

Effects of a Social Communication Intervention on Interactive Play for Young Children with Disabilities

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Abstract

Purpose: The first research aim was to examine whether children's interactive play with peers changed during the course of the intervention. The second research aim was to examine whether children generalized newly learned skills to the classroom or playground. The third research aim was to examine how children responded to the intervention based upon the presence of a disability and disability severity. *Method:* We examined the use of a social communication intervention to promote interactive play for children in dyads using a multiple baseline single subject design. The intervention consisted of three components: (a) a planning period for instructional purposes, (b) a play session to practice skills, and (c) a performance reporting period to review skills. Participants included preschool students ($n = 34$) enrolled in Head Start and collaborative classrooms and kindergarten students ($n = 2$) with language difficulties, social skill difficulties, and/or problem behavior. *Results:* Results indicated that interactive play with peers increased during the intervention sessions for most children. The greatest effects were observed for at-risk children and children with emotional and behavioral disorders experienced limited effects. *Conclusions:* The results support the use of the intervention package. We discuss implications and future directions.

Keywords: developmental disorders, language disorders, early intervention, social communication

Play Interventions for Preschoolers with Disabilities

Several recommended practices for teaching children with disabilities social interaction skills have been offered in the literature (Ostrosky & Cheatham, 2005).

These include: (a) teach children *how* to engage in sociodramatic play; (b) teach children how to share, give complements, and take turns by giving brief instructions, modeling what you want them to say and do, have them practice what you want them to say and do, and providing feedback on their practice; (c) prompt children to use social skills in the classroom; (d) reinforce children's use of social skills; (e) teach social skills to children with and without identified disabilities; and (f) teach social skills within the context of activities that captivate children's attention.

Numerous interventions have been developed to address social skill difficulties and increase interactive play in preschool children. Typically, these interventions are either peer-mediated or adult-mediated (McConnell, Missall, Silberglitt, & McEvoy, 2002).

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Peer-mediated interventions use peers as the intervention agents to assist students with disabilities (e.g., Goldstein, Schneider, & Thiemann, 2007), while adult-mediated approaches rely on adults to provide skills instruction, prompting, and reinforcement (McConnell et al., 2002).

A number of concerns have been noted with adult-mediated interventions (Rogers, 2000; Strain, Kohler, & Goldstein, 1996). Adult-mediated interventions may ignore the natural environment (Rogers, 2000) and may encourage child dependence upon adult prompting to facilitate interactive play (Strain et al., 1996). Both of these concerns may inhibit generalization of skills learned with adults to peers or to new settings (Strain et al., 1996).

Recent reviews of peer-mediated interventions that targeted social skills have also found varying results. Specific target skills have included responding to others, reciprocity, understanding others, and interacting with others (Nietzel, 2008). In general, interventions have been more effective in promoting specific skills (e.g., initiations, responses) than more global changes in their peer interactions (e.g., understanding others, expressing one's point-of-view; DiSalvo & Oswald, 2002; Mathur, Kavale, Quinn, Forness, & Rutherford, 1998). Peer-mediated interventions may allow social interactions to occur more naturally with fewer interruptions than adult-mediated interventions (Goldstein et al., 2007). While, proponents have argued that children will have an easier time transferring new skills to the classroom if they are learning them with typically developing peers (Rogers, 2000), results have indicated that maintenance and generalization effects have been less powerful than treatment outcomes (e.g., DiSalvo & Oswald, 2002).

Limitations of Interventions—Directions for Future Research

Although there have been several studies aimed at improving play for preschoolers with disabilities, there are limitations and several gaps in the literature. First, and most importantly, peer-mediated interventions tend to completely eliminate or strongly minimize the need for adult instruction in the play episode. Without teacher involvement in play or appropriate scaffolding to instruct children through play interactions, such children may resort to inappropriate play with peers and toys (Stanton-Chapman, In Press). This emphasizes the important role adults have in children's play.

Second, the majority of peer-mediated interventions examined the peer-to-peer play skills between children with disabilities and typically developing peers (English, Goldstein, Shafer, & Kaczmarek, 1997; Fall, Navelski, & Welch, 2002). This work is based on a false assumption—that only typically developing peers can serve as intervention agents. Children with disabilities can serve as intervention agents in peer-mediated interventions if properly supported by adults (Stanton-Chapman, Denning, & Jamison, 2008).

Finally, there are few studies that note the progression of play development of young children with disabilities as much variation exists in this population. Play data, over time, may provide a more inclusive picture of play deficits and indicate the impact early interventions have on later growth and the primary goal of fostering independence in play (Wong & Kasari, 2012).

Current Study

To improve upon these limitations, we present the results of a multicomponent social communication intervention to support peer-directed social interactions in young children with disabilities or at-risk for disabilities. The intervention attempts to incorporate several recommended practices from previous work in the literature and extend the work in this area. We used a social communication intervention that incorporates features from adult- and peer-mediated interventions. Previous analyses of the intervention have been effective for children with disabilities or at-risk for disabilities and there may be advantages of this combined approach.

First, the intervention is comprehensive and focuses on increasing children's interactive play with peers using effective elements of prior peer-mediated interventions (e.g., paired-approach; teaching selected peers how to prompt the target child during play; skills taught using roles within the play theme).

We added additional elements (e.g., training a peer who had a disability; including adult support as needed for interaction purposes).

Second, we taught the social communication skills using play themes (e.g., grocery store, doctor, construction, veterinarian/animal doctor, hair salon/barber shop) that encourage children to become involved with toys and materials that facilitate social exchanges amongst children (McConnell et al., 2002). Third, we taught the social communication skills using storybooks (which provide a model of thematic play and verbalizations during role-playing), picture symbols (representing the social communication skills taught during intervention implementation), and rehearsal (which allows children to practice the newly taught skills). Fourth, we used a less scripted play period with the hope that the intervention would increase spontaneous language, support the use of more complex language, and increase the amount of social interaction between the partners. Finally, we replicated the initial study three times using different participants and settings. The implementation of the intervention across subsequent years with additional participants is intended to support the external validity of the intervention through replication (Horner, Carr, Halle, McGee, Odom, & Wolery, 2005). Previous studies have examined the effectiveness of the current intervention package. Results have demonstrated increases in peer-directed requests, verbal requests, word diversity (Stanton-Chapman, Denning, & Jamison, 2008a), increased social pragmatic skills, total positive verbalizations (Stanton-Chapman, Jamison, & Denning, 2008b), and increased initiations with an immediate peer response (Stanton-Chapman et al., 2012). Interactive play with peers has not previously been examined.

Research that demonstrates the potential for social skill interventions to increase young children's skills during interactive play with peers, particularly those at-risk, is both timely and important. Therefore, the current study pursued three aims.

1. The first research aim was to focus on the intervention data from all previous years (e.g., from all four years of data collection).
2. The second research aim was to focus on the generalization data from the current year's results.
3. The third research aim was to focus on the relationship between severity of the disability and response to intervention across all previous years.

Method

We conducted a multiple baseline across participants single subject design study, and then replicated it three times with new participants during four consecutive years. Each cohort of dyads (e.g., Dyads A-E in year 1) participated for only one year.

