IMPLEMENTATION OF THE POWER CARD STRATEGY TO INCREASE APPROPRIATE SOCIAL COMMENTING OF CHILDREN WITH AUTISM SPECTRUM DISORDER DURING GAME PLAY

A Thesis Submitted to the
Temple University
Graduate Board

In Partial Fulfillment
of the Requirements for the Degree
MASTER OF SCIENCE IN
EDUCATION

---

by
Julia Prince
December 2018

Thesis Approvals:

Matthew Tincani, Ph.D., BCBA-D, College of Education

ABSTRACT

This study examined the effectiveness of the Power Card strategy in increasing social commenting of three children with ASD to their peers while playing a game. The Power Card strategy is an antecedent strategy, which incorporates the child's special interest into a script and steps to show her or him how to engage in the appropriate target behavior. Previous studies have shown that the Power Card strategy is effective when used to teach social skills. However, there have been mixed findings on the impact the Power Card strategy has on commenting during gameplay. Therefore, additional research is needed to evaluate if the Power Card strategy can increase social commenting. The purpose of this study was to examine the effects of the Power Card strategy on the frequency of comments three children with ASD made to peers during a game. Results can be interpreted to support the Power Card strategy as effective in increasing the frequency of comments made to peers while playing a game. Additionally, response generalization and stimulus generalization occurred across all three participants. Behavioral staff and participants' parents reported that the Power Card was an effective strategy and noted an increase in independent commenting in other environments.

DEDICATION

This paper is dedicated to my parents, grandparents, and Andrew, all of whom acted as my pillars of strength, guidance, and inspiration though this journey. Thank you to my parents. You both have been my guidepost, always offering your sound advice and encouragement. Thank you Mommom and Poppop, your unwavering support and love is unmatched. To Andrew, thank you for always meeting my highs, lows, and everything in-between with love, humor, and support of watching The Office on repeat.

ACKNOWLEDGEMENTS

I would like to thank Dr. Matthew Tincani for his supervision, feedback, and direction throughout this thesis process. I am extremely grateful that he took the time to help guide me. I would also like to thank Brett DiNovi and everyone at Brett DiNovi and Associates that helped me in implementing this intervention. A special thank you to Heather Francisco for allowing me to work with her social skills group, and who went out of her way to ensure that this study ran smoothly

TABLE OF CONTENTS

Page

FIGURE

TABLES

CHAPTER 1

REVIEW OF LITERATURE

Background

Autism spectrum disorder (ASD) is a lifelong developmental disability that affects 1 in every 59 children (Center for Disease Control and Prevention, 2018). ASD is four times more common among boys; approximately 1 in 42 boys and 1 in 189 girls has ASD.

ASD affects social communication and social interactions (American Psychological Association, 2013). ASD characteristics also include restricted patterns of behavior, interests, and activities. Social skill deficits are a core characteristic of ASD. These deficits can impact a child with ASD in the areas of communication, development and social outcomes when compared to their typically developing peers. Children with ASD may exhibit disruptive behaviors; this can adversely affect academic performance, which manifests in difficulties in the school setting (Koegel, Koegel, Frea, & Green-Hopkins, 2003). Challenging behavior may impact children's participation in group activities or games within their environment.

When a child transitions into adolescence, their social environment becomes more complex (Davis, Boon, Cihak, & Fore, 2010). A child with ASD may find social settings more difficult to navigate, especially conversations with others. It is often difficult for a child with ASD to understand the environmental curriculum that extends past educational rules and standards (Gagnon, 2001). Children with ASD often lack an awareness of social protocols and norms, which lack explicit rules (Linn & Myles, 2004). Social protocols include meeting expectations, pleasing others, understanding social cues, problem-

solving and obtaining the attention of others. This can create difficult and challenging situations for a child with ASD. These behavioral deficits can be improved through constructive interventions that focus on altering the physical and social environment (Green, 2001).

There is a range of abilities across social, cognitive, and communication behavior with children with ASD (Thiemann & Goldstein, 2001). In order to be effective, interventions that are developed should capitalize on characteristics distinctive to a child with ASD (Gagnon, 2001). These interventions can incorporate antecedent techniques that include special interests and visuals.

Antecedent Interventions

Antecedent interventions are a strategy to arrange antecedent stimuli in a way that will manipulate the contingency prior the occurrence of the behavior (Cooper, Heron, & Heward, 2007). Motivating operations are an environmental variable that either increase or decrease the effectiveness of a stimulus as a reinforcer (i.e., value altering), which impacts the frequency of all behaviors that have been reinforced by that stimulus, object, or event (i.e., behavior altering). For example, a child who is hungry will be more likely to engage in behaviors that have produced food in the past. When the motivating operations are identified, the environmental conditions can be modified or arranged to prompt the target behavior. These motivating operations increase the likelihood that specific stimuli in the environment will occasion behavior.

Antecedent interventions are implemented to control the environment in order to increase the likelihood the target behavior will occur by maximizing other variables that will enhance prosocial behavior (Boyd, Conroy, Mancil, Nakao, & Alter, 2007).

Professionals can help increase reinforcing consequences through the use of antecedent approaches, which are presented before the behavior occurs (Cartledge & Kourea, 2008).

Professionals must emphasize ways to prevent the occurrence of problem behavior. Typically developing peers may only need spoken instructions in order for a prompt to be effective, however, children with ASD often need additional prompts that they can discriminate the stimulus in order to emit the desired response. The discriminative stimulus is a cue in the presence of which a given response has a history of being reinforced and signals the availability of reinforcement (Cooper et al., 2007). Prompts are an example of antecedent stimuli; they are used to occasion a correct response when a discriminative stimulus is present. Prompts directly affect the behavior of the child. Prompts are often used to help aid with discrimination to occasion behaviors that lead to reinforcement (Green, 2001). Prompts can be physical or visual, which helps to guide the child to carry out appropriate actions.

Since many children with ASD have difficulty responding to spoken language, it is important to target treatment options that take advantage of a child's visual strengths (Boyd, Conroy, Mancil, Nakao, & Alter, 2007). Visual prompts are an effective antecedent intervention that can be implemented in many environments (Conroy, Asmus, Sellers, & Ladwig, 2005). Using pictures, words, or other visual cues can help a child with ASD to process and understand expectations or demands (Boutot & Tincani, 2009, p. 231). Visual prompts increase the likelihood the target behavior will occur, as well as being an intervention that the teacher or staff can implement with minimal effort (Conroy et al., 2005).

Special Interests

Like typically developing peers, using an individuals' special interests can be a tool to increase motivation (Sansosti, 2010; Lanou, Hough, & Powell, 2012; Angell, Nicholson, Watts, & Blum, 2011). One way to increase prosocial behavior in children with ASD is to engage them through their interests (Angell et al., 2011). Children with autism have narrowly focused interests; these interests can be tangible or topical (Green, 2001). Different environments may cause a child with autism to withdraw and show little interest in engaging with their surroundings. In order to increase target behaviors in the environment, the use of the child's special interest acts as motivation.

Baker, Koegel, and Koegel (1998) assessed whether social interactions increased when using the child's special interests as the theme of a social game. The study included three children with ASD in a multiple baseline design across participants. The intervention took place on the playground of a school, and a game usually played at this time was chosen. The game was modified to include the child with ASD's special interest as a theme. The duration of the interaction with peers was calculated in 10- second intervals. The participants' data showed an increase in appropriate social interactions following intervention, which was maintained after the removal of staff prompts. The researchers concluded that by incorporating special interests into an activity, the child would increase their motivation to participate.

Charlop- Christy, and Haymes (1998) evaluated using the special interest of the children with ASD in order to decrease their inappropriate behaviors. The study used a multi-element design across four children with ASD, which compared food, a special interest, and a special interest with reductive procedures (verbal "no" or timeout) as reinforcers for following the direction "Sit in your chair with your hands down" during

30-second intervals in order to assess which was most effective. The researcher concluded that when reinforced with only the participant's special interest, inappropriate behaviors decreased. Additionally, the researchers concluded that the child is less likely to satiate on their obsession compared to other reinforcers. Incorporating special interests into the intervention also increases the likelihood the behavior or skill will be maintained and generalize into other areas (Baker et al., 1998; Charlon- Christy & Haymes, 1998). Boyd et al., (2007) also concluded that using visual cues with a child's special interest had a larger impact of the effectiveness of the visual cues alone by increasing the effectiveness of social interventions.

