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Increasing the Social Interaction of Two Children with Autism Spectrum Disorder and Their Peers

Abstract

This study examined the effect of the Group Affection Activities (GAA) on social interaction of two preschool- aged children with Autism Spectrum Disorder (ASD) and their same-aged peers. In addition to the music group activities, the main component of the GAA game learning activities and peer-training were integrated into the intervention. Five peers were trained on how to interact with the target participants of the study. This including initiation of and responding to initiations through means of both verbal and nonverbal communication acts during free play. This study utilized a case study design with an ABAB model revealed that improved rates of social interactions were associated with the presence of the intervention. The findings agree with those reported by previously conducted studies, however the maintenance and generalization of improved interaction skills remain to be of a great concern. It is suggested that in order to address this important issue, an intervention program combining the Group Affection Activities with peer-training should be systematically integrated into early childhood curriculum and implemented for all to benefit.

Keywords: Social interaction; Group affection activities; Autism Spectrum Disorder; Peer-training.

Introduction

As one of the greatest challenges of Autism Spectrum Disorder (ASD), the varied degrees of social communicative competencies of children on the spectrum has been studied extensively (Bellini, Peters, Benner, & Hopf, 2007; Goldstein, Kaczmarek, Pennington & Shafer, 1992; Mathews, Vatland, Lugo, Koenig & Gilroy, 2018; McEvoy, et al., 1988; Prendeville, Prelock & Unwin, 2006). Due to the lack of or limited communication and social skills, children with ASD have difficulty initiating, responding to, and maintaining relationships with their typically developing peers as demonstrated in their play behaviors (Prendeville, et al., 2006). Observing the play behaviors of children with ASD provides clues

regarding their social communicative skills; as characterized by great challenges during symbolic and social play development (Wolfberg, DeWitt, Young, & Nguyen, 2014). As valuable as these play experiences with their peers. Children with ASD are at great risk of being excluded by their peers due to their lack of social interaction skills.

Westby (1991) noted that a child's play behavior provides a window into how a child perceives the social world. Social play requires children at various degrees of social competencies to communicate their intentions in a way that is understood by others so that interaction begin. Additionally, play requires a child to communicate and negotiate meanings and roles, settings, and adjust their behaviors according to these interactions (Westby, 1991).

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Children play in different ways based on how and with whom they play. All children engage in various types of play behaviors at different settings and times. As stated by Wolfberg et al. (2015), when children play by themselves, it is referred to as isolate play whereas when they are watching from distance called onlooker-orientation. Another type of play happens when two children engage in different activities adjacent to each other. This is called parallel-proximity play (Wolfberg et al., 2015). During parallel play, children generally do not try to influence other's play but may show interest in what others are doing. Social or interactive play, known as common focus play can be observed when two children play with each other and are engaged in "reciprocal" or "back and forth" play (McEvoy, 1985; Wolfberg et al., 2015). Common goal/ cooperative play exists when two children are engaged and collaborate with a common purpose (Wolfberg et al., 2015, p.831).

As previous research identified diverse social-partners have been employed to interact with children with ASD including teachers, psychologists, parents, siblings and typically developing peers at various settings (McConnell, 2002; Radley, Jenson, Clark and O'Neil, 2014; Rogers, 2000). The type of the social- partner, adult vs. peer also reported to be a critical variable to consider in examining the effect of the interventions. Although children with ASD reported to be responsive to interventions geared toward increasing their engagement with both adults and peers, the use of adults as partners in social interaction reported to be not easily generalized to peer partners which makes involving peers in interventions critical (Roger, 2000, p.401).

Increased understanding of (1) social communicative characteristics and needs of children with ASD (2) the importance of teaching these skills in natural settings where opportunities for incidental teaching/learning and meaningful interactions with peers are present puts a greater value on including typically developing peers in social interaction interventions (Radley, McHugh, Taber, Battaglia, & Ford, 2017). Another important factor that makes the inclusion of peers vital is the fact that has been a dramatic increase in both the number of children being diagnosed with ASD and those included in regular education settings. If not addressed, the lack of social communicative skills may ultimately lead to

increased maladaptive behaviors, which impede a child's overall well-being including having positive educational experiences, as well as healthy social/emotional development such as building positive peer relationships, nurturing and maintaining a sense of belonging.

