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EVALUATION OF A ROLE-PLAYING GAME TO IMPROVE SOCIAL SKILLS FOR
INDIVIDUALS WITH ASD

by

Kate Helbig

A Dissertation
Submitted to the Graduate School,
the College of Education and Human Sciences
and the School of Psychology
at The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy

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August 2019

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2019

Published by the Graduate School



ABSTRACT

Autism spectrum disorder (ASD) affects one in 59 children (Centers for Disease Control and Prevention, 2018). Impairments in social communication and restricted and repetitive behaviors are often associated with debilitating outcomes for individuals with ASD. Therefore, it is critical to identify successful treatments to address the social deficits characteristic of ASD. This study investigated the effects of a role-playing game (RPG) on social skill acquisition for individuals with ASD. The primary dependent variable was skill acquisition within the context of the RPG setting. Generalization of skill acquisition outside of the game-context and social functioning was also evaluated. Results indicated that the role-playing game improved social skill acquisition across all participants and was rated as a socially valid intervention by both parents and participants. Furthermore, there were mixed results for participants generalized skill acquisition. Future research should incorporate a specific strategy within the role-playing game to promote generalization of skill acquisition.

ACKNOWLEDGMENTS

I would like to acknowledge my mentor, Chad Benis, MD. Without his guidance, this project would not have been dope. I would also like to acknowledge my second mentor, and the other half of the Weird Cop Weird Cop duo, Squidley. Lastly, huge shout out to my twin brother, your awesome voices, and all of the extinction bursts that we endured during this wild ride of a dissertation.

DEDICATION

I would like to acknowledge my family/roommates Cole Winston, J, and P for being an awesome support team. I would also like to thank Chuck, my mom, and sisters for being an awesome family and putting up with me for the past 26 years. Without all of your encouragement and support, this likely would not have been completed.

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CHAPTER I - INTRODUCTION

The Effects of a Role-Play Game on Social Skill Acquisition for Individuals with ASD

According to the Centers for Disease Control and Prevention's estimate, an average of 16.8 per 1000 children are diagnosed with autism spectrum disorder (ASD), ranging between 13.1-29.3 per 1000 children (Centers for Disease Control and Prevention, 2018). Defining characteristics of ASD include impairments with social communication and engagement in restricted and repetitive behaviors (American Psychiatric Association, 2013). These impairments typically manifest during the early developmental period but continue through adulthood and often adversely impact employment opportunities or postsecondary education (Eaves & Ho, 2008; Shattuck et al., 2012).

Social communication impairment may be exhibited as a disinterest in prolonged social interactions, such as an inability to start conversations or engaging in conversation surrounding topics of specific interests only. Additionally, individuals with ASD often lack inflection and change in pitch when speaking and have a difficult time understanding humor, sarcasm, analogies, and metaphors (Starr, Szatmari, Bryson, & Zwaigenbaum, 2003; Winter, 2003). This communication impairment extends to expressing emotions and perspective taking of others' feelings (Baron-Cohen, 1995; Travis & Sigman, 1998). There are also deficits related to nonverbal communication; specifically, regarding difficulty sustaining eye contact or understanding others' body language and facial expressions. Lastly, individuals with ASD often have difficulties establishing relationships with peers or adapting their behaviors for various social settings (McPartland, Law, & Dawson, 2016).

On the other hand, restricted and repetitive behaviors and interests may appear as stereotyped movements or repetitive language, like placing objects in a linear fashion repetitively or vocalizing the same phrase at inappropriate times. Additionally, individuals with ASD may demonstrate strict adherence to routines and experience intense distress when changes are made in the routine. Restricted interests that are unusual in the amount of focus and attention as well as atypical reactivity to sensory stimuli are also characteristics of ASD (American Psychiatric Association, 2013; McPartland et al., 2016; Wolfe, Slocum, & Kunnavatana, 2014). A culmination of characteristics related to social communication deficits and restricted or repetitive behaviors often lead to undesirable outcomes as development continues.

Outcomes for Individuals with ASD

As mentioned previously, social communication deficits and restricted and or repetitive behaviors are often associated with debilitating outcomes for individuals with ASD. During early childhood development, children with ASD have fewer opportunities to respond to social interactions, and when they are interacting, it is often for limited or shorter periods of time (McConnell, 2002). Previous research has demonstrated that school-aged children with ASD are isolated and unengaged on the playground (Corbett et al., 2014). Children with ASD also report substantial loneliness and isolation compared to typically developing peers (Bauminger, Shulman, & Agam, 2003). Regarding relationships with peers, children with ASD are less likely to have reciprocal friendships (Bauminger, Solomon, & Rogers, 2010) and more likely to have lower quality relationships (Calder, Hill, & Pellicano, 2012). Additionally, children with ASD are more likely to experience social rejection from their typically developing peers (Locke, Kasari,

Rotheram-Fuller, Kretzmann, & Jacobs, 2013). This lack of high-quality peer relationships can potentially prohibit typical development of other skills such as language and intelligence (Garrison-Harrell, Kamps, & Kravits, 1997).

As children with ASD progress into adolescence, their social communication deficits can lead to other undesirable outcomes, such as poor academic achievement (Welsh, Park, Widaman, & O'Neil, 2001) social anxiety (Bellini & Peters, 2008) and low self-esteem (Tantam, 2000). Additionally, adolescents with ASD have difficulties initiating relationships with peers (Bauminger et al., 2008a) and spend less time with their peers in comparison to the time that they spend with their parents and paid professionals including paid companions, group leaders of leisure activities, and respite workers (Orsmond & Kuo, 2011). Lastly, adolescents with ASD report that they are lonely and often bullied by their peers (Humphrey & Symes, 2010; Locke, Ishijima, & Kasari, 2010).

As individuals with ASD transition into adulthood, they often have inadequate skills of daily living, continued problems with developing friendships and have difficulty living independently (Howlin, Mawhood, & Rutter, 2000). Additionally, adults with ASD experience significant problems obtaining and maintaining employment after high school (Shattuck et al., 2012). Furthermore, many of those individuals that have obtained employment are employed below their education level (Hendricks, 2010). Regarding their educational attainment, individuals with ASD are less likely to participate in post-secondary education in comparison to their typically developing peers (Eaves & Ho, 2008). Lastly, some research has indicated that individuals with ASD are less likely to participate in productive activities (i.e. occupational, educational, daily activities) during

young adulthood (Taylor & Seltzer, 2011). This lack of engagement has been associated with undesirable behavioral outcomes such as internalizing behaviors (e.g. self-injurious behaviors, repetitive habits, withdrawal, inattention), externalizing behaviors (e.g. property destruction, hurtful towards others, disruptive behaviors) and asocial behaviors (e.g. uncooperative and/or offensive behaviors; Taylor & Seltzer, 2010).

As demonstrated by previous research, the lack of social communication skills exhibited by individuals with ASD can lead to a plethora of undesirable outcomes across a variety of domains. Therefore, it is critical to identify successful treatments for the social deficit characteristic of ASD. Improvements in social communication functioning can lead to reductions in mental health problems and improvements in peer relationships and academic performance (Adreon & Durocher, 2007; Attwood, 2000; White & Roberson-Nay, 2009). Social skills training is the most frequently implemented treatment to improve social functioning (Goin-Kochel, Myers, & Mackintosh, 2007).

Social Skills Training

Social skills refer to the “interpersonal responses with specific operational definitions that allow [individuals] to adapt to the environment through verbal and nonverbal communication” (Matson, Matson, & Rivet, 2007, p. 683). Social skills training can be defined as “instruction designed to improve or facilitate the acquisition or performance of social skills” (Bellini & Peters, 2008, p. 858). Social skills training targets three areas, including skill acquisition, improvement of existing skills, and generalization of skills across people and settings (Bellini & Peters, 2008). Social skills training can be classified into five categories: ecological variations, collateral skills

interventions, child-specific interventions, peer behavior, and comprehensive interventions (McConnell, 2002).

Ecological Variations. Ecological variations of social skills training refer to modifications of the environment to promote and increase opportunities for social interactions. This can include changing an individual's activity structure or schedule and influencing the way a peer group is organized (McConnell, 2002). Ecological variations are considered a lower intensity approach, as it involves a simple restructuring of an individual's environment without adding any direct instruction or other treatment components. For example, Myles, Simpson, Ormsbee, and Erickson (1993) evaluated the effects of the presence of typically developing peers on the social interactions for children with ASD. Participants included four males with ASD and three typically developing peers. The intervention involved having typically developing peers in the presence of the participants. Researchers then observed participants social interactions with staff and peers when typically developing peers were present as well as when typically developing peers were not present. Social interactions that were recorded included praise, assistance, response to praise, sympathy, disapproval, aggression, commanding, complaining, refusing, warning, instructing, answering, questioning, and mirroring. Results indicated that when target students were in the presence of their typically developing peers there was no concomitant increase in social interactions. This study provides some evidence that ecological interventions may not be enough support for individuals with ASD.

Another study conducted by Schleien, Mustonen, and Rynders (1995) assessed the effects of an ecological variation intervention for individuals with ASD. Specifically,

children with and without ASD were placed in an art class together to evaluate if this would increase the number of social interactions between the children each minute.

Results indicated that children with ASD engaged in more social interactions initiated by their peers; however, increases in social initiations from children with ASD and responses to peer initiations were not observed. These data also indicate that ecological variations may not be the best choice of social skills training for individuals with ASD.

Collateral Skill Interventions. Collateral skill interventions are another classification of social skills training. These interventions refer to training other related skills (e.g. play or language) as a way to improve an individual's social interactions. Specifically, the literature related to this social skills training classification typically assesses the relationship between social interaction and play (McConnell, 2002). For example, Krantz, MacDuff, and McClannahan (1993) evaluated the effects of a picture activity schedule on engagement and social initiations. Participants consisted of three boys with ASD between the ages of six and eight as well as their parents. The parents trained the participants on using the picture activity schedule. The picture activity schedule consisted of a binder with one picture per page and included activities such as using play materials, hanging up one's coat, getting a snack, and finding an interaction partner. The parents trained the participants to point to a picture, obtain materials needed, complete the activity, clean up the materials, and move to the next activity. Engagement referred to looking at the picture activity schedule, attending to and using materials appropriately, and transitioning to the next activity. Social initiations included the following behaviors: approaching a person, giving or showing an object, prompting another person to participate in an activity, pointing to an object, and vocalizing at least

one distinguishable word. These behaviors were recorded by observers taking a frequency count each time a social initiation occurred during a two-hour period. Results indicated that the children exhibited increases in social initiations after their parents taught them how to use the picture activity schedule. This study provides some evidence that training indirect skills may be one method to increase social skill acquisition.

Similarly, Stahmer (1995) also researched the effects of a collateral skills intervention. Seven children with autism were taught to engage in symbolic play behaviors utilizing pivotal response training (PRT). Participants were required to engage in symbolic play to receive access to toys. The experimenters presented a preferred toy to the participant and modeled the symbolic play action until the participant responded accurately (i.e. with an approximation or exact play action). Contingent upon appropriate response, the experimenters provided praise and an opportunity to play with the preferred toy. Results demonstrated that after receiving the intervention, participants' social interactions (i.e. initiations and positive responses) improved. Collateral skills interventions are also considered a less intensive intervention approach in that social interactions are expected to result from the structured contact arranged between individuals with ASD and their typically developing peers, as opposed to implementing a combination of interventions. Additionally, collateral skills interventions aim to increase participation skills for individuals with ASD (McConnell, 2002); however, they may not be the optimal social skills intervention strategy for individuals with ASD in that there is no direct training of skills involved.

Child-specific Interventions. According to McConnel (2002), "Child-specific interventions are instructional and/ or reinforcement procedures designed specifically to

increase the skill, frequency, or quality of social behaviors emitted by children with autism” (p. 361). Specific procedures within this category include instruction to promote social knowledge and problem-solving, rich schedules of reinforcement to increase the likelihood of future social responding, social skills training, prompting and reinforcement provided by adults, and strategies addressing generalization of social skills (McConnell, 2002). For example, Licciardello, Harchik, and Luiselli (2008) evaluated the effects of an intervention incorporating pre-teaching, prompting, praise, and rewards on social interactions of four children with ASD. Pre-teaching consisted of classroom assistants having the participant select peers they could interact with prior to play time. They also had the participants practice initiations and responses and provided praise for appropriate demonstrations. Prompting occurred during play time and was provided if the participant did not initiate any interactions for 1-min. The last component of the intervention consisted of the classroom assistants providing praise and a reward if the participants met the criteria of initiating one interaction. Results indicated that social interactions and responses increased across all four of the participants.

Reinforcement strategies provided within a say-do correspondence were also assessed as a child-specific intervention strategy (Rosenberg, Congdon, Schwartz, & Kamps, 2015). Say-do correspondence refers to a strategy in which an individual gains access to a reinforcer contingent upon performing the behavior or action that they said they were going to perform. Participants consisted of three children between the ages of six and seven years old. First, participants identified peers they would engage in conversation during recess. The researchers then explained that if participants engaged in conversation, they would then receive a prize. Results demonstrated an increase in the

number of social interactions for all participants after the intervention was implemented. Another study, conducted by Koegel, Park, and Koegel (2014), evaluated the effects of a self-management intervention for three individuals with ASD. Specifically, the participants had to record conversation points that they earned after correctly demonstrating all three components of a conversation. The three components consisted of answering the question or making a related comment, elaborating on the speaker's response, and asking questions related to the topic. Results indicated that there were increases in elaborated responses and question-asking following the implementation of the intervention. Despite their apparent effectiveness, child-specific interventions in isolation may not be the best choice of intervention for individuals with ASD. Child-specific interventions focus primarily on increasing the frequency of social initiations instead of improving the quality and sustainability of those interactions. Thus, child-specific interventions may not be successful in remediating all facets of social interaction deficits exhibited by an individual with ASD (McConnell, 2002).