One intervention that incorporates special interests and visual cues is the Power Card strategy (Gagnon, 2001). The Power Card strategy is a visual aid that assists children with special needs, specifically in helping them to make sense of routines, the meaning of language, and social expectations. The Power Card can be implemented to explicitly teach students how to appropriately navigate targeted social situations (Campbell & Tincani, 2011; Lanou et al., 2012). Power Cards incorporate the special interests of the individual in order to create a scenario with steps to reach the targeted behavior (Campbell & Tincani, 2011; Gagnon, 2001; Sansosti, 2010; Keeling, Smith, Gagnon, & Simpson, 2003; Spencer, Simpson, Day, & Buster, 2008; Lanou et al., 2012; Angell et al., 2011). Power Cards are specific to the individual using them; this is what sets the Power Card apart from other interventions like social stories or pictorials (Gagnon, 2001; Daubert, Hornstein, & Tincani 2014).

Power Card Strategy

The Power Card strategy is an antecedent approach that is used to teach appropriate social skills (Gagnon, 2001; Machalicek et al., 2007). The Power Card strategy is comprised of three steps: the scenario and Power Card, the Power Card only, and the removal of the Power Card. The Power Card strategy is designed, using the principles of priming and modeling (Gagnon, 2001; Keeling et al., 2013; Sansosti, 2010). Priming is an antecedent intervention that exposes the individual to the upcoming task and introduces information and expectations of the task (Koegel et al., 2003). Priming focuses on the antecedent and the prior events that influence behavior; variables are manipulated prior to presentation of the discriminative stimulus in order to reduce the problem behavior. Priming helps make the reinforcement more likely to occur, which decreases the escape behavior. It decreases the student's need to search for sources of reinforcement outside of completing the task. The Power Card uses priming by presenting the card right before the activity and having the card depict the special interest solving the targeted social problem (Gagnon, 2001).

Practitioners in the field of applied behavior analysis have found that desired behavior change can develop when antecedents are used effectively in an intervention (Cooper et al., 2007). Motivating operation are environmental variables that alter the effectiveness of a stimulus as a reinforcer. The motivating operation can increase the reinforcing effectiveness of some stimuli, which increases the frequency of behavior which has previously been reinforced by that stimuli. By including the special interest on the Power Card, it increases the reinforcing effectiveness of the stimuli for appropriate behavior and increases the frequency of engaging in the target behavior. The special interest is a stimulus in which the child is highly interested in. The Power Card acts as a

motivating operation by using the special interest to increase the value of reinforcement for engaging in the target behavior. Once the child engages in the target behavior on the Power Card, she is in contact with natural reinforcers (i.e. increased interactions with peers). Gagnon (2001) concluded that it is often difficult to understand a child with ASD's reinforcers because they often have different types of motivation. Therefore, by incorporating the child's special interest, it can act as a motivating operation to engage in the target behavior or task.

The Power Cards strategy has specific rules and steps that explain how the child should behave in order to meet his or her targeted goal (Gagnon, 2001; Campbell & Tincani, 2011; Sansosti, 2010). The card displays the scenario of a special interest meeting the targeted goal, rules to follow in order to meet the targeted goal and provides pictures of the special interest. A brief scenario is created that explains how the special interest has a problem or challenge and describes how the special interests handles their problem or meets their goal. Then a Power Card is created that contains pictures of the special interest and steps to achieve their goal (Gagnon, 2011).

Power Cards are small, usually made to be about the same size as a trading card; they can be carried and are available for easy access. Relevant pictures, graphs, symbols, photographs, and drawings can be integrated onto the Power Card (Linn & Myles, 2004). In order for the Power Card to be an adequate intervention, the card must be written on the child's reading level, incorporate their special interests, and include the wanted behavior in order to be successful in meeting their goals (Campbell & Tincani, 2011).

Several research teams have investigated the effectiveness of the Power Cards strategy on improving social and communicative behaviors of students with ASD.

Keeling et al. (2003) used Power Cards to increase sportsmanship with a girl with ASD when playing games. Sportsmanship behavior was targeted due to the participant's tantrums exhibited during game time. The Power card included the Power Puff Girls as the role model on the Power Card because of the high and constant interest the participant showed in this cartoon. A multiple baseline across activities were used to show the duration of whining and screaming in three gameplay activities. The activities were bowling, Labyrinth Jr. and Go Fish, each lasted for exactly 30 minutes. Baseline data were collected for five days; on the sixth day, the Power Card was introduced. The intervention took place across 20 sessions. The results showed that the Power Card was successful in decreasing problematic behaviors. Across all three conditions, there was a significant drop in the duration of whining and screaming.

Devenport (2004) conducted a study by implementing Power Card in an A-B-C-A reversal design for one participant. The purpose of their study was to assess the if the Power Card had an effect on the amount of time a child with ASD spent on- task. The author incorporated a pre-intervention after baseline; during this condition, the scenario was introduced to the student for the same amount of time that would be required for the task. During the intervention condition, the scenario was presented to the student 10 minutes prior to the start of the math period. Then, data were collected during 10 minutes of the teacher directed portion of the math class period. The intervention increased the amount of time that he spent on- task. When the baseline condition was re-introduced, the amount of time spent on task remained high. The researcher concluded that due to the skill maintenance demonstrated in the final baseline condition, the Power Card was an effective strategy for increasing on-task behavior. However, the researcher was unable to

establish experimental control and control for environmental reinforcers. Therefore, further research must establish that the target behavior was met due to the implementation of the Power Card strategy and control for environmental reinforcers and variables.

Campbell and Tincani (2011) assessed the effectiveness of the Power Card intervention in order to increase direction following in the classroom. The researchers used a multiple-baselined design across three first-grade students. After baseline, the intervention was broken down into three phases. The first phase was the scenario condition. During this condition, the teacher read the scenario and Power Card to the student prior to play time. The participant was allowed to ask questions and have a discussion about the rules or steps to be followed in the Power Card. The second phase was the Power Card only condition; during this condition, the scenario was removed and only the Power Card was presented to the participant. The Power Card was placed in the play area; however, the participant was not given their Power Card and it was not prompted by staff during play time. A maintenance probe was implemented in the classroom, eight weeks after the removal of the Power Card.

In the Campbell and Tincani (2011) study data were continually collected after the card was removed. Two out of the three students did not need to re-implement the card after the maintenance data were collected. Their results were comparable to the results in the Power Card condition. The researchers also found that using the multicomponent intervention given in the specific order of reading followed by the Power Card reminder was an effective way to promote acquisition. Additionally, Campbell and Tincani assessed the classroom teacher's acceptance of the intervention. The results

showed that the classroom teacher was very satisfied with the intervention. The results were an average of 6.8 on a 7-point Likert- type scale.

Angel et al. (2011) examined an adapted Power Card strategy in order to evaluate the effectiveness of decreasing the latency in responding to teacher cues to check their visual schedules and transition to a new activity. The study included three 10 to 11- year-olds with developmental disabilities in an A-B-A-B-A-B design. The adapted Power Card only included a directive statement about checking the schedule, special interest, and two symbols. Latency was measured as the time between the teacher saying "Check your schedule" to when the child checked their schedule. The results from this study showed that the adapted Power Card was an effective strategy in decreasing the duration across all three students. Angel et al., (2011) showed the acceptability of this intervention by giving staff pre- and post-study interviews. All staff members concluded that the Power Card strategy decreased latency between interactivity transitions and that this would be a strategy they would incorporate in the future.

