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Training Paraprofessionals to Improve Social Skills in Students with Autism Spectrum Disorders

A dissertation submitted in partial satisfaction

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Doctor of Philosophy in Education

by

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VITA of Jung Sun Sunny Kim

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ABSTRACT

Training Paraprofessionals to Improve Social Skills in

Students with Autism Spectrum Disorders

by

Jung Sun Sunny Kim

The number of students with Autism Spectrum Disorders (ASD) requiring special education services in public schools have steadily increased over the last decade (Scull & Winkler, 2011; U.S. Department of Education, National Center for Education Statistics, 2013). In response, the employment of paraprofessionals in schools has increased in order to support these students (Blalock, 1991; Boomer, 1994; Frith & Lindsey, 1982; National Center for Education Statistics, 2007; Pickett, 1986). Although paraprofessionals often bear the responsibility to provide both academic and social support to students with ASD, they receive little to no training on how to successfully support these students (Giangreco, Edelman, Broer, & Doyle, 2001; Jones & Bender, 1993). Providing social support to students with ASD becomes especially important when considering the risk factors associated with not receiving appropriate social intervention such as having fewer lasting peer relationships and spending less time in peer interactions compared to typically developing peers (Bauminger, & Shulman, 2003; Kasari, Rotheram-Fuller, Locke, & Gulsrud, 2012). A recent study by Koegel, Kim, and Koegel (2014) provide optimism that

paraprofessionals can be trained to fidelity to implement an effective social intervention for students with ASD. Within the context of a multiple baseline across participants design, the present study assessed whether paraprofessionals could be trained to effectively implement social interventions for students with ASD. Specifically, paraprofessionals were trained to stand in an appropriate proximity from the target student while providing cooperative arrangements and incorporating the preferred/specialized interests of students with ASD with typically developing peers into common playground games/activities. This present study also assessed whether training paraprofessionals in these three components would improve the social interactions between students with ASD and typically developing peers (i.e., social engagement and rate of verbal initiations). The results of this present study suggest that paraprofessionals can be trained to fidelity to implement social intervention for students with ASD. The results also suggest that when paraprofessionals are trained to implement social intervention for students with ASD, the level of engagement and rate of verbal initiations improves for these students. The results are discussed in terms of their implications for using trained paraprofessionals to improve social skills for students with ASD in the school setting.

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I: Introduction

As more students with Autism Spectrum Disorders (ASD) are being fully included in public school systems (Scull & Winkler, 2011), the employment of paraprofessionals has dramatically increased over the last several decades (Blalock, 1991; Boomer, 1994; Frith & Lindsey, 1982; National Center for Education Statistics, 2007; Pickett, 1986). Currently, more than 700,000 paraprofessionals are employed in public schools throughout the United States and more than half of them provide support for students with disabilities (National Center for Educational Statistics, 2007). It has become standard practice for schools to rely on such paraprofessionals to help students with ASD receive education alongside typically developing peers.

One of the defining characteristics of ASD is a lack of socialization (American Psychiatric Association, 2013), and an essential role for paraprofessionals is to provide social support for students with ASD (Etscheidt, 2005). The implementation of a social intervention program in schools for students with ASD becomes especially important when considering the risk factors (such as depression, social anxiety, and feelings of loneliness) that are associated with not receiving appropriate social support (Reichow, Steiner, & Volkmar, 2012; Kasari, Rotheram-Fuller, Locke, & Gulsrud, 2012).

Paraprofessionals can help mitigate these risk factors by implementing appropriate social intervention during unstructured social periods such as lunch recess. However, there is a recognized lack in training for these paraprofessionals, which can hinder their efficacy in providing appropriate social support for students with ASD (Giangreco, Edelman, Broer, & Doyle, 2001; Storey, Smith, & Strain, 1993). It is critical to respond to this issue by

providing schools with a cost-efficient social intervention-training program for paraprofessionals that is effective and easy to implement.

Students with ASD in schools

With 1 in 68 children currently being diagnosed with ASD (Centers for Disease Control and Prevention [CDC], 2014), the number of students with ASD requiring special education services has steadily increased over the past several years (Scull & Winkler, 2011; U.S. Department of Education, National Center for Education Statistics, 2013). Since 1992, the number of students with ASD has increased by over 800% (Individuals with Disabilities Education Act, 2004; Aud, Hussar, Johnson, Kena, Roth, Manning, et al., 2012). In response to the increasing incidence and awareness of ASD, one of the major changes to the IDEA (formerly the Education for All Handicapped Children Act) was the identification of ASD as a separate and distinct disability category (Yell, Rogers, & Rogers, 1998). This distinction allowed for the IDEA to address issues specific to students with ASD, including the requirement that students with ASD be provided a Free and Appropriate Public Education (FAPE) in the least restrictive environment (LRE). Specifically, the IDEA requires schools to cover a wide range of skills and knowledge, including academic learning, social skills development, adaptive skills development, language and communication skills, reduction of problem behaviors, and independent living skills (Amanda J v. Clark County School District, 2001; Boomer, 1994; Etscheidt, 2005).

Social impairments in students with ASD

One of the defining characteristics of ASD is impairment in social development (American Psychiatric Association, 2013). Current research indicates that without appropriate social intervention, students with ASD can have difficulties appropriately

interacting with typically developing peers (Orsmond, Krauss, & Seltzer, 2004). Signs of these difficulties include limited responsiveness, limited or nonexistent initiations, reduced conversational reciprocity, and an overall difficulty sustaining social engagement (Humphrey, & Symes, 2011; Koegel, Koegel, Frea, & Fredeen, 2001; Knott, Dunlop, & Mackay, 2006; Stichter, Randolph, Gage, & Schmidt, 2007). This can often lead to students with ASD spending less time in peer interactions and developing fewer lasting peer relationships compared to typically developing peers (Bauminger, & Shulman, 2003).

This lack of socialization can also lead to long-term consequences for students with ASD. For example, research suggests that students with ASD are at a higher risk for developing depressive symptoms (Kim, Szatmari, Bryson, Streiner, & Wilson, 2000; Stewart, Barnard, Pearson, Hasan, & O'Brien, 2006; Strang, Kenworthy, Daniolos, Case, Martin & Wallace, 2012) and social anxiety (Gillott, Furniss, & Walter, 2001; Simonoff, Pickles, Charman, Chandler, Loucas & Baird, 2008; Wood & Gadow, 2010). Students with ASD are also more likely to report feelings of loneliness than typically developing peers (Lasgaard, Nielsen, Eriksen, & Goossens, 2010; Locke, Ishijima, Kasari, & London, 2010). While students with ASD yearn for friends (Beresford, Tozer, Rabiee, & Sloper, 2007), their challenges with social skills often hinder their ability to form meaningful friendships with typically developing peers (Chamberlain, Kasari, & Rotheram-Fuller, 2007; Rotheram-Fuller, Kasari, Chamberlain, & Locke, 2010). In addition, these students are often the victims of ridicule and bullying in schools as a result of their differences (Humphrey & Symes, 2011; Roekel, Scholte, & Didden, 2010; Symes & Humphrey, 2010). In order to improve social impairments and avert possible co-morbid risk factors faced by students with

ASD, it is imperative to provide appropriate social intervention for these students (McConnell, 2002; Rogers, 2000).

Social interventions for students with ASD

The available literature on social interventions for students with ASD offers some direction for researchers and practitioners. For example, having a structured and predictable environment has been shown to improve social skills in students with ASD (Ferrara & Hill, 1980; Mesibow & Shea, 1996). The involvement of typically developing peers has also been shown to be an effective intervention strategy for improving social interactions between students with ASD and typically developing peers (DiSalvo, & Oswald, 2002; Harper, Symon, & Frea, 2008; Smith, Lovaas, & Lovaas, 2002; Rogers, 2000). Research also suggests that implementing the intervention in natural environments (such as the school setting) can result in more rapid treatment gains for students with ASD (Koegel & Koegel, 2006; Koegel & Koegel, 2012; National Autism Center, 2009; Reichow, & Volkmar, 2010).

Incorporating highly preferred/specialized interests of students with ASD into social activities/games has shown to be an important variable in motivating these students to socially interact with typically developing peers (Koegel, Kim, Koegel, & Schwartzman, 2013; Koegel, Fredeen, Kim, Danial, Rubinstein, & Koegel, 2012; Koegel, Vernon, Koegel, Koegel, & Paullin, 2012). Research also suggests that setting up and maintaining cooperative arrangements can encourage social interactions between students with ASD and typically developing peers (Jull & Mirenda, 2011; Koegel, Werner, Vismara, & Koegel, 2005). Lastly, research has shown the effectiveness of natural and direct reinforcers in motivating students with ASD to engage in social interactions with typically developing peers (Koegel, Koegel, Harrower, & Carter, 1999).

Child preferred/specialized interests

One area of emerging research suggests that incorporating the preferred/specialized interests of students with ASD into social games/activities can motivate these students to socially engage and make verbal initiations to typically developing peers (Kasari & Patterson, 2012; Koegel, et al., 2012; Koegel, et al., 2013). For example, Koegel, Fredeen, Kim, Danial, Rubinstein, and Koegel (2012) found that incorporating target students' preferred interests into social clubs led to improvements in social engagement and verbal initiations for these students. Similar studies have indicated that incorporating these preferred interests into lunchtime activities should be considered a viable and effective social intervention model for students with ASD (Koegel, Kim, Koegel, & Schwartzman, 2013; Koegel, Vernon, Koegel, Koegel, & Paullin, 2012).

Social intervention models that incorporate preferred/specialized interests can also provide a common ground upon which friendships can be formed with typically developing peers who share similar interests (Cohen, 1977; Feld, 1982). From a theoretical point of view, these idiosyncratic interests may serve as powerful motivating reinforcers for students with ASD when incorporated into a context in which they may engage appropriately with peers (Charlop, Kurtz, & Casey, 1990; Wolery, Kirk, & Gast, 1985). For example, Koegel, Kim, Koegel, and Schwartzman (2013) found that both students with ASD and typically developing peers reported that they enjoyed participating in these social games/activities. Most of the participants with ASD in the study reported making a friend and about half of the friendships were reciprocated by typically developing peers. In addition to improving social engagement and initiations, this social intervention model can also improve affect in student

with ASD and help them develop meaningful friendships with typically developing peers who share similar interests.

While the results of this type of social intervention are promising, the feasibility of implementation by school staff needs to be systematically evaluated. Focus should ideally be placed on paraprofessionals, who are required to be present during lunch recess, and their ability to be trained to effectively implement social intervention that incorporates preferred/specialized interests. More research is also warranted to assess the ability of students with ASD to generalize these socialization skills to other settings and environments (Koegel et al., 2012; Koegel et al., 2013).

Cooperative Arrangements

In addition to incorporating the preferred/specialized interests of students with ASD into social activities and games, Kim and Koegel (2012) suggest that providing a context that promotes cooperative arrangements is crucial to the success of these social games and activities. Cooperative arrangements are scenarios in which materials are arranged so that students with ASD and their typically developing peers have to rely on each other in order to complete the task/activity (Jull & Mirenda, 2011; Koegel, Werner, Vismara, & Koegel, 2005). By setting up and maintaining cooperative arrangements, students with ASD are provided with a natural context in which they may appropriately interact with their typically developing peers (Koegel & Koegel, 2006). Research has also shown that setting up cooperative arrangements can lead to more frequent social interactions between students with ASD and typically developing peers. For example, Dugan, Kamps, Leonard, Watkins, Rheinberger, and Stackhaus (1995) set up cooperative arrangements in an inclusive classroom setting where individuals contributed their specific strengths during group

interactions. As a result of setting up cooperative arrangements, academic achievement as well as social interactions between students with ASD and typically developing peers improved.

Research has also shown the positive benefits of cooperative arrangements during play activities (e.g., non-academic periods). For example, Koegel, Werner, Vismara, and Koegel (2005) assessed whether setting up cooperative arrangements with mutually reinforcing activities during play dates would improve social interactions between children with ASD and typically developing peers. The researchers found that when cooperative arrangements were in place, reciprocal social interactions improved between children with ASD and typically developing peers. On the other hand, when cooperative arrangements were not in place, children with ASD exhibited lower levels of reciprocal social interaction with typically developing peers. The results of this study highlight the importance of arranging the environment in such a way as to promote reciprocal social interactions between students with ASD and typically developing peers.

Role of paraprofessionals

Since its passage in 2001, the No Child Left Behind Act (NCLB) has helped to define the roles and responsibilities of paraprofessionals when supporting students with disabilities (Pardini, 2005). Under the guidelines of the NCLB Act, paraprofessionals may provide direct instruction to students with disabilities only when a highly qualified teacher prepares and designs the instructional support activities and is in close and frequent proximity (U.S. Department of Education, 2004). Additional duties and responsibilities for paraprofessionals may include providing teacher assistance with translation, one-on-one tutoring, classroom

management, parent-involvement activities, educational support in a library or media center, and social support (Etscheidt, 2005; Yell, Drasgow, & Lowrey, 2005).

In conjunction with these provisions of the NCLB Act, the IDEA maintains that education is to encompass not only academic instruction, but also development in social skills. The responsibility of providing appropriate social support for students with ASD typically falls on school paraprofessionals, especially during unstructured social periods (Etscheidt, 2005). Though the law mandates that schools must provide appropriate social opportunities for students with ASD (Code of Federal Regulation; Amanda J v. Clark County School District, 2001), many schools are unsuccessful in effectively addressing this issue (Carter, O'Rourke, Sisco, & Pelsue, 2009; Giangreco, Edelman, Broer, & Doyle, 2001; Storey, Smith, & Strain, 1993). To this point, Etscheidt (2005) conducted a legal analysis assessing the frequency of cases in which schools were suspected of not providing appropriate academic and social support to students with ASD. The analysis revealed that between 1993 and 1998 (5 year span) there were 45 due process hearings and court cases (i.e., Lovaas Hearings and Cases) related to schools not providing appropriate academic and social support for students with ASD. In particular, one of the issues that had repeatedly come up was the use of under-qualified paraprofessionals to provide appropriate social support for these students (Yell & Drasgow, 2000). The lack of social support for students with ASD can be attributed to a number of reasons including: a lack of training for paraprofessionals that addresses social intervention for students with ASD; a lack of simple yet effective social intervention programs in place for school personnel to rely on; and a lack of school resources to fund social programs for students with ASD.

The need for paraprofessional training

Paraprofessionals spend a considerable amount of time with students with ASD (Giangreco, Broer, & Edelman, 2010; Jones & Bender, 1993; Riggs & Mueller, 2001; Young, Simpson, Myls, & Kamps, 1997), and they also typically supervise students with ASD during lunch recess. Unfortunately, the lack of training for paraprofessionals often hinders their ability to provide appropriate social opportunities to these students (Giangreco, Broer, & Edelman, 2010; Giangreco, Edelman, Broer, & Doyle, 2001). This is a growing concern in the field of special education, especially as schools have dramatically increased their reliance on paraprofessionals over the last 15 years (Giangreco, 2003). The National Center for Educational Statistics (2007) reports that over 700,000 paraprofessionals are employed nationwide with more than half providing support in special education. To accompany this increased reliance on paraprofessionals in supporting students with ASD during the entire school day (Harrower & Dunlap, 2001; Koegel, Harrower, & Koegel, 1999), there has been an increased demand for trained paraprofessionals (Pickett, 1996; Pickett, Likins, & Wallace, 2003). This is complicated, however, by the lack of available training programs and the lack of stringent requirements for paraprofessionals to systematically implement various interventions, such as social programs (Carter, O'Rourke, Sisco, & Pelsue, 2009; French, & Cabell, 1993; Jones & Bender, 1993).

Many paraprofessionals report that they have little to no experience conducting systematic intervention for students with ASD (Giangreco, Broer, & Edelman, 2010; Jones, & Bender, 1993), yet paraprofessionals often report spending the majority, if not all, of the school day with these students (Giangreco, Broer, & Edelman, 2010; Jones & Bender, 1993; Young, Simpson, Myls, & Kamps, 1997). Though these paraprofessionals have typically not received proper training, they are given a considerable amount of responsibility for their

student's academic and social success (Causton-Theoharis & Malmgren, 2005; Chopra, & French, 2004). In addition, paraprofessionals often report feeling burned out by the end of the school year, frustrated from the lack of training, overwhelmed from not knowing how to handle certain situations, and underappreciated by other school personnel (Chopra, Sandoval-Lucero, Aragon, Bernal, De Balderas, & Carroll, 2004; Downing, Ryndak, & Clark, 2000; Riggs, & Mueller, 2001). As a result, this has resulted in a high turnover rate amongst paraprofessionals (Chopra, et al., 2004; Downing, et al., 2000; Ghere & York-Barr, 2007; Giangreco, Broer, & Edelman, 2010).

Fisher and Pleasants (2011) conducted a statewide survey with a total of 1,867 paraprofessionals in order to obtain descriptive information about paraprofessionals' perceptions regarding their roles, current issues identified in the literature, and other concerns. The researchers found that the majority of the paraprofessionals provide behavioral and social support to students with disabilities. The researchers also found that approximately 78% of paraprofessionals felt a lack of appreciation from other school staff and approximately 70% felt that they had received insufficient training, often resulting in high turnover.

Patterson (2006) interviewed 22 paraprofessionals in order to obtain a more in-depth perspective about their perceived roles and responsibilities. One of the major themes from this qualitative study was the expressed need for more training on how to best support students with ASD. Paraprofessionals also reported that they wanted clearer expectations and responsibilities in order to clarify their boundaries when supporting students with disabilities. Similarly, Riggs and Mueller (2001) interviewed and surveyed 23 paraprofessionals in order to obtain information about paraprofessionals' experience working

in inclusive educational settings. The three most prominent findings from the study revealed that paraprofessionals in the study (1) received very little training on how to best support these students; (2) spent the most time with students with disabilities during the school day; and (3) felt frustrated because of the lack of appreciation from other school staff members and the uncertainty of their duties.

These studies clearly illustrate that paraprofessionals need more training when working with students with ASD. This lack of training can often lead paraprofessionals to feel frustrated, and suggests that paraprofessionals may not be implementing appropriate social interventions for students with ASD.

Proximity Concerns

A common problem that has been identified among many paraprofessionals is standing too close in proximity to their assigned student (i.e., hovering). Research suggests that paraprofessionals' proximity can influence social relationships between students with ASD and typically developing peers (Giangreco, Edelman, Luiselli, & MacFarland, 1997). For example, Malmgren and Causton-Theoharis (2006) studied the effects of paraprofessionals' proximity to target students, and they found that having close proximity negatively impacted the students' social interactions with typically developing peers. Tews and Lupart (2008) also investigated the effects paraprofessionals had on the social relationships between students with disabilities and typically developing peers. These researchers found that having a paraprofessional in close proximity tended to compromise social relationships between students with disabilities' and typically developing peers.