Studies in the field included a range of interventions targeted to improve the social interaction between children with ASD and their peers (DiSalvo & Oswald, 2002; Matson et al., 2007; Prendeville et al., 2006; Sivaraman & Fahmie, 2018). To a great extent, these studies have been examined for their effectiveness (Bellini et. al., 2007; DiSalvo & Oswald, 2002; McConnell, 2002; Rogers, 2000) and were reported to be impacted by a number of various factors. These factors include the type of activities used (McEvoy & Odom, 1987, Radley et al., 2017); the interaction with a specific peer and the number of peers included (Belchic & Harris, 1994); the setting (Honig & McCarron, 1988; Radley et al., 2017); and the types and combination of strategies utilized (Radley et al., 2017).

Among many interventions including peers, peer-mediated interventions are reported to be effectively employed in increasing the social interaction of children on the autism spectrum with their typically developing peers (DiSalvo & Oswald, 2002; Mathews, et al., 2018) in inclusive education settings (Goldstein, et al., 1992; Rogers, 2000). These interventions included peers as social- partners with diverse roles assigned across studies, and peer-training as the main component of the intervention (Mathews, et al., 2018). The variations reported in the planning and the implementation of peer-training including type, duration, skills taught, the nature of assigned roles, expectations of and from the peers make this component the most critical variable that directly impacts the outcome of the intervention. For instance, in some studies, peers were taught to initiate a social interaction and/or were taught to respond to a social communicative initiation of a child with ASD whose initiation might have been prompted by another person (Rogers, 2000, p.399). Peer-training programs are also reported to include diverse types of modeling and reinforcement strategies (Matson et al., 2007). Although, generally they are reported to have positive outcomes, the maintenance of the improved social interaction skills and the generalization of these

skills to diverse social- partners (DiSalvo & Oswald, 2002), and to additional settings remain a common concern (Mathews et al., 2018).

Planning and implementation of social interaction interventions that employ peer-mediated approaches including peer training in early childhood settings require intentionally planned activities that align with the context, more specifically engaging, fun and inclusive in nature. The Group Affection Activities (GAA) used by Twardosz, Nordquist, Simon and Botkin (1983) were intrinsically reinforcing by engaging both children with autism and their peers and were also easy to integrate into the classroom activities (as cited in McEvoy et al., 1988, p.193). Another intervention model as suggested by Wolfberg et al. is the Integrated Play Group (IPG) that integrated peer-training as well interactive activities during play (2015). The IPG model promotes social communication, reciprocity and relationships through symbolic play (Wolfberg, 2015). In addition to improved social communicative skills, IPG aims to promote social-emotional gains such as awareness of diversity, knowledge of and acceptance of individual characteristics and differences as well as empathy toward others (Wolfberg et al. 2015, p.831).

Twardosz et al., (1983) utilized the GAA to increase the peer interaction of 3 preschool-aged children who had developmental delays. The implementation of the GAA included discussions on the importance of friendships as well as showing affection and included preschool games and songs which were fun and engaging. Researchers reported that participants of the study who were previously isolated, during the intervention participated in activities and interacted with their peers during free play. Twardosz et al., (1983) asserted that the GAA provided the participants with opportunities to interact with their peers during pleasurable experiences, which in turn may have contributed to the development of new skills through facilitation during free play.

McEvoy et al. (1988) systematically replicated the Twardosz et al., (1983) study, assessing the effectiveness of the GAA on promoting and increasing the social interaction of 3 children with autism with their typically developing peers in a kindergarten setting. The McEvoy et al. (1988) study did not have the same emphasis on “discus-

sions about friendship and showing affection” at the degree that was used in the original study. They expanded on Twardosz et al., (1983) implementation of the GAA by utilizing the intervention to children with more severe disabilities, and by including more comprehensive measures of peer - interaction including the type, duration and the nature of interactions. McEvoy et al. focused on increasing the reciprocal peer interaction of children with autism (1988). The GAA included playing games and singing songs such as “If you are happy and you know it” and “Duck-duck-geese”. During these activities, participants were asked to show affection through following verbal prompts such as “hug a friend, give a high-five, and pat your friend on the back”. Data was collected for any unprompted verbal/nonverbal contact that lasted at least for 3 seconds. Researchers reported that the GAA were effective in increasing the peer interaction of the 3 participants with autism and their typically developing peers during free play, however this impact of student interaction was not present when similar activities without the affection component were used (McEvoy et al., 1988).

Considering that limited and inadequate social communicative skills of children with ASD have a lasting impact on all aspects of their lives, and the importance of early intervention, this study aimed to investigate the effectiveness of GAA on increasing the social interactions of 2 children with ASD and their peers. The implemented GAA incorporated game learning activities and peer-training into the intervention program. The current study was a systematic replication and extension of the studies by Twardosz et al. (1983) and McEvoy et al. (1988).