Participants

Sample. Each year all preschool children enrolled in one of three public elementary schools were screened for possible study participation based upon problem behavior, social skill difficulties, and language difficulties. In addition, two kindergarten students enrolled in one of the schools were screened based upon teacher concerns for behavior and social skills during year 4. Parent's consented to participate following guidelines of the university's institutional review board.

Criteria for participant inclusion. Each year 3, 4, and 5 year-old children were screened and selected based upon one or more of the following criteria: (a) Preschool Language Scale-4 (PLS-4; Zimmerman, Steiner, & Pond, 2002) at least 1.5 *SD* below the mean on the standardized total language score (a total standard score at or below 80), (b) borderline or clinical levels on the externalizing or internalizing subscales (a score of 60 or higher) indicated by the teacher report on the Child Behavior Checklist (CTRF; Achenbach, 1997), (c) demonstrated problem behavior or social skill difficulties (a score of 85 or below) indicated by the teacher report on the social skills subscale of the Social Skills Rating System (SSRS; Gresham & Elliott, 1990), and/or (d) teacher request. We selected children if they demonstrated language difficulties, problem behavior, or social skill difficulties.

Overall thirty-four preschool children and two kindergarten students met criteria for study inclusion. Ten children participated in years 1 (Dyads A-E) and 4 (Dyads N-R), and eight children participated in years 2 (Dyads F-I) and 3 (Dyads J-M).

Twenty-eight (78%) children received special education services at the study onset based upon their current year's individualized education plan with the following diagnoses: developmental delay (DD; 13), speech or language impairment (SLI; 13), and emotional or behavioral disorder (EBD; 2). Eight children (22%) were considered at-risk for a disability due to low scores on one or more of the screening assessments or teacher concerns, but were not formally identified with a disability. We created dyads of participants and based pairings on similarities in age and classroom schedules.

Teachers were consulted regarding dyad pairings, and we used their recommendations when therapy schedules permitted the pairing. We present child characteristics in Table 1.

Table 1: Participant Characteristics

Dyad	Child	Gender	Age in months	IEP	Race	Problem behavior	Social skill difficulties	Language difficulties	Study qualifications
Dyad A	Child A1	M	68	EBD	White	81	76	76	Behavior, Social, Language, Outlier
	Child A2	M	59	EBD	Black	90	78	86	Behavior, Social, Outlier
Dyad B	Child B1	M	61	DD	White	30	98	94	Teacher Request
	Child B2	M	62	DD	White	100	75	84	Behavior, Social, Outlier
Dyad C	Child C1	M	61	SLI	White	20	77	80	Social, Language
	Child C2	M	57	SLI	White	35	84	91	Social
Dyad D	Child D1	M	61	SLI	Hispanic	42	72	74	Social
	Child D2	M	58	DD	White	53	81	85	Social
Dyad E	Child E1	F	63	SLI	White	61	90	60	Behavior, Language, Outlier
	Child E2	M	57	N	White	9	89	102	Teacher Request
Dyad F	Child F1	M	57	SLI	White	6	118	83	Study qualifications
Dyad G	Child F2	M	54	SLI	White	36	100	97	Teacher Request
	Child G1	M	52	SLI	White	45	84	100	Request
Dyad H	Child G2	M	54	DD	White	41	82	85	Social
	Child H1	F	41	SLI	Hispanic	15	83	100	Social
Dyad I	Child H2	F	53	DD	White	33	76	88	Social
	Child I1	M	46	DD	Black	71	63	77	Behavior, Social, Language, Outlier
Dyad J	Child I2	F	52	DD	White	14	85	50	Social, Language, Outlier
	Child J1	M	56	SLI	White	66	120	75	Behavior, Language
Dyad K	Child J2	M	52	SLI	White	52	111	96	Teacher Request
	Child K1	M	51	DD	White	61	106	65	Study qualifications
Dyad L	Child K2	M	56	SLI	White	66	68	80	Behavior, Language, Outlier
	Child L1	M	44	SLI	White	50	104	113	Behavior, Social, Language, Outlier
Dyad M	Child L2	M	59	DD	White	48	118	84	Teacher Request
	Child M1	M	56	DD	Black	54	94	79	Teacher Request

	Child M2	F	52	N	White	53	103	100	Teacher Request
Dyad N	Child N1	F	51	N	Black	10	106	89	Teacher Request
	Child N2	F	60	N	White	9	110	72	Language
Dyad O	Child O1	F	35	DD	White	33	130	63	Language
	Child O2	F	37	DD	White	35	83	62	Social, Language, Outlier

Notes. Disability = disability written on child's individualized education plan at study onset. DD = developmental delay. EBD = emotional/behavioral disorder. F = female. M = male. N = no IEP. SLI = speech/language impairment.

^aFor problem behavior, children qualified for the study on the problem behavior criteria if they received 60 or more on the Teacher Report Form of the Child Behavior Checklist.

^bFor social skill difficulties, children qualified for the study on the social skill difficulties criteria if they

Dyad	Child	Gender	Age in months	IEP	Race	Problem behavior	Social skill difficulties	Language difficulties	Study qualifications
Dyad P	Child P1	F	54	N	White	13	115	77	Teacher Request
	Child P2	M	52	N	White	47	63	73	Social, Language, Outlier
Dyad Q	Child Q1	M	68	N	Black	61	84	115	Behavior, Social
	Child Q2	M	70	N	White	74	84	74	Behavior, Social, Language, Outlier
Dyad R	Child R1	M	53	DD	White	52	101	115	Teacher Request
	Child R2	M	58	SLI	Black	19	98	80	Language

received 85 or less for the Total Social Skill subscale on the Social Skill Rating System.

^cFor language difficulties, children qualified for the current study on the language difficulties criteria if their total standard score was 80 or below on the Preschool Language Scale-4.

Settings

We conducted baseline and intervention sessions in separate rooms (e.g., pull-out) at the elementary schools that were used for small group activities and meetings.

Materials

We assembled and developed play materials based on five dramatic play themes (grocery store, doctor, construction, animal doctor, hair salon/barber). Each dramatic play theme had an accompanying storybook that provided instruction on the intervention's target behaviors (initiations, responding, turn-taking, name use).

Study Personnel

Three interventionists conducted the baseline and intervention sessions. The interventionists held educational degrees in special education and their classroom experience ranged from 2 to 12 years. Coders for treatment fidelity measures and reliability coding were master's degree students in early childhood special education and psychology. All coders were blind to study outcomes.

Procedures

Each study year utilized a multiple baseline design across participants (dyads) to determine the effects of the intervention (Kazdin, 1994). Replication was achieved both by applying the intervention to the remaining baselines and to additional dyads across subsequent years. This design has been found to be especially effective in evaluating interventions targeting an increase in social behaviors (Gast & Ledford, 2010).

Baseline. All participants had 5 baseline sessions with the exception of two participants (Dyad A) who demonstrated a stable baseline after three sessions.

Each theme of toys was used once in baseline to prevent satiation before the completion of the study. The study authors, who functioned as interventionists (teachers) for sessions, brought the two children into the analog playroom and invited them to play with the toys for 10 minutes.