Peer-mediated. Peer-mediated procedures are the fourth category of social skills training interventions. Peer-mediated interventions involve utilizing typically developing peers as direct intervention agents to drive behavioral and/or academic skill change in individuals with ASD. Specifically, peers are usually trained to establish social initiations and elicit responses from children with ASD (McConnell, 2002). Procedures such as incidental peer teaching and peer tutoring are all included under the term peer-mediated interventions. Watkins, O'Reilly, Kuhn, Gevarter, Lancioni, Sigafoos, and Lang (2014) conducted a meta-analysis examining the effectiveness of peer-mediated interventions for individuals with ASD. A total of 14 studies were examined. Traditional effect sizes were

not used within this meta-analysis, instead success estimates (Reichow & Volkmar, 2010) were calculated. To calculate the success estimate, the number of successful intervention implementations was divided by the total number of attempts of intervention. A successful implementation of an intervention was determined by using visual analysis of level, trend, and variability. Results indicated that 10 of the 14 studies had positive participant outcomes for all variables. Overall, peer-mediated interventions are an effective strategy for improving social interaction skills of children, adolescents, and adults with ASD, however it is important to note the small sample size of the studies included within the meta-analysis.

An empirical investigation of a peer-mediated intervention implemented during recess was also evaluated (Barber, Saffo, Gilpin, Craft, & Goldstein, 2015). Participants included three male students with ASD between the ages of 3 and 4 years as well as three typically developing peer buddies between the ages of 4 and 5 years. The intervention consisted of the peer buddies staying near their buddy for the duration of recess, playing with their buddy, and talking about or describing the activity they were playing together. The primary dependent variables of this study were social initiations and responses. The effect the peer-mediated intervention had on social initiations and responses was evaluated by using a multiple baseline across participants. Results indicated that during intervention, participants' number of responses immediately increased compared to baseline. Additionally, the number of participant initiations also immediately increased after the peer-mediated intervention was implemented. However, during follow-up, increases in responses and initiations were not maintained for any of the participants.

Bambara, Cole, Kunsch, Tsai, and Ayad (2016) also evaluated the effects of a peer-mediated intervention to improve social skills for individuals with ASD. Participants included three high school students with ASD between the ages of fourteen and fifteen. The intervention consisted of the peer interventionists teaching the target students the discrete steps of how to have a conversation and instructing them to have conversations during lunch. The second part of the intervention was a prompting procedure in which the student interventionists reminded target students of various steps of having a conversation. The last part of the intervention involved the student interventionists structuring the conversation, so the target students could ask follow-up conversations. Results indicated that this intervention was effective in improving target students' conversation skills. Though peer-mediated interventions are generally accepted as promising intervention strategies for individuals with ASD, it is important to note that there are potentially more beneficial approaches for increasing social skills. A limitation of peer-mediated interventions is that new groups of peers will need to be trained as the child develops and begins interacting with peers in different settings (McConnell, 2002), as long-lasting effects or generalization and maintenance of skills are typically not observed (Zagona & Mastergeorge, 2016).

Multicomponent interventions. The fifth and final category of social skills training is multicomponent interventions. McConnell (2002) called this category comprehensive, however the term comprehensive can be interpreted as 'all inclusive' and for the purpose of this study, multicomponent is a clearer description of this class of social skills training. These strategies involve at least two components of previously described intervention categories (McConnell, 2002). Specifically, multicomponent interventions utilize a

variety of different intervention strategies delivered as an intervention package. As a result, many are commercialized and published for use by practitioners in a variety of settings. Examples of multicomponent manualized intervention packages intended for individuals with ASD include Superheroes Social Skills (Jenson, et al., 2011) and the Program for the Education and Enrichment of Relational Skills (PEERS; Laugeson & Frankel, 2010).

Superheroes Social Skills consists of multiple intervention approaches, including video models, role-play with corrective feedback, social scripts, and a self-monitoring component (Jenson et al., 2011). Several empirical investigations have been conducted evaluating the implementation of Superheroes Social Skills on skill acquisition.

Superheroes has been implemented in a variety of settings and with a variety of populations, including clinic (Radley, Ford, McHugh, Dadakhodjaeva, O’Handley, Battaglia, & Lum, 2015) and school-based (Radley, McHugh, Taber, Battaglia, & Ford, 2015) settings including preschool (Radley, Hanglein, & Arak, 2016), elementary (Block, Radley, Jenson, Clark, & O’Neill, 2015), middle school (Murphy, Radley, & Helbig, 2018) and high-school aged (O’Handley, Ford, Radley, Helbig, & Wimberly, 2016) individuals with ASD. These studies have all demonstrated Superheroes Social Skills to be effective in increasing social skill acquisition.

PEERS also involves various intervention strategies, such as direct instruction, role-play demonstrations of accurate and inaccurate models, perspective taking questions, role-play with corrective feedback and behavioral coaching, socialization homework, and a parent-training group. A randomized controlled trial was conducted to evaluate the effectiveness of the PEERS program for improving social skills in young adults.

Participants consisted of 22 young adults between the ages of eighteen and twenty-four. Results of a MANOVA indicated that the treatment group improved significantly in social skills, frequency of social engagement, and overall knowledge of social skills compared to the delayed treatment group (Wilks' Lambda = 0.14; $F(5.11) = 12.43$, $p < .001$) (Laugeson, Gantman, Kapp, Orenski, & Ellingsen, 2015).

Given the current research, multicomponent interventions utilizing a manualized format appear to be the best choice of intervention strategy for individuals with ASD. Due to the variety of strategies included within multicomponent interventions, there are more opportunities and benefits associated as opposed to a single intervention, such as rapid skill acquisition (Flynn & Healy, 2012). Furthermore, incorporation of a standardized curricula is recommended as a solution to link research and practice (Lord et al., 2005) and are critical for implementation and replication of clinical trials (White, Keonig, & Scahill, 2007). Additionally, a manualized intervention package reduces effort for the implementer, as all of the information is already available.

Limitations of Social Skills Training

Within the social skills literature, there are limitations that should be addressed. These limitations include social validity of social skills interventions for consumers and stakeholders as well as lack of generalization and maintenance of skill acquisition across settings and people.

Social Validity. Social validity refers to the overall satisfaction of the individuals receiving or implementing the intervention, specifically in regard to the goals, procedures, and outcomes (Alberto & Troutman, 2008; Callahan et al., 2017; Wolf, 1978). Although social skills interventions have been demonstrated to be beneficial in

increasing skill acquisition, social validity data are infrequently reported, especially within the adolescent population (McDonald & Machalicek, 2013). In the data that are available, Callahan and colleagues (2017) conducted a meta-analysis evaluating the types of social validity that are targeted by ASD researchers and practitioners. Out of 828 total studies evaluating evidence-based practices related to autism, 28 of those studies were evaluated social skills training. Out of the 28 studies related to social skills training, 13 (46.4%) of those studies included a measure of social validity. Out of 828 total studies, 201 of those studies included social validity data. Of those 201 studies, 28 articles evaluated social skills training, with only 13 (46.4%) of those articles evaluating social validity. Results indicated that 5 (18%) of these 28 articles related to social skills training found clinically significant behavioral change and 11 (39%) articles reported consumer satisfaction. Consumers consisted of parents, special education teachers, and public-school administrators. Thus, with the limited data available, it is difficult to determine whether individuals with ASD, whom were not included as consumers in the study, and other stakeholders find social skills training to be a socially valid intervention. Future research should investigate social validity within a social skills training context (McDonlad & Machalicek, 2013; Callahan et al., 2017).

Generalization. Additionally, there is a substantial lack of generalization and maintenance of these acquired skills (Bellini et al., 2007). Furthermore, the lack of generalization limits the utility of social skill training by diminishing the intervention effectiveness if it is only successful in one setting (Misra, 1992). Stokes and Baer (1977) define generalization as:

The occurrence of relevant behavior under different, non-training conditions (i.e., across subjects, settings, people, behaviors, and/or time) without the scheduling of the same events in those conditions as had been scheduled in the training conditions. (p. 350)

More simply, generalization refers to the same response occurring under different stimulus conditions or with novel people than what was originally trained. Maintenance refers to the continuation of a response once an intervention procedure has been thinned or discontinued (Cooper, Heron, & Heward, 2007). Given the identified lack of generalization and maintenance, it is imperative that strategies to promote these phenomena be incorporated into social skills training.

Stokes and Baer (1977) propose nine different technologies to promote generalization. These include a) train and hope b) sequential modification c) introduce natural maintaining contingencies d) train sufficient exemplars e) train loosely f) use indiscriminable contingencies g) program common stimuli h) mediate generalization and i) train 'to generalize'. Utilization of these strategies can be beneficial in improving generalization. It may be particularly important to consider incorporating one or more of these technologies when using a packaged social skills curriculum since they are typically implemented in a contrived clinical setting. For example, introducing a variety of exemplars and training loosely may help to promote generalization of social skills that are learned in a more controlled setting.

However, another approach to promoting generalization is to shed manualized programs and instead teach social skills in a less rigid manner in an environment that still offers the facilitator some control over the social situations presented to the client. To do this, clinicians have used role-playing games (RPGs; e.g., Dungeons and Dragons) to

teach social skills to adolescents with ASD (Geek and Sundry, 2016). RPGs can be defined as ‘the progressive creation in a small group of players of a type of collaborative narrative animated by a game master, in which each player takes on a main role (Daniau, 2016, p. 424). By having clients participate in the game, clinicians are able to arrange an infinite number of interactions and opportunities to exhibit social skills, thus increasing the client’s opportunities to respond and receive feedback.

Furthermore, the role-playing aspect naturally incorporates some of Stokes and Baer’s (1977) technologies of generalization that could promote demonstration of social skills to real-world settings. For example, ‘train loosely’ is integrated in that the clinician has “relatively little control over the stimuli presented” (Stokes & Baer, 1977, p. 377) within the RPG when considering the other players and their ability to create various social interactions that would allow for the use of the target social skill. Another strategy that seamlessly blends within the RPG context is ‘train efficient exemplars’ in that there are multiple variations and examples provided every time the game is played. For instance, consider the target skill of ‘greeting’, a new exemplar of this would occur every time a new character is introduced within the game. Lastly, ‘program common stimuli’ is evident within a RPG in that their peers are present in the training setting (i.e. RPG) as well as within the generalization settings (e.g. school).

Finally, the game mechanics inherent to RPGs allow clinicians to use progression in the game (e.g., acquisition of treasure, character advancement) to increase client buy-in and reinforce appropriate social skill use. Some RPGs (e.g., Dungeons and Dragons) already incorporate systems that allow game masters to reward players’ characters for especially good roleplaying. In a treatment context, these mechanics could be reserved

for reinforcing appropriate use of social skills within the context of the game. There have been some qualitative studies conducted related to RPGs and the potential they hold to support and improve social skills and competence (Fein 2015; Gallup & Serianni, 2017) however, there have not been any empirical evaluations of RPGs as social skills training programs.

Purpose

The purpose of this study was to evaluate the effectiveness of a social skills treatment package that is implemented within the context of a RPG. Effectiveness was determined by examining initial skill acquisition and generalization of skills across settings for individuals with ASD. To guide this inquiry, four research questions were developed:

1. Will a social skills treatment package implemented within the context of a RPG promote social skill acquisition in the training setting for individuals with ASD?
2. Will the RPG social skills treatment package promote skill generalization for individuals with ASD outside of the context of the game?
3. Will scores on the Autism Social Skills Profile (ASSP) increase above pre-treatment ratings after implementation of a social skills treatment package within the context of a RPG?
4. Will participants and other stakeholders rate the social skills treatment package implemented within the context of a RPG as socially valid?

CHAPTER II - METHOD

Participants and Setting

Prior to the study beginning, Institutional Review Board approval was obtained through the affiliate university (Appendix A). Participants included four individuals between the ages of 9 and 10 years old with a diagnosis of ASD. Participants were referred by their parents to a university-based clinic that provided an after school social skills training program. Parent consent was obtained prior to the beginning of the study (Appendix B).

Ian was a 10-year-old Caucasian male that received instruction within a general education setting. Fiona was a 10-year-old Caucasian female that received instruction within a general educational setting. Philip was a 9-year-old Caucasian male that received instruction within a home-school setting. Frank was a 9-year-old Caucasian male that received instruction within a general education setting. Participant diagnoses of ASD were confirmed through a professional evaluation from an outside psychologist as well as administration of the ASRS, a rating scale that evaluates characteristics specifically related to ASD, which was administered by the primary researcher. To be included within the study, participants needed have a score that fell within the Slightly Elevated, Elevated, or Very Elevated range on the ASRS. Additional information collected by the primary researcher regarding participant functioning levels (i.e. expressive language, receptive language, and intellectual functioning) are available (see *Table 1*)

Table 1 : *Participant Pre-Assessment Standard Scores*

Participant	PPVT-4	EVT-2	SB-5
Ian	106	96	85
Fiona	104	104	55
Philip	108	108	97
Frank	84	89	67

Social skills training occurred in a group format once per week and sessions lasted approximately one hour. Training occurred in a university conference room that included an oval shaped table, eight chairs and white board.