When Giangreco and Broer (2005) investigated the utilization of paraprofessionals in schools, they found that paraprofessionals generally did not view their close proximity to

their assigned student as a problem. Many of the paraprofessionals reported that their assigned students actually viewed them as a friend instead of seeking out friendships with typically developing peers. This study clearly highlights the importance of training and educating paraprofessionals about standing in appropriate proximity to students with ASD so that they are not negatively affecting these students' social relationships with typically developing peers.

General paraprofessional training models

There has been some positive movement toward researching and developing appropriate training models in order to effectively utilize paraprofessionals in schools. For example, a multi-component paraprofessional training model appears to be more successful in producing favorable outcomes when compared to a didactic model (Arco & Millett, 1996; Han & Weiss, 2005). Commonly used components for a multi-training package include lectures, workshops, handouts, verbal feedback, role-playing, and video-feedback (Robinson, 2011), and various studies have used different combinations of these specific components.

Hall, Grundon, Pope, and Romero (2010) trained paraprofessionals to implement behavioral interventions, such as Pivotal Response Treatment (PRT), Discrete Trial Training (DTT), and Picture Exchange Communication System (PECS) using a multi-component training model. The training consisted of a one-day workshop and ongoing performance feedback from their supervising teacher. The authors found that paraprofessionals were able to demonstrate effective use of the various targeted strategies taught during the workshop. Paraprofessionals reported high satisfaction with the training and reported feeling more confident when working with their assigned students. Bolton and Mayer (2008) also trained paraprofessionals using a multi-component model. Specifically, their training consisted of a

didactic instructional model, demonstration, general case instruction, and practice with feedback. The authors found that after the training, the paraprofessionals were able to accurately implement behavioral intervention and were able to generalize their newly acquired skills across settings.

To date, the majority of paraprofessional training has focused primarily on teaching these school personnel how to support students with ASD during academic instructional periods (Giangreco, Edelman, Broer, & Doyle, 2001; Weiner, 2010). This may be largely due to the increase in instruction-related responsibilities being placed on paraprofessionals. Many paraprofessionals also report the need for additional training in the areas of behavior management and instructional support because they spend the majority of their time with the student in the classroom setting (Carter, O'Rourke, Sisco, & Pelsue, 2009; Downing, Ryndak, & Clark, 2000; Fisher, & Pleasants, 2011; Hughes, & Valle-Riestra, 2008; Patterson, 2006). For example, Giangreco and Broer (2005) surveyed 153 paraprofessionals in order to investigate their perspective about how they were being utilized in schools. The results of the survey suggest that the paraprofessionals tend to spend the majority of their time providing instructional support to their assigned student(s), followed by behavioral support.

Though one of the defining characteristics of ASD is difficulty with socialization (CDC, 2014), paraprofessionals are not receiving adequate training to provide the necessary social support for students with ASD (Feldman & Matos, 2013; Koegel, Kim, & Koegel, 2014; Robinson, 2011).

Social intervention training models for paraprofessionals

Although studies on paraprofessional training have primarily targeted instructional

support (Giangreco, Edelman, Broer, & Doyle, 2001; Hall, McClannahan, & Krantz, 1995), it is imperative to also train paraprofessionals to implement social interventions for students with ASD. Training paraprofessionals to provide social support to students with ASD becomes especially important since these students lack the necessary social skills to develop meaningful friendships with typically developing peers (Koegel, Kim, & Koegel, 2014; Kretzmann, Shih, & Kasari, 2014; Feldman & Matos, 2013). Without receiving social intervention, these students are at a greater risk for developing secondary co-morbid disorders (as mentioned above).

A small amount of growing literature provides optimism about the prospect of training paraprofessionals to implement effective social interventions during non-academic periods (Feldman & Matos, 2013; Koegel, Kim, & Koegel, 2014; Licciardello, Harchik, & Luiselli, 2008; Robinson, 2011). For example, Robinson (2011) trained four paraprofessionals via video-feedback modeling to implement Pivotal Response Treatment (PRT) during lunch recess. Specifically, a trainer modeled how to implement PRT in the natural setting to paraprofessionals for 3 consecutive days. The trainer then videotaped the paraprofessionals implementing PRT. After the session, the trainer and each paraprofessional watched the video clip together while the trainer gave feedback to the paraprofessional. As a result of the training, the paraprofessionals' involvement and implementation of PRT increased while hovering decreased. In addition, the students were making positive gains in their individualized target goals related to social communication and demonstrated either maintained or improved affect. The study also found large and rapid improvements in the paraprofessionals' performance, and the author notes that this may be partially attributed to the training taking place in the natural setting.

Feldman and Matos (2013) also trained three paraprofessionals to facilitate social interactions between students with ASD and typically developing peers using PRT during non-academic periods. The multi-component training consisted of a workshop, a field manual, and three days of on-site training. If a paraprofessional did not meet fidelity they were trained for an additional 3 days or until they met fidelity. After training, paraprofessionals were able to appropriately and successfully facilitate social interactions between students with ASD and typically developing peers.

Although these studies suggest that paraprofessionals can be effectively trained to implement social intervention for students with ASD, research at this point is somewhat piecemeal in nature. There are more variables that need to be explored in order to develop a simple yet effective social intervention program that paraprofessionals can easily implement.

The need for a simple intervention model for schools

To date, most of the interventions implemented in schools settings are complicated to deliver, intensive, and expensive (Kasari & Smith, 2013). A recent study by Koegel, Kim, and Koegel, (2014), however, suggests optimism that a simple, effective, and cost-efficient social intervention program for schools to implement is feasible. Specifically, the researchers trained three paraprofessionals in the variables of standing in an appropriate proximity, providing cooperative arrangements, and incorporating child preferred interests into a social game/activity during lunch recess. After the paraprofessionals were trained to implement the social intervention for their assigned student with ASD, these students exhibited improvement in social engagement and initiations made to typically developing peers. It took approximately an hour to train the paraprofessionals to fidelity, suggesting that the intervention training was time-efficient. The researchers were able to train

paraprofessionals to implement social intervention games/activities that aligned with common playground games/activities that students typically engage in during lunch recess. In addition, materials used for these social games/activities consisted of resources already available in the schools, suggesting that the implementation of this type of social intervention is cost efficient. The results from this study provide optimism that paraprofessionals can be trained in a short time period to implement a simple, effective, and cost-efficient social intervention for students with ASD.

Purpose of the current study

Given the need for social development for students with ASD, and the fact that paraprofessionals have a large role supporting these students but need training (Giangreco, & Broer, 2007; Giangreco, Broer, & Edelman, 2010; Jones & Bender, 1993), the purpose of the current study is to assess whether paraprofessionals can be trained to effectively implement social interventions for students with ASD. Specifically, the current study is interested in training paraprofessionals to stand in appropriate proximity to the target student while providing cooperative arrangements and incorporating the preferred/specialized interests of students with ASD into common playground games/activities with typically developing peers. The current study will also assess whether training paraprofessionals in these three components will improve the social interactions between students with ASD and typically developing peers (i.e., social engagement and rate of initiations). The following research questions will be investigated:

1. Can paraprofessionals be trained to fidelity on three key components when implementing social activities/games during lunch recess periods (i.e., standing in an

appropriate proximity, providing cooperative arrangements, and incorporating child preferred/specialized interests)?

2. Can paraprofessionals maintain these skills and demonstrate response generalization to different social games/activities?
3. Following training, will paraprofessionals' rate of social prompting increase?
4. Will paraprofessionals and special education teachers consider the implementation of this type of social intervention to be simple and easy to implement?
5. After paraprofessionals are trained to implement this form of social intervention, will students with ASD show an improvement in their engagement with typically developing peers?
6. After paraprofessionals are trained to implement this form of social intervention, will students with ASD show an improvement in their rate of verbal initiations made to typically developing peers?
7. Will students with ASD enjoy participating in these games/activities during the lunch recess period?
8. Will typically developing peers also enjoy participating in these games/activities during the lunch recess period?

II. Method

Participants

Four different school districts, representing a total of 25 schools, were notified of this research study. The first three schools to respond were selected to participate (see settings and Table 2 for description of these schools). Participating schools selected a paraprofessional who supported a student with ASD and met the following participation criteria: (1) The paraprofessional was hired by the school district as a full-time employee; (2) the paraprofessional was nominated by the Director of Special Education at each school as needing training on social facilitation; and (3) the paraprofessional's assigned student lacked appropriate social skills as determined by the Director of Special Education at each school. All participants (paraprofessionals and students with ASD) agreed to participate in the study with written permission in accordance with University IRB and approval from the school district and the school's principal.

Dyad 1

Paraprofessional 1 was a Caucasian female who was 32 years old. She graduated from college with a Bachelor of Arts degree and had worked as a paraprofessional for 7 years. She reported that she did not receive any formal training prior to this study. She provided full time one-on-one support including the lunch recess period to Student 1.

Student 1 was a 10-year-old Hispanic American boy diagnosed with Asperger's Disorder who was fully included in the 5th grade. The special education teacher reported concerns about this student's socialization, stating that he rarely had interactions with any of his typically developing peers. She mentioned that sometimes he would attempt to socialize with another student who was also diagnosed with ASD. According to Gilliam Autism

Rating Scale (GARS-2), in the area of social interaction the student rarely interacted with his peers (scaled score of 9 and 37th percentile), which are typical of Autism Spectrum Disorders. Student 1's overall cognitive performance, as measured by the Kauffman Brief Intelligence Test (2nd edition), was superior. His verbal cognitive performance was average and his nonverbal cognitive performance was very superior. Student 1's preferred/specialized interests included building objects with Legos and excavating dinosaur sand figurines (see Table 2).

Dyad 2

Paraprofessional 2 was a Caucasian female, who was 27 years old. She graduated from college with a Bachelor of Arts and had worked as a paraprofessional for 3 years. The only formal training she received was an introduction to Applied Behavior Analysis, which was provided by the school district. She provided full time one-on-one support including the lunch recess to Student 2.

Student 2 was a 6-year-old Caucasian boy diagnosed with Autism who was in kindergarten. He was fully included in regular education, but was pulled out for speech and occupational therapy. The special education teacher reported that this student would make some attempts to socialize with peers, but these attempts were never successful. According to GARS-2, in the area of social interaction the student rarely interacted with his peers (scaled score of 9 and 37th percentile), which are typical of Autism Spectrum Disorders. Student 2's overall general conceptual ability, as measured by the Differential Ability Scales-Second Edition (DAS-II), was considered above average. His verbal ability was considered high and his nonverbal ability was considered average. Student 2's preferred/specialized

interests included identifying characters from Alpha-Friends and playing certain types of board games (e.g., Pop-up Pirate, Honey Bee, Mega Blocks Match and Build).

Dyad 3

Paraprofessional 3 was also a Caucasian female, who was 33 years old. She graduated from college with a Bachelors of Arts degree and had worked as a paraprofessional for 7 years. Prior to the start of this study, Paraprofessional 3 reported that the only formal training she received was from Peer Buddies. She provided one-on-one support including the lunch recess to Student 3.

Student 3 was a 10-year-old Caucasian boy diagnosed with Autism who was fully included in the 4th grade. Student 3 was occasionally pulled out from his general education classroom when he became disruptive (e.g., throwing objects, banging on the table). During these instances, he was placed in the school's resource room. The special education teacher reported that this student either inappropriately socialized with his peers (e.g., screeching in peers' ears, poking peers, grabbing toys, etc) or was socially isolated. According to the Gilliam Autism Rating Scale Third Edition (GARS-3), in the area of social interaction, the student rarely interacted with his peers (scaled score of 9 and 37th percentile), which are typical of Autism Spectrum Disorders. Student 3's overall general conceptual ability, as measured by the DAS-II, was considered average. His verbal and nonverbal abilities were also considered average. Student 3's preferred/specialized interests included making car noises, playing board games (e.g., Candyland and Don't Break the Ice), and playing foosball.

Table 1.

Participant Demographics

	Dyad 1	Dyad 2	Dyad 3
Paraprofessional Demographics			
Ethnicity:	Caucasian	Caucasian	Caucasian
Age:	32 years old	27 years old	33 years old
Highest Degree:	B.A.	B.A.	B.A.
# of years as an aide:	7	3	7
Formal training received:	No formal training	Introduction to ABA	Peer Buddies
Student Demographics			
Ethnicity:	Hispanic	Caucasian	Caucasian
Age/Grade:	10 years old, 5th grade	6 years old, Kindergarten	10 years old, 4th grade
Diagnosis:	Asperger's	Autism	Autism
Overall Cognitive/ Conceptual Performance:	Superior (measured by Kauffman Brief Intelligence Test - 2nd edition)	Above Average (measured by Differential Ability Scales-2nd Edition)	Average (measured by Differential Ability Scales-2nd Edition)
Social Interaction (GARS):	Scaled score 9 Percentile 37th	Scaled score 9 Percentile 37th	Scaled score 9 Percentile 37th
Preferred/Specialized interests:	Building with Legos, Excavating dinosaur sand figurines	Identifying characters from Alpha-Friends, playing board games	Making car noises, playing board games, playing foosball

Settings

The study took place at three different public elementary schools in Southern California representing a wide range of socio-economic status and ethnicity. All of the classrooms involved in this study followed an inclusive educational model wherein the

students with disabilities were primarily educated with their typically developing peers. The first school (Dyad 1) had a total of 489 students enrolled and 62.2% of the students were considered to be socioeconomically disadvantaged. The majority of the students at this school were identified as Hispanic or Latino (78%). The second school (Dyad 2) had a total of 152 students enrolled and none of the students were considered to be socioeconomically disadvantaged. The majority of the students at this school were identified as Caucasian (88%). The third school (Dyad 3) had a total of 443 students enrolled and 4.2% of the students were considered to be socioeconomically disadvantaged. The majority of the students at this school were identified as Caucasian (83.2%). All activities in the study took place on the school playground during each student's regular lunch recess period.

Table 2.

School Demographics

	School 1	School 2	School 3
Total students enrolled:	489	152	443
Majority of students identified as:	Hispanic/Latino (78%)	Caucasian (88%)	Caucasian (83.2%)
Percentage of students considered socioeconomically disadvantaged:	62.2%	0%	4.2%

Materials

An iPod touch was used to videotape all sessions, which were later analyzed. Materials used for the lunch recess games/activities in this study consisted of a foosball table, board games, Legos, dinosaur figurines, and specialized cards (see Table 3 for more

information). These resources were either already available in the schools, the paraprofessional was able to make the materials (e.g., specialized cards), or the target student brought his favorite games from home (i.e., this was the case for Student 2). As a result, the implementation of the social intervention was considered to be cost efficient.

Table 3.

Materials Used During Lunch Recess for Each Student

	Dyad 1	Dyad 2	Dyad 3
Materials used for lunch-recess games/activities:	Legos and dinosaur sand figurines	Alpha-Friends' laminated cards (paraprofessional made these cards by printing pictures of Alpha-Friends and laminating the pictures), Pop-Up Pirate, Honeybee Tree game, Mega Blocks Match and Build, Avalanche Fruit Stand game	Pictures of car parts (paraprofessional made these cards by printing pictures of car parts and laminating the pictures), Candyland, Don't Break the Ice, Foosball table

Data Collection

Data were collected by using an iPod touch to video record all sessions either by an advanced graduate student majoring in special education (who was also the trainer for the paraprofessionals) or by a naïve undergraduate student majoring in psychology. The graduate and undergraduate student had prior experience with video recordings. The video recording began as soon as the paraprofessional and the target student arrived to the playground (the time it took the paraprofessional and the target student to walk over to the playground from the cafeteria or the area where the students ate lunch was not included). Video recordings continued until the bell rang which signaled the end of the lunch recess

period. The length of the sessions for Dyad 1 ranged from 6.5 to 21 minutes (between 13 to 42 intervals). The length of the sessions for Dyad 2 ranged from 7.5 to 23.5 minutes (between 15 to 47 intervals), and the length of the sessions for Dyad 3 ranged from 6 to 12.5 minutes (between 12 to 25 intervals).

Dependent Measures

Paraprofessional Data

Percent intervals with fidelity of implementation was recorded by using a 30-second partial interval recording procedure (Koegel, et al., 2014). For each interval, a plus (+) was recorded if the paraprofessional was implementing all three procedures correctly (see below) and a minus (-) was recorded if the paraprofessional was implementing any of the three procedures incorrectly. At the end of each session, the total number of correct intervals was divided by the total number of intervals in the session and multiplied by 100 to yield a percentage of fidelity of implementation per session (see Appendix A for data sheet). Specifically, the fidelity of implementation score indicated the paraprofessionals' correct use of all three procedures simultaneously and throughout the majority of the interval (appropriate proximity to the target student, implementation of cooperative arrangements, and incorporation of target student's preferred interests with typically developing peers) during lunch recess. The following definitions were used to score fidelity:

1. *Appropriate proximity* was defined as the paraprofessional being attentive while standing far enough away (e.g., approximately 6 feet away) to not be hovering over the target student, but close enough to be within earshot of the student in order to assess whether or not the preferred/specialized interest was incorporated into the activity. Inappropriate proximity was defined as the

paraprofessional hovering next to the target student (e.g., standing or sitting between the target child and his or her peers), standing too far from the target student (e.g., standing on the other side of the playground), or not attending to the target student (e.g., having back turned from target student or talking to other playground aides/adults).

2. *Cooperative arrangements* were defined as the paraprofessionals' arrangement of the game/activity pieces so that the student with ASD and typically developing peers had to share/rely on each other to complete/continue the game/activity (e.g., sorting the game pieces and distributing them to each club member so that they had to ask one another for desired pieces). Not providing cooperative arrangements were defined as the paraprofessional not arranging the game/activity pieces so that the student with ASD and typically developing peers did not have to share/rely on each other to complete/continue the game/activity (e.g., each student has their own set of Legos or each student has their own set of cards).
3. *Child Preferred Interests* were defined as the paraprofessionals' incorporation of the preferred/specialized interests of the student with ASD into a social activity/game with typically developing peers (e.g., if the target student had a preferred/specialized interest related to making car sounds, the paraprofessional would need to incorporate car sounds into a social activity/game). Not using child preferred interests were defined as the paraprofessional not incorporating the target student's preferred/specialized interests, and instead choosing an arbitrary activity/game.

Rate of Social Prompting was recorded by tallying each prompt the paraprofessional provided to either the target student or typically developing peer to socially interact with one another (e.g., if the target student was showing the paraprofessional a Lego piece, the paraprofessional would prompt the student to show his peers). Appropriate social prompting included directly prompting or redirecting either the target student or typical peer to initiate a question, comment, or request to each other. At the end of each session, the total number of tallies was divided by the length of the session to yield a rate of social prompting per minute.

