THE IMPACT OF SOCIAL PLAY ACTIVITIES ON PROMOTING
SOCIAL INTERACTIONS OF HIGH-FUNCTIONING AUTISTIC
CHILDREN IN TAIWAN

A Dissertation in
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by
Ya-Lun Tsao

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The dissertation of Ya-Lun Tsao was reviewed and approved* by the following:

Thomas D. Yawkey  
Professor Emeritus of Education  
Dissertation Advisor  
Chair of Committee

Pamela S. Wolfe  
Associate Professor of Education

Ladislaus M. Semali  
Associate Professor of Education  
Chair of Comparative and International Education

Rama B. Radhakrishna  
Associate Professor of Agricultural and Extension Education

Glendon W. Blume  
Professor of Mathematics Education  
Coordinator of Graduate Programs in Curriculum and Instruction

*Signatures are on file in the Graduate School.
ABSTRACT

Social play activities mediated by peers with Pivotal Response Training (PRT) are interventions for enhancing high-functioning autistic children’s social behavior. A multiple baseline across subjects and across peers design was employed for this research. The purpose of this study was to assess the effects of Pivotal Response Training in social play activities with peer mediation to enhance the development of 7- to 8-year-old high functioning autistic children’s social skills with the focus on maintaining interactions, initiating conversations, and initiating play. Interviews and observations were the methods of data collection. Interviews were conducted with the parents and the teacher of the three autistic children, before and after the play sessions, respectively, to understand their current level of social skills, to check the differences in the targeted social behaviors. Observations were collected from three dyads (a normal child and an autistic one) in three successive phases: before the intervention, during the intervention, and for maintenance play sessions. Since the play sessions comprised the social interactions that occurred between each dyad, the data analysis focused on the occurrences and frequencies of the three targeted social behaviors. Two techniques, trend-line and percentage of overlap, were especially useful for the quantitative analysis.

The results of this study showed that the three high-functioning autistic children’s social behaviors for maintaining interactions, initiating conversations, and initiating play were enhanced by the social play activities involving interactions with peers with PRT. Interviews, which provided perspectives of the teacher and the parents of the three high-functioning autistic children supported the findings regarding their performance of social skills in other contexts, such as at home and in regular classes.
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CHAPTER 1
INTRODUCTION

Recently, educators in Taiwan have begun to shift their attention from mainstreaming to inclusion education for children with disabilities. The striking focal point of this shift emphasizes that children with disabilities, regardless of how minor or significant the degree of disability, all have “zero reject” status and are able to enter ordinary classes allowing full integration placement in education. In other words, exceptional students and ordinary students are to be accepted in education, equally, and are to have the opportunity for interaction. Each group of students promotes self-value and confidence in suitable educational patterns which meet exceptional students’ special needs. Consequently, designing an adequate curriculum for children with special needs to develop their social skills, and capable of being conducted in an inclusive classroom, remains an urgent issue for educators in Taiwan.

The purpose of this study was to assess the effects of pivotal response training (PRT), using peer mediation in social play activities, on 7- to 8-year-old high-functioning autistic children’s social skills development which includes maintained interactions, initiated conversations, and initiated play. The participants of this study were autistic children in an inclusive setting in Taiwan. The foundation of the social play activities was the basic, peer-implemented, pivotal response training (PRT) for children with autism. PRT assumes peers (non-autistic children), trained with PRT, administer the principles of the pivotal response training to autistic children during the social play activities. The expected result was that autistic children’s social behaviors (e.g., maintained interactions, initiated conversations, initiated play) become manifestly
improved after institution of the intervention when the autistic children interact with others. For example, the peer with PRT begins with simple actions with one toy to attract attention of an autistic child and that action develops into multiple actions with open-ended activities. Meanwhile, the autistic child first learns to observe others by sharing space, and then learns to take turns and later to cooperate with the peer during social play activities. Further, in group play, the child first learns to attend to one person, then watch others in the group, and finally to interact in structured and unstructured situations (Quill, 2000).

The overall purpose of this study was to measure the effects of the social play activities implemented by peers with pivotal responses training (PRT) on enhancing high functioning autistic children’s social development within an inclusive setting. The Purpose of the Study Section explains several related considerations.

This chapter includes the following sections: (a) Background, (b) Statement of the Problems, (c) Need for the Study, (d) Purpose of the Study, (e) Research Questions, (f) Definition of Terms, (g) Delimitations, and (h) Summary.

**Background**

With regard to educating autistic children, “Does inclusion work?” is a currently controversial issue. What is inclusion? The word “inclusion” does not even appear in the Individuals with Disabilities Education Act (IDEA) nor does any other related term, for example, inclusive education. Most educators (e.g., Crealock & Bachor, 1995; Fuchs & Fuchs, 1994; York, Doyle, & Kronberg, 1992) use the term inclusion to mean the placement of children with disabilities into general education classrooms for all or significant parts of the school day (Bowe, 2005). They (e.g., Crealock & Bachor, 1995;
Fuchs & Fuchs, 1994; York, Doyle, & Kronberg, 1992) also recognize that placements must be made to account for appropriateness and individualization to follow IDEA which guarantees each child with a disability a public education. That is, appropriateness also means meeting the unique needs of each child. Meanwhile, IDEA’s individualization mandates placement decisions are to be made on a case-by-case basis.

The reason “inclusion” became a controversy is that, for example, some advocates (e.g., Dorothy Lipsky & Alan Gartner, 1996) proposed quite radical conceptions for the meaning of “inclusion” (Bowe, 2005). First of all, they envisioned placement of all children with disabilities in general education classrooms which violates the law’s proscription against group placements. In other words, Lipsky and Gartner insisted that even children with severe disabilities be educated in general classrooms. While these children can be taught, in inclusive settings, many require a more customized curricula, more intensive instruction, and more individualized attention than they would receive in less integrated settings (Bowe, 2005).