Materials

Data Sheets. Data sheets were used by the researchers to record skill acquisition and generalization of skill acquisition (Appendix C). Each target skill was operationally defined by a task analysis. Skill acquisition was recorded by using a dichotomous rating of occurrence or non-occurrence of each discrete step of the task analysis.

Treatment Integrity Form. A treatment integrity checklist (Appendix D) was used to evaluate the researcher’s implementation of social skills training procedures. These were completed every session by the lead researcher.

Treatment Session Outlines. Outlines were developed by the primary researcher for each session to provide an overview of the story line (Appendix E). These outlines include details about the story and encounters the participants were involved with as well as notes indicating when to deliver probes for target skills. The story line was developed by the primary researcher.

Game materials. A six-sided die was used to dictate the consequences participants received throughout the RPG. Character sheets (Appendix F) and pencils were used as a

way for participants to develop their character for the game and monitor the resources they acquired during the game.

Measures

A variety of measures were administered to determine if participants were appropriate candidates for the RPG intervention.

Abbreviated Intelligence. The Stanford-Binet Intelligence Scales, Fifth Edition (SB5; Roid, 2003) is a norm-referenced assessment of intelligence and cognitive abilities. For the purpose of this study, the abbreviated battery (ABIQ) was administered to participants by a graduate student in a doctoral school psychology program that had received training in assessment administration. The SB5 ABIQ has a high internal consistency reliability ($\alpha = .91$) as well as a high test-retest reliability, ranging between .84 and .88. Regarding the criterion validity of the SB-5 ABIQ, the correlation between the SB5 ABIQ and the full scale SB5 IQ (FSIQ) was .87 for individuals above age 6. Related to the construct validity, the average of all subtests of the SB5 were above .69 on the general factor, indicating that the SB5 is a strong measure of general ability and that the SB5 ABIQ measures the intended construct.

Receptive Vocabulary. The Peabody Picture Vocabulary Test, Fourth Edition (PPVT-4; Dunn & Dunn, 2007) is a norm-referenced assessment designed for measuring receptive vocabulary of children and adults. This was administered to participants by a graduate student in a doctoral school psychology program that received training in assessment administration. The PPVT has a high internal consistency reliability ($\alpha = .94$) as well as a high test-retest reliability ($r = .93$). Regarding validity of the PPVT, correlations of the PPVT-4 and the Clinical Evaluation of Language Fundamentals,

Fourth Edition (CELF-4), that measures language ability, ranged from .67 to .75.

Correlations between the PPVT-4 and Group Reading Assessment and Diagnostic Evaluation (GRADE), which measures reading achievement, ranges between .43 to .79.

Lastly, the correlations between the PPVT-4 and Expressive Vocabulary Test, Second Edition (EVT-2), which measures expressive language, ranges between .80 to .84.

Expressive Vocabulary. The Expressive Vocabulary Test, Second Edition (EVT-2; Williams, 2007) is a norm-referenced assessment designed to evaluate expressive vocabulary for children and adults. This was also administered to participants by a graduate trained in assessment procedures. The EVT-2 has a high internal consistency reliability ($\alpha = .94$) and test-retest-reliability ($r = .95$). In reference to the validity of the EVT-2, when compared to the Group Reading Assessment and Diagnostic Evaluation (GRADE), correlations ranged from .60 to .70. Correlations between the EVT-2 and CELF-4 range between .68 and .80. Lastly when comparing the EVT and PPVT-4, correlations range between .80 to .84.

Autism Spectrum Characteristics. The Autism Spectrum Rating Scales (ASRS; Goldstein & Naglieri, 2009) is a norm-referenced assessment that measures an individual's behaviors associated with ASD. The ASRS was completed by parents of the participants. The ASRS contains 71 items that can be rated with a five-point Likert scale ranging from 0 (never) to 4 (very frequently). The ASRS has high levels of internal consistency ($\alpha = .97$) and test-retest reliability ($r = .92$). Additionally, the sensitivity of the ASRS is 90.3% and the specificity is 92.2%.

Social Functioning. The Autism Social Skills Profile (ASSP; Bellini & Hopf, 2007; Appendix G) evaluates the current level of social functioning in an individual with

ASD. This was completed by parents of the participants. The ASSP generates a total functioning score that is comprised of three factors; Social Reciprocity, Detrimental Social Behaviors, and Participation/Avoidance. A four-point Likert scale ranging from 1 (never) to 4 (very often) is used to rank items on the ASSP. Higher scores indicate socially appropriate behavior. Psychometric evaluations of the ASSP have found high internal consistency ($\alpha = .940$) and test-retest reliability ($r = .904$).

Participant Social Validity. The Children Usage Rating Profile (CURP; Briesch & Chafouleas, 2009) was completed by participants upon conclusion of the study (Appendix H). The CURP contains 21 items that evaluate acceptability and feasibility of an intervention across three factors; personal desirability, understanding, and feasibility. A Likert scale, ranging from 1 = Totally Disagree to 4 = Totally Agree is used to rate each item. Psychometric evaluations have found that there are high reliability estimates for each factor; Personal Desirability ($\alpha = .92$), Feasibility ($\alpha = .82$), and Understanding ($\alpha = .75$; Briesch & Chafouleas, 2009b). The factor correlation matrix ranged from .42 to .47, providing evidence for discriminant relations between factors.

Parent Social Validity. The Usage Rating Profile- Intervention Revised (URP-IR; Chafouleas, Briesch, Neugebauer, Riley-Tilman, 2011) contains 29 items and consists of six factors; acceptability, understanding, feasibility, family-school collaboration, system climate, and system support (Appendix I). Items range from 1 (strongly disagree) to 5 (strongly agree). Regarding internal consistency, alpha coefficients for each of the six subscales are acceptability (.95), understanding (.90), family-school collaboration (.79), feasibility (.84), system climate (.91), and system support (.72). Regarding discriminant

validity, all correlations between subscales were below .85 (Briesch, Chafouleas, Neugebauer, Riley-Tillman, 2013).

Direct Observation. Direct observations were conducted each session to obtain information on participants' skill acquisition. The percentage of skill acquisition was calculated by dividing the number of correct steps exhibited by the total number of steps multiplied by 100. The primary researcher served as the primary observer.

Treatment Integrity. Treatment integrity was measured by the primary researcher using a treatment integrity checklist. The primary researcher recorded the occurrence or non-occurrence of procedures on the treatment integrity checklist. A minimum of 20% of all sessions had a secondary observer complete the integrity checklist to obtain interobserver agreement.

Dependent Variables

The dependent variables in this study included percentage of skill acquisition and generalization of skill acquisition.

Skill Acquisition. The primary dependent variable was percentage of skill acquisition within the RPG. Skill acquisition was measured by utilizing a task analysis (see Table 2) that was comprised of discrete steps required to demonstrate the skill accurately. Target skills included Initiating a Greeting, Requesting Assistance, Acknowledging Compliments, and Complimenting Others. To determine the percentage of skill accuracy, researchers provided an opportunity within the RPG for the participants to demonstrate the skill (i.e. Good evening Ger the Knight). After 5 seconds had elapsed, researchers recorded the skill steps on the corresponding task analysis for the target skill using a dichotomous rating (i.e. yes or no). To obtain the percentage of skill acquisition,

the number of steps accurately demonstrated was divided by the total number of steps and multiplied by 100.

Table 2 :*Task Analysis of Target Social Skills*

Initiating a Greeting	Requesting Assistance	Acknowledging Compliments	Complimenting Others
Game Prompt: Greet (xx) Generalization Prompt: sit/stand within 5 ft of participant	Game Prompt: Ask for materials/help Generalization Prompt: Ask (researcher) for assistance	Game Prompt: respond to (researcher) compliment Generalization Prompt: I like your (article of clothing)	Game Prompt: Compliment (character name) Generalization Prompt: I got a new (article of clothing)
1. Face the person (orient head and shoulders w/in 3s)	1. Face the person (orient head and shoulders w/in 3s)	1. Face the person (orient head and shoulders w/in 3s)	1. Face the person (orient head and shoulders w/in 3s)
2. Make eye contact (w/in 5s)	2. Make eye contact (w/in 3s and maintained for 5s)	2. Make eye contact (w/in 3s and maintain for 5s)	2. Make eye contact (w/in 3s and maintain for 5s)
3. Provide a form of greeting (w/in 5s)	3. Ask for assistance (use the word please and positive affect)	3. Say form of thank you	3. Provide relevant compliment
4. Use appropriate tone of voice (positive affect)	4. Say thank you	4. Use appropriate voice (positive affect)	4. Use appropriate tone (i.e. not monotone or flat affect)
5. Allow person to respond (wait at least 5s)			5. Allow time for person to respond (wait at least 5s)

Generalized Skill Acquisition. The secondary dependent variable was generalization of skills in an untrained context. Generalization was assessed at the beginning of each session in the same conference room that the game was played in. Prior

to the RPG beginning, researchers delivered a naturalistic prompt (e.g. I like your shirt) for each target skill utilizing the same task analyses used for the primary skill acquisition. Data were recorded in an identical manner as primary skill acquisition.

Design and Analysis

A multiple probe design across skills with concurrent replication across participants was utilized to evaluate the effects of a RPG intervention on skill acquisition (Gast, 2010). Within this type of design, data are collected intermittently, which in turn allows for more data collection on a greater number of skills and results in data that vary minimally from repeated observations (Bijou, Peterson, Harris, Allen, & Johnston, 1969). The study consisted of three phases; baseline, intervention, and maintenance. Each phase has a minimum of five data points. Visual analysis of level, trend, variability, consistency across similar phases, overlap, and immediacy of effect (Kratochwill et al., 2010) were used to analyze data.

In addition to visual analysis, a single case effect size was also calculated to provide a quantitative estimate of the intervention's effect on skill acquisition. Baseline Corrected Tau (BCT) was calculated across participants and skills to determine the effect size. BCT is a non-parametric single-case effect size that uses a two-step process. First, the monotonic baseline trend is estimated and corrected (if needed), then if the baseline trend is statistically significant, the baseline trend can be corrected, and then the effect size is calculated (Tarlow, 2016a). BCT is expected to outperform Tau-U by providing more interpretable effect size estimates and better control for baseline trends (Tarlow, 2016b). BCT was interpreted using the guidelines recommended by Vannest and Ninci (2015), therefore scores below 0.20 were considered to be small effects, scores from 0.20

to 0.60 were considered to be moderate effects, scores from 0.60 to 0.80 were considered to be large effects, and scores above 0.80 were considered to be very large effects.

Procedures

Pre-assessment. Once referred to a university-based clinic for social skills training by parents, participants were administered the PPVT-4, EVT-2, and SB-5 to ensure that they had the necessary language and cognitive abilities to participate in a role-playing game.

The ASRS and ASSP were completed by the parents of the participants. The ASRS was utilized to verify that participants demonstrated symptomology consistent with ASD. The ASSP was used to inform the selection of target skills. Items that were rated between 0 and 2 across all participants were included as target skills. Six target skills were selected initially; however after the first session, two skills (i.e. Joining a Conversation and Responding to Greetings) were excluded as participants demonstrated high percentages of skill acquisition.

Baseline. During the first session, each participant created their RPG character and the primary researcher explained the mechanics of the RPG. In following sessions, participants engaged in the RPG. During the RPG, the primary researcher functioned as the narrator (i.e. Storyteller) of the game. The context of the game involved the participants on a mission to rescue a kidnapped princess, wherein they would be enduring a long quest, traveling to many different areas of the kingdom and meeting various people and creatures. There were multiple checkpoints in the storyline where the researcher was prompted to facilitate an opportunity for the participants to demonstrate a target skill. Specifically, a prompt was provided to elicit a response by the participant.

Prompts corresponded to the specific skill being probed. Following the response of the participant, he or she would roll a die to determine the outcome of the checkpoint.

Specifically, if the participant rolled a 1 or 2, it would result in an undesirable outcome, if the participant rolled a 3 or 4 it resulted in an acceptable outcome, and if he or she rolled a 5 or 6 it resulted in a desirable outcome. For example, imagine that the participants had just arrived at the Babbling Brook Bridge within the context of the game. They are told they must cross this bridge in order to make it to the campsite before night fall; however there is a massive hole in the middle of the bridge. They must ask Ella the Enchantress for assistance to repair the bridge, so they can cross it before sundown. If they rolled a 1 or 2, they would have to build a shelter themselves, if they rolled a 3 or 4 they would find a cave they could sleep in, and if they rolled a 5 or 6, a sweet old woman invited them to stay in her cottage. The various outcomes were developed by the primary researcher, along with all of the session content.