Social Validation from Paraprofessionals. Upon completion of the intervention training, each paraprofessional was given an 18-item survey. Eight of the items were rated on a 4-point Likert scale, 5 of the items obtained additional information about the paraprofessional (e.g., ethnicity, highest degree obtained, number of years as an aide), and 5 of the items obtained feedback regarding the training (see Appendix B).

Student Data

Data for students with ASD were collected on the parameters of social interaction frequently measured in previously published research (cf. Koegel, et al., 2012; Koegel, et al., 2013; Koegel, et al., 2014): (a) *percent intervals with engagement with typical peers*; (b) *rate of verbal initiations made to typical peers*; and (3) social validation measures.

Percent intervals with engagement with typical peers were recorded by using a 30-second partial interval recording procedure (see Appendix A for data sheet). For each interval, a plus (+) or minus (-) was recorded to denote the presence or absence of engagement. At the end of each session, the total number of pluses was divided by the total number of intervals in the session and multiplied by 100 to yield a percentage of engagement per session. Engagement was defined as the target student's appropriate use of at least 3 of

the following appropriate engagement behavior for 16 or more seconds: facing peers, making eye contact, gesturing (e.g., pointing, high-fiving, fist pounding), responding to questions, asking questions, making comments, smiling, nodding, and/or sharing of activities or materials with typically developing peers during the interval. Additionally, in order for the interval to be scored as appropriate engagement, the student with ASD and the typically developing peer had to exhibit reciprocal responses throughout the interval.

Rate of initiations made to typical peers was recorded by tallying each independent spontaneous verbal social communicative interaction the target student directed toward another typically developing peer without being prompted. Appropriate initiations include: requests, questions, or comments made to typically developing peers that either started a new conversational topic or elicited additional information pertaining to the current conversational topic. Only initiations that were not preceded by a prompt from the paraprofessional were recorded. At the end of each session, the total number of tallies was divided by the length of the session to yield a rate of initiation per minute.

Social Validation from Students with ASD. At the end of the intervention, students with ASD were given a 9-item survey. For students who had a difficult time reading the survey questions, an adult read the questions out loud (this was the case for Participant 2). Three of the items were rated on a 4-point Likert scale, 2 of the items asked demographic information (e.g., age, grade), 2 of the items asked if the student made any friends from these games/activities, 1 question asked the student how she/he felt about the lunchtime activity/game, and 1 of the items asked if they had any suggestions to improve the game/activity (see Appendix C for the survey questionnaire).

Typically Developing Peer Comparison Data

In order obtain an estimate of the typical range of appropriate social engagement and verbal initiations, data on typically developing peers that participated in the lunch recess activities/games were recorded. Typical peer data were recorded exactly in the same manner as the data recorded for students with ASD. In addition, the same 9-item social validation survey was given to the typically developing peers (also see Appendix C). Similarly, for students who had a difficult time reading the questions, an adult read the questions out loud (this was the case for many of the kindergarteners).

Special Education Teacher Data

In order to assess whether special education teachers endorsed this type of social intervention, they were given a 6-item survey at the end of the intervention-training condition (see Appendix D for the survey questionnaire). One question asked how many years they severed as a special educator, 2 of the items were rated on a 4-point Likert scale, and 3 of the items asked about their opinion and whether they would consider training future staff to implement this type of social intervention.

Reliability

An advanced graduate student majoring in special education and two undergraduate students who were naïve to the experimental hypothesis independently recorded data by analyzing video probes. The undergraduate students recorded reliability data for at least 33% of all sessions across all conditions. Interobserver reliability was calculated by dividing the total number of agreements by the total number of disagreements plus agreements. Following the guidelines of the literature, criteria of at least 80% reliability was required for all measures (Kottner, Audige, Brorson, Donner, Gajewski, Hrobjartsson, et al., 2011).

Kappa was also used to measure reliability for all categorical measures in order to control for chance agreement.

For *fidelity of implementation*, agreements were defined as the observers recording identical marks (as denoted by a plus or minus) for each 30-second interval throughout the video probe. Disagreements were defined as the observers having a different mark for a 30 second interval. The average percent agreement for Dyad 1 was 95.8% (range 83.3% to 100%) and Kappa yielded a score of 0.88, meeting Viera and Garrett's (2005) highest level of standard. The average percent agreement for Dyad 2 was 98% (range 92.8% to 100%) and Kappa yielded a score of 0.95, also meeting Viera and Garrett's (2005) highest level of standard. The average percent agreement for Dyad 3 was 99.1% (range 90% to 100%) and Kappa yielded a score of 0.98, also meeting Viera and Garrett's (2005) highest level of standard.

In order to calculate reliability for *rate of social prompting*, each session was divided into one-minute intervals. Agreements were defined as the observers recording the same number of social prompts for each one-minute interval throughout the video probe, and disagreements were defined as the observers recording a different number of social prompts in a given one minute interval. The average percent agreement for Dyad 1 was 96.3% (range 88.8% to 100%). The average percent agreement for Dyad 2 was 93.4% (range 80.7% to 100%). The average percent agreement for Dyad 3 was 90.3% (range 80% to 100%).

For *percent intervals with engagement with typical peers*, agreements were defined as the observers recording identical marks (i.e., plus or minus) for each 30-second interval throughout the video probe. Disagreements were defined as the observers having a different mark for a 30 second interval. The average percent agreement for Dyad 1 was 93.3% (range

80% to 100%) and Kappa yielded a score of 0.83, meeting Viera and Garrett's (2005) highest level of standard. The average percent agreement for Dyad 2 was 92.8% (range 80.7% to 100%) and Kappa yielded a score of 0.74, which is considered to be substantial agreement (Viera & Garrett, 2005). The average percent agreement for Dyad 3 was 94.1% (range 80% to 100%) and Kappa yielded a score of 0.88, meeting Viera and Garrett's (2005) highest level of standard.

In order to calculate reliability for *rate of verbal initiations made to typical peers*, each session was divided into one-minute intervals. Agreements were defined as the observers recording the same number of initiations for each one-minute interval throughout the video probe, and disagreements were defined as the observers recording a different number of initiations in a given one minute interval. The average percent agreement for Dyad 1 was 87.1% (range 80.5% to 100%). The average percent agreement for Dyad 2 was 92.6% (range 81.4% to 100%). The average percent agreement for Dyad 3 was 91.3% (range 80% to 100%).

Experimental Design

A non-concurrent repeated measures multiple baseline across participants experimental design (Barlow, Nock & Hersen, 2009; Bailey & Burch, 2002) was used to evaluate the effects of training paraprofessionals to implement social activities/games during lunch recess by providing cooperative arrangements and incorporating the preferred/specialized interests of students with ASD with typically developing peers, while standing in an appropriate proximity. A non-concurrent multiple baseline across participants design was selected in order to allow for flexibility of the research design in applied settings such as school (Harvey, May, & Kennedy, 2004; Watson and Workman 1981), and to ensure

that there was no possibility of interdependence of the baselines (Kazdin, 2011). The across-participant design with three dyads allowed for demonstrations of experimental effect at different points in time (c.f., Horner, Carr, Halle, McGee, Odom, & Wolery, 2005). Probes were collected one to three times per week per participant throughout the study. Systematically staggered baselines of 4, 8, and 11 sessions were recorded.

Data Analysis

Following the guidelines of What Works Clearinghouse (WWC) a visual analysis was conducted to analyze the data. Visual analysis allows for the determination of the type and amount of a functional relationship between the independent and dependent variables (Horner, et al., 2005). Specifically, the data were graphed and inspected through visual inspection for level, trend, variability, immediacy of the effect, overlap, and consistency of data patterns across similar phases in order to obtain evidence (Kratochwill, Hitchcock, Horner, Levin, Odom, Rindskopf, & Shadish 2010).

Experimental Procedure

Baseline. All participants (both paraprofessionals and students with ASD) were observed participating in their regular lunchtime activities during baseline. No changes were made to their respective lunchtime environments. Specifically, paraprofessionals were not given any prompts or instructions to stand in appropriate proximity to the target student, provide cooperative arrangements, or incorporate child preferred/specialized interests into a social activity/game with typically developing peers. In addition, paraprofessionals were not given any additional instructions to prompt social interaction between the student with ASD and typically developing peers. Similarly, students with ASD were not given any instructions to socialize with typically developing peers.

Training Workshop. After baseline observations, each respective paraprofessional was invited to participate in a multi-component training workshop that lasted approximately 90 minutes. The special education teacher at each school also elected to participate in the training workshop. The paraprofessionals and special education teachers were shown a total of 36 PowerPoint slides that began with an explanation of the importance of targeting socialization for students with ASD. The bulk of the presentation (23 slides) focused on teaching paraprofessionals key components of implementing a simple yet easy to implement social intervention for students with ASD. Specifically, paraprofessionals were taught: (1) the importance of maintaining an appropriate proximity from the target student, (2) how to provide cooperative arrangements, and (3) how to incorporate the preferred/specialized interests of students with ASD into social activities/games with typically developing peers. The paraprofessionals and special education teachers were also shown several video clips (5 total) of other paraprofessionals successfully and unsuccessfully implementing various social activities/games with their assigned student with ASD. For each video clip example, paraprofessionals were asked to identify what the paraprofessional in the clip was doing correctly and/or incorrectly. Following the video examples, the paraprofessionals and special education teachers were given four case vignettes about students with ASD. They were instructed to develop an appropriate social activity/game incorporating the key components discussed during the training. The last activity during the training workshop was for paraprofessionals and special education teachers to create a list of preferred/specialized interests of the student with ASD in order to develop an appropriate social game/activity for that target student. Most of the paraprofessionals and special education teachers were able to easily identify the preferred/specialized interests of the student with ASD, as they have been

working with these students for several years. In one case where the paraprofessional and special education teacher was unsure of the student's preferred/specialized interests, they were instructed to communicate with the student's parents to obtain this information (see Appendix E for the PowerPoint slides).

Following the workshop, paraprofessionals were given approximately 10 days to prepare any necessary materials to ensure a successful lunch recess social activity/game (e.g., flyers, game pieces, room sign-out, etc). During this time period, special education teachers at each school helped the paraprofessionals prepare and gather any necessary materials for the social intervention. Paraprofessional 1 had to gather Lego pieces from various classrooms and sort these pieces into different containers. The special education teacher assisted Paraprofessional 1 by contacting appropriate teachers that had extra Lego pieces in their class. It took Paraprofessional 1 approximately two lunch recess periods (about 40 minutes) to gather the Lego pieces from various classrooms. Paraprofessional 2 had to locate pictures of Alpha-friend characters (from the internet), print these pictures, and laminate the pictures (one of Student 2's preferred/specialized interest). The special education teacher at this school helped the paraprofessional by printing and laminating these cards. It took Paraprofessional 2 approximately four lunch recess periods (100 minutes) to prepare the materials needed for the social intervention. Paraprofessional 3 had to locate pictures of car parts (from the internet), print the pictures, and laminate these pictures (one of Student 3's preferred/specialized interest). The special education teacher at this school assisted Paraprofessional 3 by identifying appropriate peers that would be interested in participating in the social intervention. It took Paraprofessional 3 approximately three lunch recess periods (60 minutes) to make these laminated cards and she received help from Student 3

because he was highly motivated to make these cards (see Table 4 for more information about preparation time and role of special education teachers). During this time period, paraprofessionals also had the discretion to determine how many typically developing students they wanted to include in these social activities/games.

Table 4.

Preparation Time and Contribution from Special Education Teacher

	Paraprofessional 1	Paraprofessional 2	Paraprofessional 3
Materials Prepared	Lego pieces, sort pieces into different containers, make flyers, make sign-up sheet, announce to 4th and 5th grade classes	Locate pictures of Alpha-friend characters from the internet, print the pictures, laminate the pictures, identify board games, make sign-up sheet, announce to kindergarten class	Locate pictures of car parts from the internet, print the pictures, laminate the pictures, identify board games, announce to 4th grade class
Total Preparation Time	2 lunch recess periods (40 minutes)	4 lunch recess periods (100 minutes)	3 lunch recess periods (60 minutes)
Role of Special Education Teacher	Locate Lego pieces	Print and laminate cards	Locate appropriate peers

In regard to recruiting typically developing peers to participate in the social activities/games, paraprofessionals advertised by posting flyers around the school and asking classroom teachers to make announcements prior to lunch recess. As it was expected for the social games/activities to be popular, all three paraprofessionals prepared a sign-up sheet (see Appendix F for an example sign-up sheet). Each paraprofessional determined the number of space available for typically developing peers to participate. This was determined based on

the availability of materials and target student's ability to perform in a large/small group setting. Specifically, for Dyad 1, the paraprofessional limited the group to 12 students, for Dyad 2, the paraprofessional limited the group to 4 students, and for Dyad 3, the paraprofessional limited the group to 3 students. Similar to other playground games and activities, the students could leave at any time, but all the students stayed for the entire activity. The composition of the groups and their styles of interactions varied from activity to activity.

Intervention Training. Approximately 10 days following the training workshop either an advanced graduate student majoring in special education (who also provided the training) or a naïve undergraduate student majoring in psychology observed the paraprofessional implementing the social activity/game. Approximately 10 minutes prior to the second observation period, the trainer provided the paraprofessional with feedback regarding their implementation of the social activity/game from the previous session. Specifically, if the paraprofessionals met fidelity they were given positive feedback that they met fidelity. If the paraprofessionals did not meet fidelity they were given corrective feedback about the specific component(s) they did not meet fidelity on. Once the paraprofessionals met a minimum of 80% fidelity of implementation for 3 consecutive sessions without receiving corrective feedback, they were considered to be trained and the trainer no longer attended the sessions.

Follow-Up. Approximately three weeks after achieving fidelity either an advanced graduate student majoring in special education (who also provided the training) or a naïve undergraduate student majoring in psychology observed each paraprofessional to assess whether the paraprofessional was able to maintain fidelity. Similar to baseline measures, no changes were made to their respective lunchtime environments. Paraprofessionals were not

given any prompts or instructions to stand in appropriate proximity to the target student, provide cooperative arrangements, incorporate child preferred/specialized interest into a social activity/game with typically developing peers, or prompt social interactions between the student with ASD and typically developing peers. Similarly, students with ASD were not given any instructions to socialize with typically developing peers.

Response Generalization. If the paraprofessional worked with a student whose preferred/specialized interests constantly changed throughout the intervention and follow-up conditions (i.e., Paraprofessional 2 and Paraprofessional 3), the paraprofessional was assessed on whether they could generalize their skills to different social activities/games (i.e., response generalization). For example, Paraprofessional 2 and 3 worked with students whose interests changed on a daily basis. As a result, both paraprofessionals had to implement a different social activity/game that incorporated the student's new interest for each session. On the other hand, if the paraprofessional worked with a student whose preferred/specialized interests did not change during the timeframe of the study (this was the case for Paraprofessional 1), the paraprofessional was instructed to set up a social game/activity using the student's secondary interest. For example, Paraprofessional 1 worked with a student whose primary interest was building with Legos. In order to assess for response generalization, the paraprofessional was observed implementing a social activity/game that incorporated Dinosaur sand figurines (i.e., Student 1's secondary preferred interest).

III. Results

This study addressed the following research questions: (1) can paraprofessionals be trained to fidelity on three key components when implementing social activities/games during lunch recess periods (i.e., standing in an appropriate proximity, providing cooperative arrangements, and incorporating child preferred/specialized interests)? (2) Can paraprofessionals maintain these skills and demonstrate response generalization to different social games/activities? (3) Following training, will paraprofessionals' rate of social prompting increase? (4) Will paraprofessionals and special education teachers consider the implementation of this type of social intervention to be simple and easy to implement? (5) After paraprofessionals are trained to implement this form of social intervention, will students with ASD show an improvement in their engagement with typical peers? (6) After paraprofessionals are trained to implement this form of social intervention, will students with ASD show an improvement in their rate of verbal initiations made to typical peers as a result of receiving this type of social intervention? (7) Will students with ASD enjoy participating in these games/activities during the lunch recess period? (8) Will typically developing peers also enjoy participating in these games/activities during the lunch recess period?

Fidelity of Implementation

The results of paraprofessionals' percent intervals with fidelity of implementation are presented in Figure 1 and Table 4. During the baseline condition, all three paraprofessionals did not meet the fidelity of implementation on any of the three components (i.e., appropriate proximity, cooperative arrangements, and incorporation of child preferred/specialized interests). During the intervention-training condition, Paraprofessional 1 and Paraprofessional 3 were able to meet fidelity immediately, while Paraprofessional 2 needed

an additional five in-vivo corrective feedback sessions to meet fidelity. All three paraprofessionals were able to maintain high levels of fidelity after a 3-week follow-up session. A 7-week follow-up session was assessed for Paraprofessional 1 and Paraprofessional 3; Paraprofessional 1 did not maintain fidelity, while Paraprofessional 3 was able to maintain fidelity. Paraprofessionals 2 and 3 were able to demonstrate response generalization with fidelity, while Paraprofessional 1 did not demonstrate response generalization with fidelity. Specific results for each paraprofessional are reported below.

Paraprofessional 1 did not meet the 80% fidelity of implementation criterion during any of the baseline sessions. During the intervention-training condition, Paraprofessional 1 immediately reached high levels of fidelity and was able to demonstrate fidelity for three consecutive sessions (average fidelity of implementation was 90.3%, ranging from 87.5% to 96.1%). Paraprofessional 1 continued to meet fidelity of implementation at 83.3% during the 3-week follow-up session. During the 7-week follow-up session, Paraprofessional 1 did not maintain fidelity of implementation. Overall, Paraprofessional 1's fidelity of implementation during the follow-up condition was an average of 46.2%, ranging from 6.8% to 83.3%. Paraprofessional 1 also did not demonstrate response generalization with fidelity.

During the baseline sessions, Paraprofessional 2 showed a similar pattern where she did not meet the 80% fidelity of implementation criterion. During the intervention training condition, Paraprofessional 2 was able to meet 100% fidelity of implementation for 3 consecutive sessions by the 6th session. Paraprofessional 2 continued to meet fidelity of implementation (92.8%) at the 3-week follow-up session. Paraprofessional 2 was able to demonstrate response generalization throughout the intervention-training sessions.