Second, Lipsky and Gartner advocated that children with disabilities be placed in age-appropriated classrooms; however, some children benefit more when they are in classes in which their abilities and needs match the curricula and the methods of instruction. This means that children with disabilities may benefit more from content-appropriate places than from age-appropriate settings (Bowe, 2005). Although some evidence has shown negative learning outcomes from placing children with disabilities in learning inclusive settings, some research has shown outcomes that contradict the evidence. Salend and Duhaney (1999), reviewing empirical literature on inclusive practices, found that students with disabilities in general education settings, for
the most part, performed better academically than did peers who received services in pullout settings (Friend & Bursuck, 2002). Salend and Duhaney (1999) also found that students with severe disabilities engaged in more social interactions with non-disabled peers when placed in inclusive settings, and the subject children formed more friendships.

Moreover, inclusive educational settings are the most important current issue in Taiwan. Practicing “inclusiveness” in Taiwan adopts the trends of the United States. Although no explicit proclamation exists regarding “inclusion” in the “Educational Policy” in Taiwan, the Ministry of Education has continually proclaimed that children with special needs must be assigned a learning environment based on the principle of “least restrictive environment” (Lee, 2006). This environment is one in which the educational setting allows a child with disabilities to receive a free appropriate public education (FAPE). The design of the setting meets the child’s educational needs while associating with non-disabled peers in a regular educational environment to the maximum extent appropriate. Further, the definition of LRE in the IDEA is:

To the maximum extent appropriate, children with disabilities, including children in public or private institutions or other care facilities, are educated with children who are not disabled, and special classes, separate schooling, or other removal of children with disabilities from the regular educational environment occurs only when the nature or severity of the disability of a child is such that education in regular classes with the use of supplementary aids and services cannot be achieved satisfactorily. (Mastropieri & Scruggs, 2007, p. 10).

In addition, the Ministry of Education in Taiwan defined inclusive education as:

Inclusive education is one kind that is equal based on educational opportunity, resource sharing’s idea, places the body and mind of the disabled student in the ordinary class’s and grade’s education level. It not only provides the body and mind of the disabled student in the non-isolation educational environment which includes ordinary, non-disabled associates in which they study together, it also provides the ordinary classroom teacher with suitable support programs, the
related services, allows the teacher to grow, and combines special education and general education into one that achieves “teaching all comers without discrimination.” It creates a “special, but does not isolate” educational ideal (M. o. Education, 2004).

Based on these different views of inclusive education, obviously, inclusive education is an educational state which allows all people to study together, to live together, and to be comfortable by the elimination of discrimination.

In another aspect, as inherently social creatures, most children spend much of their mental energy engaged in social cognition, speculating about what other people are thinking and feeling, and choosing their behaviors toward others accordingly. The two important and interrelated aspects of social cognition are theory of mind and social information processing.

First, in the theory of mind, young children, during the preschool years, become increasingly aware of people’s mental states. They spontaneously use words that refer to desires and emotions, and also realize that the mind is distinct from the physical world, and that thoughts, memories, and dreams are not physical entities (McDevitt & Ormrod, 2007). To go into particulars, the theory of mind with children with autism refers to the characteristic that autistic children understand empathy and the perspectives of others (Simpson & Myles, 2008). Although many definitions of the theory of mind are apparent for individuals with autism, some researchers (e.g., Baron-Cohen & Swettenham, 1997; Richard, 2000) straight forwardly defined the theory of mind as the ability to understand other people’s thoughts and feelings, yet more complexly, the definition extends to concerns of the competence of children to appreciate not only their own but also other people’s mental states (i.e., intentions, pretense, perception, knowledge etc), and even the
ability of understanding the relationships between the revealed actions and mental states (Simpson & Myles, 2008).

Second, to interact effectively with other people, young children must engage their theory of mind and social perspective-taking abilities in social situations in which they process social information. During social information processing, children become involved in selecting and paying attention to certain stimuli, making sense of those stimuli through elaboration, storing what has been learned in long-term memory, and retrieving previously acquired information and beliefs on relevant occasions (McDevitt & Ormrod, 2007).

According to the results of social information processing situations, social competence is, obviously, one of the most important childhood developments. Yet a two-way relationship exists between play and social development which means that play affects children’s ability to acclimate to the social environment while the social environment influences play. John, Christie, and Yawkey (1999) mentioned that children learn attitudes and skills needed for play from their parents and from peers, both of whom may encourage certain types of play behavior and discourage others. Meanwhile, play acts as an important context for children’s acquisition of social skills and social knowledge. That is, play has a key role in social development by providing a context in which children can acquire many important social skills such as turn-taking, sharing, and cooperation, as well as the ability to understand other people’s thoughts.

One way to enhance social skills of children with autism is pivotal response training (PRT). Instituting pivotal response training (PRT), implemented by typical peers in social play activities, means to produce improvements in autistic children’s abilities to
moving toward a typical developmental trajectory and to help them take possession of opportunities to conduct meaningful lives in inclusive settings (Koegel & Koegel, 2006).

In sum, social contact is an important part of children’s development and community living. Children engage in reciprocal social interactions at home, at school, at work, and during leisure activities. And the acquisition of good social skills helps students attain a way to approach positive reinforcement for enhancing their social capabilities. Also, children must have the skills to approach peers in a socially recognized manner, or risk being unacceptable for a social group. Hence, the main focus of this study was to enhance the social skills of children with autism within the inclusive setting mandated in Taiwan and based on the social play activities.

**Statement of the Problem**

According to the statistics announced by the Ministry of the Interior in Taiwan, the population of children with autism grew from 6000 people in 2006 to 7000 people at the end of 2007. This statistic displayed a huge ascension of 16.52% within only a year, and autistic children represented the group with the most rapid growth above all populations of children with disabilities (Ministry of Interior, 2008). And, the percentage of children with autism has established approximately 0.21% of total school-age population within the 2007 academic year. In comparison, the situation in the United States is that, individuals with autism constitute approximately 0.15% of the school-age population, or 1.7% of the students served under IDEA, based on data from the U.S. Department of Education (Mastropieri & Scruggs, 2007). This quantitative information, apparently, demonstrated that autistic children may have given rise to educations’ close attention to
autism as a continuing issue of greater significance than issues involving all the populations of children with disabilities.