Intervention. Dyads A-E had 18 sessions. Dyads F-R had 15 sessions with the exception of Dyad H (14 sessions) and Dyad O (11 sessions) that had children leave the school before the conclusion of the study. We conducted sessions 5 days a week for 10 participants (Dyads A-E), and 2 to 3 days per week for the remaining children for approximately 25 minutes. Each session used one of the five dramatic play themes and cycled through each in the same order (grocery, doctor, builder, animal doctor, hair salon/barber). Three sequential components were employed during the intervention: (a) an advanced play organizer, (b) a play session, and (c) a review session. See Table 2 for a detailed description of the intervention components.

Table 2: Description of Experimental Conditions, Phases, and Procedures

Experimental Condition	Phase	Description
Baseline		Children were asked to play with the thematic toys in the room. The teacher did not prompt the children to interact with the toys or peer once the phase started. The teacher only intervened if there was a safety concern.
Intervention	Advanced Play Organizer	The teacher, target child, and peer meet as a small group for 10 minutes. This phase includes four parts: a) Instruction of theme's target vocabulary words; b) Instruction of the roles within each theme; c) Reading of storybook and teaching social communication strategies; d) Planning play (e.g., selecting of roles, discussion of how the social communication strategies can be used during the play session)
	Play Session	Target child and peer play with thematic toys for 10 minutes. The teacher sits in the play area with the children but does not get directly involved with their play. The teacher discreetly tallies each child's use of social communication strategies. If no interaction is taking place, the teacher prompts the children to engage in the thematic play activity, use the target vocabulary words, and interact using the social communication strategies.
	Review Session	The teacher, target child, and peer meet as a small group for 5 minutes. This phase includes three parts: a) Review of the thematic roles during the play session; b) Review of vocabulary words during the play session; c) Review of social communication strategy use during the play session

Measurement

Measurement included observational measures of children's behavior during baseline and intervention sessions and fidelity of implementation for treatment.

Interactive play with peers. The dependent variable in the current study was interactive play with peers. We observed each child's individual behaviors throughout the 10-minute videos of the free-play sessions.

We based the *interactive play with peers* definition upon a combination of Parten's (1932) associative and cooperative play definitions and previous play observation research (Bakeman & Brownlee, 1980; Rubin, 2001). Other researchers have created similar categories labeled as group play (e.g., Bakeman & Brownlee, 1980; Rubin, 2001). The interactive play with peers definition and additional examples/non-examples are presented in Table 3. We coded videotapes of the 10-minute free-play for baseline and intervention sessions using the definition for interactive play with peers. Coders were blind to tape order and videos were randomly assigned to each coder. Coders were not aware of the research hypotheses.

Table 3: Coding Definitions

Interactive Play with Peers
<p>Child plays with peer with or without role assignment. Play can be either positive or negative. Distinguishing feature is the focus of the child. Child is focused upon the same activity, game, piece of equipment, or part of a large piece of equipment as peer. Interactive play with peers may also contain a clearly defined goal (e.g., build a house), defined roles (e.g., doctor/patient), and conversation or discussion.</p> <p>Examples: Target child and peer are talking on the phone. Target child and peer are building a road together and take turns adding the pieces.</p> <p>Non-Examples: Target child plays alongside peer, but does not cue into peer or use peer as a model. Target child wanders around play area.</p>
Parallel Play
<p>The child is playing with toys similar to those used by peer with no sign of jointness or coordination with peer in the observed interval. Child plays with toys as she sees fit and does not seem to influence or modify the activity of the peer. No attempt to control activity of the peer.</p> <p>Examples: Target child is sitting beside peer and both are playing with the dolls. Target child are using blocks and playing side by side. Nether child attends to the other.</p> <p>Non-Examples: Target child is playing next to peer with the groceries and they are discussing their play. Child is playing alone with the blocks and peer is out of sight.</p>

Data Collection. We used a 10-second momentary time sampling (MTS) procedure (Bakeman & Gottman, 1997) to examine interactive play with peers during the intervention. Videotaped play sessions were coded using the Multi-Option Observation System for Experimental Studies (MOOSES; Tapp, Wehby, & Ellis, 1995). Momentary time sampling has been shown to mimic the continuous measurement of behaviors when observations are frequent (e.g., 10 seconds, 15 seconds) (Powell, Martindale, Kulp, Martindale, & Bauman, 1997; Saudargas & Zanolli, 1990). Coders observed behavior during the 10-second interval, noted the behavior occurring at the end of the 10-second interval, and then had 5-seconds to record their data. This resulted in a 15-second complete interval or four observations/minute. Since behavior was not observed continuously, data was analyzed as a frequency count of observed intervals (range 0-40).

Training of Coders. The first author trained two coders prior to analyzing the videotaped play sessions to collect reliability data. We required a criterion of 80% reliability on four consecutive training tapes prior to collection and retrained coders if they fell below this criterion.

Procedural Fidelity Measures

Fidelity of Implementation for Treatment. We completed fidelity of treatment checklists for 20% of the baseline and intervention sessions for each dyad to determine if the intervention procedures were implemented as described. Trained research assistants other than the interventionists who were blind to the study outcomes viewed and scored videotapes of the entire sessions.

Criterion for fidelity of treatment was correct completion of 90% of the prescribed items. Reaching the criterion level indicated that the interventionist organized, described, and demonstrated the toys used in the play theme, read the storybook, discussed and modeled the use of the social communication strategies, introduced vocabulary for the day's theme, attended to the children's activities during the play session, and reviewed the children's use of the social communication strategies and target vocabulary words in the review session.

If fidelity of treatment was lower than the established criterion at any point during the intervention, this person was retrained on the intervention procedures until the 90% criterion was again achieved. In the four years of intervention, no interventionist had to be retrained to criterion.

Generalization Data

We observed children's play behaviors in the classroom to assess the generalization of children's interactive play with peers during the fourth year of data collection. Project staff members, who were blind to the purpose and outcomes of the study, conducted the assessments using a coding sheet. Project staff members were careful to observe the target children so they did not realize they were being observed (i.e., positioning themselves in areas of the classroom where they did not have to follow the target children from center to center). Each child was observed in the classroom for two 15-minute sessions prior to the intervention and two 15-minute sessions after completion of the intervention (30 minutes combined). The interactive and parallel play definitions are presented in Table 3. Observations were made using Dell Axim handheld computers and MOOSSES (Tapp et al., 1995) software using the same 10-second MTS procedure. This system resulted in a range of 0-120 occurrences of each behavior.

Inter-observer agreement checks occurred randomly across 20% of the observations from each of the five dyads. Overall inter-observer agreement for pre-intervention observations was .81 (range .70 to .88). Overall kappa values were .79 (range .49 to .90). Overall inter-observer agreement for post-observations was .81 (range from .74 to .87). Overall kappa values were .78 (range .50 to .90).