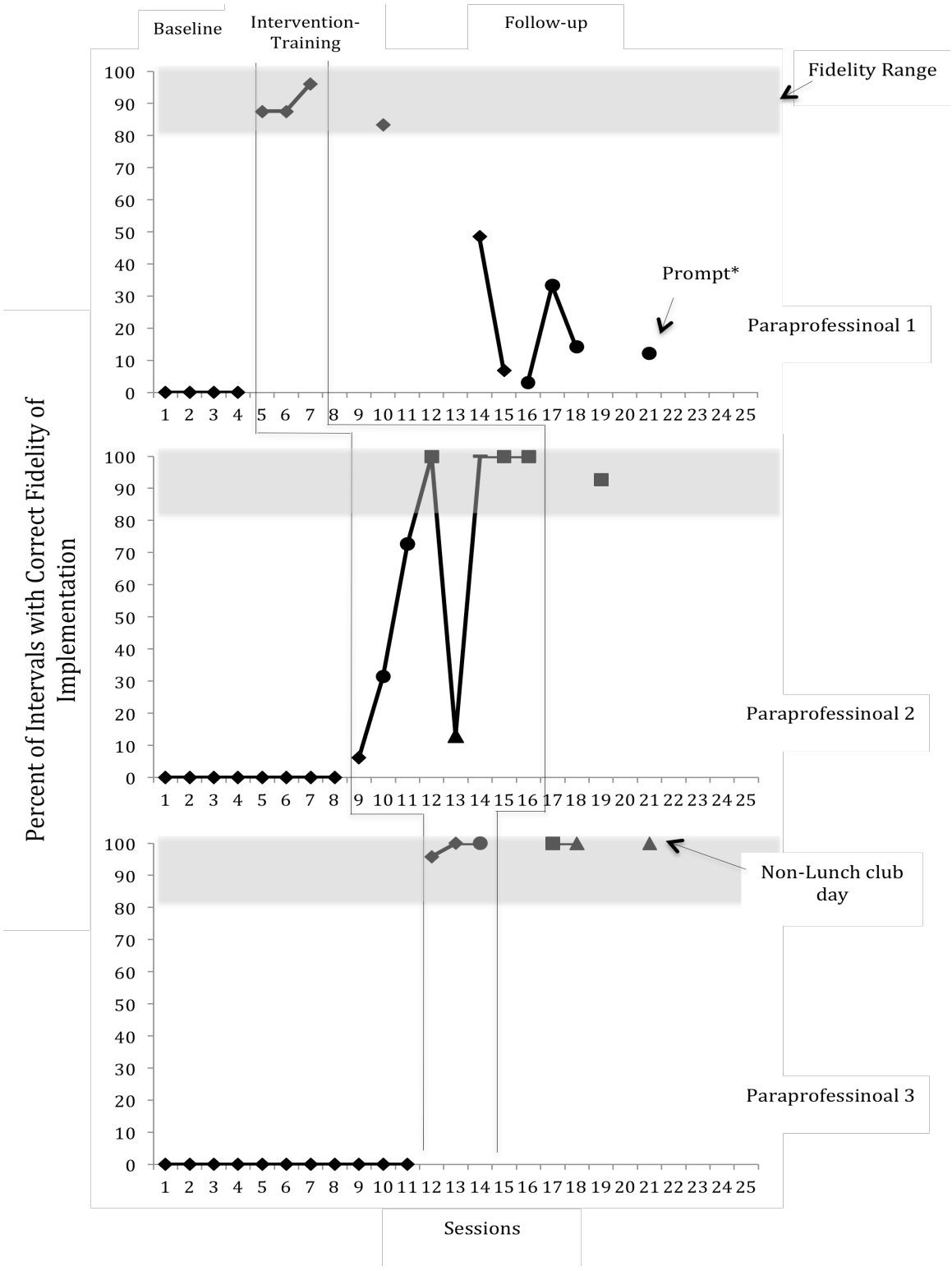

Figure 1. Paraprofessionals' fidelity of implementation. For Paraprofessional 1, the asterisk (*) notes that she was prompted by the special education teacher to set up a new lunch club activity. The different marker style notes a different activity/game.

Paraprofessional 3 was also similar to the other paraprofessionals during baseline, never reaching the 80% minimum criterion for fidelity of implementation. During intervention-training condition, Paraprofessional 3 was able to immediately reach fidelity of implementation for 3 consecutive sessions (average fidelity of implementation was 98.6%, ranging from 95.8% to 100%). During the 3-week and 7-week follow-up sessions, Paraprofessional 3 maintained 100% fidelity of implementation. Paraprofessional 3 was able to demonstrate response generalization throughout the intervention-training and follow-up sessions.

Social Prompting

The results of paraprofessionals' rate of social prompting are presented in Figure 2. It is important to note that paraprofessionals were not trained to provide social prompting to students with ASD or typically developing peers. During the baseline condition, all three paraprofessionals exhibited low levels of social prompting. During the intervention condition, all three paraprofessionals' rate of social prompting increased. During the follow-up condition, the paraprofessionals' rate of social prompting either maintained or decreased. Specific results for each paraprofessional are reported below.

During the baseline condition, Paraprofessional 1 did not provide any social prompts. During the intervention condition, Paraprofessional 1's rate of social prompting increased to an average of 0.32 per minute, ranging from 0.18 to 0.61. During the follow-up and response generalization conditions, Paraprofessional 1's rate of social prompting slightly decreased to an average of 0.15 per minute, ranging from 0.09 to 0.22.

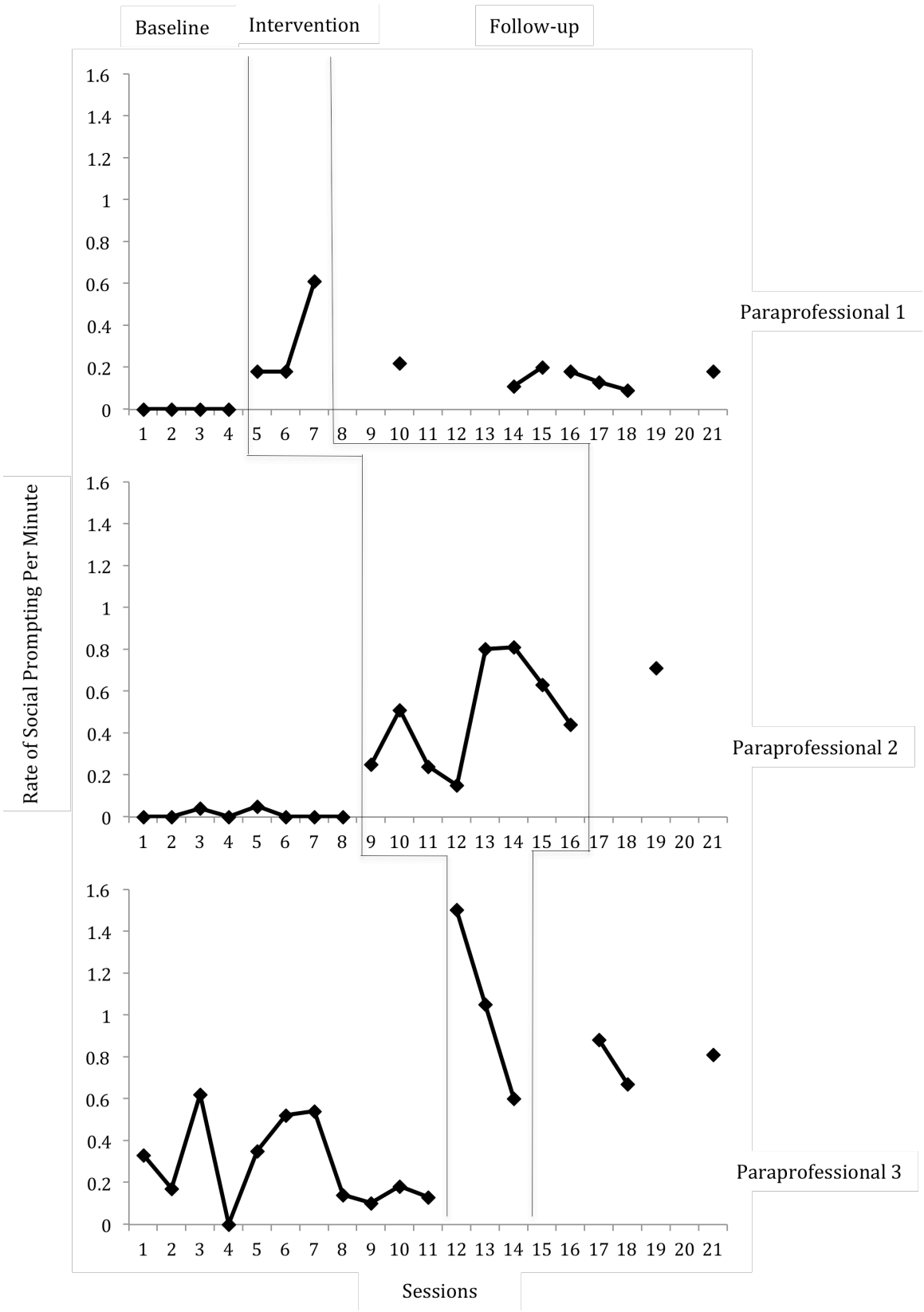

Figure 2. Social prompting by paraprofessionals.

During the baseline condition, Paraprofessional 2's rate of social prompting was an average of 0.01 per minute, ranging from 0 to 0.05. During the intervention condition, Paraprofessional 2's rate of social prompting increased to an average of 0.47 per minute, ranging from 0.15 to 0.81. Paraprofessional 2's rate of social prompting was 0.71 per minute at the 3-week follow-up session.

Paraprofessional 3's rate of social prompting was an average of 0.28 per minute, ranging from 0 to 0.62 during the baseline condition. During the intervention condition, Paraprofessional 3's rate of social prompting increased to an average of 1.05 per minute, ranging from 0.6 to 1.5. Paraprofessional 3's rate of social prompting decreased to an average of 0.78, ranging from 0.67 to 0.88 during the follow-up condition.

Social Validation from Paraprofessionals

The results of the 18-item survey given to each paraprofessional are presented in Table 5. The paraprofessionals had an average of 5.6 years of experience (Paraprofessional 1 had 7 years of experience, Paraprofessional 2 had 3 years of experience, and Paraprofessional 3 had 7 years of experience). All three paraprofessionals graduated from college with a B.A and all three paraprofessionals identified as being Caucasian. In general, all three paraprofessionals did not report receiving any training specifically on social interventions for students with ASD.

Job satisfaction/Affect. When asked generally about how much they enjoyed working in this field, all three paraprofessionals reported that they loved it (giving a rating of 1 on a 1 to 4 scale where 1 = love it, 2 = somewhat love it, 3 = mostly don't love it, and 4 = definitely don't love it). When asked generally about how stressed they felt working with their assigned student, two reported that they were not stressed (giving a rating of 4 on a 1 to 4

scale where 1 = extremely stressed, 2 = very stressed, 3 = somewhat stressed, and 4 = not stressed) and one reported that she was somewhat stressed (giving a rating of 3). When asked generally about how happy they were working, one reported that she was very happy (giving a rating of 2 on a 1 to 4 scale where 1 = extremely happy, 2 = very happy, 3 = somewhat happy, and 4 = not happy) and two reported that that they were somewhat happy (giving a rating of 3).

Training. When asked about how helpful the workshop was, two reported that the workshop was extremely helpful (giving a rating of 4 on a 1 to 4 scale where 1 = not helpful, 2 = somewhat helpful, 3 = very helpful, and 4 = extremely helpful) and one reported that the workshop was very helpful (giving a rating of 3). When asked about how satisfied they were with the training, two reported that they were very satisfied (giving a rating of 2 on a 1 to 4 scale where 1 = extremely satisfied, 2 = very satisfied, 3 = somewhat satisfied, and 4 = not satisfied), and one reported that she was extremely satisfied (giving a rating of 1). When asked to comment on the most helpful part of the training, two of the paraprofessionals reported that receiving feedback and tips were the most helpful, and one of the paraprofessionals reported that receiving suggestions for games/actives was most helpful. When asked to comment on the least helpful part of the training, two of the paraprofessionals reported "N/A" and one of the paraprofessionals reported that all was helpful. When asked whether they had any concerns about the procedures to implement the social intervention, all three paraprofessionals reported that they did not have any concerns. Lastly, when asked if they would continue to implement this social intervention for the remainder of the school year, all three paraprofessionals said yes.

Simplicity and easiness of implementation. When asked to rate the simplicity of the social intervention, two reported that it was very simple (giving a rating of 2 on a 1 to 4 scale where 1 = extremely simple, 2 = very simple, 3 = somewhat simple, and 4 = extremely difficult) and one reported that it was extremely simple (giving a rating of 1). When asked to rate the overall easiness of implementing the social intervention, all three paraprofessionals reported that is was extremely easy to implement (giving a rating of 4 on a 1 to 4 scale where 1 = extremely hard to implement, 2 = somewhat hard to implement, 3 = somewhat easy to implement, and 4 = extremely easy to implement).

Confidence. When asked how confident they felt about facilitating social interactions between their assigned student and typically developing peers after receiving the training, all three reported that they were very confident (giving a rating of 4 on a 1 to 4 scale where 1 = definitely not confident, 2 = mostly not confident, 3 = somewhat confident, and 4 = extremely confident).

Table 5.

Social Validation Results from Paraprofessionals

Survey Questions (In order it was asked)	Para 1	Para 2	Para 3
Ethnicity:	Caucasian	Caucasian	Caucasian
Additional trainings received (please list them):	No	Yes, ABA Level 1 &2	Peer Buddies Training
Are any of these trainings evidence based?	No	"I'm not sure"	--
Number of years as an aide:	7	3	7
Highest degree:	BA	BA	BA
How much do you enjoy working in this field?	1	1	1

(1 = love it, 2 = somewhat love it, 3 = mostly don't love it, 4= definitely don't love it)			
How stressed do you feel working with your assigned child? (1 = extremely stressed, 2 = very stressed, 3 = somewhat stressed, and 4 = not stressed)	4	4	3
How happy are you working? (1 = extremely happy, 2 = very happy, 3 = somewhat happy, and 4 = not happy)	2	3	3
The workshop was helpful (1 = not helpful, 2 = somewhat helpful, 3 = very helpful, and 4 = extremely helpful)	4	4	3
Please rate the simplicity of this social intervention (1 = extremely simple, 2 = very simple, 3 = somewhat simple, and 4 = extremely difficult)	2	2	1
After the training, how confident do you feel in your abilities to facilitate social interactions between your child and his or her peers? (1 = definitely not confident, 2 = mostly not confident, 3 = somewhat confident, and 4 = extremely confident)	4	4	4
Please rate your satisfaction with the training you have received (1 = extremely satisfied, 2 = very satisfied, 3 = somewhat satisfied, and 4 = not satisfied)	2	2	1
Please rate the overall easiness of this intervention (1 = extremely hard to implement, 2 = somewhat hard to implement, 3 = somewhat easy to implement, and 4 = extremely easy to implement)	4	4	4
What was the most helpful part of this training?	"I feel that the most helpful part of this training was the feedback/tips"	"Feedback & extra tips"	"Activity suggestions"
What was the least helpful part of this training?	N/A	"All was helpful"	N/A

Do you have any concerns about the procedures to implement a lunch club?	"No, not at this time"	"Nope. Awesome idea"	"No"
Will you continue to implement a lunch club for your student the rest of the school year?	Yes	Yes	Yes
Any additional comments:	--	--	--

Outcomes from Students with ASD

Data on student behavior showed similar results to the paraprofessionals with low levels of social behavior during baseline and rapid improvements during the intervention condition. Specifically, during the baseline condition (prior to training the paraprofessionals) the students exhibited low levels or no engagement with typically developing peers and initiated with their peers at a very low rate (see Figures 3 and Figure 4). In contrast, when paraprofessionals were trained in the three variables (i.e., appropriate proximity, provide cooperative arrangements, incorporate preferred/specialized interests of the target student with typically developing peers), an increase in engagement between students with ASD and typically developing peers occurred. As well, an increase in rate of verbal initiations made by the target students to their typical peers was also observed. Specific details for each measure are presented below.

Percent Intervals with Engagement with Typical Peers.

The results of percent intervals students with ASD were engaged with typically developing peers are presented in Figure 3. During the baseline condition, all three participants exhibited low levels of engagement with typically developing peers. During the intervention condition, all three participants' engagement with their typical peers increased.

All three participants exhibited some levels of improved engagement with their typical peers during the follow-up condition. Specific results for each student are described below.

During the baseline condition, Student 1 was engaged with typically developing peers an average of 4.2% of the intervals, ranging from 0 % to 13.3%. During the intervention condition, Student 1's level of engagement with typical peers increased to an average of 63.1%, ranging from 34.3 to 88.4%. In addition, Student 1 was able to reach the typical range of engagement for two out of three sessions. During the first follow-up session, Student 1 was able to maintain high levels of engagement (77.7%), but by the 2nd and 3rd follow-up sessions, Student 1's level of engagement dropped to 37.1% and 41.3% respectively. During the generalization condition, Student 1 was unable to maintain generalization, dropping down to an average of 15.8% engagement with typically developing peers, ranging from 3% to 40%.

Student 2 was engaged with his typically developing peers an average of 3% of the intervals, ranging from 0% to 22.5%, during the baseline condition. During the intervention condition, Student 2's engagement with typical peers increased to an average of 32.1%, ranging from 6% to 51.8%. During the follow-up session, Student 2's engagement with typical peers increased to 64.2%.

During the baseline condition, Student 3 was engaged with typically developing peers an average of 5.8% of the intervals, ranging from 0% to 39.1%. During the intervention condition, Student 3's engagement with typical peers increased to an average of 94.1%, ranging from 82.3% to 100%. Student 3 was able to reach the typical range of engagement for two out of three sessions. Specifically, during the first two follow-up sessions, Student 3

continued to maintain high levels of engagement (96% and 100% respectively), but by the 3rd session it dropped to 68.1%.