Lanou, Hough, and Powell (2012) implemented the Power Card for one participant with ASD with the aim to increase self- awareness and increase interaction with classmates in a school setting. This area was targeted based on anecdotal observations made by the teachers. Specifically, nonverbal cues and personal space were targeted areas for improvement. Due to a heightened interest in the Titanic, the theme of the Power Card was created to incorporate this interest and the strategy. Historical about the Titanic were incorporated within the strategy, it also included the thoughts and feelings of others. The participant reviewed his card multiple times a day and was given visual and verbal prompts to reference back to the card. Students were also trained to give

verbal prompts such as “Iceberg right ahead” to serve as a reminder when the participant was getting to close. The results for the participant showed an immediate increase in socially appropriate peer interactions, along with an increase in peer acceptance and inclusion. Additionally, there was a decrease in complaints about inappropriate space during a social interaction from the peers and staff. This participants’ results showed that using their special interest helped to motivate and increase the willingness of the participant to have conversations with staff and peers. A social validity assessment was also completed by teachers suggesting this strategy took minimal time to develop and the implementation was easy for the teachers.

Daubert et al. (2014), evaluated the effects of using a modified Power Card on turn taking and social commenting for children with ASD while playing board games. Two participants were included in this study, authors implemented a multiple probe across conditions in order to assess the effects of the modified Power Card Strategy. They modified the Power Card by eliminating the scenario phase of the Power Card and instead faded the steps on the Power Card to one to three words.

The results of Daubert et al. (2014) study showed that the Power Card intervention was effective in increasing appropriate initiating and relinquishing a turn during the game. However, the intervention did not consistently increase social commenting during gameplay. Both students showed variable commenting while playing the different games. Appropriate commenting was primarily made during the most preferred game. Social validity of the Power Card strategy was given to both the children and the parents. Parents reported that the Power card strategy was effective and noted a

decrease in tantrum behavior when playing a board game at home. The participants both stated that they enjoyed the Power Card and getting help from their special interest.

Overall, the Power Card strategy research has shown that the intervention is effective and results in a positive behavior change behavior (Campbell & Tincani, 2011; Gagnon, 2001; Sansosti, 2010; Keeling et al., 2003; Spencer et al., 2008; Lanou et al., 2012; Angell et al., 2011; Daubert et al., 2014). However, few studies included follow-up data to measure the long-term effects of the Power Card strategy. Certain experimental designs show experimental control but are not able to show generalization (Angell et al., 2011). Along with maintenance probes, generalization should also be tested in further research (Angell et al., 2011; Campbell & Tincani, 2011). Another limitation found by Daubert et al., (2014) was that although the Power Card was effective in increasing turn-taking, the results raised the concern that the Power Card strategy could potentially limit the type of conversation the child would engage in. Daubert et al., (2014) concluded that the Power Card may limit broader conversation topics, and instead, topics would be primarily about the special interest.

Another limitation shown in the Power Card strategy research is that only two studies have been published on the effects of the Power Card to implement social commenting during gameplay (Daubert., et al 2014; Keeling et al., 2003). Keeling et al. (2003) showed the Power Card was effective for decreasing inappropriate comments made during gameplay and with generalization of the target behavior. However, Daubert. et al (2014) were unable to show stable rates of commenting and therefore could not conclude that the Power Card strategy was effective in increasing commenting. Thus,

more research is needed to evaluate whether the Power Card can be implemented with minimum staff effort in order to increase social commenting during gameplay.

The current study sought to further evaluate the effects of the Power Card when used to increase appropriate social commenting during gameplay. It also addressed the promotion of appropriate social commenting while discouraging limited non- content comments. Therefore, the present study examined whether the Power Card is effective in order to increase socially appropriate comments made by children with ASD during gameplay with peers. This study also addressed the social validity of the staff who work with the child, and participants, in order to assess the acceptability of the Power Card intervention. The research questions addressed by this study are:

(a) What are the effects of the Power Card strategy on increasing socially appropriate comments made by children with ASD during gameplay with peers? (b) Will socially appropriate commenting to peers generalize? (c) To what degree are staff and participants satisfied with the implementation and effects of the Power Card strategy?

CHAPTER 2

METHOD

Participants

Three children with ASD participated in this study. All participants received special education services, which included attending a social skills group weekly. Each learner in the social skills group worked on turn taking, reciprocal conversation with peers, and transitioning within the social skills sessions prior to this study. These participants were recruited based on being enrolled in a social skills group. The participants were able to play a game with peers, but did not interacting or speaking to other peers during the game. The three participants mastered turn-taking, and were able to remain on-task for at least 10 minutes. All three participants spoke in full phrases and would respond to questions or prompts given by staff (e.g. "How was school today?"). The three participants each had a special interest that acted as a motivator or reinforcer in other environments. No participant had previous exposure to the Power Card intervention. Prior to the start of the study approval from the university's review board and consent was obtained by parents.

Alex was a six-year-old Caucasian male diagnosed with ASD. He was diagnosed with ASD based on the criteria of the Autism Diagnostic Observation Schedule (ADOS). He received special education services and behavioral services in school and at home. Alex had difficulty engaging in reciprocal conversation, often directing any comments to the nearby staff. During group games and free play; he engaged with the toys and games appropriately but did not engage with peers. When playing group games, he offered and accepted turns without prompting; comments made to peers were made when he was

winning or if they were prompted. Based on observation and talking to Alex's staff, Alex's special interest was Thomas the Tank Engine.

Beth was a nine-year-old Caucasian female who was diagnosed with ASD. She was diagnosed by a developmental pediatrician at five-years-old. She received special education services in school, she spent her school day in the general education setting and does not have a 1-1 aid. Beth enjoyed talking to adults and would respond to questions from peers and adults. She would often script parts of her favorite television show and do impersonations of a character from a show during a conversation. Beth had difficulty making eye contact, staying on topic, and engaging with peers. During gameplay, Beth would engage with staff but not peers, often looking up in the air when speaking to them. Based on observation and staff recommendation, Author was selected as Beth's special interest.

Chad was a seven-year-old Caucasian male who was diagnosed with ASD. He received special education at school and behavioral intervention services in the home. Chad was quiet and would often only interacted with his 1-1 staff. Even when prompted, Chad would often whisper his answers to his staff. Chad would willingly play different games and activities during the social skills time, however, during gameplay redirection was needed when Chad engaged in imaginary play with the pieces on the game. Based on the staff's recommendation Scooby Doo was selected as Chad's special interest.

Setting

The study took place in the basement office of a behavioral consultation company located in a suburban community in New Jersey. This location was reserved by the social skills group, in order to conduct weekly sessions. During the social skills group ten

children were present, along with five RBTs and one BCBA. The room had two small tables and a large carpet. Three activities were selected each week and placed on one of the three locations. The children were split into three groups and rotated every 12-minutes to a new station. Whole group activities occurred prior to the activities, and free play occurred in between and at the end of the social skills activity stations.

The game Sorry ® was placed at the center of a child's size circular table prior to the participants coming into the room. Four chairs were placed around the table, each child sat at a chair of a specific colored game piece (red, green, blue, yellow). The data collector sat on the outside of the table, positioning the chair back into the corner away from the circle table. When IOA was conducted, the staff member sat on the opposite side of the table and away from the primary observer. The game was played during social skills rotations, during a 10-minute session. The Power Card was read individually outside of the social skills area away from peers, directly before gameplay.

Materials

Prior to the implementation of the Power Card, treatment fidelity checklists and data collection sheets were distributed to the secondary observe and the staff running the Sorry ® game station, these were used as aids to review target behavior, non-examples, and how to implement the game. The board game Sorry® was selected based on the novelty of the game to all three participants. The game board, three individual game pieces, and cards were included across all sessions. Pop the Pig® and Candyland® were used during generalization probes.

Each participant was given a Power Card. The card focused on the target behavior of making socially appropriate comments to peers during gameplay. The card was

individualized for each participant based on the child's special interest. The scenario and Power Cards were created based on the criteria Gagnon (2001) established for this intervention. There were visuals of the child's special interest on the Power Card; these appeared throughout the scenario and the Power Card, these images varied for each participant. An example of Beth's Power Card used for this study can be found in Appendix A.