Social Validity Measure

We collected measures of social validity during the second, third, and fourth years of data collection. Social validity refers to the social importance and acceptability of an intervention's treatment goals, procedures, and outcomes (Foster & Mash, 1999). Three preschool teachers with Master's degrees in early childhood special education who were blind to the scope of the study rated the social acceptability of the intervention procedures and socially important changes in behavior. Changes in behavior (e.g., outcomes) were calculated through the use of videotapes 16 5-min samples of children's play. Baseline and intervention session video clips from each dyad (two baseline; two intervention) were randomly selected. A 6-item questionnaire rated the quality and quantity of social interactions between the two children. Sample questions included items such as "How often did the children use verbal requests to communicate or participate in play with a peer – five or more times, 3 to 4 times, 1 to 2 times, or never?";

"What techniques of requesting did you observe in the interaction that appear to be effective for the children?"; "How often did the children use nonverbal requests to communicate or participate in play with a peer – five or more times, 3 to 4 times, 1 to 2 times, or never?". The observers scored their judgments on a 5-point Likert scale and brief text for short answer questions. All ratings were summed and averaged to determine an overall social validity score. Scores ranged from a minimum of 0 to a maximum of 40.

Accuracy of Coding and Interobserver Agreement

The primary coder coded all baseline and intervention sessions, and two trained research assistants coded 20% of those sessions from all 36 children to assess interobserver agreement (4-5 sessions per child). Interobserver agreement sessions were randomized, but equally distributed across dyads and experimental conditions. Two types of interobserver agreement were reported.

The first method used an exact agreement formula in which the total number of agreements was divided by the total number of agreements plus disagreements and multiplied by 100. Criterion during data collection was 80% (Kazdin, 1982) across the reliability observations. The second method used Cohen's (1960) kappa to account for chance and recorded both occurrence and non-occurrence data. Fleiss (1981) characterized kappa values as follows: .40 - .60 (fair), .60 - .75 (good), and greater than .75 (excellent). Interobserver agreement for interactive play with peers averaged 84% (range 66-97) and kappa values averaged 0.88 (range 0.64-0.94) across children. We addressed observer drift by retraining coders when reliability fell below 80% agreement.

Data Analysis Procedures

To analyze the data for Aim 1 we examined the differences between baseline and intervention phases for all children using visual analysis of five features (level, trend, variability, immediacy, overlap) based on the definitions established in Kratochill and colleagues (2010) review of single subject data analysis. We analyzed datum as a frequency count of behaviors across the 10-minute free-play sessions. Interactive play with peers had a range of occurrences of 0 – 40 during each intervention and baseline session. Level was defined as the difference in the mean scores for data between the baseline and intervention sessions (Kratochwill et al., 2010). A positive value indicated that the change was in the expected direction.

Trend was defined as the slope of the best fitting straight line for the data within each phase (Kratochwill et al., 2010). Variability was defined as the range or standard deviation of data around the best-fitting straight line for each phase (Kratochwill et al., 2010). For trend and variability we compared baseline and intervention phases. Immediacy was defined as the difference between the last three data points in the baseline phase and the first three data points in the intervention phase in the expected direction (Kratochwill et al., 2010). Lastly, overlap was defined as the proportion of data from one phase that overlapped with data from the previous phase (Kratochwill et al., 2010). Overlap was calculated for each participant by counting the number of data points in the intervention that were higher than the highest baseline session, dividing this number of non-overlapping data points in the treatment series by the total number of data points in the treatment series and multiplying this number by 100. This process is the same as the calculation for percent non-overlapping data (Scruggs, Mastropieri, & Castro, 1987). We used the following criterion to interpret the results of the intervention based on the number of visual analysis features that demonstrated positive effects for each child: 5/5 (large effect); 4/5 (moderate effect); 3/5 (low effect); 2/5 or less (not effective).

To analyze the data for Aim 2 we examined the generalization data for nine children during year 4 by comparing the parallel play and interactive peer play children exhibited prior to baseline sessions and after the final intervention session. One child left the school prior to the post-intervention classroom sessions.

To analyze the data for Aim 3 we examined the effect of the intervention on outliers (e.g., children with scores greater than 2 SD's above or below the mean on one of the screening protocols) and children based upon disability diagnosis at the study's onset using the same strategy we used for Aim 1. We examined outliers based upon inclusion criteria. Twelve (33%) children were considered outliers. Of this group, five had scores above 70 on the CTRF (Achenbach, 1997); three had scores below 70 on the SSRS (Gresham & Elliott, 1990); and four had scores below 70 on the PLS-4 (Zimmerman et al., 2002).

Results

Fidelity of Implementation for Treatment

To determine whether the intervention procedures had been implemented as described, we completed fidelity-of-treatment checklists for 20% of the intervention sessions for each dyad. The criterion level for implementation of the intervention procedures was completion of at least 90% of the proscribed items observed during the intervention sessions. Fidelity of treatment ranged from 95% to 100%.

Effects on Interactive Play with Peers After Intervention

The first research question addressed whether the social communication intervention would have an effect on children's interactive play with peers. The multiple baseline results across participants are displayed in Figure 1 and presented in Table 4. We examined children based upon five features of visual analysis: level, trend, variability, immediacy, and overlap. Results showed that two children (5%) in Dyad H had positive effects in two features of visual analysis indicating no effects from the intervention. Overall, visual analysis indicated that 34 children (94%) had at least some effect from the intervention. Thirteen children (36%) had positive effects in three features of visual analysis indicating a low effect from the intervention.

Eighteen children (50%) had positive effects in four features of visual analysis indicating a moderate effect from the intervention. Lastly, three children (8%) including both children from Dyad R had positive effects in five features of visual analysis indicating a large effect from the intervention.

One consideration in variability is how children responded to the different intervention themes. All dyads progressed through the intervention in the same order – grocery, doctor, builder, animal doctor, and hair salon/barber) during baseline and intervention sessions. Specifically, children in Dyads J, K, L, N and Q seemed to demonstrate a wave in the data that reflected their response to the different intervention themes. Visual analysis also suggested that the doctor and grocery store themes were more effective and the barber theme was less effective at supporting consistent interactive play with peers.

Table 4: Examination of Level, Trend, Variability, Immediacy, and Overlap across Children