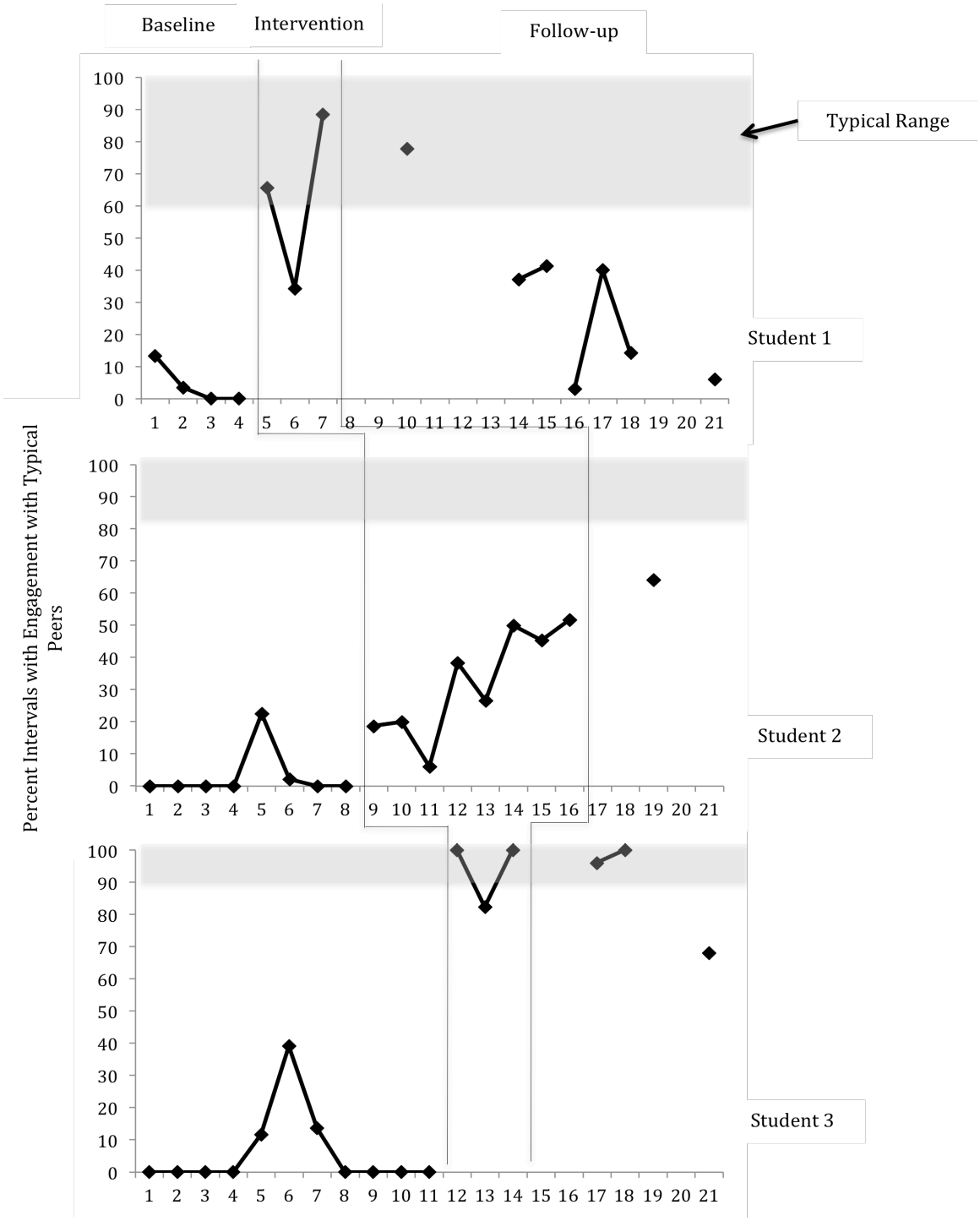

Figure 3. Social engagement of students with ASD with typically developing peers. The gray bars denote the typical range of engagement.

Rate of Verbal Initiations Per Minute Made to Typical Peers.

The results of rate of initiations per minute students with ASD made to typically developing peers are presented in Figure 4. During the baseline condition, all three participants made limited verbal initiations to typically developing peers. During the intervention condition, all three participants' rate of verbal initiations increased. The students either maintained similar rates of verbal initiations or slightly dropped down during the follow-up condition. Specific results for each student are described below.

During the baseline condition, Student 1 made an average of 0.15 verbal initiations per minute to typical peers, ranging from 0 to 0.6. During the intervention condition, Student 1's verbal initiations made to typical peers reached the typical range (average of 1.74 verbal initiations per minute, ranging from 1.43 to 1.92). Although Student 1's rate of verbal initiations slightly dropped in the follow-up condition, he continued to verbally initiate in the typical range (average of 1.35 verbal initiations per minute, ranging from 1.2 to 1.5). Student 1's rate of verbal initiations dropped during the generalization condition to an average of 0.2 verbal initiations per minute, ranging from 0 to 0.6.

During the baseline condition, Student 2's rate of verbal initiations made to typical peers was an average of 0.02 per minute, ranging from 0 to 0.09. During the intervention condition, Student 2's rate of verbal initiations made to typical peers increased to an average of 0.66 per minute, ranging from 0.06 to 1.7 (he reached the typical range on the 8th session). During the follow-up session, Student 2's rate of verbal initiations made to typical peers was 1.21 per minute.

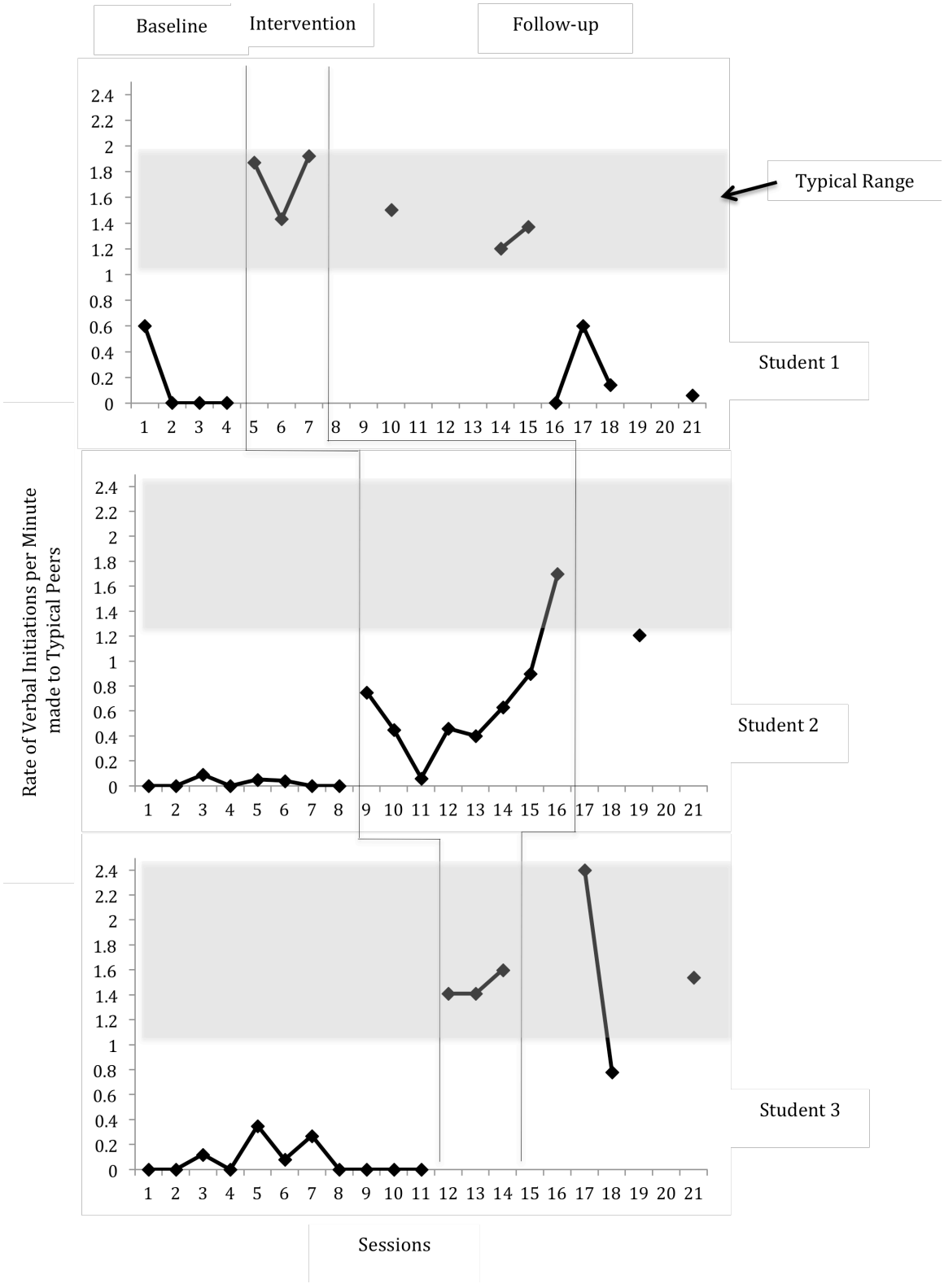

Figure 4. Verbal initiations made by students with ASD to typically developing peers. The gray bars denote the typical range of verbal initiations.

During the baseline condition, Student 3's rate of verbal initiations made to typical peers was an average of 0.07 per minute, ranging from 0 to 0.35. During the intervention condition, Student 3's rate of verbal initiations made to typically developing peers reached the typical range (average of 1.47 verbal initiations per minute, ranging from 1.41 to 1.6). During the follow-up condition, Student 3's rate of verbal initiations made to typical peers continued to remain high, averaging 1.57 verbal initiations per minute, ranging from 0.78 to 2.4 (he was initiating in the typical range for two out of three sessions).

Social Validation from Students with ASD

The results of the 9-item survey given to each student with ASD are presented in Table 7. Two of the students were 10 years old (one student was in 5th grade and one student was in 4th grade) and one student was 6 years old (he was in Kindergarten).

Affect. When asked to rate how much they liked participating in these lunchtime games/activities, all three students reported that they loved it (giving a rating of 1 on a 1 to 4 scale, where 1 = I love it, 2 = I like it, 3 = It is okay, and 4 = I do not like it). When asked how much they enjoyed participating in these lunchtime games/activities, all three students reported that they enjoyed it (giving a rating of 1 on a 1 to 4 scale, where 1 = I enjoy it, 2 = I like it, 3 = It is okay, and 4 = I do not enjoy it). When asked how much fun they have playing these games/activities, two of the students reported that it is so much fun (giving a rating of 1 on a 1 to 4 scale, where 1 = It is so much fun, 2 = It is fun, 3 = It is a little fun, and 4 = It is not fun) and one student reported that it is fun (giving a rating of 2). When asked how participating in these games/activities made them feel, all three students reported that it made them feel happy.

Friendship formation. When asked if they made new friends since playing these games/activities, two students reported a "no" and one student reported a "yes." For the student that reported a yes, he was asked to identify his new friend (this friendship nomination was reciprocated).

Suggestions. When students were asked if they had any suggestions to improve these games/activities, two of the students did not have any suggestions and one of the students suggested getting more Legos.

Table 6.

Social Validation Results from Students with ASD

Survey Questions (In order it was asked)	Student 1	Student 2	Student 3
Age	10	6	10
Grade	5th	K	4th
Rate how much you like lunch club? (1 = I love it, 2 = I like it, 3 = It is okay, and 4 = I do not like it)	1	1	1
How much do you enjoy lunch club? (1 = I enjoy it, 2 = I like it, 3 = It is okay, and 4 = I do not enjoy it)	1	1	1
How much fun do you have in lunch club (1 = It is so much fun, 2 = It is fun, 3 = It is a little fun, and 4 = It is not fun)	1	1	2
Lunch club makes me feel:	Happy	Happy	Happy
I made new friends since joining lunch club: Yes/ No	No	Yes	No
If yes, list the name of your new friends	--	Listed a girl who frequently participates in these	--

		activities/games	
Suggestions to improve lunch club:	More Legos	Nothing	No

Relationship of Paraprofessional's Fidelity and Social Behavior of Students with ASD

The results of this study demonstrate a relationship between paraprofessionals' implementation of the social intervention with fidelity and the social behavior of students with ASD (i.e., engagement and verbal initiations). Specifically, when paraprofessionals were not providing social intervention with fidelity, the students with ASD rarely engaged with typically developing peers and made little to no verbal initiations to their peers during lunch recess periods. When the paraprofessionals were trained and implemented the social intervention with fidelity, the social behaviors of the students with ASD improved.

Dyad 1. The relationship between Paraprofessional 1's fidelity of implementation and the social behavior of Student 1 are presented in Figure 5. During the baseline condition, when Paraprofessional 1 was not trained and did not provide social intervention, Student 1's overall social engagement and verbal initiations made to typically developing peers were low. When Paraprofessional 1 was trained and implemented the social intervention with fidelity, Student 1's overall social behavior improved, reaching the typical range. During the follow-up condition, when Paraprofessional 1 implemented the social intervention with fidelity (the first follow-up session), Student 1's social behavior continued to remain in the typical range, but when Paraprofessional 1 did not implement the social intervention with fidelity (after the first follow-up session), Student 1's social behavior dropped, eventually reaching baseline levels.

Dyad 2. The relationship of Paraprofessional 2's fidelity of implementation and the social behavior of Student 2 are presented in Figure 6. During the baseline condition, when

Paraprofessional 2 was not trained and did not provide social intervention, Student 2's overall social engagement and verbal initiations made to typically developing peers were low. When Paraprofessional 2 was trained and implemented the social intervention with fidelity, Student 2's overall social behavior improved. During the follow-up condition, as Paraprofessional 2 continued to implement the social intervention with fidelity, Student 2's engagement continued to improve, and although his verbal initiations made to typical peers dropped, it remained in the typical range.

Dyad 3. The relationship of Paraprofessional 3's fidelity of implementation and the social behavior of Student 3 are presented in Figure 7. Similar to the other dyads, during the baseline condition, when Paraprofessional 3 was not trained and did not provide social intervention, Student 3's overall social engagement and verbal initiations made to typically developing peers were low. When Paraprofessional 3 was trained and implemented the social intervention with fidelity, the social behavior of Student 3 improved, reaching the typical range. During the follow-up condition, when Paraprofessional 3 continued to implement the social intervention with fidelity, Student 3's engagement with typical peers and verbal initiations made to typical peers continued to stay in the typical range for 2 out of the 3 sessions.

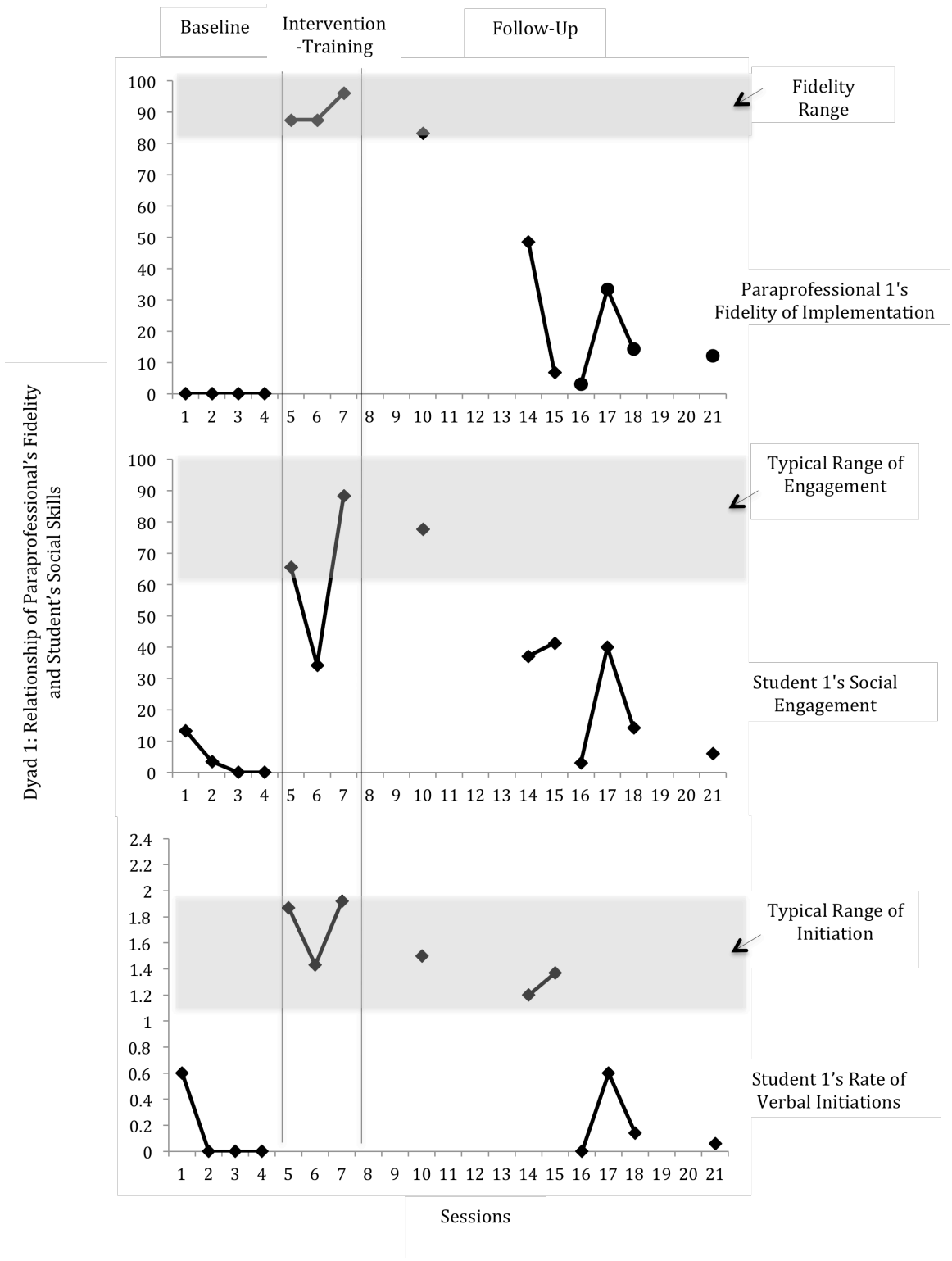

Figure 5. The social relationship of Paraprofessional 1's fidelity of implementation and Student 1's social skills (i.e., engagement and verbal initiations).