Method

Participants

The participants of this study were 7 preschool-aged children enrolled in a half day intervention program that was conducted 5 days a week at a Speech and Hearing Foundation. They were receiving speech and language services provided by a speech language pathologist acting as their classroom teacher. Out of the seven children, two children, Mike and Ward who were diagnosed with ASD were identified as target participants while the other 5 chil-

dren were included in the peer-training program as social-partners.

Mike, 4 years 11 months old, had a normal, healthy appearance but exhibited significantly limited social communicative skills. More specifically, his speech was limited with single words, used echolalic speech and had limited vocabulary. Mike exhibited neither an interest nor an attempt to engage with his peers. As reported by his teacher and the researcher, he demonstrated strong dislike for physical proximity with others, which is a crucial component for successful social interactions during play. He rarely showed interest to play with toys and lacked the ability to use materials appropriately without teacher prompting. Mike followed one-step instructions with adult verbal or physical prompts as needed. His teacher stated that, Mike reacted to minor changes in the environment with extreme distress. He had some repetitive body movements such as arm-waving and displayed poor eye-contact. Mike was able to read and write but was not, yet toilet trained. Mike's Test of Early Reading Ability score fell in the 94th percentile for his age. His recognition of sight words was at the first-grade level.

The second target participant of the study, Ward, 4 years 11 months old, also had the diagnosis of ASD and demonstrated similar characteristics that were exhibited by Mike. However, Ward's social communication was more severely impacted by his speech production and the lack of social skills. In addition, Ward's speech was less intelligible, and used fewer vocabulary than Mike. He demonstrated no interest to engage with his peers and required both verbal and physical prompts to participate in activities. While he could read and write some sentences and complete basic mathematical processes, he was also not toilet trained. Ward's word recognition was at second grade level. Ward exhibited severe signs of distress at times, signs of over stimulation, and difficulties communicating his frustration. He had meltdowns that lasted up to 20 minutes at times for no apparent reasons. Yes, Mike and Ward had a diagnosis ASD. Unfortunately, their scores on the Autism scale were not available to me.

Mike and Ward's peers were 5 male classmates also receiving speech and language services in the same classroom. Two of them had speech production (articula-

tion) difficulties and language delays, while the other three had only language delays. They ranged in age from 3 years 11 months to 5 years (mean being 4 years 6 months). Even though the targeted peers had speech production and language delays, none were at a degree that impacted either their social engagement or interest to play with others. The researcher observed the targeted peers initiating interactions, requesting and sharing toys, playing in a close proximity, and showing interest to participate in the group activities. A group of 6 children who were also receiving speech and language services at the Speech and Language Foundation shared the playground daily at the same time period, during free play. This group of untrained-peers' initiations and/or responses to initiations by Mike or Ward were also recorded as interactions (N=6).

Setting

For the purpose of this study, all participants were observed for their interaction, and the intervention implemented in either the classroom where all daily activities were conducted by the same teacher at the Speech and Hearing Foundation, or at the playground where free play took place. Group Affection Activities including game-learning activities, peer-training and musical group activities were conducted in the classroom. On sunny days, free play took place following the musical activities in the playground on sunny days or in the classroom during inclement weather. The classroom teacher was a speech language pathologist and was assisted by an instructional assistant at all times.

Experimental Design

Observation and data collection.

Prior to the baseline data collection, the researcher conducted an interview with the classroom teacher, and for two weeks, observed all participants focusing on their social interactions during play in both the classroom and playground. During this period, all participants were engaged in activities as part of their curriculum. No attempts were made to encourage them to engage or facilitate any social interaction during activities.

In this study, a case study design employing an ABAB model was used. As stated by Alnahdi (2015) through introducing and withdrawing the intervention, this de-

sign provides the means for the effectiveness of the intervention to be assessed reliably (p. 260). Participants were observed, and data was collected during both baselines and interventions during free play. Interaction behaviors of the participants were observed, and data was collected for baseline (1) for 8 days; intervention (1) for 9 days; baseline (2) for 3 days and intervention (2) for 4 days. The intervention program included the following components that were implemented daily for the periods noted: game learning activities were 15 minutes in length and were conducted for 15 minutes first 3 days of the implementation; musical group game sessions were 15 minutes in length; and peer-training sessions were 15 minutes in length. For the baseline phase(s) of the study, the intervention program was removed, and data collected during free play.