Child	Level			Trend			Variability			Immediacy			Overlap	Total
	BL	INT	Diff	BL	INT	Diff	BL	INT	Diff	BL	INT	Diff		
A1	19.00	14.06	-4.94	-12.50	-1.34	11.16	0.87	0.35	0.52	19.00	26.33	7.33	11%	3
A2	20.00	13.39	-6.61	-12.50	-1.35	11.15	2.60	0.38	2.22	20.00	26.33	6.33	11%	3
B1	2.00	6.61	4.61	0.50	-0.76	-1.26	0.67	0.41	0.26	3.00	10.33	7.33	33%	3
B2	0.80	6.44	5.64	0.20	-0.90	-1.10	0.28	0.39	-0.11	1.00	12.33	11.33	61%	3
C1	10.80	21.60	10.80	0.60	-0.07	-0.67	0.99	0.48	0.51	11.67	19.67	8.00	44%	3
C2	11.20	21.60	10.40	0.50	-0.05	-0.55	0.53	0.48	0.05	11.00	19.67	8.67	50%	4
D1	11.60	17.20	5.60	-2.10	0.52	2.62	0.75	0.44	0.31	9.00	8.67	-0.33	44%	3
D2	12.00	16.00	4.00	-2.80	0.34	3.14	1.65	0.41	1.24	9.33	15.67	6.34	22%	4
E1	3.00	10.67	7.67	-1.40	-0.14	1.26	1.10	0.40	0.70	2.33	13.67	11.34	44%	4
E2	2.80	10.78	7.98	-1.20	-0.06	1.14	1.04	0.39	0.65	2.33	13.67	11.34	61%	5
F1	1.60	8.73	7.13	0.20	0.70	0.50	0.83	0.57	0.26	1.67	1.00	-0.67	53%	4
F2	2.40	8.67	6.27	-1.10	0.33	1.43	0.55	0.60	-0.05	1.00	0.67	-0.33	53%	3
G1	9.20	16.93	7.73	0.80	-0.62	-1.42	2.01	0.73	1.28	10.33	20.67	10.34	47%	3
G2	9.40	16.73	7.33	1.40	-0.43	-1.83	1.59	0.70	0.89	11.00	19.67	8.67	47%	3
H1	8.80	2.57	-6.23	-4.10	-0.03	4.07	2.44	0.20	2.24	3.33	1.33	-2.00	0%	2
H2	6.60	2.29	-4.31	-3.90	0.07	3.97	1.47	0.18	1.29	1.33	0.67	-0.66	0%	2
I1	9.20	14.53	5.33	-2.10	-0.30	1.80	1.99	0.61	1.38	6.67	10.67	4.00	40%	4
I2	9.00	14.87	5.87	-2.20	-0.25	1.95	1.95	0.59	1.36	6.67	11.00	4.33	33%	4

Child	Level			Trend			Variability			Immediacy			Overlap	Total
	BL	INT	Diff	BL	INT	Diff	BL	INT	Diff	BL	INT	Diff		
J1	10.20	16.20	6.00	-1.20	0.40	1.60	1.35	0.79	0.56	9.00	22.00	13.00	47%	4
J2	8.80	16.53	7.73	-1.50	-0.41	1.09	1.60	0.73	0.87	7.00	22.00	15.00	47%	4
K1	6.60	17.47	10.87	0.20	-0.08	-0.28	2.30	0.74	1.56	6.67	19.67	13.00	53%	4
K2	6.60	18.60	12.00	0.20	-0.33	-0.53	2.30	0.69	1.61	6.67	21.33	14.66	53%	4
L1	8.20	21.00	12.80	-0.70	-0.48	0.22	3.67	0.58	3.09	8.00	22.33	14.33	40%	4
L2	8.40	20.87	12.47	-1.30	-0.31	0.99	3.83	0.60	3.23	7.67	23.00	15.33	33%	4
M1	9.80	20.67	10.87	-1.20	0.09	1.29	3.46	0.48	2.98	8.33	17.00	8.67	27%	4
M2	10.00	20.33	10.33	-2.00	0.81	2.81	3.30	0.51	2.79	7.67	10.33	2.66	27%	4
N1	11.00	22.80	11.80	-0.50	-1.12	-0.62	1.31	0.71	0.60	11.67	33.00	21.33	80%	4
N2	8.20	20.60	12.40	0.70	-0.47	-1.17	2.03	0.82	1.21	10.33	28.00	17.67	60%	4
O1	3.00	5.17	2.17	0.60	0.10	-0.50	1.22	0.37	0.85	4.33	4.67	0.34	17%	3
O2	3.60	4.27	0.67	0.40	0.43	0.03	1.03	0.34	0.69	4.33	2.67	-1.66	27%	3
P1	5.80	14.20	8.40	1.20	-1.20	-2.40	2.16	0.57	1.59	9.00	27.33	18.33	27%	3
P2	6.40	14.33	7.93	1.10	-1.18	-2.28	2.32	0.55	1.77	9.67	26.67	17.00	27%	3
Q1	8.20	16.20	8.00	-4.50	-0.53	3.97	2.64	0.62	2.02	3.00	21.33	18.33	20%	4
Q2	9.40	18.47	9.07	-3.90	-0.22	3.68	2.26	0.62	1.64	5.33	21.67	16.34	27%	4
R1	3.40	28.13	24.73	-0.30	0.16	0.46	0.64	0.55	0.09	3.67	19.33	15.66	93%	5
R2	3.60	30.07	26.47	-0.50	0.41	0.91	0.60	0.48	0.12	3.67	20.33	16.66	93%	5

Notes: BL = Baseline sessions; INT = Intervention sessions; Diff = Difference between baseline and intervention sessions.

Effects on Generalization of Skills to Classroom and Playground

The second research question addressed whether children in the current year's results generalized newly learned skills to the classroom and playground. We examined generalization data for nine children during year 4. One child left the school prior to the post-intervention classroom observations. Table 5 presents generalization results. Eight children (89%) demonstrated increased levels of either parallel play or interactive play with peers in the classroom and on the playground. Five children (56%) demonstrated increased levels of parallel play (N1, N2, O1, P1, P2). Five children (56%) demonstrated increased levels of interactive play with peers (P2, Q1, Q2, R1, R2).

Table 5: Generalization Data

Dyad	Child	PP		IP	
		Total Pre	Total Post	Total Pre	Total Post
Dyad N	N1	72 (6)	73 (8.5)	33 (4)	25 (8)
	N2	42 (19)	74 (4)	54 (33)	14 (8)
Dyad O	O1	11 (4.5)	47 (5.5)	38 (24)	10 (0)
	O2	57 (6.5)	X	2 (0)	X
Dyad P	P1	61 (1.5)	4 (2)	11 (6)	4 (1)
	P2	50 (5)	1 (0.5)	2 (0)	67 (16)
Dyad Q	Q1	2 (1)	22 (1)	45 (16)	65 (5)
	Q2	29 (7.5)	31 (3.5)	67 (1)	74 (14)
Dyad R	R1	88 (15)	5 (1.5)	2 (0)	44 (30)
	R2	70 (1)	36 (14)	10 (4)	52 (24)

Notes: IP = Interactive play with peers. PP = parallel play. Standard deviations are in parentheses.

Effects on Interactive Play with Peers based upon Outliers and Disability

The third research question examined the effects from the intervention on outliers and children based on the primary disability on their IEP. Twelve children (33%) were identified as outliers and included four children with threshold scores on the PLS-4 (Zimmerman et al., 2002: E1, I2, K2, O2), five children with threshold scores on the CTRF (Achenbach, 1997: A1, A2, B2, I1, Q2), three children with threshold scores on the SSRS (Gresham & Elliott, 1994: I1, K2, P2), and one child (I1) who was identified as an outlier in two areas. Children with low scores on the PLS-4 and SSRS did better than average in the intervention. Three out of four children (75%) with threshold scores on the PLS-4 had positive effects in four features of visual analysis indicating a moderate effect from the intervention. Similarly, two out of three children (66%) with low scores on the SSRS had positive effects in four features of visual analysis indicating a moderate effect from the intervention. In contrast, only two out of five children with high scores on the CTRF had positive effects in four features of visual analysis. For the remaining outliers visual analysis indicated a low effect from the intervention. One child (I4) had threshold scores in both the CTRF and the SSRS and visual analysis indicated a moderate effect from the intervention.