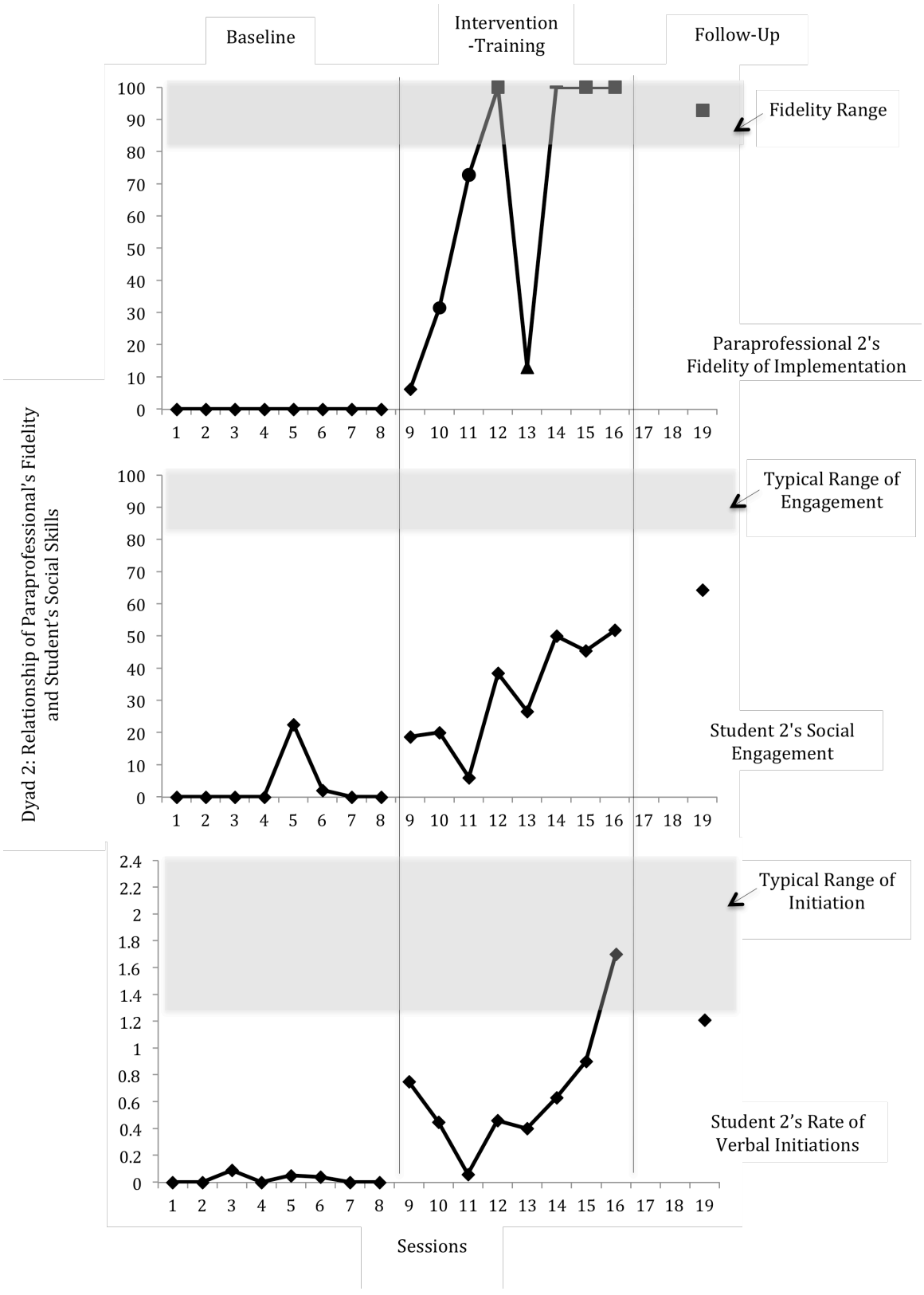

Figure 6. The social relationship of Paraprofessional 2's fidelity of implementation and Student 2's social skills (i.e., engagement and verbal initiations).

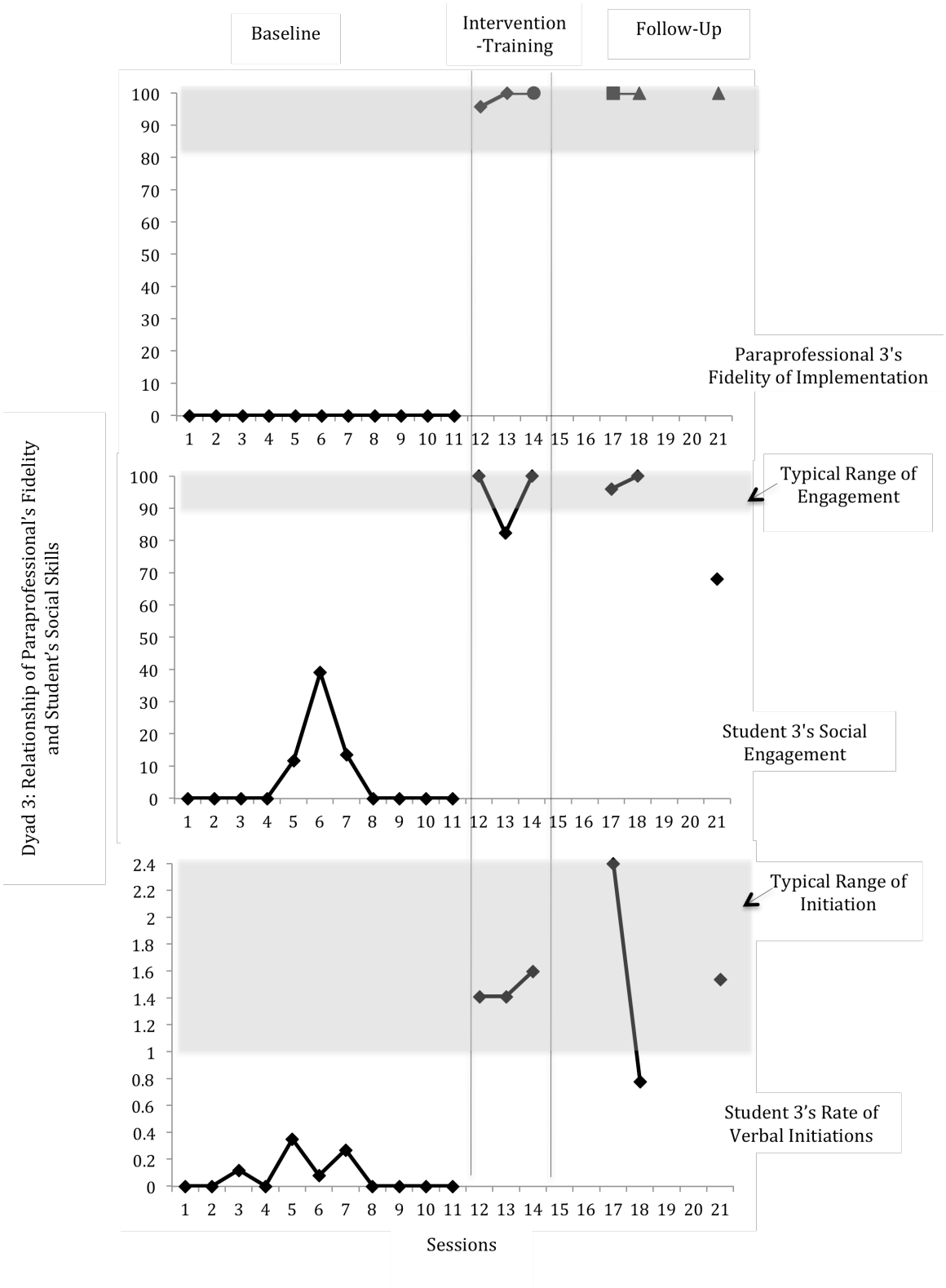

Figure 7. The social relationship of Paraprofessional 3's fidelity of implementation and Student 3's social skills (i.e., engagement and verbal initiations).

Social Validation from Special Education Teachers

At the end of the intervention-training condition, special education teachers at each participating school (n=3) were given a 6-item survey. The results of the special education teachers' survey responses are presented in Table 6. On average, special education teachers had 13.3 years of experience (teacher 1 had 13 years of experience, teacher 2 had 9 years of experience, and teacher 3 had 18 years of experience). When asked about their opinion on these individualized lunchtime games/activities, special education teachers generally reported that it is helpful for encouraging social interaction between students with ASD and typically developing peers. When asked if special education teachers would consider training their future staff, all three teachers reported "yes." When asked if they expected anything else from the training, in general all three teachers reported that the training was thorough and helpful.

Simplicity and easiness of implementation. When asked to rate the simplicity of the social intervention, two reported that it was very simple (giving a rating of 2 on a 1 to 4 scale where 1 = extremely simple, 2 = very simple, 3 = somewhat simple, and 4 = extremely difficult) and one reported that it was extremely simple (giving a rating of 1). When asked to rate the overall easiness of implementing the social intervention, two of the special education teachers reported that it was extremely easy to implement (giving a rating of 4, on a 1 to 4 scale where 1 = extremely hard to implement, 2 = somewhat hard to implement, 3 = somewhat easy to implement, and 4 = extremely easy to implement), and one special education teacher reported that it was somewhat easy to implement (giving a rating of 3).

Table 7.

Social Validation Results from Special Education Teachers

Survey Questions (In order it was asked)	Special Education Teacher 1	Special Education Teacher 2	Special Education Teacher 3
Number of years as a special education teacher:	13	9	18
Please rate the simplicity of this social intervention (1 = extremely simple, 2 = very simple, 3 = somewhat simple, and 4 = extremely difficult)	2	2	1
Please rate the overall easiness of this intervention (1 = extremely hard to implement, 2 = somewhat hard to implement, 3 = somewhat easy to implement, and 4 = extremely easy to implement)	4	3	4
What is your opinion on these individualized lunch clubs?	"It works very well for the student with special needs as well as their typical peers. Upper elementary students tend to lose interest in the playground activities and need something to do with structure that engage them. It is easy to implement to encourage peer interaction and gives the adults a clear focus on how to assist them."	"These lunch clubs are fantastic. It gives all students the chance to expand their social skills and to know others, in a fun way. I think it is a very effective and positive way for students to have semi-structured peer interactions."	"These clubs are an important investment in bridging the gap between typical peers and students in special education."

Would you consider training your staff to implement these individualized lunch clubs? (yes/no)	Yes	Yes	Yes
Is there anything else you expected from the aide training?	"It would be great to have a follow up training later in the year to follow up on skills learned and to review how to facilitate lunch clubs."	"No, it was well done."	"Training was very thorough and complete."

Typically Developing Peers Comparison Data

Data from typically developing peers that participated in the social games/activities during lunch recess were obtained in order to provide an estimate of the typical range of percent intervals with engagement and rate of verbal initiations per minute for students with ASD.

Percent Intervals with Engagement. For Dyad 1, typically developing peers' percent intervals with engagement ranged from 59% to 100%. For Dyad 2, typically developing peers' percent intervals with engagement ranged from 81% to 100%, and for Dyad 3, typically developing peers' percent intervals with engagement ranged from 88.2% to 100%. The gray bar on Figure 3 notes the typical range.

Rate of Verbal Initiations Per Minute. For Dyad 1, typically developing peers' rate of verbal initiations ranged from 0.93 to 1.88 initiations per minute. For Dyad 2, typically developing peers' rate of verbal initiations ranged from 1.2 to 2.4 initiations per minute, and for Dyad 3, typically developing peers' rate of verbal initiations ranged from 0.94 to 2.4 initiations per minute. The gray bar on Figure 4 notes the typical range.

Social Validation from Typically Developing Peers

The results of the 9-item survey given to typically developing students are presented in Table 8. When asked to rate how much they liked participating in these lunchtime games/activities, the modal response from the typical peers was that they liked it (giving a rating of 2 on a 1 to 4 scale, where 1 = I love it, 2 = I like it, 3 = It is okay, and 4 = I do not like it). When asked how much they enjoyed participating in these lunchtime games/activities, the modal response from the typical peers was that they enjoyed it (giving a rating of 1 on a 1 to 4 scale, where 1 = I enjoy it, 2 = I like it, 3 = It is okay, and 4 = I do not enjoy it). When asked how much fun they have playing these games/activities, the modal response from the typical peers was that it was fun (giving a rating of 2 on a 1 to 4 scale, where 1 = It is so much fun, 2 = It is fun, 3 = It is a little fun, and 4 = It is not fun). When asked how participating in these games/activities made them feel, the modal response from the peers was that these games/activities made them feel happy.

Friendship formation. When asked it they made new friends since playing these games/activities, the modal response from the typical peers was a no.

Suggestions. When students were asked if they had any suggestions to improve these games/activities, the modal response was the typical peers was no suggestions.

Table 8.

Social Validation Results from Typically Developing Peers

Survey Questions (In order it was asked)	Modal Response n = 9 (School 1)	Modal Response n = 4 (School 1)	Modal Response n = 3 (School 1)
Age	10	6	9 & 10 (half were 9 & half were 10)
Grade	5th	K	4th

Rate how much you like lunch club? (1 = I love it, 2 = I like it, 3 = It is okay, and 4 = I do not like it)	2	1 & 2 (half reported 1 & half reported 2)	1
How much do you enjoy lunch club? (1 = I enjoy it, 2 = I like it, 3 = It is okay, and 4 = I do not enjoy it)	2	1	2
How much fun do you have in lunch club (1 = It is so much fun, 2 = It is fun, 3 = It is a little fun, and 4 = It is not fun)	2	1	2
Lunch club makes me feel:	Happy	Happy	Happy
I made new friends since joining lunch club: Yes/ No	No	Yes	No
If yes, list the name of your new friends	--	Target Student was nominated most	--
Suggestions to improve lunch club:	N/A	New Games	N/A

IV. Discussion

The results of this study suggest the following: (1) paraprofessionals can demonstrate fidelity on the three key components when implementing social activities/games during lunch recess periods (i.e., standing in an appropriate proximity, providing cooperative arrangements, and incorporating child preferred/specialized interests with typically developing peers); (2) some of the paraprofessionals can maintain these skills and demonstrate response generalization to different social games/activities; (3) paraprofessionals' rate of social prompting can increase (although they were not trained to provide social prompting); (4) paraprofessionals and special education teachers consider this type of social intervention to be simple and easy to implement. Overall, each paraprofessional was able to demonstrate their strengths and weaknesses during the intervention-training and follow-up conditions. For example, some of the paraprofessionals were able to reach fidelity immediately after the training workshop, while some required additional corrective feedback sessions. While some of the paraprofessionals were able to maintain and generalize these newly acquired skills, some did not maintain these skills during the follow-up condition nor demonstrate response generalization. Specific details are described below.

The results of this study also suggest the following for students with ASD after paraprofessionals are trained to implement this form of social intervention: (1) students with ASD showed improvement in their engagement with typically developing peers; (2) students with ASD showed improvement in their verbal initiations made to their typically developing peers; (3) students with ASD reported enjoying participating in these games/activities during

the lunch recess period; and (4) typically developing peers also reported enjoying participating in these games/activities.

Impact on Paraprofessionals

Prior to the training, paraprofessionals were not providing appropriate social intervention for their student with ASD during lunch recess. Instead, paraprofessionals were often standing in too close of proximity (i.e., hovering) to their student, standing too far away from their student (e.g., on the other end of campus), attending to other students on the playground, or socializing with other paraprofessionals. Two of the three paraprofessionals would attempt to encourage their students to socialize with other disabled students, which was unsuccessful and counter-productive. The other paraprofessional would closely follow her student around the school playground throughout the entire lunch recess. This is consistent with the literature on paraprofessionals not having the necessary skills to provide social interventions for students with ASD (Feldman & Matos, 2013; Koegel, Kim, Koegel, 2014; Mazurik-Charles, & Stefanou, 2010; Robinson, 2011) and standing in inappropriate proximity to their student (Giangreco, & Broer, 2007; Giangreco, & Broer, 2005; Giangreco, Edelman, Luiselli, & MacFarland, 1997) as a result of a general lack of training.

With training, two of the paraprofessionals (Paraprofessional 1 and Paraprofessional 3) were able to immediately meet fidelity in implementing all three components of the social intervention (i.e., standing in appropriate proximity, providing cooperative arrangements, and incorporating child preferred/specialized interests with typically developing peers). Paraprofessional 2 needed a few more corrective in-vivo feedback sessions before reaching fidelity. Specifically, Paraprofessional 2 was able to meet fidelity on proximity and incorporation of child preferred/specialized interests, but had more difficulties with providing

cooperative arrangements. By the sixth session, however, she was able to meet fidelity on all three components for three consecutive sessions. Paraprofessional 2 may have had a more difficult time meeting fidelity because her student had a different interest each session. As a result, she had to change the game/activity for each session before she was able to demonstrate fidelity.

Paraprofessional 2 and Paraprofessional 3 were able to maintain high levels of fidelity during the follow-up condition and they were able to demonstrate response generalization throughout the intervention-training and follow-up conditions. Although Paraprofessional 1 was able to maintain fidelity at the 3-week follow-up session, she was unable to meet fidelity at the 7-week follow-up session and did not demonstrate response generalization. Paraprofessional 1 may have had more difficulties maintaining fidelity and demonstrating response generalization for two possible reasons. First, her student's preferred/specialized interests did not change during the intervention-training condition, thus she did not receive feedback on her implementation on the fidelity components for other activities/games. On the other hand, Paraprofessional 2 and Paraprofessional 3 worked with students whose preferred/specialized interests changed during the intervention-training condition, thus they were able to get feedback from the trainer. It may be important for paraprofessionals to demonstrate fidelity with different stimulus materials during the intervention-training condition in order to maintain and generalize the newly acquired skills.

Second, two of the follow-up sessions for Paraprofessional 1 were conducted after winter break, which may have led to Paraprofessional 1 forgetting some key concepts from the training workshop (e.g., concept of cooperative arrangements). On the other hand, for Paraprofessional 2 and Paraprofessional 3 there were no major breaks between the

intervention-training sessions and follow-up sessions. Being in the school setting with an uninterrupted schedule (e.g., no major break) may have provided Paraprofessional 2 and Paraprofessional 3 an advantage in their ability to continue implementing the social intervention with high fidelity. These results suggest that a follow-up training/refresher for some paraprofessionals may be necessary, especially after they return from a big break from school. Future research may be warranted to investigate the effects of additional ecological variables (e.g., school environment, support from school staff) on the ability of paraprofessionals to maintain and generalize their skills.

The paraprofessionals in this study were not trained to provide social prompting to their student with ASD. However, the rate of social prompting for all three paraprofessionals increased during the intervention condition. Paraprofessional 1's rate of social prompting decreased when she was not implementing the social intervention with fidelity during the follow-up and generalization condition. At this point, it is unknown why the paraprofessionals' rate of social prompting increased during the intervention condition. The set-up of the social games/activities may have provided natural opportunities for paraprofessionals to provide social prompts to their student. Further research investigating additional variables in the performance of paraprofessionals can help to inform the development of increasingly effective social training programs.

The literature suggests that paraprofessionals want additional training on how to best support their student (Carter, et al., 2009; Chopra, et al., 2004; Patterson, 2006), and this type of training may help to provide strategies for paraprofessionals to provide appropriate social support for their student with ASD. The social validation questionnaire in this study revealed that all three paraprofessionals considered this training to be helpful. All three

paraprofessionals also reported satisfaction with this training with no suggestions for improvement. While these results suggest that paraprofessionals may consider this social training program to be effective, additional research is needed to further validate this effectiveness and encourage wide spread implementation.

The literature also suggests that paraprofessionals often report feeling frustrated because they do not know how to support their student, generally as a result of the lack of training they receive (Downing, et al., 2000; Riggs, & Mueller, 2001). The majority of paraprofessional training studies have not assessed the confidence level of paraprofessionals when providing social support to students with ASD. This study was able to assess paraprofessionals' confidence level of facilitating social interaction between students with ASD and typically developing peers after receiving training. Specifically, all three paraprofessionals in this study reported that they felt extremely confident in facilitating social interactions between students with ASD and typically developing peers. It is unknown, however, whether these specific paraprofessionals felt confident in supporting their student prior to the training or if their confidence level had increased as a result of the training. Future research investigating variables related to improving paraprofessionals' confidence could be important as this may improve their job satisfaction, overall affect, and possibly their performance as a result.