Today, since autism is an issue for which many educators express their concerns, many definitions have appeared which attempt to narrow its scope. The one mostly well accepted is that children with autism experience considerable difficulty with normal social skills and peer interactions. In fact, the American Psychiatric Association (1980) proclaimed that difficulties with social development and problems with social relationships are hallmarks of autism and are among the chief defining characteristics of this pervasive developmental disorder (Stone & Greca, 1986).

In addition, students with autism typically have difficulties with social skills. Their problems include deficits in specific social skills, as well as problems with social relations. The social deficit in autism sometimes manifests itself as rather mild impairments (i.e., difficulty establishing eye contact, making or interpreting facial expressions, or altering body postures) (Scott, Clark, & Brady, 2000). Moreover, students with autism usually lack appropriate social responsiveness from a very early age. They generally avoid physical contact (e.g., cuddling and holding), and they may not make eye contact. As Friend and Bursuck (2002) suggested, problems with social interactions persist as autistic children mature; they appear unaware of others’ feelings and may not seek interactions with peers or adults. They may have unusual language patterns, including spoken language without intonation; echolalia, or repetition of others’ speech.

Moreover, tracing the issue of autistic children within inclusive education and synthesizing the research in Taiwan, which are related to and which are controversial subjects, most research emphasized the attitudes of the staff (teachers, administrators)
and parents to inclusiveness, but disregarded the uniqueness and the characteristics of learning among children with autism (Yeh, 2005). However, under the mandate for inclusive education, the educational considerations for autistic children have become more serious day-by-day. In this situation, the issue worth serious consideration becomes: What kind of social skill interventions can be used by teachers in the inclusive education setting that not only to help the children with autism to promote their social skills, but also those general education children? Obviously, then, the current issue regarding children with autism in an inclusive setting is focusing on intervention which may enhance social capabilities of autistic children rather than focusing on the ways to change the attitudes of the staff (teachers, administrators). Thus, the basis for this research was to focus on the interventions to increase social-behavior competency of children with autism.

**Need for the Study**

This study assessed the effect of Pivotal Response Training (PRT) using peer mediation in social play activities on 7- to 8-year-old high functioning autistic children’s social development, which includes maintained interactions, initiative conversations, and initiative play. The participants of this study were autistic children within an inclusive educational setting in Taiwan. The hypothesis was that peer mediated intervention should help children with autism navigate a variety of social situations, especially in the inclusive educational setting, which involves autistic children in significant amounts of social interactions with peers. This study presented three basic areas for discussion: (a) the social play activities’ enhancement of the social development of autistic children, (b) the current situation of inclusive education in Taiwan, and (c) the application of the
study’s findings to the relevant issue of social interactions of children with autism.

As to the first area of interest, children with autism represent a developmentally heterogeneous group whose acquisition of social skills is qualitatively different from other children (Quill, 2000). However, in peer mediated social play activities, based on the principles of pivotal response training (PRT), the intervention aimed to enhance the autistic children’s social skills as represented by their abilities to accommodate or adapt to ongoing situations and social interactions.

Second, the term inclusion, traditionally, describes the education of students with disabilities in general education settings. This means that students with disabilities are served primarily in the general education classroom, under the supervision and responsibility of the general education, classroom teacher (Mastropieri & Scruggs, 2007). However, when necessary and justifiable, students with disabilities may also receive some of their instruction in another setting, such as a resource room.

In addition, besides the generally broad definition of the inclusion, a familiar statement of the individual rights basis for inclusion is the Salamanca Statement (UNECSO, 1994), which proclaimed:

At the first, the statement takes the view of children’s rights which proclaimed that every child has a fundamental right to education, and every child must be given the opportunity to achieve and maintain an acceptable level of learning. Second, the statement asserts the uniqueness of each child, that every child has unique characteristics, interests, abilities, and leaning needs. Yet the special education system should be designed, and then special educational programs implemented to take into account the wide diversity of these characteristics and needs. In addition, those with special educational needs must have access to regular schools which should accommodate them within a child-centered pedagogy capable of meeting these needs. Finally, the statement concluded with the point that regular schools with this inclusive orientation are the most effective means of combating discriminatory attitudes, creating welcoming communities,
building an inclusive society and achieving education for all. Moreover, the inclusive orientations provide effective education to the majority of children and improve the efficiency and ultimately the cost-effectiveness of the entire education system (UNECSO, 1994, p.5).

Moreover, children with autism are often not attached importance to the point of even having been neglected for a long time in the educational settings in Taiwan. However, since the emergence of the trend toward humanism, the attitudes regarding the matter of children with autism has changed, and the questions of education of exceptional children also garnered more importance (Hsu, 2004). As a result of reviews of the developmental trends in special education in Taiwan from overseas experiences, the Ministry of Education of Taiwan published the “The Education Report of Children with Disabilities” which, in accordance with changing times, complied with worldwide trends. In addition, in the report, “zero-rejection” and “human-based inclusion” are all reflected in giving importance to the impetus for inclusive education.

Third, some research studies in Taiwan (e.g., Jang, 2005; Lo, 2003; Ye, 2004), which were social play curriculum-related, all applied the curriculum to integrated play groups for exploring the effectiveness of promoting social interactions of high-functioning autistic children. These studies found that the social interaction and social skills of targeted subjects (high-functioning children with autism) were higher than with the previous social play curricula. In addition, not only are the social interactive abilities with peers promoted, but also the other abilities (e.g., communication, cognitive capacity) are improved. The similarity in these studies is that they all used play as an intervention to enhance the social interactions and social skills of children with autism.
Mostly, they established play groups, integrated or inclusive settings, as platforms for observing interactions between autistic children and peers.

In addition, when applying social play activities to children with autism, a peer is usually considered a pivotal mediation for improving social abilities of autistic children. Besides, some research (e.g., Harper, Symon, & Frea, 2008; Roeyers, 1996; Strain, Kerr, & Ragland, 1979) in the United States, stressed the value of mediating peers in social play activities for improving the social capabilities of children with autism. Some research in Taiwan (e.g., Chang, 2006; Feng, 2004; Feng & Feng, 2005) also emphasized the importance of implementing use of peers with Pivotal Responses Training (PRT) to enhance social interaction abilities of children with autism.