We also examined children's scores based upon primary disability. Results indicated that children with EBD had the lowest overall effects and children who were considered at-risk had the strongest effects. Children with SLI appeared to outperform children with DD, but neither group appeared to perform as well as children considered at-risk. Two children (A1, A2) were identified with EBD (6%) and both had a low effect from the intervention. Thirteen children (36%) were identified with DD and seven (54%) of them at least a moderate effect from the intervention. Specifically, six had a moderate effect and one had a high effect from the intervention.

Thirteen children (36%) were identified with SLI and eight (62%) of them had at least a moderate effect from the intervention. Specifically, seven had a moderate effect and one had a large effect from the intervention.

Lastly, eight children were considered at-risk and six (75%) of them had at least a moderate effect from the intervention. Specifically, five had a moderate effect and one had a large effect from the intervention.

We conducted further analysis of effects on children who were considered at-risk.

Three dyads (N, P, Q) contained children that were both considered at-risk and all three demonstrated increased interactive play with peers during the intervention phase. Two dyads (N, Q) had a moderate effect and one dyad (P) had a low effect from the intervention. Two dyads (E, M) contained one child with a disability and one child who was considered at-risk. All children in each dyad had at least a moderate effect and one (E2) had a large effect from the intervention.

Examination of Social Validity

Scores could range from 0-40. For intervention procedure acceptability, the averages were 38, 39, and 40. For Scores on socially important changes in behavior the mean ratings of baseline video clips on social importance were 11.5, 14.1, and 17. Mean ratings of intervention clips on social importance were 32.5, 39.5, and 38.5 (range 30-40). This suggests that professionals in early childhood special education generally found the social communication intervention to be effective with preschoolers with disabilities. The raters had little difficulty distinguishing between the selected video clips from before and after the intervention.

Discussion

Effects on Interactive Play for All Children

The first finding was that the interactive play with peers of most children increased as a result of treatment based upon visual analysis (see Figure 1 and Table 4). Visual analysis suggested a positive effect from the intervention for most children. Interactive play with peers increased for 34 children (94%) during the intervention. Twenty children (68%) had at least a moderate effect from the intervention.

Other research has been mixed regarding changes in children's interactive play with peers. Longitudinal analyses of the play behaviors of children with disabilities from preschool into early elementary school have found a statistically significant increase in children's conversations with peers, but no changes in children's interactive play with peers (Guralnick, et al., 2007; Sigafoos et al., 1999). Guralnick et al. (2007) also found that amounts of interactive play with peers were low during both time points (0.08 at time 1; 0.12 at time 2).

Effects on Generalization

The present study demonstrated generalization of increased parallel or interactive play for most children during the fourth year. This is significant, since most studies have generally demonstrated limited generalization and transfer of learned skills (DiSalvo & Oswald, 2002; Vaughn et al., 1999). We also received anecdotal reports that some children were playing with their dyad partner during the same or subsequent school years. Future work, however, should examine ways to support skills needed for generalization to the classroom and playground.

Effects on Interactive Play for Outliers and Children with Disabilities

Children with more severe language and social skill difficulties had a positive effect from the intervention. Visual analysis suggested that children with more severe behavior problems (e.g., scores >80 on the CTRF) failed to demonstrate increased interactive play with peers. Visual analysis also suggested that children with SLI, DD, and those considered at-risk had positive effects from the intervention, and children with EBD had no effects.

Previous research targeting interactive play with peers has demonstrated increases in interactive play for children considered at-risk or diagnosed with mild developmental delays, but studies have demonstrated limited effects for children with more severe problem behaviors.

Fantuzzo et al. (1996) noted increases in interactive play with peers (effect size (ES) = 1.5) following a classroom based peer intervention package. Interactive play with peers was defined as a combination of associative and collaborative (e.g., child engages with other children in a mutual way) play.

Guralnick, Connor, Neville, and Hammond (2006) following a comprehensive intervention found statistically significant changes in increased group play for the treatment group. In these studies all participants were considered at-risk and socially withdrawn (Fantuzzo et al., 1996) or all participants had mild developmental delays, but were excluded if they exhibited clinical levels on the CTRF (e.g., > 70; Guralnick et al., 2006). In contrast, in the present analysis 15 children (42%) were diagnosed with DD or EBD and five children (14%) exhibited clinical levels (e.g., > 70) of problem behavior on the CTRF. In the present analysis, children with EBD had limited effects, but the majority of children with DD had at least a moderate effect.

When compared to children considered at-risk it may be more difficult to teach cooperative play skills to children with developmental disabilities (DD, EBD), since the social deficits for children with developmental disabilities may be more severe and involve more areas of social functioning (e.g., interest in peers, engagement with toys; Guralnick, 1999; Guralnick & Groom, 1988; Guralnick et al., 1996a). Therefore, it may be more complicated to intervene with children with disabilities than children who are at-risk, since there are more deficits to support and skills to teach. The present findings also suggest that children with EBD may require additional support during the intervention. More research is needed to examine this outcome.

Few studies have compared the social interactions of children with SLI, children with DD, typically developing children, and children considered at-risk. Guralnick et al. (1996a) found that children with SLI and typically developing children displayed similar levels of sustained interactive play with peers; interest in peers, responses to peer's social bids, and engagement with toys. Children with SLI displayed differences with typically developing peers during language related activities (e.g., fewer positive social behaviors, less conversation, fewer positive responses to social bids toward peers; Guralnick et al., 1996a), and children with DD have demonstrated less interactive play with peers, more solitary play (Guralnick et al., 1996a), less interest in peer play (Guralnick et al., 1996b), and fewer unilateral or reciprocal friendships (Guralnick et al., 1996b) than either typically developing children or children with SLI. The peer play deficits for children with DD have been shown to affect multiple areas of functioning (e.g., Guralnick, 1999; Guralnick & Groom, 1988). Therefore, the present findings differ from earlier research (e.g., Sigafos et al., 1999; Guralnick et al., 2007; Malone & Langone, 1999) by suggesting that the social communication intervention was effective at increasing the interactive play with peers for children with SLI, DD, and those considered at-risk.

Limitations

First, the interpretation of the standardized measures of social skills (SSRS; Gresham & Elliott, 1990) and problem behaviors (CTRF; Achenbach, 1997) relied on teacher ratings of children's behaviors. Bias in teacher ratings may compromise the validity of teacher rating scales and complicate interpretation of results (Mashburn, Hamre, Downer, & Pianta, 2006).

Second, pairing two children with delays or disabilities may delay or impede the progress of the treatment by requiring more intensive intervention to create lasting change. Previous research has demonstrated that nearly all aspects of peer interactions are affected in children with DD (e.g., Guralnick, 1999; Guralnick & Groom, 1988) and that the play skills of children with DD are unlikely to change without systematic intervention (Sigafos et al., 1999).

Third, generalization data based on direct observation in the classroom is difficult to interpret. Children should have been observed for more than 30 minutes pre- and post-intervention and settings should have been controlled to ensure that children had similar access to peers during all observations. This would require careful planning in future studies.

Implications

First, the intervention seemed to be an effective way to increase skills to support interactive play with peers for children with developmental delays, speech/language impairment and those considered at-risk. The intervention described in the current study used a pull-out approach for service delivery.