The scenario described how the special interest interacted with their peers when they played a game, it was written from the point-of-view of the special interest. The scenario also described how the special interest attempts a solution in order to be successful at the target behavior. The end of the scenario encouraged the participant to try and make comments to their peers about the game. Three steps were listed in order to explain to the participant, how they could interact with their peers just as their special interest did in the scenario.

The Power Card used during the Power Card Only condition included the solution broken into three steps, along with pictures of the special interest. The scenario and Power Card were attached to an index card and laminated in order to increase the durability of the card over time.

Dependent Variable

The Power Card was implemented to measure the effects of the number of socially appropriate comments the child with ASD made to their peer during gameplay. Therefore, the dependent variable for the study was defined as an independent, socially appropriate comments toward peers. Comments were defined as the participant uttering a two or more-word phrase to a peer who was also engaged in the game without prompting

from staff. To be scored, the comment had to be relevant to the game. For example, positive feedback given to other players and positive observations made about the game were scored as socially appropriate comments. Non- examples included negative comments towards peers, language inappropriate for an elementary school child to use (e.g., cursing), and comments about other activities besides the game, such as lines from movies, TV, video games, or comments about other activities that the participant engages in. The comments "my turn" and "your turn" also were excluded as socially appropriate comments in this study due to the fact that these were behavioral goals for all three participants and had been taught in isolation for months prior to the start of the study.

Data Collection

Data were collected each time Sorry® was played during the social skills instructional period. Data were taken for 10-minutes; starting immediately after the game rules were reviewed through when the game ended. The experimenter was the primary data collector during all phases of baseline, intervention, and maintenance probes. An example of the data sheet can be found on Appendix B.

Data were collected on the frequency of comments during the 10-minute game period. Each occurrence of a comment during the game period was circled on the data sheet, a total number of comments was recorded after the game concluded. Additionally, the primary observer documented the responses made that were not included on the Power Card. These responses were written next to the frequency data of that participant.

Interobserver Agreement

Interobserver agreement (IOA) data were collected by other staff from the company conducting the social skills group. The staff included a board-certified behavior

analyst (BCBA) and registered behavior technicians (RBTs). All staff were trained during baseline. Training included examples and non-examples of the target behavior and how to collect data. Prior to the start of the study, three sessions were held to train data collecting procedures. During these sessions, the Power Card procedure and treatment fidelity were reviewed. Also, examples and non- examples of commenting that were to be recorded on the data sheet were examined. Practice data were taken across during gameplay during social skills. IOA data for commenting were calculated by using total count IOA, the smaller divided by the larger number then multiplied by 100%. Training concluded after IOA data practice sessions reached 100% across three game sessions. Data were collected at the start of the hour long social skills group and a second game was played at the conclusion of the group once a week. An additional session was conducted one time per week prior to a social skill outing. IOA data were recorded by the secondary data collector, the social skills BCBA, and RBTs. Data were reviewed and IOA data were collected across 42% of the sessions. IOA for commenting was calculated by the number of agreements plus disagreements, then multiplying by 100%. The average IOA for commenting to peers was 97% (range, 91.6 – 100%).

Procedural Fidelity

A procedural fidelity checklist was created for the baseline condition; a separate checklist was created for the Scenario and Power Card conditions. The procedural fidelity checklist for baseline included “Yes.”, “No.”, and “N/A.” questions to ensure the game was run the same way each time and implemented in the correct order. The procedural fidelity checklist for baseline can be found on Appendix D.

A procedural fidelity checklist was also included during the Scenario + Power Card condition, Power Card Only condition, and maintenance (Appendix E). Questions about the implementation of the Power Card were added to this checklist. Also, reinforcement questions were included on the procedural fidelity checklist in order to ensure the same amount of reinforcement was given to each participant.

Procedural fidelity was collected across 42% of the session. Procedural fidelity was calculated by dividing the total number of answers marked "yes" by the total number of possible yes and no responses and multiplying by 100. Treatment fidelity and IOA on procedural fidelity was 100%.

Social Validity

Social validity data were collected from staff who work with the participants in multiple settings and from the participants. The surveys were used to evaluate the participants' and staffs' acceptance of the intervention and the effects of the intervention. A four-point Likert-type scale was presented to the staff, asking them to questions geared toward the effects the Power Card and their acceptance of the intervention. The questions were constructed to evaluate if staff and parents found the Power Card strategy effective and whether or not they were satisfied with the strategy. The staff who work with the participants were given the survey before, during, and after the intervention; parents were given the survey at the conclusion of intervention. The social validity questionnaire is found on Appendix F. A social validity questionnaire was created to assess the participants' acceptance and the effectiveness of their Power Card. This survey asked the participants to select ☺, 😐, and ☹ for each statement; an example of this questionnaire can be found on Appendix G.

Experimental Design

This study used a multiple probe design across participants (Cooper et al., 2007). Within the multiple probe baseline design, there were four phases. The first phase was baseline and data were collected on comments made to peers during gameplay. The second phase incorporated the scenario and Power Card component of the intervention. Phase three was the implementation of the Power Card alone. During phase final phase, the Power Card was removed and data were collected to see if any improvements in social commenting maintained after the intervention was withdrawn. Additionally, during the maintenance portion of the study, data were also collected when participants engaged in different games with peers to assess generalization effects. The Power Card strategy was introduced to the next participants after the first participant met acquisition criteria. Acquisition criteria were defined as an 80% increase in the number of comments above the average of all ten- minute baseline sessions.

Procedure

Special Interest Assessment. Prior to the baseline condition, data were collected in order to select the child's special interest. This was done by staff and parent interviews and direct observation of the child during free time during in- between instructional sessions (Campbell & Tincani, 2011). After consenting to the study, parents and social skills staff were asked to fill out a survey in order to gather more information on the child's special interest. The survey was sent home to the parents, staff filled out the form at the social skills group. The questionnaire can be found on Appendix C.

Baseline. During baseline, the children participated in the game Sorry ® for 10 minutes. Each session during baseline, the game was placed on the table and all game materials

were placed on the board. After the game was set up, the participants came to the table and sat in front of their game pieces. The participants used the same color game pieces throughout the study. Then the experimenter reviewed the instructions and checked if the participants had any questions. Following the review, the experimenter said "Let's start.", this also signaled that the 10-minute game session and data collection had begun. Data were collected on the number of times the participant made a comment while playing the game. During baseline, all comments that were made were reinforced with praise from staff. Data collection stopped after 10 minutes of the game was played; due to the complexity of the game Sorry®, the game never concluded early. Therefore, the staff prompted the participants to end the game after the 10-minute duration. The experimenter concluded the end of the game by stating, "Time is up, you can transition to the next activity."

Scenario + Power Card Condition. During the Scenario + Power Card Condition, the scenario component of the Power Card outlined by Gagnon (2001) was introduced to the child. First, the game and materials were set up prior to the participants coming to the table. During this phase, the child was prompted to read the scenario and Power Card prior to sitting at the table where the game was located. The primary observer read the scenario with the child, including the steps to emit the target behavior. During this time, the participant had the opportunity to ask questions or talk about the scenario. The child was also given the choice to place their Power Card on the game table. The staff did not reference or redirect the participant to the card once returning to the table.

Once all participants were at the table, the instructions were reviewed and the game began (similar to baseline). Data were collected on comments made to peers during

the 10-minute game session. The first comment made by the participant was praised by the staff. All comments after were reinforced with praise from staff on a VR3 schedule. On average, every three comments the participant made to their peers were reinforced; the VR3 schedule was selected to account for the potential increase in frequency of commenting with the intervention. It would not be practical to reinforce all comments; therefore, a natural reinforcement schedule was selected. The comments that were reinforced were determined prior to the start of the session. This was determined by averaging the possible number of comments and selecting which number comments to reinforce in order for an average of every three comments to receive verbal praise. The game concluded after 10- minutes. The staff prompted the participants to transition to the next activity.

Staff reinforced socially appropriate comments, but only when the participant made a comment toward their peer. Vocal reinforcement included; "Great job telling _____ he made a good move."; "Nice eye contact when you told ____ you liked the game." "I love how you told ___ what you noticed." Social phrase was the only type of reinforcement given after a comment was made. The first comment from the participant was always reinforced, the comments that followed, were reinforced on a variable ratio (VR) schedule of three. Reinforcement protocol is included on the fidelity checklist, which can be found on Appendix E.