**Conceptual Framework**

Figure 1.1 illustrates the overall conceptual framework for this study. The three indicators shown at the bottom of the right side of the figure refer to the three dependent measures. Dyads (an autistic child and a non-autistic child) were videotaped during 15-minute play sessions before, during, and after PRT, once per day for 15 minutes.

In addition, as the effects of the peer’s pivotal response training (PRT), effects of the designs of the social play activities, the parents’ educational backgrounds and their attitudes toward the intervention were identified as factors that might influence the social interaction of high-functioning autistic children during the social play activities. These factors were identified as moderator variables in the study.
Initiated play
Initiated conversations
Maintained interactions
Dependent variable

Moderating variable
1. Effects of PRT training of peers
2. Effects of designs of the social play activities
3. Parents’ educational backgrounds
4. Parents’ attitudes toward the intervention (PRT)

Social play activities implemented by peers with Pivotal Response Training (PRT)

Social interactions

Maintained interactions
Initiated conversations
Initiated play

The social interacted relationships between high-functioning autistic children and non-autistic children in inclusive classroom settings

Figure 1.1 The conceptual framework for the study.
**Purpose of the Study**

Based on the results of previous studies, the main reason for establishing this current study’s research setting in an inclusive education classroom, and adopting Pivotal Response Training was to probe the results of such interventions for current application to inclusive education in Taiwan.

Moreover, this study assessed the effects of pivotal response training (PRT) when using peer mediation in play activities to enhance 7- to 8-year old high functioning autistic children’s social skills’ development which includes maintained interactions, initiative conversations, and initiative play.

**Research Questions**

According to the main purpose of this study, the following questions guide the research. Each research question gains substance from the review of literature in Chapter 2.

1. What effect do peers having Pivotal Response Training (PRT) affect social development of autistic children by engaging in social play activities with them?
   
   (a) Do peers with Pivotal Response Training affect a high-functioning autistic child’s skills for maintained interactions?
   
   (b) Do peers with Pivotal Response Training affect a high-functioning autistic child’s skills for initiated conversations?
   
   (c) Do peers with Pivotal Response Training affect a high-functioning autistic child’s skills for initiated play?

2. How effective can social skills intervention be for improving social interactions between autistic and non-autistic children who are in inclusive classroom settings?
3. What are the teachers’ and parents’ perspectives regarding social skills performance of autistic children in an inclusive education classroom?

Definition of Terms

Some specialized terms used in this study include: (a) inclusion, (b) inclusion of students with disabilities, (c) high-functioning autism, (d) Individuals with Disabilities Education Act, (e) theory of mind, (f) social information processing, and (g) pivotal response training (PRT).

Inclusion

Inclusion is the provision of services to students with disabilities. These services include those individuals with serve impairments attending neighborhood schools, in age-appropriate, general education classes, with the necessary support and supplementary aid (for the child and the teacher) to assure the child’s success with academics, behavior, and socialization, and to prepare the child for participation as a full and contributing member of the society (Bowe, 2005).

Inclusion of Students with Disabilities

Like individualized education program (IEP) students, all students with disabilities must be included in the states’ assessment systems. Individualized education program (IEP) teams, or section 504 placement teams, are responsible for determining whether or not a student is able to participate in standard assessments, and if so, what (if any) accommodations are appropriate. The state's obligation is to provide reasonable accommodations necessary to validly measure the achievement of students with disabilities relative to state standards. In those infrequent cases when an IEP team or section 504 team determines that standard assessments, even with reasonable
accommodations, do not provide a student with an opportunity to demonstrate knowledge and skills, then the state or school district must provide an alternate assessment. Whatever the assessment approach, the scores of students with disabilities must be included in the assessment system for purposes of public reporting and school and district accountability (D. Education, 2004).

**High-functioning Autism**

High-functioning autism is a form of autism in which the individual’s intellectual functioning is at least within the average range (i.e., IQ greater than 85). Estimates are that 20% of children with autism may attain the classification of high-functioning autism (Fombonne, 1999). A significant debate remains as to whether or not high-functioning autism (not a formal diagnosis) and Asperger syndrome (AS) are distinct. While the two disorders may be distinct regarding historical variables such as early language, behavior, and symptomatology, such differences may become insignificant in childhood and adolescence (Neisworth & Wolfe, 2005).

**Individuals with Disabilities Education Act (IDEA)**

Formerly known as the Education for All Handicapped Children Act, the IDEA (Individuals with Disabilities Education Act) underwent, most recently, revision in 2004. The Individuals with Disabilities Education Act (IDEA) is a United States Federal Law that governs how states and public agencies provide early intervention, special education, and related services to children with disabilities. It addresses the educational needs of children with disabilities from birth to the age of 21.

IDEA is civil rights law; however, states are not required to participate. As an incentive, and to assist states in complying with its requirements, IDEA makes funds
available to states that adopt at least the minimum policies and procedures specified in the act regarding education of children with disabilities. In defining the purpose of special education, IDEA 2004 clarifies Congress’ intended outcome for each child with a disability: Students must be provided a Free Appropriate Public Education (FAPE) that prepares them for further education, employment, and independent living.

Simply, this act reauthorizes the Education for all Handicapped Children Act. The revised legislation adds two new disability categories (traumatic brain injury and autism) to the definition of students with disabilities. A comprehensive definition of transitional services is a further addition to the act (Ysseldyke, 2004).

Theory of Mind (TOM)

Theory of mind encompasses complex understanding of people’s mental and emotional statuses: thoughts, beliefs, feelings, motives, intentions, and so on. Theory of mind enables people to interpret and predict the behaviors of important people in their lives, and to interact with individuals more effectively (McDevitt & Ormrod, 2007). Specifically, as Simpson and Myles (2008) expressed, theory of mind, often referred to as TOM or ToM, is not a “true theory” per se, but is a term representing ability and skill. Theory of Mind is important as it predicates an ability for social understanding for comprehending what other people think and feel as well as for reading facial expressions, nonverbal language, gestures and delicate cues in social interactions. It is always a challenge for those with theory of mind deficit, like individuals with autism.