As part of the data collection, observed behaviors were scored as either (+) or (-) as defined by McEvoy et al. (1985). Sharing, organizing a play, assisting, receiving a share or assistance from another participant, speaking to or touching another participant as a nonverbal initiation act for interaction behaviors were scored as a plus (+). On the other hand, behaviors such as playing by himself, sitting with his back turned to his peers, observing other's behaviors and talking to himself were marked as a minus (-). Any social engagements with untrained peers were scored as a plus (+) (McEvoy et al., 1985).

Procedures

Baseline.

Baseline observation and data collection of social interactions between targeted participants and their same-aged peers were obtained daily at the same time, during free play at the playground. Data was recorded by the researcher using score sheets and a timer. Participants were not provided with any types of prompts including verbal encouragement to play together. The baseline (1) data was collected for 8 days, while baseline (2) data was collected for 3 days. Mike was absent on the 3rd day of the baseline (2) data collection.

Interobserver agreement.

Prior to data collection, the researcher and the teacher met and reviewed the interaction behaviors which were specifically defined and the descriptive criteria of scoring.

Both the researcher and the classroom teacher had similar advanced education and training in speech and language pathology. Therefore, they had a common understanding of the interactive behaviors from the social and communication perspective. They independently observed and recorded the data for the duration of each 10-minute session.

Inter-observer reliability is the consistency of data collection reports among independent observers. The coefficient of reliability is determined by the formula of dividing the number of agreements and multiplying by 100 (Alberto & Troutman, 1990). Each observation session was divided into 40 intervals. A partial interval recording system was utilized in which 10 seconds were taken to observe and five seconds to score utilizing a timer. Interobserver agreement counted for 62% of baseline (1) and 25% of intervention (1). Interobserver agreement for Mike during baseline (1) was 95%, and for intervention (1) determined to be 100%. For baseline (2), inter-observer agreement was 100% for both Mike and Ward. For Ward the agreement during baseline (1) and intervention (1) was 100%. Interobserver agreement was calculated for baseline (1-2) and intervention (1) using the same formula.

Intervention

During the implementation of the intervention, the researcher was assisted by a speech and language pathologist who was assigned as the classroom teacher. This study implemented the Group Affection Activities consisted of game learning activities, peer-training and musical group activities. These activities were planned and implemented in sequence to provide participants with ample opportunities for interaction and engagement. Activities were intentionally sequenced so that the newly introduced behavior would be reinforced and independently imitated/practiced with no time delay during free play. The GAA were utilized for the duration of 9 days for Intervention (1) and 4 days for Intervention (2) phases. Three days of structured game learning activities were implemented during first 3 days of the Intervention (1). The musical group activities were implemented during both Intervention (1) and (2) in a less structured manner right before the free play period.

Game learning activities.

Game learning activities were implemented for the first 3 days of the intervention, 15 minutes a day, prior to free play period. Game learning activities were planned and implemented by the researcher. During these activities, participants were provided with both verbal instructions and demonstrations on how to play together and also opportunities to practice the modelled behaviors. For example, all participants were instructed on how to play a ball game during which all participants were actively included. In this particular game, they were required to call each other's name prior to tossing the ball into the air for that participant to catch the ball. Through this game, social communicative skills such as name calling, eye contact, body positioning and proximity, responding, and requesting were taught, modelled and reinforced in a context of fun and engaging play.

Peer training.

During peer-training, 5 classmates of Mike and Ward were trained for 15 minutes a day on how to interact with Mike and Ward who were diagnosed with ASD. The purpose of the peer-training was to inform the peers on how to interact with others and to empower them to be able to show others how to engage in interaction "as little leaders" (McEvoy et al., 1985). Peer-training included teaching verbal and nonverbal acts of social initiation of interaction during play, adult modeling of initiations of interactions during play, and responding to any initiated interactions by targeted participants and encouraging them to participate in play. More specifically, any act toward a peer with an intent of social interaction such as touching, holding hands, asking for a toy or sharing, requesting attention, showing intent to engage were among desired target behaviors. During the training, the researcher utilized both verbal and physical prompting, modeling, role play with feedback and praising strategies. The training activity was conducted during a time period in the classroom when Mike and Ward were scheduled to participate in an activity in another classroom.

Musical group games.

The musical group games component of the intervention was implemented for 9 days during Intervention (1) and 4 days during Intervention (2) which also lasted 15

minutes a day. Two musical games were implemented by the classroom teacher including all participants of the study. These games were "Duck-duck-goose" and "London Bridge" as referenced by McEvoy et al. (1985). The song of six little ducks was played and sung during the "duck-duck-goose" game, and the "London Bridge" game was played by singing the song as well.

