon and Wilcox (2011) point out that their

participants who watched video models were highly interested in watching television. In the

current study, students were not surveyed, which may have affected their motivation to watch the

videos. Both Participant 1 and Participant 2 quickly lost interest in the intervention and voiced

their discontent for wanting to view their personalized videos.

Similar to previous studies, there were several limitations to the current study. Like other

studies, the intervention was tailored to each participant, which will make it difficult to

implement with other individuals. Second, there was not any follow-up to measure whether or

not the skills were maintained over time. Another limitation is lack of generalization. The

intervention was only implemented during a Saturday social skills program. Future studies

should focus on including other settings. The greatest limitation was internal validity; it is

unclear what had the most effect on the participants' results. It is difficult to decipher what part

of the intervention may have had the greatest impact on participants' joining in behavior. The

results during the reminder phase were not as strong as anticipated. During the final intervention

phase, results for both participants were variable; however, both participants did demonstrate some success in the final intervention phase. The results may be improved for both participants with some modifications to the intervention; for example, including the participants in the making of the videos, and having more videos to watch.

For future studies, there are several changes that could be made to improve the outcome. As Plavnick et al. (2015) and the current study show, personalized videos are fairly easy to make and edit using the iPads and iMovie software. To further gain participants' interest and attention, making videos with peer or self-models may make the content more appealing. For Participant 1, he was interested in sports and drawing activities. Perhaps having better props within the videos to highlight these interests may have better captured his interest and attention. Participant 2 showed great interest in personal hand-held video games; again, using materials that draw attention to these interests may have secured increased consideration in participation. Providing the participants with tangible reinforcers for accurately completing the steps in the SODA strategy correctly may help increase motivation. Participants could earn points, they could be given a preferred item, or time to engage in a preferred activity. Participants were pulled aside from their regular schedule to watch the videos, which may have led to them being distracted and not fully attending to the instructions of the intervention. In the future, participants could be provided with the intervention prior to beginning an activity during their regular schedule. The current study only allowed intervention to take place once per week, given the participants attended the Saturday program; providing the intervention more consistently throughout the week may help improve the results of future studies. This could be done at home or at school. By using the SODA acronym, participants can easily remember the steps needed to join in with their peers. Adding the video modeling component allows for individuals to see what is required

to complete the steps. Although it may be difficult to clarify what component may make the

greatest impact, this type of intervention can provide individuals with autism spectrum disorder a

strategy to help foster and improve their social skills.

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Appendix

Joining In

Record data when you see the child approaching one or more individuals (kids and/or adults) who are sitting or standing (not moving). The child you are observing appears to intend to join in or initiate conversation or play.

Child _____   Date
_____

Observer _____   Start/Stop
Time_____

Activity	Other children/adults involved	Stopped		Waited 3 seconds		Looked at one face		Context appropriate for joining in		Used appropriate question/statement	
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No

Notes/Comments:

_____
_____
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