Social Information Processing

Young children attend to and interpret various aspects of a situation and eventually choose what is, in their awareness, an appropriate response (McDevitt & Ormrod, 2007).
Pivotal Response Training (PRT)

Pivotal Response Training (PRT) is a model based on the developmental approach and applied behavior analysis (ABA) procedures for comprehensively servicing delivery and providing learning opportunities for children in the context of their natural environments (Koegel & Koegel, 2006). In addition, it is a composite of the research on task interpersonal, direct reinforcement, and role of identities. Koegel and Koegel (1989) also addressed that the identified key pivotal behaviors of autistic children are motivation, and responsivity to multiple cues (Koegel et al., 1989). Based on the two key areas mentioned, the corresponding components, primarily developed by Koegel O’Dell and Koegel (1987) are child-choice, natural reinforcers, and reinforcement of attempts (Benaron, 2004).

First, child-choice means to create an environment that complete materials and topics allow autistic children to show their preferences. The goal of child-choice within PRT can be achieved by a child’s selection of incentive or desirable materials or preferred objects for teaching desired skills. It can also be generalized to the daily routine. For example, in the social play activities, as in the study, typical peers may place toys around and wait for the autistic children to pick up one favorite toy, then start the activities between the two to produce opportunities for autistic children’s social interactions.

Second, in the Pivotal Response Training, the natural reinforcers refer to planned rewards which represent something that flows naturally from the child’s actions or verbalizations (Benaron, 2004).

In addition, reinforcement of attempts refers to providing children with reinforcements whenever they make any unambiguous attempt to produce desired
behaviors or the exact behaviors required. For example, as in this study, typical peers might speak words of cheer to the autistic children when they appeared to be “taking-turn” during the play activities.

**Delimitations**

This research intended to probe the impact of social play activities mediated by peers with Pivotal Response Training (PRT). The basis was researchers’ (e.g., L. K. Koegel, Camarata, Valdez-Menchaca, & Koegel, 1998) manifestations that the initiations of autistic children could be displayed by responses to simple “Wh” questions after the children were taught. Thus, based on the context of children’s initiations, this research adopts the definitions of three measurements: maintained interactions (e.g., answering the questions asked by other), initiated conversations (e.g., express what they do or how they feel), and initiated play (e.g., autistic children actively tell others what they want to play) from the related research (e.g., Kohler, Strain, & Maretsky, 1990; Pierce & Schreibman, 1995). Thus, the observations focused on these three targeted behaviors, and form the bases for describing results.

In addition, as Koegl and Koegel (2006) asserted, besides parents of the intervention media, the siblings, teachers, peers are also to be included in the PRT intervention projects in order to ensure application of a coordinated and comprehensive delivery. Thus, based on the assumption, the recruited sample populations for this research were three autistic children, and each child was paired with a non-autistic child as a play partner in an inclusive classroom.
Summary

The sections in this chapter discussed the fact that most educators advocate seeking accessible interventions for enhancing the social interactions of children with autism. Although controversial, placing these children in an inclusive education environment is crucial. Yet, when discussing issues regarding children with autism, the main viewpoint encompasses the issue of “When is good timing for implementing intervention to enhance social interaction abilities of autistic children?” And, the issue of early intervention is often an important consideration. Thus, this research emphasized intervention for enhancing the social interactions of high-functioning autistic children through peers with Pivotal Response Training (PRT). Mainly, the study observed three principal aspects of the social interactions of the three high-functioning autistic children: maintained interactions, initiated conversations, and initiated play.

Chapter 1 is followed by a chapter which examines the literature, in particular underscoring the theoretical framework and the characteristics of related research, and forms the bases for designing the current study.
CHAPTER 2
REVIEW OF LITERATURE

This study assessed the effects of pivotal response training in using peer mediation in social play activities on 7- to 8-year-old high functioning autistic children’s social skills development which includes maintained interactions, initiative conversations, and initiative plays. The following sections describe the selected critical elements that comprise the growth and learning of autistic children in an inclusive education environment that includes non-autistic children. Thus, this chapter presents relevant literature regarding autistic children’s social development within the trend of inclusive education. This chapter encompasses the following sections: (a) Characteristics and Patterns of Play of Autistic Children, (b) Challenges of Children with Autism during Play Activities, (c) Functions and Development of Play, (d) Selected Play Theories, (e) Variations in Approaches to Play in Special Education and General Education, (f) Ways of Developing Play in Children within the Autistic Spectrum, and (g) Summary.

Characteristics and Patterns of Play of Autistic Children

Children with developmental delays or disabilities sometimes experience equivalent delay in some characteristics of play. Contrarily, children with autism have a pattern of development that is not delayed, but rather is distorted (Ouinn & Rubinm, 1984). In play activities, apparently, children with autism lack make-believe ability because of their lack of basic representational skills, while other children with severe mental retardation may not have the same lack. In other words, autistic children are unable to have one object represent another or to represent themselves in mental states as with dolls or imaginative play scenarios (Frost, Wortham, & Reifel, 2001). Children with
autism tend to engage in repetitive and stereotypical manipulation of toys and object play rather than using toys in appropriate ways or even in complex play.

Moreover, autistic children are believed to have the ability to represent or symbolize through instructions, but not in spontaneous play. They are believed to lack the ability to engage in symbolic play due to a corresponding lack of motivation. This deficit means that poor social contact and level of receptive language skills might influence the absence of ability to engage in symbolic play. The play of autistic children can be rigid and unimaginative due to missing peer interaction, likely resulting in the disabled child’s remaining isolated from nearby group play.

Review of empirical studies, (e.g., Sigman & Mundy, 1987) revealed that children with autism demonstrated a wide range of different play behaviors in both unstructured free-play and structured play situations. They display a range of different functional acts and some symbolic play during manipulative and relational play activities. When compared to another groups of mentally retarded children, autistic children showed either different functional play or different integrated sequences of play. This shows the greatest difference in terms of object-directed and doll-directed play acts.

In sum, children with autism tend to engage in repetitive and stereotyped play rather than using toys in appropriate ways or even in complex play. However, not all of the children with autism displayed stereotypical play behaviors, and they may play similarly even with non-autistic children.