The desired social interactive behavior was defined as a verbal or nonverbal initiation or response to an initiation of an interaction by others. Even though, the participants were taught to initiate through use of verbal and nonverbal prompts, during the observation of the interactions among Mike, Ward and their peers, initiations and responses were not differentiated, and were not specifically recorded in this study. Verbal prompt is simply an instruction to the child telling him/her what to do (McEvoy et al., 1988). As appropriate in the context of play, prompts such as "it's your turn", "call Mike", "hold his hand" were also provided by the teacher. Reinforcement of the targeted social interactive behaviors was also another important component of the program. Social reinforcement such as verbal praise ("you did it" and "I am proud of you") and physical contact ("high five", "pats on the back" and "hug") were provided right after expected behaviors occurred. In addition to verbal prompts, modelling and physical prompts as means of demonstrating the appropriate way to initiate were employed. For participants who needed more support than modeling, physical guiding was provided by verbally explaining and physically assisting them through the appropriate behavior (McEvoy et al., 1988).

Free Play.

During free play period, the social interaction behaviors of Mike, Ward and their trained-peers were observed for 10 minutes and recorded as either a plus (+) or minus (-). In order to control any possible impact of an external factor, the participants had access only to balls to play with and the playground equipment. In addition to trained-peers, the presence of untrained-peers who shared the playground during free play provided Mike and Ward with additional opportunities to interact with others.

Results

Mike and Ward's social interactions with their peers were the primary dependent variable included in this study. Mike and Ward's number of interactions with their peers (trained- and untrained peers) during free play for the baseline (1-2), and

intervention (1-2) are presented in Table 1. Both target participants of the study, Mike and Ward interacted more often with their peers during free play for intervention when the GAA (game learning activities, peer-training and musical group activities) were implemented than baseline when intervention was removed.

Table 1.
The Number of Interactions Mike and Ward had with their peers during free play

Participants	Phases of the Study				Total
	Baseline1 Expected-1	Intervention1 Observed-1	Baseline2 Expected-2	Intervention2 Observed-2	
Mike	15	78	5	24	122
Ward	0	31	2	7	40

In addition to Mike and Ward's interactions with trained-peers, Table 2 also shows the number of interactions Mike and Ward had with their untrained- peers during free play. Out of a total of 13 days of Intervention (1-2), Mike and Ward interacted with

their untrained-peers only on 3 days during free play. Ward had a total of 5 interactions as he interacted on 2 separate days, while Mike had 4 interactions on the 8th day of the Intervention (1).

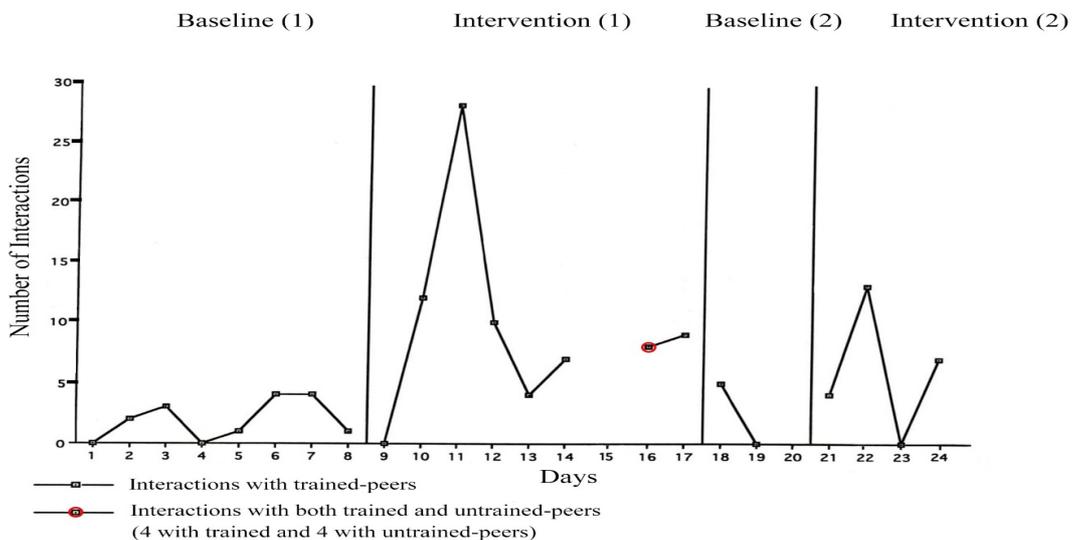
Table 2.
The Number of Interactions between Mike and Ward, and their Untrained-Peers

Intervention (1)	Targeted Participants	
	Mike	Ward
Days	Number of Interactions	
Day 2	---	3
Day 8	4	---
Day 9	---	2

Social interaction data of the targeted participants are presented in Figures 1 and 2. Figure 1 illustrates the frequency of the

social interactions between Mike and his peers during free play. Mike's scores ranged from 0 to 28.