Each baseline session began with the collection of generalization data. Probes were provided out of the RPG context to evaluate generalization of the skill in a non-game context. Specifically, this time occurred at the beginning of each session, before the game began. Participants were told they could have free time, in which they typically colored on the dry erase board or played Uno. During free time, the researchers provided a naturalistic prompt (see Table 2) and after 5 seconds recorded the participant's response. Researchers thanked participants for compliance with the probe and did not provide praise or corrective feedback. One generalization probe was collected per every three training probes for each target skill.

Following generalization data collection, the researcher welcomed the participants to the session and provided a brief summary of what had occurred the previous week in the game. After check-in, the RPG began and probes for each skill were periodically provided by the researchers within the context of the game. Following the provision of a probe, researchers did not provide any praise or corrective feedback, but simply thanked the participant for compliance with the probe during the RPG. A minimum of three probes per skill were collected every session. Baseline for each skill concluded after at least five probes were collected, and data were stable or indicated a decreasing trend.

Intervention. During each intervention session, the RPG was still in progress. The researcher began the session by welcoming the participants and providing a brief summary of what had occurred last week in the game. Prior to any checkpoints occurring, researchers used behavioral skills training (BST) to teach appropriate use of the target skill. Specifically, researchers introduced the target skill and rationale in the context of the game. For example, “today we are talking about Requesting Assistance. This is important so we can appropriately ask others for help. Each time you demonstrate this appropriately, you will have the chance to earn a bonus that can be added to the number you roll on the die”. Researchers then modeled an incorrect demonstration of the target skill and had participants identify the incorrect steps, followed by an accurate skill demonstration. Participants then had an opportunity to role-play the target skill within the context of the game. During role-play, researchers provided praise for accurate skill demonstration and corrective feedback for inaccurate skill demonstration. Each participant had two opportunities to role-play and practice appropriately using the target skill during BST. After each demonstration of the target skill, participants rolled the die.

Contingent upon the participant demonstrating the skill with 100% accuracy, this would add a 'bonus' to their roll, which could promote their roll to the next classification. For example, if a participant rolled a 3 (which resulted in an acceptable outcome) but they demonstrated the skill with 100% accuracy, their character would receive the outcome as if they had rolled a 5 or 6.

After BST, the game proceeded in an identical manner to baseline. Check points occurred at a minimum of three times per session for the target skill. Following the provision of a probe, researchers did not provide praise or corrective feedback, but instead just informed the participant if he or she had received the bonus without any further explanation. Once mastery was reached, the next target skill was introduced within the RPG context and the current target skill was moved to maintenance. Mastery was defined as three consecutive probes of skill acquisition at 100% accuracy. Intervention for a target skill concluded after at least five probes were administered and data were at a consistently high level.

Generalization of skill acquisition was assessed at the beginning of the next session, prior to the RPG beginning. Procedures looked identical to baseline generalization procedures. One generalization probe was administered per every three training probes for each target skill.

Maintenance. Maintenance began once every participant had demonstrated mastery of a target skill. Maintenance occurred in an identical manner to baseline, in that probes were conducted within the context of the RPG and researchers recorded participant skill acquisition after 5 seconds. Researchers did not provide praise or corrective feedback and thanked participants for compliance with the probe. Maintenance

of generalization of skill acquisition also occurred in an identical manner to baseline generalization data collection procedures.

Social Validity

To assess the quality of the RPG intervention, participants were administered the CURP at the conclusion of the study. To evaluate parent perception of the effectiveness of the intervention, they completed the URP-IR at the conclusion of the study.

Interobserver Agreement and Treatment Integrity

The primary researcher served as the primary observer with a trained graduate student in a doctoral school psychology program assisting in data collection procedures as a secondary observer. The data collected by the primary observer were the data used for visual analysis. Prior to data collection, the secondary observer was provided with task analyses for all target skills. The secondary observer was trained in the university-based clinic setting and obtained at least 90% agreement with the primary researcher prior to collecting data. The primary researcher explained in detail each of the discrete steps that completed the tasks analysis by providing examples and non-examples of accurate skill demonstration. When agreement fell below 80%, the secondary observer was retrained. Interobserver agreement (IOA) was assessed for at least 20% of sessions across each phase for each skill per participant. For Ian, IOA was calculated for 61% of all sessions with a minimum of 20% across all phases with a mean of 99% (80-100%). For Initiating Greetings, IOA was collected for 65% of sessions with an average IOA of 99%, (80-100%); for Requesting Assistance, IOA was collected for 60% of sessions with an average IOA of 100%; for Accepting Compliments, IOA was collected for 58% of

sessions, with an average IOA of 100%; and for Complimenting Others IOA was collected for 62% of sessions with an average IOA of 98% (80 -100).

For Fiona, IOA was calculated for 60% of all sessions with a mean IOA of 9% (25-100%). For Initiates Greetings, IOA was collected for 68% of sessions with a mean of 100%; for Requests Assistance IOA was calculated for 47% of sessions with a mean IOA of 99% (75-100%); for Accepting Compliments IOA was calculated for 57% of sessions with a mean IOA of 86% (25-100%) and for Compliments Others IOA was calculated for 78% sessions with a mean IOA of 93% (80-100%).

For Philip, IOA was calculated for 54% of all sessions with a mean of 99% (75-100%). For Initiates Greetings, IOA was collected for 53% of sessions with an average of 100%; for Requests Assistance, IOA was collected for 58% of sessions with an average of 97% (75-100%); for Accepting Compliments, IOA was collected for 46% of sessions with an average IOA of 100%; and IOA was collected for 61% of sessions for Complimenting Others with an average IOA of 100%.

For Frank, IOA was calculated for 58% of all sessions with a mean IOA of 99% (75-100%). For Initiates Greetings, IOA was calculated for 70% of sessions with a mean IOA of 98% (80-100%); for Requests Assistance, IOA was calculated for 56% of sessions with an average IOA of 99% (75-100%); IOA was calculated for 45% of sessions for Accepting Compliments with a mean IOA of 100%; and lastly for Complimenting Others, IOA was calculated for 61% of sessions with a mean IOA of 100%. To calculate IOA, the total number of agreements was divided by the total number of agreements and disagreements and multiplied by 100 (Cooper, Heron, & Heward, 2007). Agreements referred to the primary and secondary observers'

dichotomous ratings of whether or not the participant demonstrated each discrete step within the task analysis for the target skills.

Treatment integrity was evaluated by the primary researcher who completed a checklist that outlined the steps of the intervention. This checklist was completed following every session. The researcher recorded if the step occurred or did not occur using the aforementioned checklist. To calculate treatment integrity, the number of steps that were completed were divided by the total number of steps possible and multiplied by 100. IOA for treatment integrity was assessed for 100% of all sessions. Treatment integrity was 100%.

CHAPTER III - RESULTS

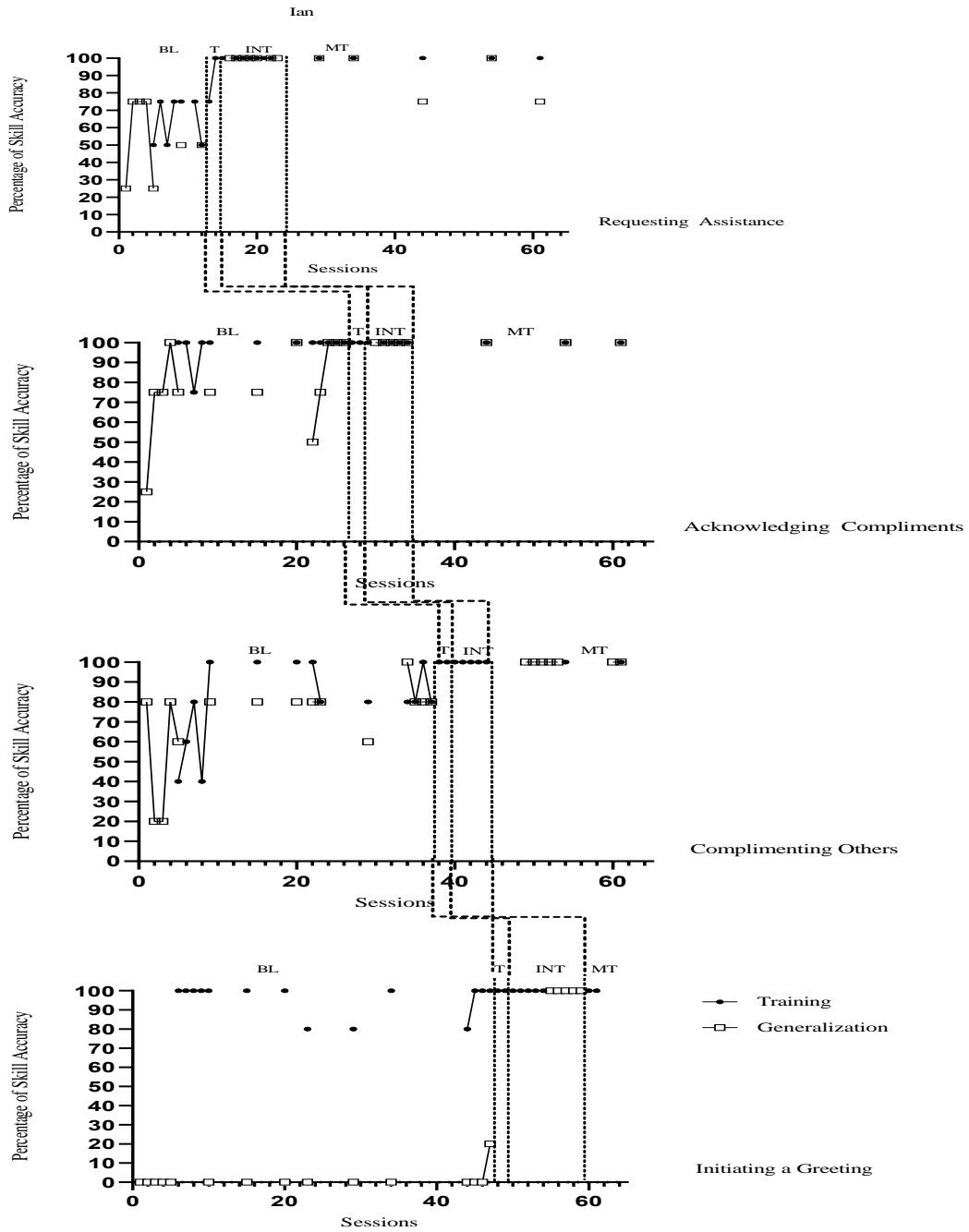
The accurate demonstration of target skills within the context of a RPG was the primary dependent measure of the present study with a secondary measure of generalized target skills demonstrated outside the context of a RPG. Mastery of a target skill was defined as 100% skill accuracy across three consecutive data points within the context of the RPG.

Ian. Results for Ian are presented in Figure 1. During baseline in the training setting, Ian demonstrated moderate to high levels for Initiating a Greeting ($M = 95%$, range = 80-100%), low to moderate levels for Requesting Assistance ($M = 64%$, range = 50-75%), high levels for Acknowledging a Compliment ($M = 97%$, range = 75-100%), and low to high levels for Complimenting Others ($M = 80%$, range = 40-100%). During training sessions, Ian demonstrated 100% skill accuracy for Initiating a Greeting, Acknowledge Compliments, and Compliments Others. For Requesting Assistance, Ian demonstrated an increase in percentage of skill acquisition. After implementation of intervention, Ian demonstrated high consistent levels for Initiating a Greeting ($M = 100%$), Requesting Assistance ($M = 100%$), Acknowledging Compliments ($M = 100%$), and Complimenting Others ($M = 100%$). During maintenance, Ian continued to demonstrate mastery for Initiating a Greeting ($M = 100%$), Requesting Assistance ($M = 100%$), Acknowledging Compliments ($M = 100%$) and Complimenting Others ($M = 100%$).

During generalization of skill accuracy, Ian demonstrated low levels for Initiating a Greeting ($M = 1%$, range = 0-20%), low to moderate levels for Requesting Assistance ($M = 53%$, range = 25-75%), moderate to high levels of percentage of skill accuracy for

Acknowledging Compliments ($M = 78\%$, range = 25-100%), and low to moderate levels for Complimenting Others ($M = 70\%$, range = 20-100%). Following implementation of the RPG intervention, Ian demonstrated consistently high levels for all target skills ($M = 100\%$). Following the removal of the intervention, Ian demonstrated moderate to high levels of skill accuracy for Requesting Assistance ($M = 90\%$, range = 75-100%), and high levels for both Acknowledging Compliments ($M = 100\%$) and Complimenting Others ($M = 100\%$).