**Challenges of Children with Autism during Play Activities**

Social interaction, communication, and imagination are the principal elements in play activities. Unquestionably, children with autism engage in play activities in unusual
ways. Vygotsky claimed that, “in play a child always behaves beyond his average ability because play contains all developmental tendencies in a condensed form” (Sherratt & Peter, 2002, p. 3). This playfulness commonly remains latent for the majority of autistic children (Sherratt & Peter, 2002). Children with autism seem to lack the urge to spontaneously engage in playful behavior during free-play; however, structured play contexts with an interested adult can reveal indications of their play potential and clear enjoyment of activities. Ironically, the structured approach to explicitly teach children with autism how to play creatively actually has an overtly cognitive dimension when play is essentially an affective activity for autistic children.

Children with autism are fundamentally challenged in their abilities to encode and decode meaning (Frith, 2003). They appear to demonstrate a lack of empathy, have difficulty with flexible, lateral thinking, and tend to be very literal. In addition, Vygotsky (1978) recognized that children learn cultural tools (such as turn-taking, queuing and conversation) through the facilitation of peers and people surrounding them during play activities. He also mentioned that children learn how to internalize socio-cultural conventions and also to transcended themselves as they extend themselves and make their own realities through play, based on real-life and domestic situations. The resultant idea, based on the aforementioned, is that without intervention, impairments experienced by autistic children in communication, social interaction and flexible thinking will undermine their real, potential, play competence and subsequent development.

In addition, children with autism generally fail to develop a normal understanding of the fact that people have minds and mental states. The early signs of the dysfunction are apparent as impoverished play, social perspective-taking, and join-attention gestures
Children with autism tend to engage in repetitive play activity, ranging from manipulating objects and enacting elaborate routines to pursue and absorb narrowly focused interests. Without any guidance, they seem unlikely to engage in functionally appropriate play with objects. Yet children with autism tend to avoid peers or resist social overtures. They passively engage in play with little or no self-initiation during free-play situations, as they lack a predisposition to play spontaneously with peers. Generally speaking, autistic children rarely make overtures to peers in unstructured settings.

Narrowly, then, children with autism have a triad of impairments: difficulties in social interaction, communication, and inflexible thought processes during play activities. Autistic children often experience fundamental difficulties in engaging with others and with implicit understanding that other people share a joint focus of interest (Sherratt & Peter, 2002). This means that autistic children often fail to find meaning within ordinary interactions, while other normally developing children are attuned to looking for such opportunities in social interactions.

Moreover, children with autism encounter difficulties in communication during play activity. Most autistic children do not develop effective communication through speech, sign language, or the use of symbols. Communication by autistic children is often highly restricted. They also have difficulty using gestures and posture to communicate meaning to others. For example, the absence or late development of pointing to indicate something of interest or significance may lead to further communicative complications. In addition, children with autism experience an overwhelming tendency towards repetition in their actions and thought processes. They are impaired in their fluency for spontaneously producing a range of responses from a single stimulus (Sherratt & Peter, 2002).
example, they may not be able to generate expected play sequences, relying instead on repeating a prescribed narrative during such activities.

**Functions and Development of Play**

Play can influence children when it occurs between different age groups. Scarlett, Naudeau, Salonius-Pasternak, and Ponte (2005) mentioned that, “play during infancy and toddler years do not always happen with parents” (p. 42). In many instances, infants and toddlers play with other children, such as friends at daycare, neighbors, or siblings. This means that one can legitimately assume that older, more competent children and siblings provide scaffolding. For instance, older children or siblings have a tendency to play more gently with a toddler than they would with another 5-year-old child. Yet, older children have more limited perspective-taking abilities than their parents, which may limit their capacity to scaffold their younger siblings or peers (Vandell & Wilson, 1987). Consequently, older children might not have the same motivation and patience to engage infants in turn-taking activities, for example.

Infants spend more time in turn-taking exchanges with their mothers than they do with their siblings. Nevertheless, despite these developmental limits of how preschoolers scaffold infants’ play, infants’ play experiences with older siblings preclude more turn-taking exchanges between infants and same-age peers later on (Scarlett, Naudeau, Salonius-Pasternak, & Ponte, 2005). Siblings, then, can help young children become constructive players. On the other hand, the entire play situation is entirely different when infants and toddlers play with age-mates. According to (Mueller & Lucas, 1975), children play by themselves, imitate, take turns, and progressively initiate new forms of play through interacting with their age-mates, just as they did with their parents.
Moreover, peers have different interests than adults – interests that most often match younger children’s own interests. For instance, peers are less likely than caregivers to imitate those youthful behaviors that do not interest them, which means that children benefit from less scaffolding by adults. At the same time, some social abilities are more likely to be acquired from peers than from adults (Howes, 1989). According to Scarlett et al. (2005), one more distinction should be considered, namely: Which occurs during play with familiar peers and play with non-familiar peers? Concerning this point, Eckerman, Davis, and Didow (1989), discovered actions coordinated with the actions of peers and extended social interactions following Mueller and Lucas’s model (Scarlett et al., 2005) (See Table 2.1 below.)
Table 2.1

*Major Types of Play among Same-age Toddlers*

<table>
<thead>
<tr>
<th>Categories</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unrelated (solitary)</td>
<td>Acts on different play material than peer or on the same play material (e.g., beanbag) but at a distance from peers and without any coordinated or interfering features</td>
</tr>
<tr>
<td>Tangential (solitary)</td>
<td>Acts neither coordinated nor interfering with peers that involve the same play material as peer’s nor occurs near peer, also, gestures or words directed to a peer that are somehow related to peer’s actions, words, or gestures but fails to meet the criteria for Coordinated or Interfering Play</td>
</tr>
<tr>
<td>Interfering (presocial)</td>
<td>Acts that interrupt or interfere with peer’s continuing ongoing actions; also, requests interrupt or stop peer’s actions</td>
</tr>
<tr>
<td>Coordinated (social)</td>
<td>Acts thematically related to the specifics of a peer’s acts that allow a peer’s continuing activity while expanding that activity to include both children</td>
</tr>
<tr>
<td>1. Imitative</td>
<td>Performing the same action as peer, one or more of the distinctive elements of a peer’s actions, a thematic variant of a peer’s actions (e.g., hiding but at a different location), or an elaboration of a peer’s actions (e.g., marching around the box before jumping off it)</td>
</tr>
<tr>
<td>2. Complementary</td>
<td>Performing the same action as a peer, one or more of the distinctive elements of a peer’s actions, or a thematic variant of a peer’s actions (e.g., hiding but at a different location)</td>
</tr>
<tr>
<td>(2a) Complementary role</td>
<td>Performing an act that together with a peer’s act forms a common play theme (e.g., “finding” a “hiding” peer); performing a role in an established game that differs in content from a peer’s role (e.g., “leading” in follow-the-leader games)</td>
</tr>
<tr>
<td>(2b) Complementary directive</td>
<td>Use of conventional gestures or words to direct a peer in the continuation or elaboration of an activity (e.g., “go jump”) or the joint activity of the two children</td>
</tr>
<tr>
<td>(2c) Complementary response</td>
<td>Responding appropriately to the complementary interfering, or tangential directives of a peer (e.g., going where peer directs)</td>
</tr>
</tbody>
</table>