Figure 1.
The number of peer interactions Mike had during free play for baselines and interventions.

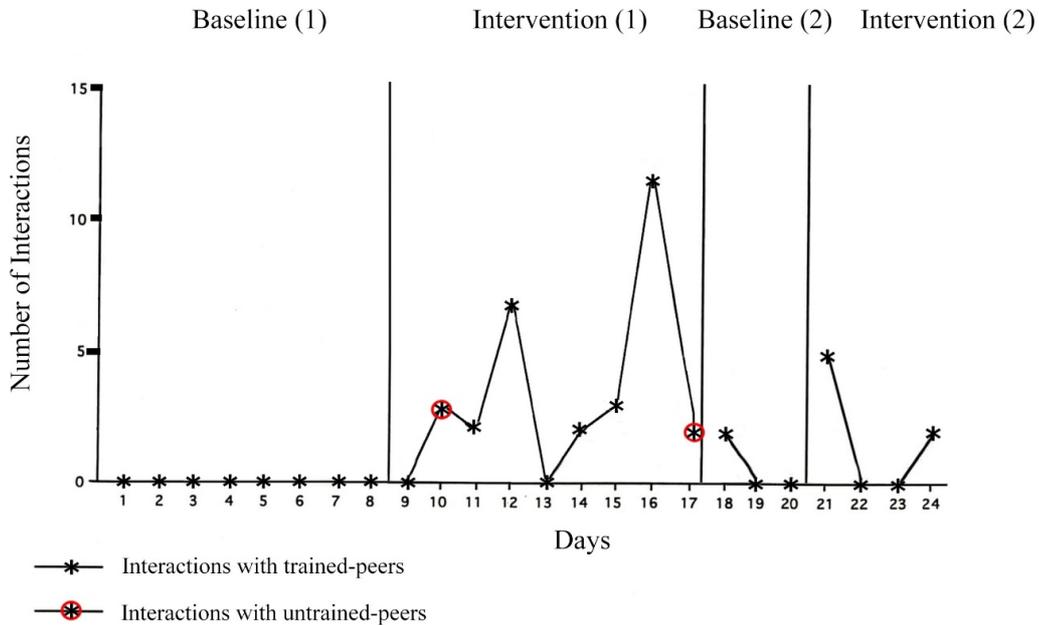


Ward's frequency of social interactions with his peers during free play is illustrated in

Figure 2. Ward's scores ranged from 0 to 12.

Figure 2.

The number of peer interactions Ward had during free play for baselines and interventions.



A Chi-square test of independence was performed to examine possible differences between the expected and observed data collected for the baseline and intervention phases on Mike and Ward's social interactions with their peers during free play. The test was performed for both within and across subjects to determine whether or not any difference in observed social interaction was at a significant level. Initially, within subject analysis was conducted including Mike's A1-B1 and A2-B2, and Ward's A1-B1 and A2-B2 expected and observed interaction data (see Table 3 and Table 4). For the purpose of determining whether or

not the observed and expected data across participants was significantly different, the data was analyzed for A1-B1 and A2-B2 phases (See Table 5 and Table 6). The data was presented in both contingency and calculated expected frequency tables. An alpha level of .05 was used for all statistical tests.

The results of the Chi-square analysis are presented below. As seen in Table 3 and 4 the difference between Mike's expected (baseline) and observed (intervention) interactions was not significant at alpha .05, $\chi^2(1, N = 122) = 0.200, p < .05$.

Table 3.

A 2 x 2 contingency table illustrating the frequencies of Mike's expected and observed social interactions with peers during free play for baseline and intervention phases

	Observed (Intervention)	Expected (Baseline)	
1	78	15	93
2	24	5	29
	102	20	122

Table 4.

A 2 x 2 contingency table illustrating the calculated expected frequencies of Mike's social interactions with peers during free play for baseline and intervention phases

	Observed (Intervention)	Expected (Baseline)
1	77.8	15.2
2	24.2	4.75

(Chi-square = 0.200 E-01, df = 1, $p = 0.888$)

Table 5 and 6 presents Ward's data included in the analysis. The analysis revealed a significant difference between observed and expected values at alpha

0.05 $X^2(1, N= 40) = 7.25, p < .05$. This difference was significant even at alpha .01 level, $p < .01$.