All three paraprofessionals indicated that this social intervention was simple and easy to implement, and they reported that they would continue implementing the social intervention for their students for the remainder of the school year. The literature suggests that a barrier to implementing social interventions in schools is the complex nature of the interventions, which often requires highly trained staff to deliver the intervention (Kasari &

Smith, 2013). In order for schools to implement effective social intervention programs for students with ASD, a simple, yet easy to implement model may be ideal. The results from the social validation suggest that this social training program may be desirable for school districts because of the simplicity and easiness of implementation.

Consistent with previous intervention studies, training paraprofessionals to fidelity of implementation in related areas were accomplished in a relatively short time period (Causton-Theoharis & Malmgren, 2005; Koegel, et al., 2014; Mazurik-Charles & Stefanou, 2010; Storey, et al., 1993). For Paraprofessionals 1 and 3, after attending a 90-minute training workshop they were able to demonstrate fidelity of implementation for three consecutive sessions. Even with the additional corrective in-vivo feedback sessions, Paraprofessional 2 was trained to fidelity within a total of 165 minutes (a little less than 3 hours). This suggests that the intervention training was time efficient, which contributes to the potential ease of implementation in school districts.

Implementing this social intervention in this study used resources already available in the schools, keeping the cost low. As school districts are often faced with budget cuts, this social intervention can provide a viable option for schools to implement an effective social intervention for students with ASD at a very low-cost.

Impact on Students with ASD

During the baseline condition, when the paraprofessionals were not implementing social intervention for students with ASD, their social engagement and verbal initiations made to typical peers were low. Specifically, Student 1 was often playing in the sandbox either alone or with other disabled students, Student 2 mainly ran around the perimeter of the school playground alone, and Student 3 preferred to be alone or interact with other disabled

students on the swing. While all three students attended schools that practiced a full inclusion model, simply integrating these students with typically developing peers in the classroom was not enough to improve their social engagement. This is consistent with previous research that suggests that physical integration is not sufficient for improving social skills in students with ASD and that additional intervention is necessary (Harrower & Dunlap, 2001; Hemmeter, 2000; Hunt & Goetz, 1997; Koegel, Robinson, Koegel, 2009; McConnell, 2002).

When the paraprofessionals in this study were trained to provide social interventions for students with ASD, the social engagements and verbal initiations improved for these students. Specifically, Student 1 engaged with typical peers and made verbal initiations at a similar rate as the typically developing peers. Student 2's engagement and verbal initiations gradually increased, and he was able to reach the typical rate of verbal initiations by the 8th session and in the follow-up session. Student 3's engagement and verbal initiations also improved, reaching the typical range. The improved social skills in Student 3 were especially noteworthy, because he was often aggressive and inappropriate with his peers prior to intervention (e.g., yelling in peers' ears, pushing peers). During intervention and follow-up sessions, Student 3 completely ceased to exhibit aggressive behavior with his typically developing peers.

During the follow-up condition, Student 2 and Student 3 were able to maintain high levels of social engagement and verbal initiations. On the other hand, Student 1's social skills (i.e., engagements and initiations) dropped back down. This may likely be related to the fact that Paraprofessional 1, who was assigned to work with Student 1, did not continue implementing the social intervention at fidelity. For Student 2 and Student 3, their

paraprofessionals continued to implement the social intervention at high fidelity. These results suggest the importance of paraprofessionals to provide on-going social interventions with fidelity, in order to see continued social skills improvement in students with ASD.

The literature suggests that incorporating child preferred/specialized interests into social intervention programs can provide an appropriate social context in which students with ASD and typically developing peers who share similar interests can interact and socialize with one another (Carter, Common, Sreckovic, Huber, Bottema-Beutel, Gustafson, et al., 2014; Kasari & Patterson, 2012; Koegel et al., 2014). This type of social intervention may serve as a powerful reinforcer that motivates students with ASD to appropriately socialize with typically developing peers (Koegel et al., 2012; Koegel et al., 2013). Providing cooperative arrangements may have also helped to provide a natural context that encouraged students with ASD and typically developing peers to socially interact with each other. This corroborates previous research that suggests that providing cooperative arrangements can lead to more frequent social interactions between students with ASD and typically developing peers (Bene, Banda & Brown, 2014; Koegel, et al., 2005).

In regards to mental health, the results of this study also suggest that students with ASD enjoyed participating in these social activities/games. In fact, all three students reported that playing these games during lunch recess made them feel "happy." This is important because it suggests that not only are social skills in students with ASD improving, but they are also enjoying their participation in these social interventions. In addition, the target students may have accumulated extensive knowledge related to their preferred/specialized interests. Their expertise may allow these students to feel confident in participating in these social activities/games, especially when typically developing peers may

be encouraged to value and rely on the students with ASD in order to complete the game/activity (Koegel, et al., 2013). Students with ASD are often bullied and victimized in schools (Humphrey & Symes, 2011; Roekel, et al., 2010; Symes & Humphrey, 2010), and future research should investigate the potential for these types of social intervention programs to help decrease the level of bullying and victimization often experienced by these students.

Student 1 and Student 3 indicated that they did not make a new friend after participating in the social intervention. This may have been due to the fact that they may have already considered some of the peers that participated in the social activities/games as a friend. Student 2, however, did indicate that he made a new friend as a result of the social intervention, and his friendship nomination was reciprocated by the same peer. Student 2 may have been in a better position to develop reciprocated friendship with typically developing peers because he received additional intervention sessions as a result of his paraprofessional not meeting fidelity during the first six sessions of the intervention-training condition. This is an important area for future research because the literature suggests that students with ASD often form unilateral friendships (Bauminger & Kasari, 2000; Chamberlain, et al., 2007). As one of the students in this study developed reciprocated friendship after participating in the social intervention, investigating additional environmental factors (e.g., number of typically developing peers participating in the activities/games) may be important for better understanding reciprocated friendship formation.

Relationship of Paraprofessional's Fidelity and Social Behavior of Students with ASD

Before the paraprofessionals received training, the students with ASD tended to exhibit a lack of social interaction with typically developing peers. Once paraprofessionals were trained to implement social intervention, there was a recognized improvement in the social behaviors of these students with ASD. It is also worth noting that when Paraprofessional 1 did not maintain fidelity after the 2nd session during the follow-up condition, Student 1's social behavior dropped, eventually reaching baseline levels. For Dyad 2 and Dyad 3, as the paraprofessionals were able to continue to implement the social intervention with fidelity during the follow-up condition, the social behavior for Student 2 and Student 3 continued to either remain in the typical range, improve, or slightly drop (but never reaching baseline levels). These results suggest a strong relationship between the paraprofessional's ability to implement social intervention with fidelity and the degree of improvement in the social behavior of students with ASD.

Additional Benefits (Special Education Teachers and Typically Developing Peers)

Special Education Teachers. At the end of the intervention-training condition, special education teachers were given a survey. Similar to the paraprofessionals, all three special education teachers reported that the training was helpful and that they viewed this type of social intervention to be simple and easy to implement. They also reported that they would consider training their future staff in these social procedures. This suggests optimism that these special education teachers will continue training their staff to implement this type of social intervention program in the absence of an outside trainer. The simplicity of implementing this social intervention may be an influential factor for special education teachers in their consideration of continuing this training for their staff.

Typically Developing Peers. Typically developing peers also seemed to like and

enjoy participating in these social activities/games, and the majority of these peers reported that these activities/games made them feel "happy." Similar to students with ASD, typically developing peers may have also been motivated to participate in these social activities/games due to shared interests in the particular theme of the program. Although the paraprofessionals did not have any difficulties recruiting typically developing peers, future research investigating the demographics and characteristics of typically developing peers that enjoy participating in these social activities/games can allow for a better understanding of ideal peer candidates.

Limitations/Future Directions

Although the results of this study suggest that training paraprofessionals leads to improved social skills in students with ASD, there were some limitations to this study. For example, since the paraprofessionals were only assigned to one student, and this study was completed within the school year, it was not possible to obtain stimulus generalization. Future research should investigate paraprofessionals' ability to implement this type of social intervention with other students with ASD (i.e., demonstrating stimulus generalization). In addition, investigating the ability of paraprofessionals to demonstrate fidelity the following school year (i.e., after summer break) will provide a more insight as to the external validity of this training. Finally, as some of the paraprofessionals in this study were able to maintain fidelity and demonstrate response generalization, investigating the effects of additional environmental variables can help to explain why some paraprofessionals may be better than others in maintaining and generalizing their skills.

This study attempted to understand friendship formation between students with ASD and typically developing peers, and found that many students that participated in this study

reported that they did not make a new friend as a result of the social intervention program. Future research investigating additional environmental factors may illuminate variables that influence friendship formation between students with ASD and typically developing peers. It would also be noteworthy to investigate the composition and characteristics of typically developing peers in order to get a better understanding of ideal peer candidates.

As special education teachers in this study reported that they would be interested in training their future staff to implement this social intervention, future research may be warranted to investigate the feasibility of a trainer-of-trainee program. Specifically, it would be interesting to train special education teachers, then assess if they can train their staff to fidelity. It would also be interesting for future research to investigate whether trained paraprofessionals can train typically developing peers to implement this type of social intervention for students with ASD.

Conclusion

The present study adds important information to the current literature in regards to training paraprofessionals. Specifically, the results of this study suggest that it is feasible to train paraprofessionals to fidelity to implement a social intervention program for students with ASD. Paraprofessionals and special education teachers seem to view this type of training to be helpful and they seem to view the implementation of the social intervention to be simple and easy to implement. This type of social intervention may be desirable for school districts because of the low-cost and ease of implementation. In addition, as many students with ASD have social goals listed on their Individualized Educational Plan (IEP), training paraprofessionals to implement this type of social intervention may also make this program desirable for many schools. In regard to students with ASD, the results of this study

suggest that when paraprofessionals are trained to implement this type of social program, improved social skills in these students are noted (e.g., social engagement and verbal initiations). These social games/activities seem to appeal to both students with ASD and typically developing peers. The results of this study are promising, but there are a number of future directions to improve upon and extend the applicability of this social intervention-training program for paraprofessionals. Overall, the results of this study provide optimism that paraprofessionals can be trained to fidelity to implement a simple yet effective social intervention for students with ASD, which then improves the social skills in these students.

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Appendix A

Data Sheet

Observer:
Date:
Paraprofessional:
Child:

Time interval	Appropriate Proximity (+/-)	Cooperative Arrangement (+/-)	Child choice (+/-)	**Met Fidelity?** (yes/no)	Rate of Social Prompting (tally)	Intervals Engaged **CHILD** (+/-)	Rate of Initiations **CHILD** (tally)
0:00-0:30							
0:30-1:00							
1:00-1:30							
1:30-2:00							
2:00-2:30							
2:30-3:00							
3:00-3:30							
3:30-4:00							
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12:00-12:30							
12:30-13:00							
13:00-13:30							
13:30-14:00							
14:00-14:30							
14:30-15:00							

Comments:

Appendix B

Paraprofessional Survey

Number of years as an aide: _____ Highest degree: _____

How much do you enjoy working in this field?

1	2	3	4
Love it	Somewhat love it	Mostly don't love it	Definitely don't love it

How stressed do you feel working with your assigned child?

1	2	3	4
Extremely stressed	Very stressed	Somewhat stressed	Not stressed

How happy are you working?

1	2	3	4
Extremely Happy	Very Happy	Somewhat Happy	Not Happy

The workshop was helpful

1	2	3	4
Not helpful	Somewhat helpful	Very helpful	Extremely helpful

Please rate the simplicity of this social intervention

1	2	3	4
Extremely simple	Very simple	Somewhat simple	Very difficult

After the training, how confident do you feel in your abilities to facilitate social interactions between your child and his or her peers?

1	2	3	4
Definitely not confident	Mostly not confident	Somewhat confident	Extremely confident

Please rate your satisfaction with the training you have received

1	2	3	4
Extremely Satisfied	Very Satisfied	Somewhat Satisfied	Not Satisfied

Please rate the overall easiness of this intervention

1	2	3	4
Extremely hard to implement	Somewhat hard to implement	Somewhat easy to implement	Extremely easy to implement

What was the most helpful part of this training?

What was the least helpful part of this training?

Do you have any concerns about the procedures to implement a lunch club?

Will you continue to implement a lunch club for your student the rest of the school year?

Any additional comments?

Appendix C

Survey for Students with ASD and Typically Developing Peers

Name:

1. Age 2. Grade

3. Rate how much you like Lunch Club (please circle):

1	2	3	4
I love it	*I like it*	*It is okay*	*I do not like it*

4. How much do you enjoy Lunc club (please circle):

1	2	3	4
I enjoy it	*I like it*	*It is okay*	*I do not like it*

5. How much fun do you have in Lunch club (please circle):

1	2	3	4
It is so much fun	*It is fun*	*It is a little fun*	*It is not fun*

6. Lunch club makes me feel_____

7. I made new friends since joining Lunch Club: Yes/ No

8. If yes, list the name of your new friends:

9. Suggestions to improve Lunch club?

Appendix D

Survey for Special Education Teachers

Number of years as special education teacher:_____

Please rate the simplicity of this social intervention

1	2	3	4
Extremely simple	Very simple	Somewhat simple	Very difficult

Please rate the overall easiness of this intervention

1	2	3	4
Extremely hard to implement	Somewhat hard to implement	Somewhat easy to implement	Extremely easy to implement

What is your opinion on these individualized lunch clubs?

Would you consider training your staff to implement these individualized lunch clubs? (yes/no)

Is there anything else you expected from the aide training?

Appendix E

PowerPoint Slides Used during the Training Workshop

-Hello, my name is Sunny Kim and I'm a graduate student at UCSB. The title of my workshop is: Training Paraprofessionals to Provide Social Opportunities for Children with ASD

-Before I begin, I want to acknowledge how difficult your job is but also how important your work is in terms of making a difference in the lives of children with special needs. Although I do not have experience being an aide, I do have experience working with difficult children and I've had my fair share of being spat at, hit at, kicked at, and you name it. Most importantly, I'm here today to be a source of resource for you. We are all working with children with special needs and we need to rely on each other and put our heads together in order to provide these children with the best educational experience. I'm not providing this workshop because I think I know everything, but I want to share with you what I know tends to work, especially with children with ASD. Also, I can learn from you guys. So, thank you so much for being here today and providing me with this opportunity to share with you guys what I know about working with children with ASD.

Introduction: Current Context of ASD

- Currently 1in 88 children are diagnosed with Autism Spectrum Disorder (ASD)
- More boys are affected than girls (4:1)
- Cause of ASD is unknown
- Early intervention = best prognosis
- Core symptoms of ASD include: deficits in social,communication, and behavior

Communication Difficulties

- Language delays
- Echolalia
- Abnormal prosody
  - Atypical rhythm, stress, intonation, and loudness
- Pronoun reversals
  - "She" for "He"
- Pragmatic impairments
  - "you want candy" instead of "I want candy"
- Semantic impairments
- Nonverbal

- Mention: Nonverbal children

Behavior Difficulties

- Repetitive and rigid behavior routines
  - Examples: spinning a car wheel continuously
- Self-stimulatory behavior
  - Examples: hand flapping, body rocking
- Self-injurious/Aggressive behavior
  - Examples: tantrums, hitting, biting

- Note on aggression and autism

Social Difficulties

- Limited responding to typical peers
- Limited comments, questions, requests
- Limited interaction in a social setting
- Reduced conversational reciprocity
- Unilateral friendships
- Limited social gestures (e.g., social smiles, eye contact, pointing, facing peer)

Purpose of this workshop

- Focus on social difficulties for students with ASD
- Learn motivational variables of PRT that can be implemented in the school environment
- Learn how to implement effective intervention to target socialization for students with ASD

Why Target Social Skills?

- Prevent secondary disorders such as depression, anxiety, feelings of loneliness, and suicidal thoughts
- Easier to target social skills when children with autism are younger

- Again, your job is very important as you can help prevent children with Autism from developing these horrible secondary disorders.

Pivotal Response Treatment

- Drs. Koegel considered founders of PRT
- Recognized as one of the strongest scientifically based practices for treatment of ASD
- PRT places importance on **motivation** and implementation in **natural environment**
- Targets pivotal areas in order to seek collateral gains in untargeted areas
- PRT focuses on positive reinforcement and does not encourage punishment

-Recognized as one of the strongest scientifically based practice for treatment of ASD: What does that mean? It means PRT is highly effective at improving symptoms of ASD

-This is important because we know that punishment is not as effective

Motivational Variables of PRT

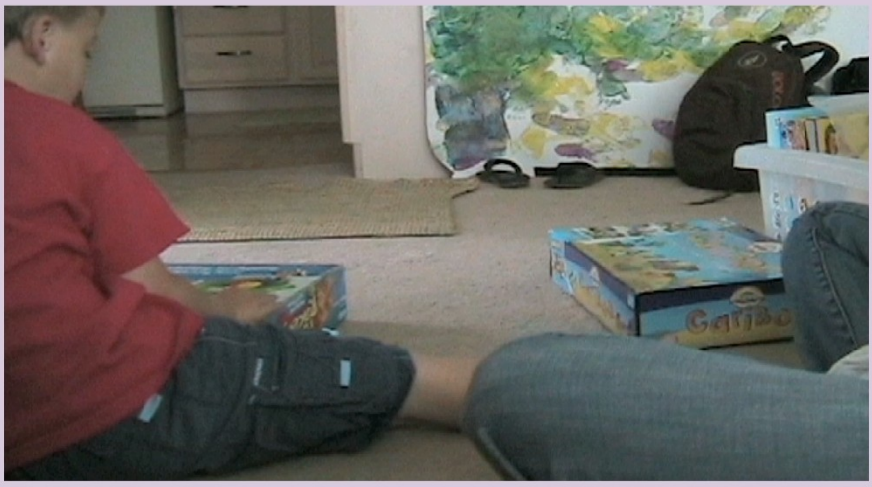
- Child Choice
- Reinforce Attempts
- Task Variation
- Natural Reinforcement
- Interspersal of Maintenance and Acquisition*

-Interspesal of maintenance and acquisition – brief mention

Child Choice

- Preferred activities chosen by the child
- Assess the child's interests prior to intervention
  - Need to consider that the child's interests may change
- We want to follow the child's lead
  - What is the child motivated by?
- If we cannot follow the child's lead,then provide the child with options within the activity/task
  - Ex: The child with autism wants to play with airplanes, but all his peers want to play tag. A solution would be to play airplane tag

Child Choice



-In the this clip, the target child chooses a game that is too difficult for him but the aide follows his lead and modifies the game

Social Choice

- Follow the child's lead **BUT** incorporate typically developing peers
  - Invite peers to play with the child
  - Redirect the child to invite peers to play
  - Prompt (ONLY WHEN NEEDED!)