Figure 1. Percentage of Skill Accuracy, Ian



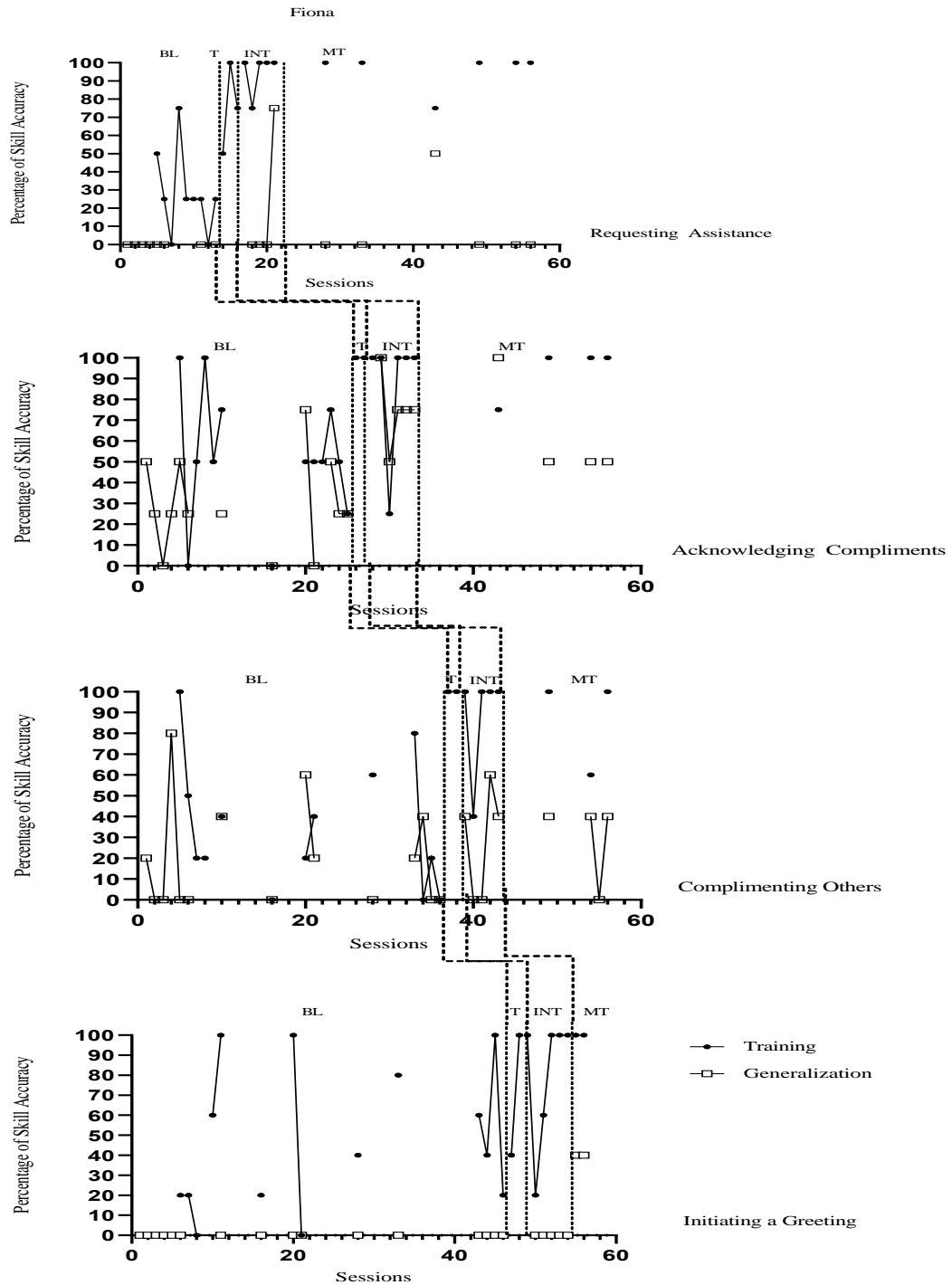
Fiona. Results are presented in Figure 2 for Fiona. During baseline, Fiona demonstrated low to high levels of percentage of skill accuracy for Initiating a Greeting ($M = 47\%$, range = 0-100%), low to moderate levels for Requesting Assistance ($M =$

27%, range = 0-75%), and low to high levels for Acknowledging Compliments ($M = 51%$, range = 0-100%) and Complimenting Others ($M = 34%$, range = 0-100%). During the training sessions, the level of skill accuracy increased for Initiating a Greeting ($M = 70%$, range = 40-100%) and Requesting Assistance ($M = 75%$, range = 50-100%). Immediate increases in percentage of skill accuracy were observed for Acknowledging Compliments ($M = 100%$) and Complimenting Others ($M = 100%$) during training sessions. Following implementation of intervention, the level of percentage of skill accuracy increased ($M = 80%$, range = 20-100%) for Initiating a Greeting, Requesting Assistance ($M = 95%$, range = 75-100%), Acknowledging Compliments ($M = 87%$, range = 25-100%), and Complimenting Others ($M = 88%$, range = 40-100%). During maintenance, Fiona continued to demonstrate high levels of skill accuracy for Initiating a Greeting ($M = 100%$), Requesting Assistance ($M = 95%$, range = 75-100%), Acknowledging Compliments ($M = 93%$, range = 75-100%), and Complimenting Others ($M = 86%$, range = 60-100%).

During generalization of skill accuracy, Fiona demonstrated low levels for both Initiating a Greeting and Requesting Assistance ($M = 0%$) during baseline. Low to moderate levels were observed during baseline for Acknowledging Compliments ($M = 28%$, range = 0-75%) and Complimenting Others ($M = 18%$, range = 0-80%). Following implementation of the intervention, Fiona continued to demonstrate low levels of skill accuracy for Initiating a Greeting ($M = 0%$) and Requesting Assistance ($M = 18%$, range = 0-75%). For generalization of Acknowledging Compliments, Fiona demonstrated an immediate increase in percentage of skill accuracy ($M = 75%$, range = 50-100%) following implementation of the intervention. Fiona continued to demonstrate low to

moderate levels during for generalization of Complimenting Others after intervention ($M = 28\%$, range = 0-60%). During maintenance, Fiona demonstrated low levels for generalization of Initiating a Greeting ($M = 40\%$) and Requesting Assistance ($M = 12\%$, range = 0-50%). Moderate levels were observed for Acknowledging Compliments ($M = 62\%$, range = 50-100%) and Complimenting Others ($M = 40\%$) during maintenance.

Figure 2. Percentage of Skill Accuracy, Fiona.



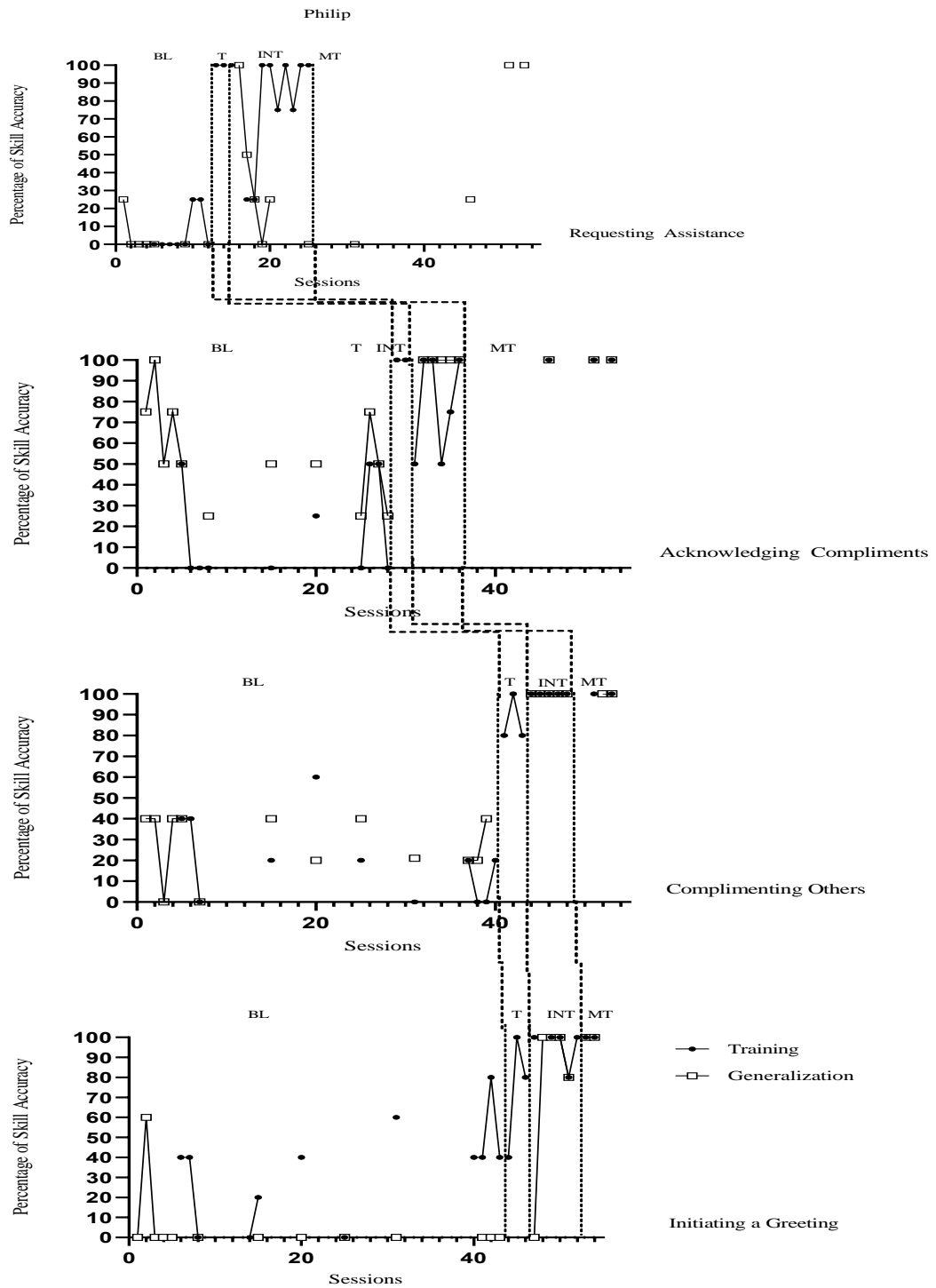
Philip. Results are presented in Figure 3 for Phillip. During baseline, Phillip demonstrated low to moderate levels of percentage of skill accuracy for Initiating a

Greeting ($M = 33\%$, range = 0-80%), low levels of percentage of skill accuracy for Requesting Assistance ($M = 6\%$, range = 0-25%), low to moderate levels of percentage of skill accuracy for Acknowledging Compliments ($M = 17\%$, range = 0-50%) and low to moderate levels for Complimenting Others ($M = 0-60\%$). During the training sessions, the percentage of skill accuracy increased for Initiating a Greeting ($M = 70\%$, range = 40-100%), Requesting Assistance ($M = 100\%$), Acknowledging Compliments ($M = 100\%$), and Complimenting Others ($M = 90\%$, range = 80-100%). Following implementation of the RPG intervention, immediate increases in percentage of skill accuracy were observed for Initiating a Greeting ($M = 96\%$, range = 80-100%), Acknowledging Compliments ($M = 79\%$, range = 50-100%). Increases in percentage of skill accuracy were also observed for Requesting Assistance ($M = 80\%$, range = 25-100%) and Complimenting Others ($M = 100\%$). During maintenance, Phillip continued to demonstrate high levels for Initiating a Greeting ($M = 100\%$), Acknowledging Compliments ($M = 100\%$), and Complimenting Others ($M = 100\%$). For Requesting Assistance, Phillip demonstrated moderate to high levels of percentage of skill accuracy during maintenance ($M = 82.5\%$, range = 50-100%).

During generalization of skill accuracy, Phillip demonstrated low to moderate levels of percentage of skill accuracy for Initiating a Greeting ($M = 4\%$, range = 0-60%) and Complimenting Others ($M = 27\%$, range = 0-40%) during baseline. Phillip also demonstrated low levels of percentage of skill accuracy for Requesting Assistance ($M = 3\%$, range = 0-25%) and low to high levels of percentage of skill accuracy for Acknowledging Compliments ($M = 54\%$, range = 25-100%) during baseline. Following implementation of the RPG intervention, increases in generalization of percentage of skill

accuracy were observed for Initiating a Greeting ($M = 76\%$, range = 0-100%), Accepting Compliments ($M = 100\%$), and Complimenting Others ($M = 100\%$). For Requesting Assistance, Phillip demonstrated low to high levels of generalization of percentage of skill accuracy ($M = 33\%$, range = 0-100%) following the implementation of the intervention. During maintenance, Philip continue to demonstrate high levels of generalization of percentage of skill accuracy for Initiating a Greeting ($M = 100\%$), Acknowledging Compliments ($M = 100\%$), and Complimenting Others ($M = 100\%$). For Requesting Assistance, Philip demonstrated low to high levels of generalization of percentage of skill accuracy ($M = 56\%$, range = 0-100%) during maintenance.