Power Card Only Condition. The Power Card Only Condition was identical to the protocol described to the Scenario + Power Card Condition, with the exclusion of the scenario. During the Power Card Only Condition, the scenario was removed and replaced by the Power Card. The Power Card condition was implemented the same way as the

Scenario condition, with the exception of only the Power Card was presented to the participant. Comments were reinforced on the same schedule as the Scenario + Power Card Condition.

Maintenance and Generalization. During the final phase of the intervention, the Power Card was withdrawn. Participants continued to play the game Sorry ®, during this 10-minute game session no Power Card was presented. During the maintenance condition, no prompts were given to the participant to comment to peers. Data were collected the same way as the previous conditions in order to assess if the participant met the target behavior without the strategy in place. Comments were reinforced on the same schedule as the Scenario + Power Card Condition and Power Card Only *Condition*.

Generalization probes were gathered while the participants engaged in a different game in the same setting and a different game in a different setting. The participants engaged in a different game with their peers, the Power Card and prompts were not given during gameplay. The generalizations probes were conducted exactly the same as baseline with the exception of all comments were reinforced on a VR3 schedule. Generalization probes were also collected at the bowling alley, where all three participants played a 10-minute game of bowling. Data were collected the same way as the previous conditions.

CHAPTER 3

RESULTS

The purpose of the study was to evaluate the effectiveness of the Power Card strategy on increasing the number of comments made by a child with ASD to their peers during gameplay. The target behavior included making positive comments towards peers independently. Additionally, this study evaluated generalization of the target behavior across setting and games. Social validity questionnaires were also collected to assess staffs' and participants' satisfaction. The results of the Power Card intervention are shown in Figure 1.

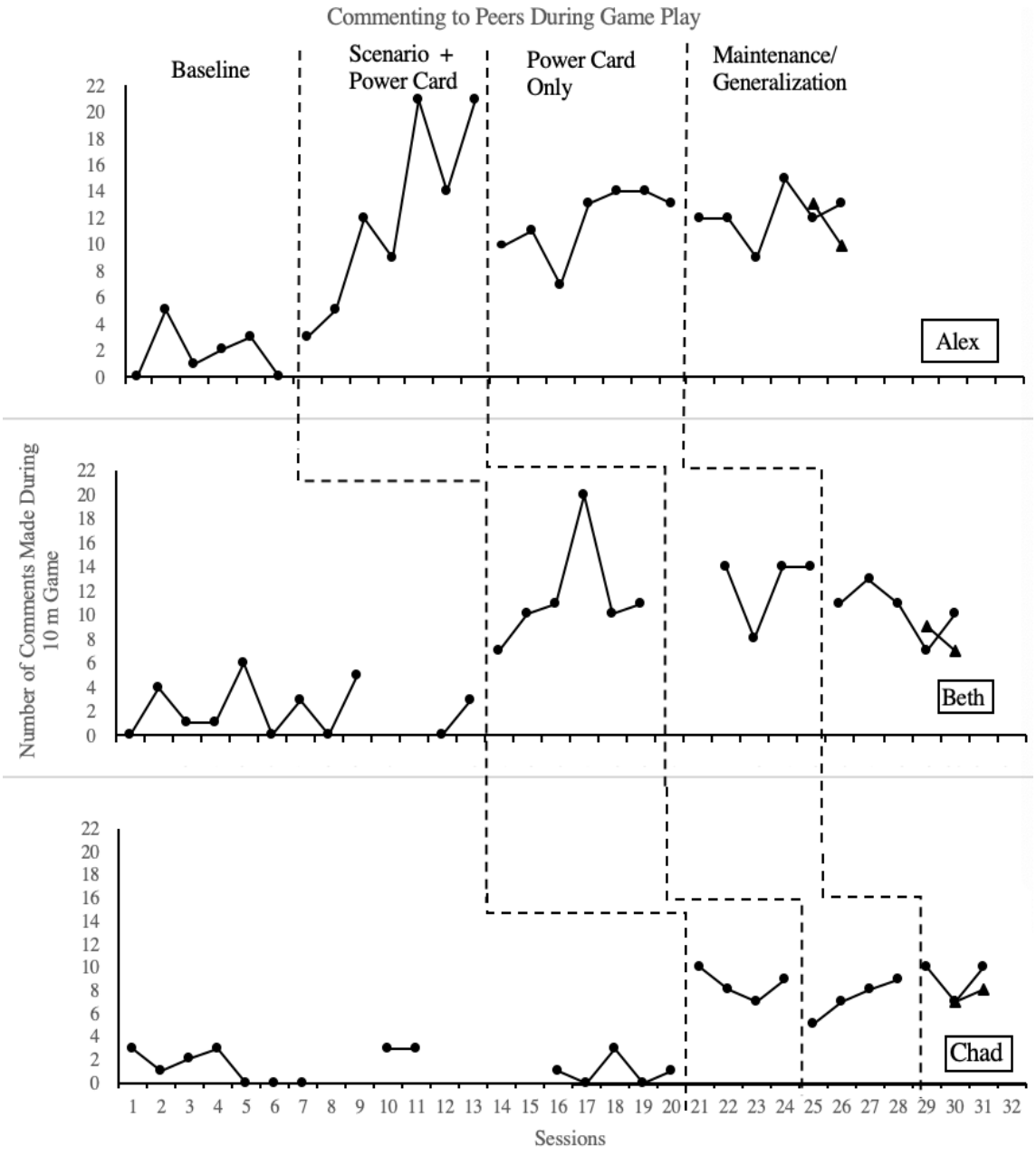

Figure 1. Frequency of comments made during 10- minute game session in baseline, Scenario and Power Card condition, Power Card condition, and Maintenance/ Generalization condition for all three participants.

Baseline. Alex, Beth, and Chad averaged 2.2 (range, 0- 5), 1.9 (range, 0- 6), 1.4 (range, 0- 3) respectively for comments to peers during a ten-minute game session in baseline. The results of baseline data collection suggested that an intervention needed to be implemented to increase independent comments to peers.

Scenario + Power Card Condition. After the addition of the Scenario + Power Card, Alex increased the number of independent comments made to peers an average of 12.1 (range, 3- 21) comments per 10- minute game session. He met criterion of 80% across three game sessions on the seventh session. Beth's average number of comments made increased to an average of 11.5 (range, 7- 20) with the implementation of the Scenario + Power Card. She met criterion after the fourth session, however, the Scenario + Power Card were still implemented in order to assess if stable levels of commenting would occur. Chad's commenting increased immediately after the implementation of the scenario card. He made an average of 8.5 (range, 5-9) comments.

Power Card Only Condition. The second phase of the intervention excluded the scenario, the Power Card was the only stimulus presented to the participant prior to gameplay. During this phase, Alex emitted fewer comments per session in this phase. However, after the third session, Alex's comments stabilized and never overlapped with the number comments during baseline. He made an average of 11.7 comments (range, 7- 14) during this condition. Alex met criterion after the sixth session; however, an additional session was included in order to obtain stable commenting before moving on. Beth emitted an average of 12.5 (range, 8- 14) comments during this phase. Beth met criterion after the fifth session in the Power Card condition. Chad continued to increase the number of

comments during the game to his peers. He made an average of 7.25 comments (range, 5-9) during this condition. Chad met criterion of the fourth session.

Maintenance and Generalization. The Power Card and scenario were not presented in the maintenance/generalization phase. In the maintenance phase, Alex continued stable levels of commenting to his peers, he commented an average of 12.1 (range, 9- 15) comments in the ten- minute game session. Beth's comments to peers decreased to an average of 10.4 (range, 7- 13) comments per session. Chad's commenting increased to an average of 9 (range, 7-10) comments during the ten- minute session with his peers.

The data participants' data suggested that commenting generalized to other settings and games. Generalization probes were taken during bowling. Generalization probes were also collected for during Pop the Pig® for Alex and Beth and Candyland ® for Chad. Alex made 13 and 10 comments, Beth made 9 and 7 comments, and Chad made 7 and 8 comments, respectively, during the generalization probes.