Table 5

A 2 x 2 contingency table illustrating the frequencies of Ward's expected and observed social interactions with peers during free play for baseline and intervention phases.

	Observed (Intervention)	Expected (Baseline)	
1	31	0	31
2	7	2	9
	38	2	40

Table 6.

A 2 x 2 contingency table illustrating the calculated expected frequencies of Ward's social interactions with peers during free play for baseline and intervention phases.

	Observed (Intervention)	Expected (Baseline)
1	29.4	1.55
2	8.55	0.450

(Chi-square = 7.25 E-01, df = 1, $p = 0.007$)

The data across participants was analyzed independently for the first (B1 & I1) and the second phases (B2 & I2) of the study. There was a difference on measured variables across participants. The difference between Mike and Ward's expected

and observed number of interactions with their peers for baseline -1 and intervention -1 phase was significant at alpha .05 level, $X^2(1, N=124) = 5.69, p < .05$ (See Table 7 & 8). This difference was significant even at alpha .01 level, $p < .01$.

Table 7.

A 2 x 2 contingency table illustrating both Mike and Ward's frequency of expected and observed social interactions with peers for baseline-1 and intervention-1 phases.

	Observed (Intervention1)	Expected (Baseline1)	
Mike	78	15	93
Ward	31	0	31
	109	15	124

Table 8.

A 2 x 2 contingency table illustrating both Mike and Ward's calculated expected frequencies of social interactions with peers for baseline-1 and intervention-1 phases.

	Observed (Intervention1)	Expected (Baseline1)
Mike	81.8	11.2
Ward	27.2	3.75

(Chi-square = 5.69, df = 1, $p = 0.017$)

As seen in Table 9 and 10, there was no significant difference across participants on measured variables for baseline-2

and intervention-2 phase $\chi^2(1, N = 38) = 0.113, p > .05$.

Table. 9.

A 2 x 2 contingency table illustrating both Mike and Ward's frequency of expected and observed social interactions with peers for baseline-2 and intervention-2 phase.

	Observed (Intervention2)	Expected (Baseline2)	
Mike	24	5	29
Ward	7	2	9
	31	7	38

Table. 10.

A 2 x 2 contingency table illustrating both Mike and Ward's calculated expected frequencies of social interactions with peers for baseline-2 and intervention-2 phase

	Observed (Intervention2)	Expected (Baseline2)
Mike	23.7	5.34
Ward	7.34	1.66

(Chi-square = 0.113, df = 1, $p = 0.736$)

The baseline interaction data for Mike and Ward was consistent with the descriptive characteristics observed by the researcher prior to the baseline data collection. This data was reflective of the limited social communicative interactions Mike had with his peers, as well as more severe social communicative limitations - almost no interactions Ward demonstrated. As demonstrated in Figure 1 and 2, the increase in the Mike and Ward's interactions with their trained- and untrained- peers followed a similar pattern.

Results of this study supported the findings of the study by McEvoy et al. (1988) findings that the GAA are effective in providing opportunities for children to interact which lead to increased social interaction of children with ASD and their same-aged peers.

Discussion

The results of this study provide strong evidence that the Group Affection Activities, in addition to game learning activities and peer-training were effective in increasing the social interaction of two participants with ASD and their -trained and untrained-peers. The results of this study supported previous studies by Kamps, Leonard, Vernon, Dugan, Delquadri, Gershon, Wade, and Folk (1992), McEvoy et al., (1988) and Twardosz et al., (1983) illustrating that social interaction can be increased through

shared group affection activities. Stain et al. (1985) reported that through implementing programs embedding peer-training into the intervention, participants' peer interactions were significantly increased.

This study systematically replicated the study by McEvoy et al. (1988) and modified the intervention to maximize its effectiveness in order to increase the interaction of 2 preschool-aged children with ASD and their same-aged peers. More specifically, the GAA was modified with the addition of game learning activities that employed through the use of direct instruction strategies in a structured manner. These game learning activities were implemented for the first 3 days of the intervention and prior to the musical game activities. In addition to the GAA, the impact of the game learning activities is believed to have contributed to the increased social interactions during free play.

The observed increase in interactions among peers were reported to be results of interventions that (1) employed group activities that were engaging, (2) provided opportunities to interact, and (3) utilized strategies involving peer training, facilitation of language, modelling and reinforcement, therefore there is no question that these types of interventions are effective. Although other studies reflect variations in regard to procedures and behaviors observed, there are more similarities with respect to the settings and the type of activi-

ties observed. Despite these differences, these studies provide sufficient evidence on the characteristics required for an intervention program to be effective.