To make the intervention program more inclusive, the intervention program needs to be offered in the natural classroom environment. Clinicians or teachers, rather than research staff, should serve as interventionists. Storybook readings could be done during story times or small group times in the regular classroom schedule. Additionally, clinicians or teachers could conduct appropriate prompting of social communication strategies during center or outside time. Another consideration is that it may be more feasible for clinicians to conduct the intervention by pulling two children with disabilities from the classroom. It is difficult for clinicians to pull children from the classroom who are not on their caseload and the present study provides preliminary evidence that the current pullout model can be effective when both children in a dyad have a disability.

Second, pairing children with disabilities seemed to result in increased interactive play with peers for the majority of the children. Third, the use of a less scripted play package seemed to be an effective way to increase children's interactive play with peers. Generalization data demonstrated that these changes translated to the classroom or playground setting for some children.

Clinicians and teachers could plan to support this generalization of newly learned skills to other settings through prompting and use of similar language and cue cards. Future research should also examine ways to support efficacy across settings. Fourth, children with more severe behavior problems may require additional support to create lasting behavior change. Clinicians and teachers may need to closely monitor progress and additional supports may be needed during paired interventions.

Future research should examine outcomes and changes for the intervention. First, researchers should continue to explore how different children (DD, SLI, EBD, at-risk) respond to the intervention and ways to maximize their outcomes. Future research should examine components that may increase the effects of the intervention. These may include the additional use of visual cues during intervention, self-monitoring techniques, and the use of mnemonics. Second, researchers should continue to examine intervention effects with different settings, materials and people. The present study provides preliminary evidence of generalization of some skills. Third, it is possible that an interaction is occurring between language abilities (e.g., use of personal pronouns, receptive language) and behavior problems (e.g., ability to respond to or initiate peer or adult requests). Future research should examine this possibility. Fourth, Some of these results may be affected by differing responses for children to the intervention themes that may be related to children's familiarity with the various themes and the opportunities the various themes provided for children to engage in reciprocal interactions. For example, most children are very familiar with the roles and scenarios present in the grocery store or at the doctor's office. These themes create very clear roles of doctor/patient and clerk/shopper that children can adopt during the intervention. In contrast, children may have less familiarity with a visit to the veterinarian or they may become so focused with the pet dolls that they interact less with their peer. The builder theme also creates a scenario that has two builders working alongside each other and may create fewer opportunities for interactions, especially sustained interactions. More research may be necessary to examine how children are responding to the different play themes, and whether different themes are more conducive to developing specific play skills. Finally, there is preliminary evidence that this intervention package may be effective for school-aged children. Additional research is needed to examine how school-aged children respond to the intervention and materials.

Summary

This study examined the effects of a social communication intervention on the interactive play with peers of children in the preschool and Kindergarten classroom. The results indicated that interactive play with peers increased for most children during the intervention based upon visual analysis.

The results from this study suggest that the intervention has promising effects for creating sustained peer interactions in preschool and Kindergarten classrooms.

References

- Achenbach, T. M. (1997). Guide for the caregiver-teacher report form for ages 2-5. Burlington, VT: University of Vermont, Department of Psychiatry.
- Bakeman, R., & Brownlee, J. R. (1980). The strategic use of parallel play: A sequential analysis. *Child Development*, 51(3), 873-878.
- Bakeman, R., & Gottman, J. M. (1997). *Observing interaction: An introduction to sequential analysis* (2nd ed.). New York: Cambridge University Press.
- Cohen, J. A. (1960). Coefficient of agreement for nominal scales. *Educational and Psychological Measurement*, 20(1), 37-46.
- Cress, C. J., Arens, K. B., & Zajicek, A. K. (2007). Comparison of engagement patterns of young children with developmental disabilities between structure and free-play. *Education and Training in Developmental Disabilities*, 42(2), 152-164.
- DiSalvo, C. A., & Oswald, D. P. (2002). Peer-mediated interventions to increase the social interaction of children with autism: Consideration of peer expectations. *Focus on Autism and Other Developmental Disabilities*, 17(4), 198-207.
- English, K., Goldstein, H., Shafer, K., & Kaczmarek, L. (1997). Promoting interactions among preschoolers with and without disabilities: Effects of a buddy skills-training program. *Exceptional Children*, 63(2), 229-243.
- Epstein, J. L. (1983). Selection of friends in differently organized schools and classrooms. In J. L. Epstein & N. Karweit (Eds.), *Friends in Schools* (pp. 39-61). New York: Academic Press.
- Fall, M., Navelski, L. F., & Welch, K. K. (2002). Outcomes of a play intervention for children identified for special education services. *International Journal of Play Therapy*, 11 (2), pp. 91-106.
- Fantuzzo, J., Sutton-Smith, B., Atkins, M., Meyers, R., Stevenson, H., Coolahan, K., Weiss, A., & Manz, P. (1996). Community-based resilient peer treatment of withdrawn maltreated preschool children. *Journal of Consulting and Clinical Psychology*, 64(6), 1377-1386.
- Fliess, J. L. (1981). *Statistical methods for rates and proportions*. New York: Wiley.
- Foster, S. L., & Mash, E. J. (1999). Assessing social validity in clinical treatment research issues and procedures. *Journal of Consulting and Clinical Psychology*, 67, 308-319.
- Gast, D. L., & Ledford, J. (2010). Variations in multiple baseline designs and combination designs. In D. L. Gast (Ed.), *Single subject research methodology in behavioral sciences* (pp. 382-416). Mahwah, NJ: Routledge.
- Gest, S. D., Sesma, A., Jr., Masten, A. S., & Tellegen, A. (2006). Childhood peer reputation as a predictor of competence and symptoms 10 years later. *Journal of Abnormal Child Psychology*, 34(4), 509-526.
- Goldstein, H., Schneider, N., & Thiemann, K. (2007). Peer-mediated social communication intervention: When clinical expertise informs treatment development and evaluation. *Topics in Language Disorders*, 27(2), 182-199.
- Gresham, F. M., & Elliott, S. N. (1990). *Social skills rating system manual*. Circle Pines, MN: American Guidance Service.
- Gresham, F. M., Sugai, G., & Horner, R. H. (2001). Interpreting outcomes of social skills training for students with high-incidence disabilities. *Exceptional Children*, 67(3), 331-344.
- Guralnick, M. J. (1990). Social competence and early intervention. *Journal of Early Intervention*, 14(1), 3-14.
- Guralnick, M. J. (1999). Family and child influences on the peer-related social competence of young children with developmental delays. *Mental Retardation and Developmental Disabilities Research Reviews*, 5(1), 21-29.
- Guralnick, M. J., Connor, R. T., Hammond, M. A., Gottman, J. M., & Kinnish, K. (1996a). The peer relations of preschool children with communication disorders. *Child Development*, 67(2), 471-489.
- Guralnick, M. J., Connor, R. T., Neville, B., & Hammond, M. A. (2006). Promoting the peer-related social development of young children with mild developmental delays: Effectiveness of a comprehensive intervention. *American Journal of Mental Retardation*, 111(5), 336-356.
- Guralnick, M. J., Gottman, J. M., & Hammond, M. A. (1996b). Effects of social setting on the friendship formation of young children differing in developmental status. *Journal of Applied Developmental Psychology*, 17(4), 625-651.