Figure 3. Percentage of Skill Accuracy, Philip

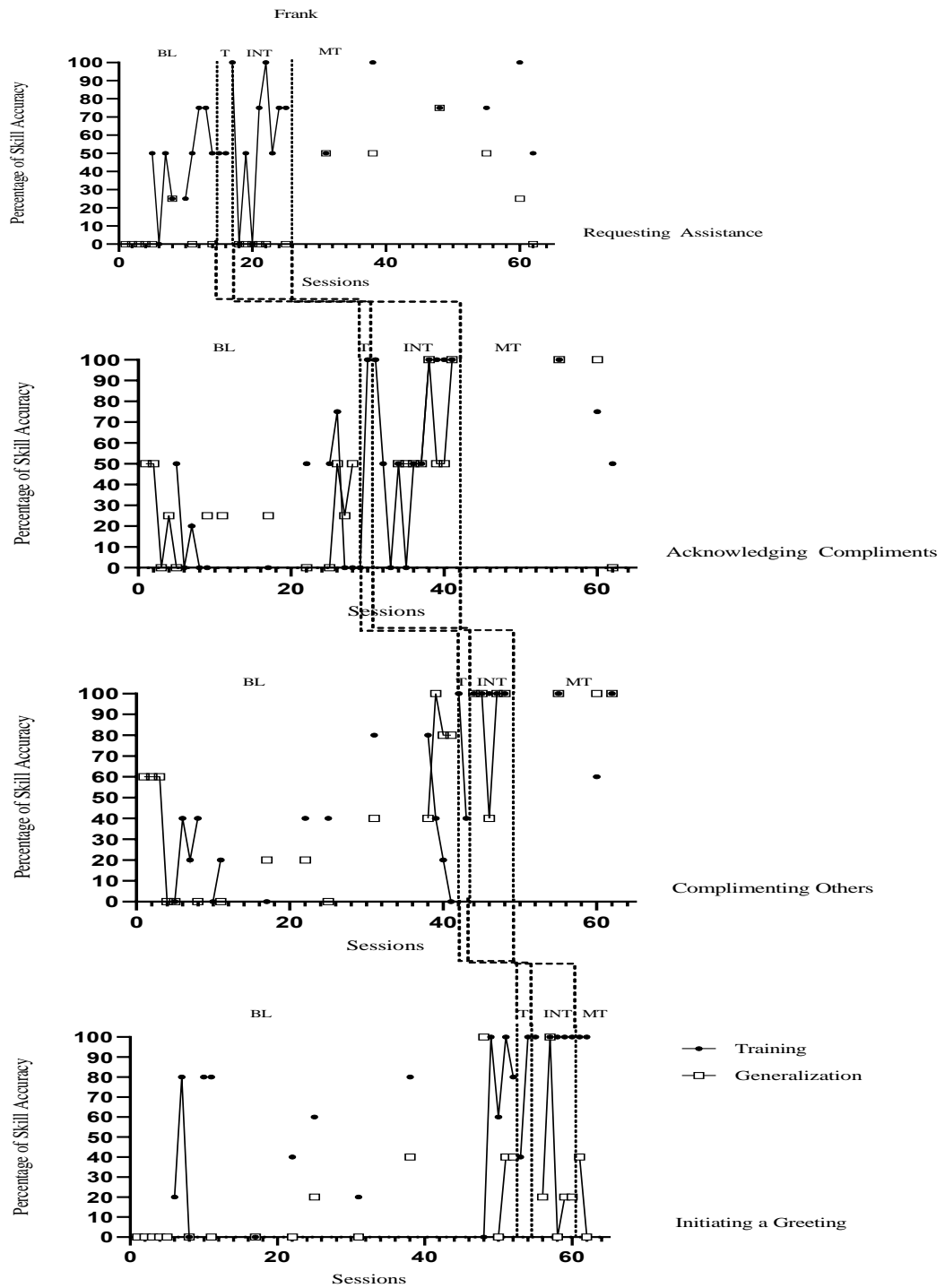


Frank. Results are presented in Figure 4 for Frank. During baseline, Frank demonstrated low high levels of percentage of skill accuracy for Initiating a Greeting ($M = 53\%$, range = 0-100%) and Complimenting Others ($M = 30\%$, range = 0-80%) and low to moderate levels of percentage of skill accuracy for Requesting Assistance ($M = 44\%$, range = 0-75%) and Acknowledging Compliments ($M = 22\%$, range = 0-75%). During training sessions, increases in percentage of skill accuracy were observed for Initiating a Greeting ($M = 70\%$, range = 40-100%), Requesting Assistance ($M = 50\%$), Acknowledging Compliments ($M = 50\%$, range = 0-100), and Complimenting Others ($M = 70\%$, range = 40-100%). After implementation of the intervention, Frank demonstrated high levels of percentage of skill accuracy for Initiating a Greeting ($M = 100\%$) and Complimenting Others ($M = 100\%$) and low to high levels for Requesting Assistance ($M = 58\%$, range = 0-100%) and Acknowledging Compliments ($M = 63\%$, range = 0-100%). During maintenance, Frank demonstrated high levels of percentage of skill accuracy for Initiating a Greeting ($M = 100\%$), moderate of high levels for Requesting Assistance ($M = 75\%$, range = 50-100%), Acknowledging Compliments ($M = 75\%$, 50-100%), and Complimenting Others ($M = 86\%$, range = 60-100%).

During baseline of generalization of percentage of skill accuracy, Frank demonstrated low to high levels for Initiating a Greeting ($M = 15\%$, range = 0-100%), low levels for Requesting Assistance ($M = 3\%$, range = 0-25%), low to moderate levels for Acknowledging Compliments ($M = 25\%$, range = 0-50%), and low to high levels for Complimenting Others ($M = 30\%$, range = 0-80%). Following implementation of intervention, increases in generalization of percentages of skill accuracy were observed for Initiating a Greeting ($M = 32\%$, range = 0-100%), Acknowledging Compliments ($M =$

62%, range = 50-100%), and Complimenting Others ($M = 88%$, range = 40-100%). For Requesting Assistance, Frank demonstrated low levels of generalization of percentage of skill accuracy ($M = 0%$) following implementation of intervention. During maintenance, Frank demonstrated low levels of generalization of percentage of skill accuracy for Initiating a Greeting ($M = 20%$, range = 0-40%), low to moderate levels for generalization of percentage of skill accuracy for Requesting Assistance ($M = 41%$, range = 0-75%), and high levels of generalization of percentage of skill accuracy for Acknowledging Compliments ($M = 100%$) and Complimenting Others ($M = 100%$).

Figure 4. Percentage of Skill Accuracy, Frank



Effect Sizes

BCT (Tarlow, 2016a) scores were calculated across participants comparing baseline to intervention and baseline to maintenance in both the training (Table 3) and generalization (Table 4) settings for all four skills. For Ian, BCT scores revealed small to moderate effect sizes for all skills, with the exception of Requesting Assistance which revealed very strong effects. For Fiona, BCT scores indicated moderate effect sizes across skills, with the exception of Requesting Assistance which revealed strong effects. For Phillip, BCT scores revealed moderate to very large effect sizes across all skills. BCT scores revealed moderate to large effect sizes across all skills for Frank. Regarding generalization of percentage of skill accuracy, BCT scores indicated very strong effect sizes for Initiating a Greeting, strong to very strong effect sizes for Requesting Assistance, moderate effect sizes for Acknowledging Compliments and moderate to strong effect sizes for Complimenting Others for Ian. BCT scores for Fiona revealed small to very large effect sizes for Initiating a Greeting, moderate to large effect sizes for Requesting Assistance and Acknowledging Compliments, and small to moderate effects for Complimenting Others. BCT scores for Phillip indicated strong to very strong effect sizes for Initiating a Greeting, moderate to large effect sizes for Requesting Assistance, strong effect sizes for Acknowledging Compliments, and small to moderate effect sizes for Complimenting Others. Lastly, BCT scores for Frank revealed moderate effect sizes for Initiating a Greeting, small to moderate effect sizes for Requesting Assistance, moderate to strong effect sizes for Acknowledging Compliments, and moderate effect sizes for Complimenting Others.

Table 3 : *BCT Scores Comparing Baseline to Intervention and Baseline to Maintenance, Training*

	Ian	Fiona	Phillip	Frank
Initiating a Greeting- Intervention	.26	.37	.72	.61
Initiating a Greeting- Maintenance	.18	.41	.57	.44
Requesting Assistance- Intervention	.89	.77	.79	.25
Requesting Assistance- Maintenance	.86	.79	.81	.51
Accepting Compliments- Intervention	.16	.46	.73	.48
Accepting Compliments- Maintenance	.13	.54	.73	.57
Complimenting Others- Intervention	.51	.55	.77	.70
Complimenting Others- Maintenance	.37	.50	.60	.55

Note. BCT scores below .20 are considered small effects, scores from .20 to .60 are considered to be moderate effects, scores from .60-.80 are considered to be large effects and scores above .80 are considered to be very large effects

Table 4 : *BCT Scores Comparing Baseline to Intervention and Baseline to Maintenance, Generalization*

	Ian	Fiona	Phillip	Frank
Initiating a Greeting- Intervention	.91	.00	.75	.58
Initiating a Greeting- Maintenance	--	1.00	.83	.58
Requesting Assistance- Intervention	.87	.43	.54	-.24
Requesting Assistance- Maintenance	.69	.32	.64	.51
Accepting Compliments- Intervention	.51	.66	.69	.65
Accepting Compliments- Maintenance	.45	.51	.60	.28
Complimenting Others- Intervention	.71	.16	.00	.51
Complimenting Others- Maintenance	.55	.23	.59	.55

Note. BCT scores below .20 are considered small effects, scores from .20 to .60 are considered to be moderate effects, scores from .60-.80 are considered to be large effects and scores above .80 are considered to be very large effects

Social Validity

As a measure of social validity, parents completed the URP-IR (Chafouleas et al., 2011; see Table 5). Overall, parents perceived the intervention to be socially valid, as their scores ranged from 4.4 to 5.2 on a six-point scale. Anecdotally, parents reported that their children would discuss the RPG at home and were excited about returning to social skills training sessions.

Table 5 : *Parent URP-IR Scores*

	Ian’s Parent	Fiona’s Parent	Phillip’s Parent	Frank’s Parent
Acceptability	5.2	5.3	5.2	4.4
Understanding	5	5	5	5
Home School Collaboration	5.3	5	4.7	4.3
Feasibility	5	5.3	5	4
System Climate	5	4	5.2	5
System Support	3.3	5.5	4	4.6
Average	4.9	5.1	5	4.4

Participants also completed the CURP (Briesch & Chafouleas; see Table 6) as a measure of social validity. The CURP consists 21 items and is comprised of 3 factors including Personal Desirability, Feasibility, and Understanding. Participants completed the CURP using a four-point Likert scale ranging from “I totally disagree” to “I totally

agree.” All participants rated the RPG as socially valid as evidenced by total scores ranging between 2.6 and 3.3. out of a total of 4 points.

Table 6 : *Participant CURP Scores*

	Ian	Fiona	Phillip	Frank
Personal Desirability	3.6	3.3	4	3.6
Feasibility	1.6	2.6	1	1.4
Understanding	3.8	3.7	4	3.2
Average	2.9	3.3	2.9	2.6

Social Functioning

Additionally, the ASRS (Goldstein & Naglieri, 2009; see Table 7) and ASSP (Bellini & Hopf, 2007, see Table 8) were given following the completion of the intervention to see if parent perception of their child’s characteristics of ASD and social skills had changed. All participant’s parents’ ratings of ASD characteristics decreased following the implementation of the intervention, with the exception of Fiona.

Furthermore, Ian’s descriptive score changed from a descriptive category of Slightly Elevated on the pre-test to Average following provision of the RPG intervention.

Regarding social functioning, all participant’s scores of social functioning improved, with the exception of Phillip.

Table 7 : *Participant ASRS T-Scores*

	Ian		Fiona		Phillip		Frank	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Social/Communication	68	53	63	61	53	54	62	56
Unusual Behaviors	57	52	64	68	65	64	70	67
Self-Regulation	52	45	62	66	62	60	68	68
Total	60	51	65	67	61	60	69	65

Table 8 *Participant ASSP Pre and Post Scores*

	Ian		Fiona		Phillip		Frank	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Social Reciprocity	45	62	50	57	61	53	52	59
Participation/Avoidance	23	39	40	40	31	35	31	33
Detrimental Social Behaviors	31	33	17	15	30	31	22	22
Total	112	149	120	124	130	129	114	123

CHAPTER IV– DISCUSSION

The purpose of this study was to evaluate the effectiveness of a RPG on social skill acquisition for children with ASD. Overall, results suggest preliminary evidence demonstrating the effectiveness of the RGP intervention for promoting acquisition of social skills. Immediately following implementation of the intervention, participants' percentages of skill accuracy improved across all skills. Results of this study are consistent with available research in that multicomponent interventions that incorporate BST are effective strategies for immediately increasing the social skill acquisition for children with ASD (Radley et al., 2015; Radley, Helbig, Murphy, McCargo, & Lown, 2018). Though this study incorporated a multicomponent intervention, it was novel in that one of the strategies was a RGP, as opposed to typically used strategies such as video models, social stories, and perspective taking questions (Jenson et al., 2011; Laugeson et al., 2015). What may be most important about the RPG intervention in comparison to traditional methods of social skills training is the participant's motivation to accurately demonstrate the target social skills, as it was related to their performance in the RPG, which appeared to be of reinforcing value to the participants. Additionally, the delivery of reinforcement differed within the context of the RPG multicomponent intervention in that it was immediately provided following participant demonstration of skill as opposed to previous studies in which a tangible reinforcer was delivered at the end of the social skills training lesson (O'Handley, Ford, Radley, Helbig & Wimberly, 2016; Radley, Dart, Helbig, Schrieber, & Ware, 2018).

Additionally, all participants maintained high levels of skill accuracy throughout the context of the RPG, which may be a more meaningful outcome. A criticism of the

social skills literature is the lack of observed maintenance of trained skills (Bellini, Peters, Benner & Hopf, 2007); however, all of the participants in the current study maintained a higher level of skill acquisition in comparison to baseline levels. The observed maintenance in skill acquisition could be due to the initial reinforcement provided for appropriate skill demonstration and the participant's inability to determine the schedule of reinforcement.