In addition, Groos identified two types of human play that he saw as functional: experimental play and socionomic play (Frost et al., 2001). Experimental play provides sensory and motoric practice, including object manipulation, construction, and games with rules. Such play is a precursor to adulthood, where more self-control tends to be exhibited. Socionomic play provides practice for interpersonal skills, including chase and rough-and-tumble games, social and dramatic play, and imitation.

In sum, the above illustrates that play may broadly serve children’s development in a variety of ways. Play relates to cognitive, social, and emotional development. Additionally, play seems more strongly connected with decentralization and perspective taking. It also appears to be a causal factor in the development of divergent thinking, metacommunication and other metacognitive abilities (Johnson, Christie, & Yawkey, 1999).

**Play Promoting Children’s Overall Development**

Children’s play has been hypothesized as contributing to the cognitive, motor, and social development of children, including the development of perception, attention, memory, problem-solving skills, language, communication, creativity, logical operations, emotion regulation, self-regulation, social skills, gender roles, social relationships, conflict resolution, coping with stress, and so on. Also, according to Fein & Kinney, (1994), “children who spontaneously engage in [make-believe play], when compared to their less playful peers, tend to be more friendly, popular, expressive, cooperative, verbal, and creative, as well as less impulsive and aggressive, and more likely to take the perspective of others” (p. 189).
Children with disabilities may engage in play differently than their non-disabled peers. The nature of play for children with disabilities depends on the particular disability or combination of disabling factors, the opportunities for play, the accessibility of toys, availability of a modified play environment, and the presence of peers and adults to facilitate and encourage play (Frost et al., 2001). Based on Fein and Kinney’s (1994) classification of disabilities in terms of “intellectual impairments, physical disabilities, and emotional disorders” (p.197), several organizational patterns are beneficial for discussing these different types of disabilities as well as the effects and benefits gained though play. In addition, since many children have multiple disabilities, they might have disabling conditions in more than one category.

In an increasingly industrialized and technical society, many emerging issues have been found regarding children’s play. While play continues to be important for children’s learning, new contexts have arisen within which play serves previously unrecognized functions. The communities in which play takes place have changed, and parental supervision is not what it once was. In modern society, suburban neighborhoods and mobile professionals provide more change in children’s lives than stability (Frost et al., 2001). For many emerging social conditions, fortunately, the history of play provides some perspective, which allows adults some insight into play for its continued importance. Just as imaginary play has become a predominant element in today’s materialistic society, simultaneously, the challenging, and the purely fanciful come together in contemporary studies of the history of play.
Accordingly, adults should provide a playing environment for children that helps children learn to make choices and deal with the ramifications of those choices, while also facilitating the communication and expression of ideas. Meanwhile, parents and teachers alike need to assess how children make responsible choices and their appropriate expressions of themselves.

**Selected Play Theories**

The following sections explain theories of play, and provide valuable knowledge for both teachers and parents in understanding what a sound play environment is and how to promote it for children with special needs. As mentioned earlier, play theories are the assumptions used to predict young children’s play behavior. While risking confusion and possibly complicating actions with theory, the fact is, research cannot escape theory, in the sense that researchers always use it (Frost et al., 2001). Therefore, a clear understanding of each theory for facilitating young children’s play is crucial.

*Constructivist Theories*

*Theory of Piaget*

The Piagetian explanation represents common features of cognitive-development that are evident at different stages (Scarlett et al., 2005). Piaget delineated three stages (see Table 2.2) for explaining the development of play: (a) a stage dominated by nonsymbolic practice games, (b) a stage dominated by make-believe and symbolic games, and (c) a stage dominated by games with rules.
Table 2.2

Piaget’s Stages of Play

<table>
<thead>
<tr>
<th>Age (Approximate)</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early to late infancy</td>
<td>Nonsymbolic practice games</td>
</tr>
<tr>
<td>Early childhood (before age 6)</td>
<td>Make-believe and symbolic games</td>
</tr>
<tr>
<td>Late Childhood (before age 12)</td>
<td>Games with rules</td>
</tr>
</tbody>
</table>


Piaget’s interests in cognition, based on philosophical foundations, took shape from observations of his three children. He assumed that innate mental structures were an inevitable result of experience (Frost et al., 2001). Researchers have found Piaget’s observations of infant development to be quite accurate. Also, Piaget’s view of cognitive development is culturally neutral in that children within different cultural groups follow the same sequence. This further enhanced the Piagetian notion that cognitive development proceeds in predictable, invariant steps (in his terms, a sensori-motor period) (Hale-Benson, 1986).