- Guralnick, M. J., & Groom, J. M. (1988). Friendships of preschool children in mainstreamed playgroups. *Developmental Psychology, 24*(4), 595-604.
- Guralnick, M. J., Neville, B., Hammond, M. A., & Connor, R. T. (2007). The friendships of young children with developmental delays: A longitudinal analysis. *Journal of Applied Developmental Psychology, 28*(1), 64-79.
- Horner, R. H., Carr, E. G., Halle, J., McGee, G., Odom, S., & Wolery, M. (2005). The use of single-subject research to identify evidence-based practice in special education. *Exceptional Children, 71*(2), 165-179.
- Kazdin, A. E. (2010). *Single-case research designs: Methods for clinical and applied settings* (2nd ed.). New York: Oxford University Press.
- Landy, S. (2002). *Pathways to competence: Encouraging healthy social and emotional development in young children*. Baltimore: Paul H. Brookes.
- Malone, D. M. & Langone, J. (1999). Teaching object related play skills to preschool children with developmental concerns. *International Journal of Disability, Development, and Education, 46*(3), 325-336.
- Mashburn, A. J., Hamre, B. K., Downer, J. Y., & Pianta, R. C. (2006). Teacher and classroom characteristics associated with teacher's ratings of prekindergarteners' relationships and behaviors. *Journal of Psychoeducational Assessment, 24*(4), 367-380.
- Mathur, S. R., Kavale, K. A., Quinn, M. M., Forness, S. R., & Rutherford, R. B. (1998). Social skills interventions with students with emotional and behavioral problems: A quantitative synthesis of single subject research. *Behavioral Disorders, 23*, 193-201.
- McConnell, S. R., Missall, K. N., Silbergliitt, B., & McEvoy, M. A. (2002). Promoting Social Development in Preschool Classrooms. In Shinn, M. E., Walker, H. E., & Stoner, G. (Eds.), *Interventions for academic and behavior problems II: Preventive and remedial approaches* (pp. 501-536). Bethesda, MD: National Association of School Psychologists.
- Neitzel, J. (2008). *Overview of peer-mediated instruction and intervention for children and youth with autism spectrum disorders*. Chapel Hill, NC: National Professional Development Center on Autism Spectrum Disorders, Frank Porter Graham Child Development Institute, The University of North Carolina.
- Ostrosky, M. M. & Cheatham, G. A. (2005). Teaching the use of a problem-solving process to early educators, *Young Exceptional Children, 9*, 12-19.
- Oswald, C. A., & Oswald, D. P. (2002). Peer-mediated interventions to increase the social interaction of children with autism: Consideration of peer expectancies. *Focus of Autism and Other Developmental Disabilities, 17*(4), 198-207.
- Parten, M. (1932). Social participation among preschool children. *The Journal of Abnormal and Social Psychology, 27*(3), 243-269.
- Powell, J., Martindale, B., Kulp, S., Martindale, A., & Bauman, R. (1977). Taking a closer look: Time sampling and measurement error. *Journal of Applied Behavior Analysis, 10*, 325-332.
- Rogers, S. J. (2000). Interventions that facilitate socialization in children with autism. *Journal of Autism and Developmental Disorders, 30*(5), 399-409.
- Rubin, K. H. (2001). *The Play Observation Scale (POS) (rev.)*. Baltimore, MD: University of Maryland.
- Saudargas, R. A., & Zanolli, K. (1990). Momentary time sampling as an estimate of percentage time: A field validation. *Journal of Applied Behavior Analysis, 23*, 533-537.
- Scruggs, T. E., Mastropieri, M. A., & Castro, G. (1987). The quantitative synthesis of single-subject research: Methodology and validation. *Remedial and Special Education, 8*(1), 24-33.
- Sigafoos, J., Roberts-Pennell, D., & Graves, D. (1999). Longitudinal assessment of play and adaptive behavior in young children with developmental disabilities. *Research in Developmental Disabilities, 20*(2), 147-162.
- Stanton-Chapman, T. L. (In Press). Promoting positive peer interactions in the preschool classroom: The role and the responsibility of the teacher in supporting children's sociodramatic play. *Early Childhood Education Journal*.
- Stanton-Chapman, T. L., Denning, C. B., & Jamison, K. R. (2012). Communication skill building in young children with and without disabilities in a preschool classroom. *The Journal of Special Education*.
- Stanton-Chapman, T. L., Jamison, K. R., & Denning, C. B. (2008a). Building social communication skills in young children with disabilities: An intervention to promote peer social interactions in preschool settings. *Early Childhood Services: An Interdisciplinary Journal of Effectiveness, 2*, 225-251.
- Stanton-Chapman, T. L., Denning, C. B., & Jamison, K. R. (2008b). Exploring the effects of a social communication intervention for improving requests and word diversity in preschoolers with disabilities. *Psychology in the Schools, 45*, 644-664.

- Strain, P., Kohler, F., & Goldstein, H. (1996). Learning experiences . . . An alternative program: Peer-mediated interventions for young children with autism. In E.D. Hibbs & P.S. Jensen (Eds.), *Psychosocial treatments for child and adolescent disorders: Empirically based strategies for clinical practice* (pp. 573–586). Washington, DC: American Psychological Association.
- Strain, P. S., & Odom, S. L. (1986). Peer social initiations: Effective intervention for social skills development of exceptional children. *Exceptional Children*, 52(6), 543-551.
- Tapp, J. T., Wehby J. H. & Ellis D. (1995). MOOSES: A Multi-option observation system for experimental studies. *Behavior Research Methods, Instruments, & Computers*, 27(1), 25-31.
- Tawney, J. W., & Gast, D. L. (1984). *Single subject research in special education*. Columbus, OH: Merrill.
- Thorp, D. M., Stahmer, A. C., & Schreibman, L. (1995). Effects of sociodramatic play training on children with autism. *Journal of Autism and Developmental Disorders*, 25, 265-282.
- Vaughn, S., Kim, H-A., Morris Sloan, C. V., Tejero Hughes, M., Elbaum, B., & Sridhar, D. (1999). Social skill interventions for young children with disabilities: A synthesis of group design studies. *Remedial and Special Education*, 24, 2-15.
- Walker, H. M., & Gresham, F. M. (2013). The school-related behavior disorders field: A source of innovation and best practices for school personnel who serve students with emotional and behavioral disorders. In W. M. Reynolds & G. E. Miller (Eds), *The Handbook of Psychology* (2nd ed.) (pp. 411-440). Hoboken, NJ: John Wiley & Sons, Inc.
- Weiner, J., & Schneider, B. H. (2002). A multisource exploration of the friendship patterns of children with and without learning disabilities. *Journal of Abnormal Child Psychology*, 30, 127-141.
- Wong, C., & Kasari, C. (2012). Play and joint attention of children with autism in the preschool special education classroom. *Journal of Autism and Developmental Disorders*, 42, 2152-2161.
- Zimmerman, I. L., Steiner, V. G., & Pond, R. E. (2002). *Preschool Language Scale-r*, revised. San Antonio, TX: The Psychological Corporation.