-It is important that we encourage our kiddos to interact with typically developing kids…GIVE reasoning for this

Social Choice

-She notice that he is playing by himself so she redirects the child and invites typically developing peers to play…you'll see a follow--up later

Reinforce Attempts

- Reinforce all reasonable attempts by providing positive praise (e.g., great job sharing) when the child with autism is trying to socialize with his/her peers

Reinforce Attempts

-In the first clip, you'll notice that the target child is giving an object to his peer and the aide reinforces that behavior by providing him with a positive praise. Positive praise is especially important for this target child because he is highly motivated by attention from adults

Task Variation

- Varying the social task within the activity
  - Avoids boredom
  - Keeps the child interested and motivated

Task Variation

-In this clip, you will notice the social activities being varied. The target child plays a game with his peers first, but then decides to play tag.

- Also did you notice how the aide incorporated social choice by redirecting the child to tell his peers?

Natural Reinforcement

- Reinforcers are part of the social activity
- Child is intrinsically motivated by the reinforcer

Natural Reinforcement

-Clip 1--he asks his peers for popcorn and he gets naturally reinforced

-Child 2 wanted to play tag so he got naturally reinforced by being able to play tag with his peers …follow up clip from task variation clip…we have child choice, social choice, NR, as well as task variation

Cooperative Arrangement

- Set up the activity so that the child with autism and his peers rely on each other to complete the task

Cooperative Arrangements

-In both clips, you will notice that the game pieces are arranged in a way where peers need to ask each other

Integration

- How do we integrate these motivational variables of PRT into lunchtime activities in order to help improve socialization for students with ASD?

-We can implement lunch clubs

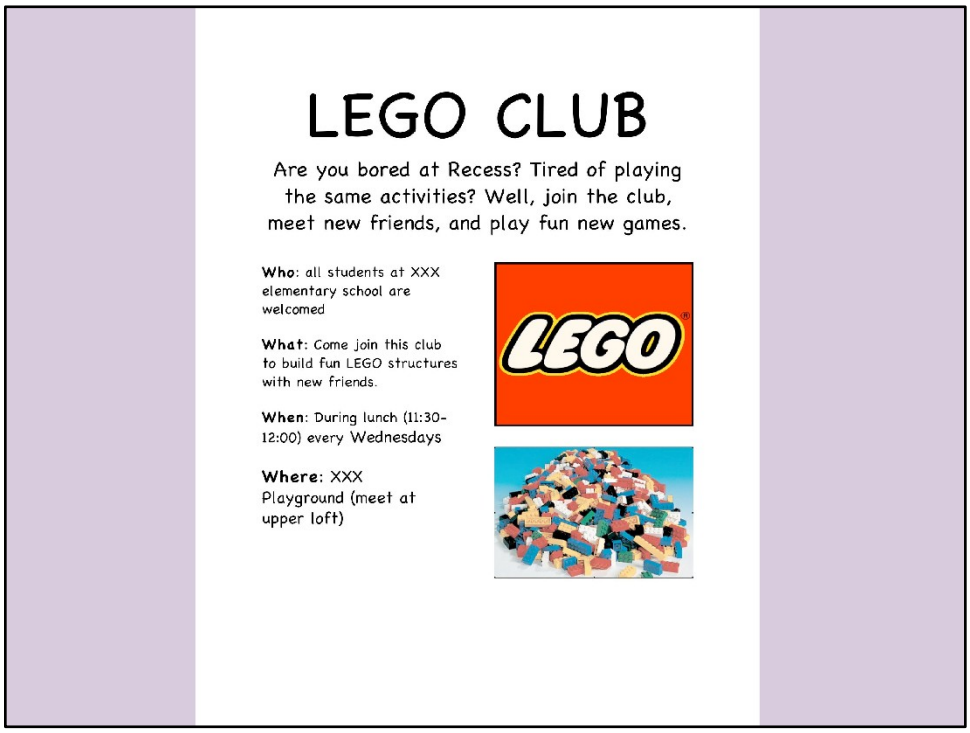
Lunch Clubs: Key Components

- Step 1: Child Choice
  - Assess what the child is good at
  - What does the child prefer to play during recess
- Step 2: Cooperative Arrangement
  - Set up the activity so that all club members rely on each other
- Step 3: Reinforce Attempts
  - Provide positive praise to BOTH the child with autism and typical peers
- Step 4: Natural Reinforcement
  - The child is getting naturally reinforced for being social while playing with his/her preferred activity

-Interspersal of maintenance and acquisition tasks and task variation opportunities (e.g., if the target child and peers want to play a different game) may come up in some social situations so its important to keep those in mind

Other Key Components

- The club activities needs to be mutually reinforcing for all students
  - If the child with autism likes doors, a door club would not be appropriate,but a Lego Club/ Architect Club where the child with autism get to designs a door would be appropriate
- Announce the clubs (e.g.,flyers) so that it is available to all students during recess
  - We don't want to single out the child with autism



-Here is an example of a club flyer we used to announce the LEGO Club

Other Things to Consider ...

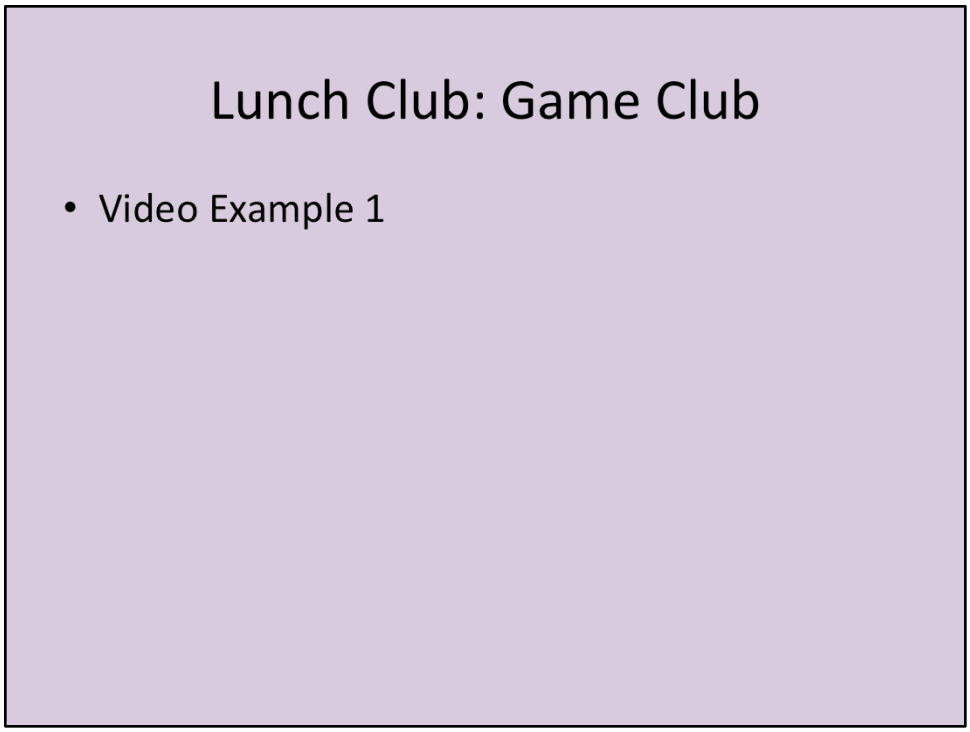
- Proximity to the child with autism
  - Standing right next to the child with autism or standing too far away from the child with autism
- Frequently prompting the child
  - The child becomes prompt dependent
- Telling other students that the club is designed for the a particular student because he has autism
- Being too involved in the activity
  - Students become dependent on you rather than each other

- Emphasis on Proximity!!!

Lunch Club Examples

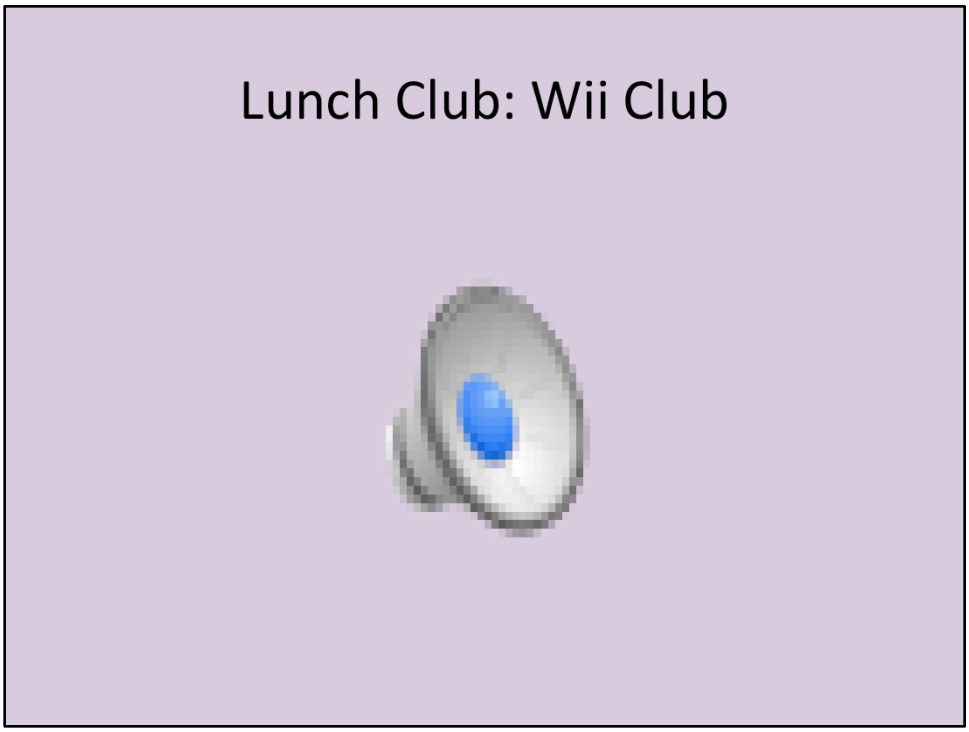
- You will now see a few examples of lunch clubs
  - What is the aide doing correctly?
  - What is the aide doing incorrectly?

-I'm not going to show you perfect lunch club clips because there is always room for improvement…



- Think about proximity, cooperative arrangements, and incorporation of child preferred interests

-What did the aide do correctly?
-Improvements?



-The target goal for Nancy (child with autism) is for her to appropriately interact with her peers. Prior to Wii Club, Nancy would sit alone and stare off into space.

-The aide did a wonderful job of following the child's lead but could have done a better job with cooperative arrangement. How could we set this up so that it better?

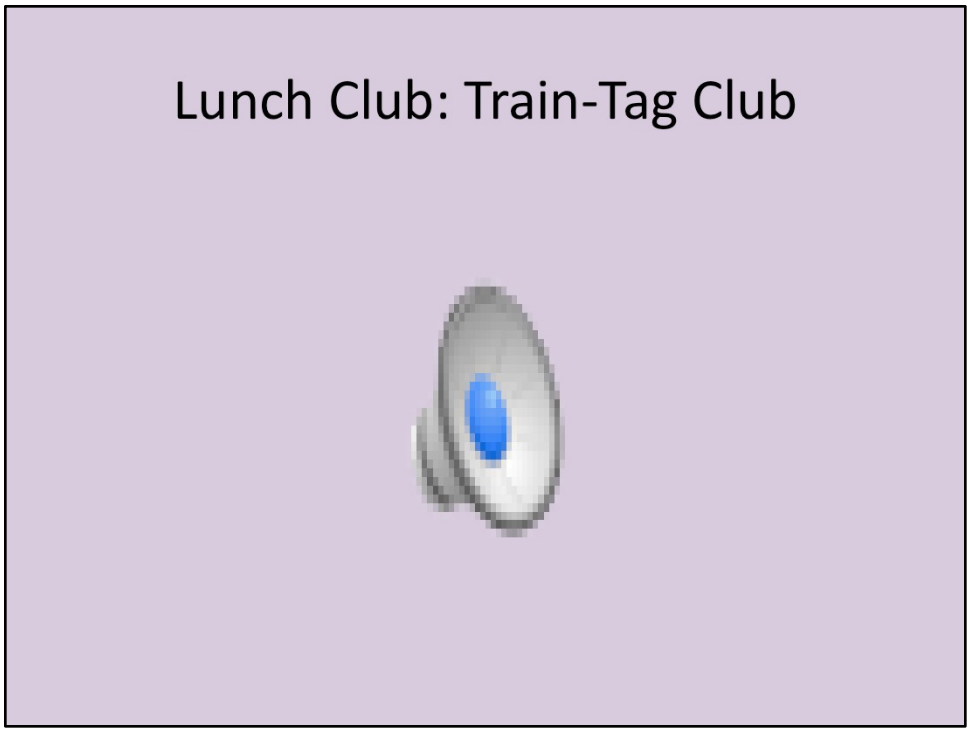
-Do you work with any kids like Nancy?

-This is another clip of Mike. His interests have changed over the course of the school year.

-In this clip, the aide does not have cooperative arrangement set up, and is not facilitating social interaction. The aide, however did a nice job of following the child's lead and is reinforcing attempts but not social attempt.

-What would you do differently? How can we set this up so that the children are interacting with each other?

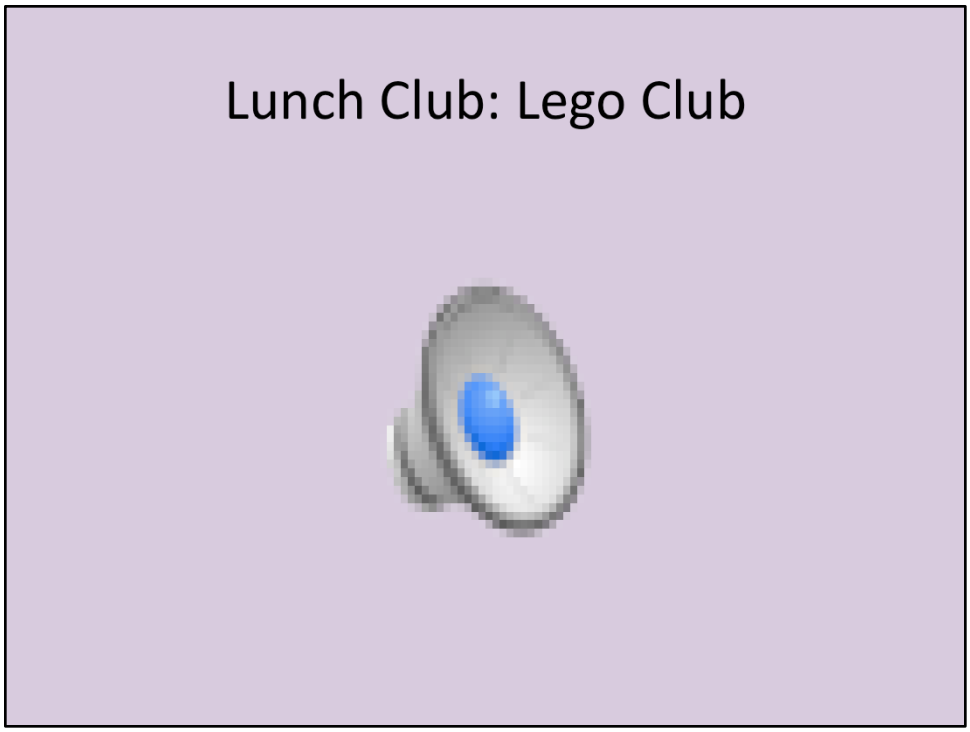
- Would this work with your kid?



-The target child, Billy, is obsessed with trains. He would only talk about trains and could not socialize with his peers. Therefore, we wanted to figure out a way to incorporate trains so that he can socialize with his peers. We did this by having Billy play train tag with his peers. Every student got a random train card. They had to run around and trade train cards with each other.

-In this clip, the aide is doing a great job facilitating social interaction. He is also reinforcing social attempts not only to Billy but other peers. Does his have cooperative arrangement set up?

-Would this type of club work with your child?



-In this clip, the aide did a great job seeking up cooperative arrangement and following the child's lead. Also, the aide did a great job of redirecting the typical peer to show his friends his Lego creation. Did you guys notice anything? How could you make this lunch club even better?

-Would this work with your child?

What About Nonverbal Kids?

- Lunch club can work with nonverbal students
- Follow the same steps
  - Child choice
  - Cooperative arrangement
  - Reinforce attempts
  - Natural reinforcement
- Picture Exchange System
  - Provide pictures of game/material pieces to the nonverbal student, and have him/her exchange the picture for the actual item with his peers

-For example, if the nonverbal student with autism chose Legos because that is what he really likes to play with, then have pictures of different Lego colors and give these picture cards to the student. The student would then exchange the picture card for the actual Lego piece with his/her typically developing peers. You might also want to teach him and do a few practice rounds.

Group Activity

- Break into small groups and assess the student with ASD's preferred interests
- What would be an appropriate lunch club for the student in the vignette?
- How can we incorporate the PRT components into the lunch club?

Vignettes

- Student 1: Tony
  - Tony is a 10 year-old boy in the 5th grade diagnosed with ASD. Academically he is above grade level but he has difficulties socializing with his peers. Because he has difficulties interacting with his peers, he often gets aggressive with his peers. As a result, his one-on-one aide stands in close peers proximity to Tony which limits his social interactions with his peers. When he is not interacting with his peers, he is always talking about airplanes and toilets.
- Student 2: Jennifer
  - Jennifer is a 5 year-old girl diagnosed with ASD. She is still learning how to communicate and her primary mode of communication is through PECS. When Jennifer is talking, she is echoing lines from her favorite television show, SpongeBob. Jennifer is often socially isolated from her and she is always playing with her SpongeBob doll. She is not aggressive with her peers.

Vignettes continued ...

- Student 3: Julian
  - Julian is a 7-year old boy in the 15[1] grade diagnosed with ASD. Academically and cognitively, he is one year below grade level. He is often observed walking alone along the perimeters of the school playground. He is never seen interacting with his peers. When his one-on-one aide asks him what he is doing during recess, he says he is pretending to be a subway or a train. When asked to play with his peers, he avoids the situation by making up some excuse (e.g., my stomach hurts).
- Student 4: Susie
  - Susie is an 14 year old girl entering high school diagnosed with ASD. Academically and cognitively she is at grade level. Susie is motivated to make friends but often makes inappropriate statements in order to get her peers' attention. When she is talking to her peers, she only talks about her favorite show, Simpsons. As a result, her peers try to avoid her.

Appendix F

Example of a Sign-Up Sheet Made by One of the Paraprofessionals