Although the targeted participants were similar to those included in the study by McEvoy et al. (1988), this study included targeted -peers who were not typically developing and instead exhibited speech and language delays. With these differences in mind, researcher suggests that the results obtained were encouraging and hold promise regarding the inclusion and training of peers with mild social communicative difficulties to act as social-partners to their peers with more severe social communicative competencies.

For baseline (2), the first day interaction data suggested a carry -on effect from the intervention (1) which dropped to no interaction on the second day as the intervention was removed. The interaction during intervention (2) followed somewhat a similar inconsistent number of interactions. These variations in Mike and Ward's interactions might be due to the fact that children with ASD exhibit inconsistent and varied degrees of interaction in social context. However, it is also important to note that the decreased or lack of interaction by Mike and Ward on the same day might be due to an external variable. This consistent pattern across participants including the absence of social interaction should be examined and any possible external variable should be controlled for.

It is important that the data for baseline 2 and intervention 2 is interpreted cautiously due to fewer days of baseline observation and intervention being implemented than the previous phases. The overall data regarding Mike and Ward's interactions with their trained as well as untrained-peers viewed as being inconsistent within the subjects, however consistent across subjects. During the intervention 1 and 2 the participants' interactions increased while on other days dropped or did not exist. The researcher does not have a clear explanation for this consistency across subjects regarding the variation; unless the intensity of the intervention might have created the peak points for both subjects at the mid-point of the intervention 1. It is unknown whether or not the similar pattern on interactions would have been observed if the intervention 2 was implemented for 9 days but not 4.

Likewise, patterns of persistence observed in interactions of both Mike and Ward during free play were consistent with those have been reported in previous studies, however the researcher shares the same concern of maintenance of these interactions after the removal of the intervention. In addition to the maintenance of the skills acquired, the generalization of these skills to other settings and peers needs to be examined. Related studies have been examining the interaction types, their duration and the quantity of the interaction, but neglected the quality of social interaction which has a greater impact on the overall social, communicative and cognitive development of young children during early years.

Limitations

Several cautions to the interpretations of the results of the study are in order. First overgeneralization should be avoided because of the small sample size of the study. Secondly, unlike many studies that implemented interventions that included typically developing peers in order to increase the social interactions of children with ASD, the findings of this study may be limited by the fact that trained-peers themselves had mild speech and language difficulties. Despite the fact that trained-peers were not typically developing, and the setting was not inclusive, the increased interactions reported in this study were very encouraging as they were similar to those reported by McEvoy et al. (1988). Thirdly, the data collected in this study was limited to whether or not an interaction was present. The observations did not differentiate the types of interactions such as: initiation of an interaction; response to an initiation by a peer; or if the social communicative act was verbal or nonverbal. This decision was made with consideration of the characteristics and needs of the target participants. The researcher asserts that the targeted skills of interaction were appropriate for the participants who had few to no interactions without adult prompting. In addition, the characteristics of the targeted- peers were also factored in this decision.

Conclusion

Regardless of the social, communicative and cognitive competencies of children,

most of them enjoy engaging in play behaviors, organizing games, holding hands, and dancing to a tune they hear. It is important to train peers to apply strategies that are naturally a part of their repertoire in order to maximize the acquisition of new social communicative skills and reinforce them through natural opportunities. It is in this way that they are internalized and become a child's own. The implementation of the GAA encouraged increased engagement and facilitated enjoyment through affection, which resulted in increased level of interaction for all participants. This impact can be explained by the fact that musical group games integrate music, movement, turn taking, fun, social interaction, sharing, touching which are integral part of early childhood development.

The decrease in interactions when the GAA was removed directed our attention to a more fundamental question: *Should these social communicative skills be taught through interventions or, through natural processes and opportunities of interaction in their daily environments?* The answer to this question creates an urgency to refocus and consider the nature of early childhood development. The acquisition of social communicative skills is developed through a process of engaging in opportunities of structured and unstructured activities in natural settings as they interact with their peers for years, rather than through implementation of short-term interventions.

As it has been studied at a great extent, it is important to continue investigating the effect of intervention programs that are easy to integrate into early childhood curriculum in order to improve and maintain the acquired social communicative skills following an intervention. Extending these short-term effective interventions conducted with a small number of children to a comprehensive early childhood curriculum as a critical embedded component, and their school wide implementation urgently needed. This shift in focus requires further dialogues and inclusion of training programs into special education and early childhood teacher preparation programs; infusion of well-coordinated, inclusive studies into early childhood curriculum; their experimentation at a larger scale as well as extending their benefits to both home and community settings.

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