The current study expands available social skills literature by providing the first experimental evaluation of a RPG intervention to train discrete social skills. There have been previous implementations of RPGs used within a therapeutic context for training social skills; however, to our knowledge there has not been an experimental investigation on this topic. The current study expands the available social skills literature by providing an experimental evaluation of a new strategy for social skills training along with preliminary evidence that RPGs are effective for promoting social skills for children with ASD.

A major criticism of social skills training is the lack of assessing and implementing socially valid interventions (McDonald & Machalicek, 2013). Not only was social validity evaluated in the current study, but participant ratings of the intervention were high, indicating that they perceived the intervention to be acceptable. Anecdotally, all of the participants stated that they enjoyed playing the RPG and expressed disappointment at the end of each session when the facilitator ended the game. Parents also perceived the intervention to be socially valid, as indicated by their high ratings on the URP-IR. These preliminary findings are promising in that they suggest the RPG is socially acceptable for consumers and stakeholders.

Limitations

Several limitations must be considered when interpreting the results. First, the external validity of the results of this study are limited. Specifically, the sample size was limited in that it only included four participants. Additionally, the setting in which the intervention was conducted limits the external validity of the findings as it was conducted in a clinic setting and was implemented by experienced graduate students. Furthermore, generalization of learned skills was assessed in the same environment, so it is unclear if generalization of skills would be evidenced across settings or people. Future research should explore how well the effects of the RPG intervention generalize to other contexts and settings.

In light of the inconsistency of generalization of social skills, it is important to note that the naturally incorporated generalization technologies were not as salient as they could have been (Stokes and Baer, 1977). Specifically, the strategy of ‘program common stimuli’ was not as salient in that the characters did not extend outside of the RPG setting. Additionally, ‘train efficient exemplars’ were not as salient as the exemplars were specific to the game playing context instead of the naturalistic generalization context. Furthermore, ‘introduce natural contingencies’ was not employed outside of the RPG context, as the contingencies within the game were related towards obtaining desired outcomes, which rendered irrelevant in the generalization context, as the game was not in play.

The saliency of the discriminative stimuli used to elicit the performance of the desired target skill may also be a factor that contributed to the limited generalization of skill acquisition. Specifically, some of the prompts used in the untrained context may not

have aligned to the corresponding training skill or been as salient as they were during the RPG context, thus not providing a clear cue that the performance of the target skill was desired.

Another potential concern of the current study is related to assessment. Even though the selection for target skills encompassed a parent rating scale as well as direct observation, one of the participants still demonstrated considerably high levels of percentage of skill accuracy during baseline. Additionally, the assessment process in the current study did not include assessment procedures to determine the likelihood of the type of skill deficit, which could have been beneficial in assisting researchers in matching the appropriate type of strategy to the type of exhibited.

Future Directions

There are various avenues of future research that can be explored in relation to a RPG intervention. First, replications of the current study need to be conducted to demonstrate the effectiveness of RPGs promoting skill acquisition for individuals with ASD. Additionally, more participants are needed to provide a larger sample size and further demonstrate the effectiveness of the RPG intervention in promoting social skills for individuals with ASD.

Future researchers should consider incorporating technologies of generalization within the context of the RPG as a way to promote generalization of target skills. For example, programming strategies such as Sequential Modification or Introduce Natural Maintaining Contingencies outside the context of the RPG could potentially be effective ways to promote generalization of target social skills. For example, during assessment of

generalization of skill acquisition, a prompting procedure could be implemented upon observation of lack of generalization.

Future researchers should also consider more intensive assessment procedures. For example, a skill vs performance deficit could be of value so researchers can match the intervention deliver to the actual skill deficit. Additionally, by incorporating more intensive assessment procedures that may be a way to avoid high levels of percentage of skill accuracy during baseline.

Another avenue to pursue within the context of RPG interventions is the evaluation of additional social skills that were not discretely trained within the RPG intervention. Within the structure of the RPG, there were many opportunities for participants to engage in social skills such as problem solving, working together as a team, and social engagement. Future research could systematically evaluate the acquisition of skills that were not specifically trained.

Lastly, future researchers should consider conducting the RPG intervention with the addition of typically developing peers within the group. There could be additional benefits such as modeling of accurate social skills demonstrated by the typically developing peers which could potentially promote generalization of skill acquisition.

Conclusion

Social skill deficits can lead to a plethora of undesirable outcomes, such as isolation and social rejection (Locke, Kasari, Rotheram-Fuller, Kretzmann, & Jacobs, 2013), difficulties initiating relationships with peers (Bauminger et al., 2008) and difficulties obtaining or maintaining employment (Shattuck et al., 2012). The most frequently implemented treatment to improve social functioning is social skills training.

The purpose of this study was to evaluate the effectiveness of a social skills intervention implemented within the context of a RPG. Results indicated that this RPG intervention was effective in promoting social skill acquisition and maintenance as well as a socially valid intervention for children with ASD, however the results related to skill generalization were limited. Future research should seek to utilize the technologies of generalization as a means to promote generalization of skill use.

APPENDIX A – IRB Approval



INSTITUTIONAL REVIEW BOARD

118 College Drive #5147 | Hattiesburg, MS 39406-0001
Phone: 601.266.5997 | Fax: 601.266.4377 | www.usm.edu/research/institutionalreview.board

NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months.
Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 17110102

PROJECT TITLE: Evaluation of a Role-Playing Game to Improve Social Skills for Individuals with ASD

PROJECT TYPE: Doctoral Dissertation

RESEARCHER(S): Kate Helbig

COLLEGE/DIVISION: College of Education and Psychology

DEPARTMENT: Psychology

FUNDING AGENCY/SPONSOR: N/A

IRB COMMITTEE ACTION: Expedited Review Approval

PERIOD OF APPROVAL: 11/13/2017 to 11/12/2018

Lawrence A. Hosman, Ph.D.

Institutional Review Board

APPENDIX B Parent Consent

Dear Parent,

My name is Kate Helbig and I am a doctoral student in the School Psychology Program at The University of Southern Mississippi. I am currently working on a project titled “Effects of a Role-Playing Game on Skill Acquisition for Individuals with ASD”. This project is evaluating the effectiveness of a social skills intervention in the format of a role-playing game on social skill acquisition. This project is being conducted under the supervision of faculty member, Dr. Evan Dart.

Purpose:

The purpose of my project is to evaluate the effectiveness of a social skills treatment package that is implemented within the context of a role-playing game. The rationale behind this study is to utilize a game-based approach to train social skills for individuals with ASD. These results could potentially be published or presented at a research conference or in a peer-reviewed journal so others can utilize this intervention for social skills training, however all names will be changed to pseudonyms prior.

Description of Study:

If you agree to allow your child to participate in the study, baseline observations will be conducted by the primary researcher along with secondary researchers (graduate and undergraduate students at USM). Baseline probes will consist of providing a prompt that allows for the participants to respond with the skill steps outlined in the task analyses and the behavioral responses will be recorded (e.g. a dichotomous recording of the participant either appropriately completing or not completing the step). During this

phase, there will be no skills training or intervention provided. Once levels of skill accuracy reach stable level and trend, the intervention phase may begin.

The intervention phase will consist of the lead researcher facilitating a role-playing game. A narrative will be described with various opportunities to practice and use social skills throughout the session will be provided. After a participant has demonstrated the skill, praise and or corrective feedback will be provided. Additionally, performance of the target skill will correlate with the participants' outcome in the game (i.e. better skill performance will result in a better outcome in the game). Researchers will record participants' behavior response by using the task analyses to assess if each step was correctly or incorrectly demonstrated.

A generalization phase will then be conducted to promote accurate skill demonstration in a different setting. During this phase, researchers will provide probes outside of the game context to evaluate if the child can demonstrate the target skills outside of the game context.

During the maintenance phase, which will occur after the skills training intervention has been provided, researchers will provide opportunities for demonstration of skill accuracy. This will occur in both the training and generalization settings. Data will be collected and recorded in the same way as every other previous phase. The duration of all intervention implementation as well as data collection will last approximately one hour and will occur two times per week.

Benefits and Risks:

Benefits that could potentially occur for your child include development of skill acquisition. This can be beneficial in regards to an improvement in social interactions at

school, home, and other routine interactions. These improvements in social interactions could potentially lead to developments in future various relationships. There appear to be very few risks for your student participating in this study. The greatest discomforts your child may experience is the training process, however, this is similar to routine classroom procedure.

Confidentiality:

All information collected during this study will be confidential. Identifying information regarding your name, child's name, and other identifying information will not be disclosed to any person not involved in this study. It is possible that results from this study will be shared at professional conferences or published in scholarly journals, however all identifying information will be removed prior to presentations and/or publications.

Consent:

Your consent for your students' participation in this study is entirely voluntarily. You also have the right to withdraw your consent from the study at any time without penalty, prejudice, or loss of benefits. Additionally, further services may be provided outside the study if requested. The primary researcher will take every precaution to conduct this study with the best scientist practice procedures. This project has been reviewed by the Institutional Review Board, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research participant should be directed to the Chair of the IRB at 601-266-5997. If you give consent to participate in this study, please read, sign, and return the following page. Please keep this letter for your records. If you have questions about this

study, please contact the primary researcher, Kate Helbig, kate.helbig@usm.edu or the primary researcher's supervisor, Dr. Evan Dart (evan.dart@usm.edu).

Sincerely,

Kate Helbig, M.A.

School Psychologist-in-Training

Department of Psychology

The University of Southern Mississippi

THIS SECTION TO BE COMPLETED BY PARENT

Please Read and Sign the Following:

Consent is hereby given to participate in this research project. All procedures and/or investigations to be followed and their purpose, including experimental procedures, were explained to me. Information was given about all benefits, risks, inconveniences, or discomforts that might be expected.

The opportunity to ask questions regarding the research and procedures was given. Participation in the study is completely voluntary, and participants may withdraw at any time without penalty, prejudice, or loss of benefits. All personal information is strictly confidential, and no names will be disclosed. Any new information that develops during the project will be provided if that information may affect the willingness to continue participation in the project.

Questions concerning the research, at any time during or after the project, should be directed to the Principal Investigator with the contact information provided above. This project and this consent for have been reviewed by the Institutional Review Board, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research participant should be directed to the Chair of the Institutional Review Board, The University of Southern Mississippi, 118 College Drive #5147, Hattiesburg, MS 39406-0001, (601) 266-5997.

Name of Child

Signature of Parent

Person Explaining the Study

Date

Date

APPENDIX C Data Sheets

Initiating A Greeting

Training probe: 'greet (character name)'

Gen probe: sit/stand w/in 5 ft of participant

DATE	SESSION	PHASE	GEN	1. Face the person (orient head and shoulders w/in 3s)	2. Make eye contact (w/in 3s and maintain for 5s)	3. Provide form of greeting (w/in 5s)	4. Use appropriate tone of voice (positive affect)	5. Allow person to respond (at least 5s)	% Accurate (0, 20, 40, 60, 80, 100)	IOA %

Requests Assistance

Training Probe: 'ask for XX' (materials or help)

Gen Probe: 'ask XX for assistance' OR present difficult task that would require assistance

DATE	SESSION	PHASE	GEN	1. Face the person (orient head and shoulders w/in 3s)	2. Make eye contact (w/in 3s and maintain for 5s)	3. Asks for assistance (uses the word please and positive affect)	4. Says thankyou	% Accurate (0, 25, 50, 75, 100)	% IOA

Acknowledges Compliments

Training Probe: 'respond to compliment'

Gen Probe: 'I like your XX (shirt, shoes, article of clothing)'

DATE	SESSION	PHASE	GEN	1. Face the person (orient head and shoulders w/in 3s)	2. Make eye contact (w/in 3s)	3. Says form of thankyou	4. Uses appropriate voice (positive affect)	% Accurate (0, 25, 50, 75, 100)	% IOA

Compliments Others

Training Probe: 'Compliment (character name)'

Gen Probe: 'I got a new (article of clothing you are wearing)'

DATE	SESSION	PHASE	GEN	1. Face the person (orient head and shoulders w/in 3s)	2. Make eye contact (w/in 3s and maintain for 5s)	3. Provide compliment to person that is relevant)	4. Use appropriate tone (i.e. not monotone/fl at affect)	5. Allow time for person to respond (wait at least 5s)	% Accurate (0, 20, 40, 60, 80, 100)	IOA

APPENDIX D Treatment Integrity

ROLE-PLAYING GAME TREATMENT INTEGRITY AFTER SCHOOL 2017-2018

Skill: _____ Date: _____
 Observer: _____ Phase: _____

This form is used to assess the level of treatment integrity for each component of the role-playing game social skills intervention. Record if components were conducted as planned (Yes) or not conducted as planned (No) during each session; or if the day's session did not require a particular component (N/A).