In addition to increasing the frequency of comments made during gameplay, participants made novel social comments not on the Power Card. The participants started making novel comments not on the Power Card, this is an instance of response generalization because these comments were not instructed on the Power Card. On each Power Card, the specific phrases listed were, "Nice move,"; "Great job,"; and "Better luck next time." In all sessions after the intervention began "Great job," and "Nice move," were commented to peers. However, the three participants also began making comments and observations to peers about the game not specifically taught on the card. The comments made to peers were documented.

Novel comments occurred for Alex during the fifth session during the Scenario and Power Card phase. Beth's novel comments began after the first session of the Power Card phase. Comments made by Beth also began to occur before the first move of the game occurred. Chad made novel comments after the first maintenance session; however, most comments made towards peers were the comments had been included on the Power Card. Table 1, Table 2, and Table 3 list the comments made during each condition respectively.

Comments on Power Card	Novel comments during the Scenario + Power Card	Novel comments during Power Card Only	Novel comments during maintenance + generalization
Nice move	Thank you	Wow, what a high big number.	Look you landed on fire
Great job	Hey, look you landed on fire	Look you are at my home	That is a high number, Beth
Better luck next time	I need to turn this	I am getting close to my home	You are in Beth's home
	I hope I get to blue		I am going to send you back home, Beth
			You got the same number as me
			Wait, it says 11, you moved 12
			Your piece is on-top of mine
			You can move 4 spaces or you can go home

Table 1. Comments on Power Cards versus novel comments for Alex during scenario + Power Card, Power Card only, and maintenance + generalization conditions.

Comments on Power Card	Novel comments during the Scenario + Power Card	Novel comments during Power Card Only	Novel comments during maintenance + generalization
Nice move Great job Better luck next time	None	Alex, my brother's favorite color is yellow, like your color Look Alex, you can slide You are sliding ahead of me Look you landed on the circle 11 is a big number	None

Table 2. Comments on Power Cards versus novel comments for Beth during scenario + Power Card, Power Card only, and maintenance + generalization conditions.

Comments on Power Card	Novel comments during the Scenario + Power Card	Novel comments during Power Card Only	Novel comments during maintenance + generalization
Nice move Great job Better luck next time	None	None	Alex, I got a seven You got a 12, you need to stop after that You need to follow each space You have to go back

Table 3. Comments on Power Cards versus novel comments for Chad during scenario + Power Card, Power Card only, and maintenance + generalization conditions.

Social Validity

The social validity statements that staff and parents were asked on this survey: (1) The implementation of this intervention was successful. (2) You have seen a desired change in the number of independent comments made during gameplay. (3) You have noticed a decrease in the number of prompts needed when the child is engaging with peers. (4) The intervention does not need to be changed or altered. (5) The intervention is a good use of time and resources. (6) You are satisfied with the intervention procedure. (7) You have noticed a decrease in maladaptive behaviors. (8) You have noticed an increase in social commenting in other environments. (9) You felt comfortable implementing the Power Card. (10) The Power Card strategy met the goal of the child increasing social commenting to peers without prompting to others. The average response for the Power Card strategy across all questions were 100% "Strongly agree." Both BCBAs who filled out the social validity questionnaire also stated they will continue to use the Power Card strategy to increase social commenting with other children with ASD. The parents that returned the survey noted that commenting increased other environments.

Additionally, the feedback on the social validity questionnaire from the participants' BCBAs and staff noted an increase in commenting across all participants in other settings. The BCBA for Alex noted detailed commenting occurring during group outings, and a decrease in prompting to interact with others. The BCBA who oversaw the social skills group noted Alex had an increase in independent sharing and making positive comments to peers. Chad's staff noted an increase in reciprocal greetings and interactions when approached by peers and adults.

The participants' social validity questionnaire addressed: (1) I wanted to read my Power card before social skills. (2) I understood how my hero solved the problem (3) I can follow the steps my hero took when I am commenting to peers when playing games. (4) I asked for help if I did not understand. (5) I followed all the steps on my Power Card when making comments to my peers. (6) I liked reading the Power Card before social skills, it helps me to remember what to do. (7) I like having the Power Card in front of me, it reminds me of what to do when I am playing with others. (8) My staff did not have to tell me to make a comment to the people I was playing a game with during social skills. (9) The Power Card strategy helped me to meet my goal of commenting to my peers without prompting from others. (10) I like having my Power Card, it feels good to make positive comments to my peers. The participants' social validity questionnaire was given multiple times to each participant throughout the intervention. If at any time the child selected ☹ on more than on occasion, they would be given the option to stop the Power Card. However, all participants answered ☺ to all ten questions 100% of the time and therefore, remained in the study.

CHAPTER 4

DISCUSSION

This study evaluated the effects of the Power Card intervention on increasing appropriate comments made to peers during gameplay for three children with ASD. The research questions addressed in this study were: (a) What are the effects of the Power Card strategy on increasing socially appropriate comments made by children with ASD during gameplay with peers? (b) Will socially appropriate commenting to peers generalize? (c) To what degree are staff and participants satisfied with the implementation and effects of the Power Card intervention?

Prior to the implementation of the Power Card, participants were making an average of two comments during a ten- minute game session with peers. Based on the data collected during and after the Power Card intervention concluded, commenting to peers during gameplay increased over baseline for all three participants. The study shows that stable levels of commenting can occur as a result of the Power Card strategy. The percentage of nonoverlapping data points (PND) were 90% for Alex and 100% for Beth and Chad. The initial effect of the Power Card intervention for Alex was variable and an increase in commenting was not immediate during the Scenario and Power Card conditions, stable levels of commenting occurred in the Power Card Only Condition and maintenance and generalization phase. Alex's average frequency of commenting continued to increase during the maintenance and generalization phase. It is important to note that the high frequency of Alex's comments made during Scenario + Power Card Condition was not matched in the other conditions. Although the results demonstrated in the Scenario + Power Card condition were variable, a substantial increase in frequency

occurred. This could have potentially occurred due having both the scenario and the Power Card read prior to game play, which suggests that the script was faded too soon, and additional Scenario + Power Card sessions were needed.

The generalization probes showed that commenting remained stable when the Power Card was not presented in other environments, which further supports that the Power Card strategy was effective across all three participants. However, during the maintenance phase Beth's frequency of comments reduced compared to the previous conditions. This could be due to extraneous variables such as the start of a new school and schedule which Beth participated in prior to the maintenance phase. These extraneous variables may have caused environmental events that effected the Beth's behavior in which obscured the effects of the independent variable.

Another significant finding from this research is the novel responses occurred for all three participants. Although these occurred at different phases and sessions for each participant, each of the participants made comments not specifically taught on their Power Card. Novel commenting first occurred in the study after Alex and Beth were introduced to the Power Card strategy, during which the participants received positive comments from a peer when they took a turn during the game. It can be hypothesized that the novel comments occurred due to the target behaviors meeting the naturally existing contingencies of reinforcement. These findings are consistent with Baker et al., (1998), which concluded that increases in appropriate social interactions continued without prompting due to being highly motivated to play the game with their peers.

These findings support use of a child's special interest incorporated within an intervention in order to increase or decrease a target behavior (Baker et al., 1998;

Charlon- Christy & Haymes, 1998; Boyd et al., 2007; Gagnon, 2001). None of the participants needed to be redirected from talking about their special interest. The dependent variable excluded all comments made about the special interest. Therefore, the findings from this study confirm that including the special interest did not limit comments made to peers. The current study supports the findings of Keeling et al. (2003) which found that incorporating the child's special interest had significant implications on the increase of positive behavior and the novel comments made during the intervention. The special interest did not impede on appropriate comments made to the peers; none of the participants' comments made throughout the study were about their special interest (Keeling et al., 2003).