Social Skills Training components	YES	NO	N/A
1. Probe target baseline skills (see protocol)			
2. Probe target maintenance skills (see protocol)			
3. Have materials ready and place in front of group			
4. Welcome participants to session (game)			
5. Narrate story line			
6. Prior to role-play, provide description on how to accurately demonstrate target skill			
7. Allow for at least two opportunities of skill demonstration from EACH participant			
8. Provide praise/corrective feedback to EACH participant immediately following skill demonstration			
9. Tell participants their consequences in the game and base it off skill performance (see session outline)			
10. Conduct probes of target skills (see session outline)			
11. Dismiss group			
12. Place data in file and graph data			

APPENDIX E Sample Session Outline

During today's journey we have had good fortune and come across the town market. We are able to purchase food, which is critical at this point as we were robbed last week.

Introduce Expressing Wants and Needs (requesting skill)

Face the person (orient head and shoulders)

Make eye contact with speaker

Ask for what you want

Wait for response (without talking)

Thank person

Questions?

Today we have stumbled upon the Mid-Town Market Place. The market is filled with tons of people, smiling, talking, and laughing. There are fantastic smells of freshly baked bread, warm cherry pies, and crisp red apples. Your stomach is growling, as it has been a few days since your last meal. You come across a sweet older woman wearing an apron. This is Alice, the best baker in town. In order to purchase any food, you will need to express your wants and needs to Alice.

Good morning travelers! You seem extremely worn out and I swear I could hear your stomachs growling from 20 feet away! Lucky for you I have quite the variety of treats today. I have my famous 'Kings loaf of bread', packed full of magical nutrients that won't require you to eat for another week, and I just pulled it out of oven less than five minutes ago!

Participant rolls dice

Skill Demonstration #1

If the participant gets 100% accuracy on EWN, then participant can move up one classification of points.

5-6: 'king loaf bread', lasts for a week and is full of rich nutrients

3-4: 'standard bread', lasts for 2-3 days and has half of the nutrients

1-2: 'peasant bread', lasts one day and will have to find food again

Just as you are about to leave the Mid-Town Market Place, you see something out of the corner of your eye. It is a stand with dozens of bright gleaming swords. You realize that since you were recently robbed, you no longer have any form of protection and desperately need to get a sword. You walk over to the stand and see Old Man Withers, a grouchy old man with wrinkles, permanently curled fingers, and gray scraggly hair. Rumor has it that he was one of the best knights back in his younger days. It is extremely important to communicate clearly and politely with this man if you want any chance of receiving a sword.

What are you outsiders looking at? You should get a painter to create a portrait, it will last longer. If you are trying to purchase some of these swords, be warned that I only sell them on very special occasions to people that I think have earned them. It takes a special person to carry a sword like the ones I've got here.

Participant rolls dice

Skill Demonstration #2

5-6: gold plated sword

3-4: allowed to purchase standard sword

1-2: no sword and Old Man Withers tells participant to take a hike, no protection

APPENDIX F Sample Character Sheet

Character Description

Name:

Background:

Personality:

Portrait:

Materials/Abilities Acquired Today:

APPENDIX G Autism Social Skills Profile

Autism Social Skills Profile
Scott Bellini

Child's Name: _____
FIRST MIDDLE LAST

Birthdate: _____ Age: _____ Sex: Female Male Today's Date: _____
MO. DAY YEAR MO. DAY YEAR

School: _____ Grade: _____

Your Name: _____
FIRST MIDDLE LAST

Relationship to Child: Mother Father Guardian Other _____

Street Address: _____

City: _____ State: _____ Zip: _____

Phone: (_____) _____

The following phrases describe skills or behaviors that your child might exhibit during social interactions or in social situations. Please rate **HOW OFTEN** your child exhibits each skill or behavior independently, **without assistance from others** (i.e., without reminders, cueing and/or prompting). You should base your judgment on your child's behavior over the last **3 months**.

Please use the following guidelines to rate your child's behavior:

Circle **N** if your child **never** or **almost never** exhibits the skill or behavior.

Circle **S** if your child **sometimes** or **occasionally** exhibits the skill or behavior.

Circle **O** if your child **often** or **typically** exhibits the skill or behavior.

Circle **V** if your child **very often** or **always** exhibits the skill or behavior.

Please do not skip any items. If you are unsure of an item, please provide your best estimate. You may use the "Brief Description" section to provide additional information on the particular skill or behavior. For instance, if your child will exhibit a particular skill or behavior more frequently when cueing or prompting is provided, or when interacting with adults rather than peers, please make note of this in the "Brief Description" section.

Autism Social Skills Profile

Never	Sometimes		Often		Very often
N	S		O		V
Skill Area	How Often				Brief Description
Invites Peers to Join Him/Her in Activities	N 1	S 2	O 3	V 4	
Joins in Activities With Peers	N 1	S 2	O 3	V 4	
Takes Turns During Games and Activities	N 1	S 2	O 3	V 4	
Maintains Personal Hygiene	N 1	S 2	O 3	V 4	
Interacts With Peers During Unstructured Activities	N 1	S 2	O 3	V 4	
Interacts With Peers During Structured Activities	N 1	S 2	O 3	V 4	
Asks Questions to Request Information About a Person	N 1	S 2	O 3	V 4	
Asks Questions to Request Information About a Topic	N 1	S 2	O 3	V 4	
Engages in One-On-One Social Interactions With Peers	N 1	S 2	O 3	V 4	
Interacts With Groups of Peers	N 1	S 2	O 3	V 4	
Maintains the "Give-and-Take" of Conversations	N 1	S 2	O 3	V 4	
Expresses Sympathy for Others	N 1	S 2	O 3	V 4	
Talks About or Acknowledges the Interests of Others	N 1	S 2	O 3	V 4	

Autism Social Skills Profile

	Never	Sometimes	Often	Very often	
	N	S	O	V	
Skill Area	How Often				Brief Description
Recognizes the Facial Expressions of Others	N 1	S 2	O 3	V 4	
Recognizes the Nonverbal Cues, or "Body Language" of Others	N 1	S 2	O 3	V 4	
Requests Assistance From Others	N 1	S 2	O 3	V 4	
Understands the Jokes or Humor of Others	N 1	S 2	O 3	V 4	
Maintains Eye Contact During Conversations	N 1	S 2	O 3	V 4	
Maintains an Appropriate Distance When Interacting With Peers	N 1	S 2	O 3	V 4	
Speaks With an Appropriate Volume in Conversations	N 1	S 2	O 3	V 4	
Considers Multiple Viewpoints	N 1	S 2	O 3	V 4	
Offers Assistance to Others	N 1	S 2	O 3	V 4	
Verbally Expresses How He/She Is Feeling	N 1	S 2	O 3	V 4	
Responds to the Greetings of Others	N 1	S 2	O 3	V 4	
Joins a Conversation With Two or More People Without Interrupting	N 1	S 2	O 3	V 4	
Initiates Greetings With Others	N 1	S 2	O 3	V 4	

Autism Social Skills Profile

	Never	Sometimes	Often	Very often	
	N	S	O	V	
Skill Area	How Often				Brief Description
Provides Compliments to Others	N 1	S 2	O 3	V 4	
Introduces Self to Others	N 1	S 2	O 3	V 4	
Politely Asks Others to Move out of His/Her Way	N 1	S 2	O 3	V 4	
Acknowledges the Compliments Directed at Him/Her by Others	N 1	S 2	O 3	V 4	
Allows Peers to Join Him/Her in Activities	N 1	S 2	O 3	V 4	
Responds to the Invitations of Peers to Join Them in Activities	N 1	S 2	O 3	V 4	
Allows Others to Assist Him/Her With Tasks	N 1	S 2	O 3	V 4	
Responds to Questions Directed at Him/Her by Others	N 1	S 2	O 3	V 4	
Experiences Positive Peer Interactions	N 1	S 2	O 3	V 4	
Compromises During Disagreements With Others	N 1	S 2	O 3	V 4	
Responds Slowly in Conversations	N 1	S 2	O 3	V 4	
Changes the Topic of Conversation to Fit Self-Interests	N 1	S 2	O 3	V 4	
Misinterprets the Intentions of Others	N 1	S 2	O 3	V 4	

Autism Social Skills Profile

	Never	Sometimes	Often	Very often	
	N	S	O	V	
Skill Area	How Often				Brief Description
Makes Inappropriate Comments	N 1	S 2	O 3	V 4	
Engages in Solitary Interests and Hobbies	N 1	S 2	O 3	V 4	
Ends Conversations Abruptly	N 1	S 2	O 3	V 4	
Fails to Read Cues to Terminate Conversations	N 1	S 2	O 3	V 4	
Exhibits Fear or Anxiety Regarding Social Interactions	N 1	S 2	O 3	V 4	
Experiences Negative Peer Interactions	N 1	S 2	O 3	V 4	
Engages in Socially Inappropriate Behaviors	N 1	S 2	O 3	V 4	
Exhibits Poor Timing With His/Her Social Initiations	N 1	S 2	O 3	V 4	
Is Manipulated by Peers	N 1	S 2	O 3	V 4	
Engages in Solitary Activities in the Presence of Peers	N 1	S 2	O 3	V 4	

For more information on how to use this assessment tool in the context of teaching social skills, see S. Bellini, *Building Social Relationships: A Systematic Approach to Teaching Social Interaction Skills to Children and Adolescents with Autism Spectrum Disorders and Other Social Difficulties* ©2006; AAPC Publishing; www.asperger.net

APPENDIX H Children's Usage Rating Profile



CURP - Actual

Directions: Think about the method that your teacher or other adult has used with you. After reading each sentence, circle the number that matches your belief about it. For example, if the sentence was "I like chocolate ice cream," you might circle "4" for "I totally agree."

		I totally disagree	I kind of disagree	I kind of agree	I totally agree
1.	This was too much work for me.	1	2	3	4
2.	I understand why my teacher picked this method to help me.	1	2	3	4
3.	I could see myself using this method again.	1	2	3	4
4.	This is a good way to help students.	1	2	3	4
5.	It is clear what I had to do.	1	2	3	4
6.	I would not want to try this method again.	1	2	3	4
7.	This took too long to do.	1	2	3	4
8.	If my friend was having trouble, I would tell him/her to try this.	1	2	3	4
9.	I was able to do every step of this method.	1	2	3	4
10.	I felt like I had to use this method too often.	1	2	3	4

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	I totally disagree	I kind of disagree	I kind of agree	I totally agree
11. Using this method gave me less free time.	1	2	3	4
12. There are too many steps to remember.	1	2	3	4
13. Using this method got in the way of doing other things.	1	2	3	4
14. I understand why the problem needed to be fixed.	1	2	3	4
15. This method focused too much attention on me.	1	2	3	4
16. I was excited to try this method.	1	2	3	4
17. This method made it hard for the other students to work.	1	2	3	4
18. I would volunteer to use this method again.	1	2	3	4
19. It is clear what the adult needed to do.	1	2	3	4
20. I was able to use this method correctly.	1	2	3	4
21. I liked this method.	1	2	3	4

APPENDIX I Usage Rating Profile – Intervention Revised



URP-Intervention

Directions: Consider the described intervention when answering the following statements. Circle the number that best reflects your agreement with the statement, using the scale provided below.

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1. This intervention is an effective choice for addressing a variety of problems.	1	2	3	4	5	6
2. I would need additional resources to carry out this intervention.	1	2	3	4	5	6
3. I would be able to allocate my time to implement this intervention.	1	2	3	4	5	6
4. I understand how to use this intervention.	1	2	3	4	5	6
5. A positive home-school relationship is needed to implement this intervention.	1	2	3	4	5	6
6. I am knowledgeable about the intervention procedures.	1	2	3	4	5	6
7. The intervention is a fair way to handle the child's behavior problem.	1	2	3	4	5	6
8. The total time required to implement the intervention procedures would be manageable.	1	2	3	4	5	6
9. I would not be interested in implementing this intervention.	1	2	3	4	5	6
10. My administrator would be supportive of my use of this intervention.	1	2	3	4	5	6
11. I would have positive attitudes about implementing this intervention.	1	2	3	4	5	6
12. This intervention is a good way to handle the child's behavior problem.	1	2	3	4	5	6
13. Preparation of materials needed for this intervention would be minimal.	1	2	3	4	5	6

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		Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
14.	Use of this intervention would be consistent with the mission of my school.	1	2	3	4	5	6
15.	Parental collaboration is required in order to use this intervention.	1	2	3	4	5	6
16.	Implementation of this intervention is well matched to what is expected in my job.	1	2	3	4	5	6
17.	Material resources needed for this intervention are reasonable.	1	2	3	4	5	6
18.	I would implement this intervention with a good deal of enthusiasm.	1	2	3	4	5	6
19.	This intervention is too complex to carry out accurately.	1	2	3	4	5	6
20.	These intervention procedures are consistent with the way things are done in my system.	1	2	3	4	5	6
21.	This intervention would not be disruptive to other students.	1	2	3	4	5	6
22.	I would be committed to carrying out this intervention.	1	2	3	4	5	6
23.	The intervention procedures easily fit in with my current practices.	1	2	3	4	5	6
24.	I would need consultative support to implement this intervention.	1	2	3	4	5	6
25.	I understand the procedures of this intervention.	1	2	3	4	5	6
26.	My work environment is conducive to implementation of an intervention like this one.	1	2	3	4	5	6
27.	The amount of time required for record keeping would be reasonable.	1	2	3	4	5	6
28.	Regular home-school communication is needed to implement intervention procedures.	1	2	3	4	5	6
29.	I would require additional professional development in order to implement this intervention.	1	2	3	4	5	6

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