The results of this study have shown that the Power Card strategy was effective in increasing the frequency of comments made during gameplay. The findings from this study support the Keeling et al. (2003) study by showing that the frequency of commenting increased after the Power Card strategy was implemented and the responses made by the participants generalized. The results of increasing commenting support that the Power Card strategy is appropriate to implement to increase commenting. The results from this study demonstrated experimental control, supporting the findings that the Power Card strategy can increase the frequency of appropriate comments. These findings support the validity of prior research and the conclusion that the Power Card strategy has a positive effect on behavior change (Campbell & Tincani, 2011; Gagnon, 2001; Sansosti, 2010; Keeling et al., 2003; Spencer et al., 2008; Lanou et al., 2012; Angell et al., 2011; Daubert et al., 2014). This study extends the findings of Campbell and Tincani (2011), in that the data from this study indicated that stable commenting continued after

the Power Card was removed. Results of the current study support that the Power Card can be removed and the desired effects are maintained. This study also provides data that novel responses occurred while the Power Card strategy implemented, and after it was removed. The results during maintenance and generalization also provide data that show stable commenting to peers generalized to other environments. The Power Card strategy expands the participants social and recreational skills by improving their participation in socially- based board games (Daubert et al., 2014). The special interest on the Power Card was an establishing operation when first introduced to the participant. Once the participant was exposed to the natural reinforcement of peer attention and reciprocal comments, the peer became a conditioned reinforcer. Therefore, the participant's comments to their peers increased and continued after the intervention concluded when they engaged in a game with their peers.

Additionally, by using the Power Card as the only prompt given for commenting to peers, it can also be concluded that prompt fading strategies were effective. The multicomponent intervention was able to be faded after stable levels of responding occurred with each participant; allowing a minimal number of prompts to be incorporated as commenting to peers increased over baseline. All three participants continued to comment to their peers even after no prompts were given, showing that the fading protocol is appropriate in order to meet the target behavior.

The second research question was answered based on the results from the social validity questionnaire and the treatment integrity results. The staff working these participants felt that the Power Card intervention was a good use of their time and recourses and that they saw the increase in commenting made to peers. The treatment

integrity data along with the social validity responses indicate that staff found the Power Card easy to implement, effective, and an intervention that they would use for other children with ASD.

Based on the commenting data, treatment integrity data, a social validity data, the results of this study can be interpreted to conclude that the Power Card intervention is an appropriate and effective strategy to use when increasing comments made to peers during gameplay with children with ASD.

Limitations

Due to the single-subject research design and the limited number of participants, future replication of this study is needed in order to verify these results. When replicating this study, considerations may include increasing the number of sessions, tracking maintenance for a longer period of time, and increasing the number of generalization probes. These changes might allow for the data to show how the effects of the Power Card are maintained in the same environment and how the generalize for an extended period.

Another limitation of this study is the location and delivery of these sessions. Due to the intervention taking place during a social skills group, there were many distractions in the environment. Primarily, these distractions included games being played in the immediate environment, and the peers who were not included in the study. There were several instances of peers engaging in tantrum behavior, which caused a distraction to the participants and potentially impacted the number of comments made during that session. It was difficult to control for these extraneous variables; however, these distractions and behaviors will continue in this environment after the conclusion of this intervention.

Future research should look at the maintenance and generalization effects of the Power Card intervention when implemented in the natural setting versus a contrived setting.

One of the purposes of the Power Card strategy for this study was as a tool to decrease the number of staff prompts given to the child in order for them to comment to their peers independently. Although the researcher did not prompt the participants to comment, prompting in other environments with other staff were not evaluated. In future research, data should have been taken on the number of staff prompts given to engage in making comments to peers in other environments; in order to assess if the frequency of prompting has increases, decreased, or remained the same. Future research should evaluate the number of prompts given by staff for the child to engage in commenting in the generalization environments. This will allow the researcher to assess and directly measure the change in target behavior before and after the Power Card was implemented in the generalized environment.

REFERENCES

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders (DSM- IV- TR)*. Washington, DC:

Angel, M. E., Nicholson, J. K., Watts, E. H., & Blum, C. (2011). Using a multicomponent adapted power card strategy to decrease latency during interactivity transitions for three children with developmental disabilities. *Focus on Autism and Other Developmental Disabilities*, *26*(4), 206-217.

Baker, M. J., Koegel, R. L., & Koegel, L. K. (1998). Increasing the social behavior of young children with autism using their obsessive behaviors. *Journal of the Association for Persons with Severe Handicaps*, *23*(4), 300-308.

Boutot, E. A., & Tincani, M. (2009). *Autism encyclopedia: The complete guide to autism spectrum disorders*(pp.231). Sourcebooks, Inc.

Boyd, B. A., Conroy, M. A., Mancil, G. R., Nakao, T., & Alter, P. J. (2007). Effects of circumscribed interests on the social behaviors of children with autism spectrum disorders. *Journal of autism and developmental disorders*, *37*(8), 1550-1561.

Campbell, A., & Tincani, M. (2011). The power card strategy: Strength-based intervention to increase direction following of children with autism spectrum disorder. *Journal of Positive Behavior Interventions*, *13*(4), 240-249.

Cartledge, G., & Kourea, L. (2008). Culturally responsive classrooms for culturally diverse students with and at risk for disabilities. *Exceptional Children*, *74*(3), 351-371.

Charlop-Christy, M. H., & Haymes, L. K. (1996). Using obsessions as reinforcers with

and without mild reductive procedures to decrease inappropriate behaviors of children with autism. *Journal of autism and developmental disorders*, *26*(5), 527-546.

Conroy, M. A., Asmus, J. M., Sellers, J. A., & Ladwig, C. N. (2005). The use of an Antecedent based intervention to decrease stereotypic behavior in a general education classroom: A case study. *Focus on Autism and Other Developmental Disabilities*, *20*(4), 223-230.

Cooper, J. O., Heron, T. E., & Heward, W. L. (2007). Applied behavior analysis.

Daubert, A., Hornstein, S., & Tincani, M. (2015). Effects of a modified power card strategy on turn taking and social commenting of children with autism spectrum disorder playing board games. *Journal of Developmental and Physical Disabilities*, *27*(1), 93-110.

Davis, K. M., Boon, R. T., Cihak, D. F., & Fore III, C. (2010). Power cards to improve conversational skills in adolescents with Asperger syndrome. *Focus on Autism and Other Developmental Disabilities*, *25*(1), 12-22.

Devenport, J. M. (2004). Use of the Power Card strategy as an intervention with an elementary school student with Asperger syndrome: Increasing on-task behavior in the general education setting (Doctoral dissertation, University of South Florida).

Edition, F., & American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders. *Arlington: American Psychiatric Publishing*.

Gagnon, E. (2001). Power cards: Using special interests to motivate children and youth with Asperger syndrome and autism. AAPC Publishing.

Gersten, R., & Baker, S. (2000). What we know about effective instructional practices for English-language learners. *Exceptional children*, *66*(4), 454-470.

Green, G. (2001). Behavior analytic instruction for learners with autism: Advances in stimulus control technology. *Focus on Autism and Other Developmental Disabilities*, *16*(2), 72-85.

Keeling, K., Smith Myles, B., Gagnon, E., & Simpson, R. L. (2003). Using the power Card strategy to teach sportsmanship skills to a child with autism. *Focus on Autism and Other Developmental Disabilities*, *18*(2), 105-111.

Koegel, L. K., Koegel, R. L., Frea, W., & Green-Hopkins, I. (2003). Priming as a method of coordinating educational services for students with autism. *Language, Speech, and Hearing Services in Schools*, *34*(3), 228-235.

Lanou, A., Hough, L., & Powell, E. (2012). Case studies on using strengths and interests to address the needs of students with autism spectrum disorders. *Intervention in School and Clinic*, *47*(3), 175-182.

Linn, A., & Myles, B. S. (2004). Asperger Syndrome and Six Strategies for Success. *Beyond Behavior*.

Machalicek, W., O'Reilly, M. F., Beretvas, N., Sigafoos, J., & Lancioni, G. E. (2007). A review of interventions to reduce challenging behavior in school settings for students with autism spectrum disorders. *Research in Autism Spectrum Disorders*, *1*(3), 229-246.

Morris, R. R., Kirschbaum, C. R., & Picard, R. W. (2010, October). Broadening

accessibility through special interests: a new approach for software customization. In *Proceedings of the 12th international ACM SIGACCESS conference on Computers and accessibility* (pp.171-178). ACM.

National Center for Health Statistics (US), United States. Department of Health, Human Services, Centers for Disease Control, & Prevention (US). (2018). *Health, United States, 2009: In Brief* (No. 2018). US Department of Health and Human Services, Centers for Disease Control and Prevention, NCHS.

Sansosti, F. J. (2010). Teaching social skills to children with autism spectrum disorders using tiers of support: A guide for school-based professionals. *Psychology in the Schools*, *47*(3), 257-281.

Snyder, T. D., & Dillow, S. A. (2012). *Digest of education statistics 2011*. National Center for Education Statistics.

Spencer, V. G., Simpson, C. G., Day, M., & Buster, E. (2008). Using the Power Card strategy to teach social skills to a child with autism. *Teaching Exceptional Children Plus*, *5*(1),
n1.

Thiemann, K. S., & Goldstein, H. (2001). Social stories, written text cues, and video feedback: Effects on social communication of children with autism. *Journal of applied behavior analysis*, *34*(4), 425-446.

APPENDIX A

POWER CARD EXAMPLE

Arthur Plays A Game

Arthur loves to play games with his friends! He doesn't like when no one talks during the game. Arthur really likes when he can talk to his friends about the game. He makes eye contact with his friends when he talks to them. When Arthur and his friend play games, he can say to his friends "Thanks for playing with me" or comment on how they are playing. Arthur loves to say positive things to his friends like "Nice move", "Better luck next time" or "Great job" during the game. It makes Arthur happy to talk to his friends about the game.

Back

Arthur wants you to have fun and talk to your friends when you play games. Arthur wants you to remember:

1. Look at your friends when you talk to them.
2. Think about what it going in the game, and talk to your friend about it.
3. You can say something positive to your friends after they take a turn or at the end of the game.

Remember these three things and you can have fun when you play games just like Arthur!

APPENDIX B

DATA SHEET

Name of Primary Investigator:_____
Secondary Investigator:_____
Date/ Session Number:_____ IOA Taken:_____If yes, name of data collector)

Data on Appropriate Comments Towards Peers during game play is defined as while playing a game with peers, the child makes a comment towards the peer(s) without prompting from staff. Comments that are made after verbal or gestural prompts from staff will not be counted on this data sheet.

Child	CIRCLE THE NUMBER of SOCIALLY APPROPROPRIATE COMMENTS MADE DURING THE GAME.
Alex	**1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20**
Beth	**1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20**
Chad	**1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20**

EXAMPLES	**NON- EXAMPLES**
COMMENT ABOUT PEERS PERFORMANCE	OFF TOPIC COMENTS
COMMENTS ABOUT STARTING OR ENDING THE GAME (ASKING QUESTIONS TO PEERS, REMARKS ABOUT THE CONCLUSION OF THE GAME)	SAME COMMENT REPEATILY SAID OR SAID AFTER PEER (ECHOIC)
COMMENT OFFERING POSITIVE REMARKS ARTER GAME (“GOOD GAME”, “NICE JOB”)	NEGATIVE COMMENTS TOWARDS SELF OR PEER
	COMMENTING ABOUT TURN TAKING OR PROMPTING A PEER FOR A TURN

APPENDIX C

PREFERENCE ASSESSMENT

Name:_____
Child's Name:_____
Date:_____

1) **Does your child have a favorite toy or an item they play with more than other toys?**

_____

_____

2) **Is there anything that your child really likes collecting?**

_____

_____

3) **Does your child have a topic or interest that that repeatedly talk about?**

_____

_____

4) **Does your child have a favorite TV or movie show that they watch repeatedly or reference often?**

_____

_____

5) **What would you recommend as your child's special interest; this special interest would help to motivate them to engage and connect to the Power Card?**

_____

_____

APPENDIX D

PROCEDURAL FIDELITY CHECKLIST FOR STAFF DURING BASELINE

Name:_____Date/Session:_____Student:_____

IOA:_____

Directions: Complete after the intervention. Fill out as accurately as possible.

1. Did you place the game on the table?
   Yes No N/A

2. Did you set up the game prior to the children coming to the game?
   Yes No N/A

3. Did you announce that it was time to come to the table to play the game?

   Yes No N/A

4. Did each child have their own spot and materials at the table?
   Yes No N/A

5. Did you go over the objective of the game prior to playing?

   Yes No N/A

6. Did each child receive 2 or more turns during game play?

   Yes No N/A

7. During gameplay, were the game's rules implemented with the social skills group?

   Yes No N/A

8. Did you prompt the conclusion of the game?

   Yes No N/A

9. Did the learners play a different game after the conclusion of the game?

   Yes No N/A

APPENDIX E

PROCEDURAL FIDELITY CHECKLIST FOR INTERVENTION

Name:_____Date/Session:_____Student:_____

IOA:_____

Directions: Complete after the intervention. Fill out as accurately as possible.

1. Did you place the game on the table?

   Yes No N/A

2. Was the Power Card read before coming to the game?

   Yes No N/A

3. Was the child allowed to ask if they had any questions or needed the Power Card to be repeated?

   Yes No N/A

4. Did the child have the option to keep the card?

   Yes No N/A

5. Did you reinforce the first comment made to peer?

   Yes No N/A

6. After the first comment did you reinforce on a VR3 schedule?

   Yes No N/A

7. Did each child receive two or more turns?

   Yes No N/A

8. Did the you prompt the conclusion of gameplay?

   Yes No N/A

9. Did the group of learners move to a different game after the game concluded?

   Yes No N/A

APPENDIX F

SOCIAL VALIDITY QUESTIONNAIRE

Name:_____
Date:_____
Relationship to Student: _____
Directions: Circle the number that best number in response to the question
The score of 5 means “strongly agree”, 4 means “agree”, 3 means “somewhat agree”, 2 means “disagree”, and 1 means “strongly disagree”.

1. The implementation of this intervention was successful.	NA	1	2	3	4
2. You have seen a desired change in on-task behavior.	NA	1	2	3	4
3. You have noticed a decrease in the number of redirections needed when the child is completing work independently.	NA	1	2	3	4
4. This intervention does not need to be changed or altered.	NA	1	2	3	4
5. This intervention is a good use of time and resources.	NA	1	2	3	4
6. You are satisfied with the intervention procedure.	NA	1	2	3	4
7. You have noticed a decrease in maladaptive behaviors.	NA	1	2	3	4
8. You have noticed an increase on- task behavior in other subjects.	NA	1	2	3	4
9. You felt comfortable implementing the Power Card.	NA	1	2	3	4
10. You feel comfortable to continue use the Power Card intervention for other behaviors.	NA	1	2	3	4

APPENDIX G

SOCIAL VALIDITY QUESTIONNAIRE FOR CHILD

Name:_____Date:_____Session:_____

Directions: Complete after the intervention. Fill out as accurately as possible. Circle ☺**,** 😐**,** or ☹ write your total number of ☺ responses at the bottom of the page.

1. I wanted to read my Power Card before social skills?

   ☺ 😐 ☹

2. I understood how my hero solved the problem?

   ☺ 😐 ☹

3. I can follow the steps my hero took when I am commenting to peers when playing games?

   ☺ 😐 ☹

4. I asked for help if I did not understand?

   ☺ 😐 ☹

5. I asked followed all the steps on my Power Card when making comments to my peers?

   ☺ 😐 ☹

6 I liked reading the Power Card before class, it helps me to remember what to do?

☺ 😐 ☹

7. I like having the Power Card in front of me, it reminds me of what to do when I am playing with others?

☺ 😐 ☹

8. My staff did not have to tell me to make a comment to the people I was playing a game with during social skills?

☺ 😐 ☹

9. The Power Card intervention helped me meet my goal of commenting to my peers without prompting from others?

☺ 😐 ☹

10. I like having my Power Card, it feels good to make positive comments to my peers?

☺ 😐 ☹

Total Number of ☺ responses: _____

Percentage:_____