Table 2.3 below shows the six stages of play of very young children, from birth to 24 months, and explains the content of play. These initial stages of play are critical to both special and general education.
### Table 2.3  
**Cognitive Development and Play: Piaget’s Stages**

<table>
<thead>
<tr>
<th>Stage 1: Reflexes</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the first stage, between birth and 1 month, infants use reflexes to learn. Newborns use the sensorimotor activities of sucking, looking, listening, and grasping. They exercise, refine, and organize these reflexes.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stage 2: Primary circular reactions</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants, between 1 and 4 months begin to adapt their reflexes as they interact with the environment. Sucking is adapted to specific objects such as nipples and pacifiers. Objects are sucked for nutrients or for pleasure. Other actions involving the child’s own body are repeated because the infant finds them to be interesting. For example, the infant kicks his legs or stares at his hand. These actions are repeated over and over in a circular manifestation of action and response.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stage 3: Secondary circular reactions</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between 4 and 8 months, the infant repeats actions that involve objects, toys, clothing, or another person. The infant performs an action that elicits a pleasing response from a parent and repeats the action to extend the reaction. The infant might also kick repeatedly to activate a crib toy or shake a rattle to hear the sound again and again. Vocalizations are included in the actions produced by the infant to get a response from another person.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stage 4: Coordination of secondary circular reactions</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>The infant between 8 months and 1 year can coordinate several behaviors. Piaget identified infants as capable of true intelligence because their behavior is goal directed. The infant might try to reach a forbidden object or use different vocalizations to hear the sounds made. Emerging motor skills enable the child to incorporate more of the environment in activities. As part of the emergence of intentional behaviors, infants achieve object permanence. Infants can retrieve hidden objects, demonstrating that they understand that an object still exists when it is out of sight. They can anticipate events such as the departure of a parent or preparation of a meal.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stage 5: Tertiary circular reactions</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toddlers between the ages of 12 and 18 months become creative and experiment with new behaviors. A toddler might try different ways to drop food from a high chair or to throw a toy. The toddler does not repeat the same behaviors but tries variations on the original behavior. Toddlers’ inventive</td>
<td></td>
</tr>
</tbody>
</table>
behaviors can be very trying for parents and caregivers. One of Piaget’s children enjoyed emptying kitchen cupboards and experimenting with new ways to roll canned goods and open containers, and trying different combinations of noise from cooking pans and lids on the kitchen floor.

| Stage 6: Mental combination | True problem solving emerges between 18 and 24 months. The toddler can mentally consider solutions to problems before taking any action. Rather than using trial and error, the child can anticipate what might happen if certain behaviors are used. In this stage, toddlers develop a more advanced understanding of object permanence. They understand that objects can be moved when they are out of sight and look in different locations to find a toy. They are able to represent mentally something that is not present. For example, a toddler can pretend to be sleeping. The toddler is leaving the sensorimotor period of development and moving toward the preoperational period of thinking. |


*Theory of Vygotsky*

In comparison, with respect to the role of play in the development of young children, Vygotsky focused on two fundamental issues: first, the origin and genesis of play, and second, whether or not play is the dominant activity of young children (Frost et al., 2001). Vygotsky thought that play, as in pretend play, serves a key developmental function for young children’s mental maturity. To illustrate, Vygotsky presented the “zone of proximal development” (ZPD) - the difference between what a child can do with help and what can be accomplished without guidance. Using the ZPD concept, play can be seen as an example of development. A child performing at a higher level than his or her usual behavior shows that the upper levels of ZPD are promoted by social interactions with adults or peers. Adults and peers can effectively “scaffold” the children’s learning, helping them achieve even higher levels of developmental thinking and behavior.
In sum, Piaget gave a set of standards for identifying different types of play at particular ages. Comparatively, Vygotsky proved that play is a developmental zone, in which the child can progress more in conventional educational activities. Both of the two theories contribute a clear understanding about young children’s play.

**Social Learning Theory: Bandura**

Play is intricately involved in the socialization process. A two-way relationship exists between play and social development (Johnson et al., 1999). While the social environment influences play, play also affects children’s ability to accommodate their social environments which have important effects on children’s play.

The social learning theory of Bandura emphasizes the importance of observing and modeling the behaviors, attitudes, and emotional reactions of others. Bandura (1977) states:

> Learning would be exceedingly laborious, not to mention hazardous, if people had to rely solely on the effects of their own actions to inform them what to do. Fortunately, most human behavior is learned observationally through modeling: From observing others one forms an idea of how new behaviors are performed, and on later occasions this coded information serves as a guide for action (pp.22).

Social learning theory explains human behavior in terms of continuous reciprocal interaction between cognitive, behavioral, an environmental influences. Young children learn attitudes and skills for play from their parents and from other children. In addition, play has a main role in social development by providing a context in which children can acquire many important social skills.

In sum, play is so much a part of the lives of human beings that one may fail to reflect on the range of play activities in which one engages, and thereby not fully comprehend what those activities mean (Frost et al., 2001). Play has multiple meanings, and multiple
forms of activities can be called play. Most studies focusing on child development contend that play, based on fantasy or imagination, is necessary for children. As children may pretend in a manner that reflects the experiences they have had, play becomes an imitation of life that serves to educate them. Also, children operate with assumed social rules when they play, thereby learning how to relate with one another.

**Common Elements of Play-based Curricula**

Three common features for most play models which allow active involvement in a daily schedule are: play centers and spatial arrangement, provision for special kinds of play materials, and divergent activities allowing for creative expression (Frost et al., 2001).

*Play Centers and Spatial Arrangement*

Most play-oriented programs have clearly defined play centers, constructed and organized in special ways to enhance children’s play (Frost et al., 2001). Many play centers manifest logical arrangements in order to increase play frequency and quality so as to promote learning. In this type of play center, the arrangement positions compatible materials near one another and incompatible ones far away. For example, blocks, dramatic play, or motor play centers are nearby, but away from quieter activity places such as reading and science areas (Frost et al., 2001).

Moreover, the play centers can have a modified open-plan design in which centers are divided into two or three areas, but are open on at least one side for easy access to encourage play. An additional area, a place for children to be alone in the play center and to enjoy a brief respite from active classroom life, contributes to feelings of comfort and security in school.
Balance of Play Materials

The most critical aspect of the quality of children’s play is the balance of play materials. Prescott (as cited in Frost et al., 2001) suggested that a good balance in play materials means an equilibrium between complex and simple materials, and open-ended versus close-ended materials. Complex materials are those frequently used, such as clay. In contrast, simple materials are those only one or a few children use, such as books. In addition, the open-ended materials allow children to express themselves freely and creatively while closed materials are the ones that structure the order of children’s play.

Divergent Activities and Creative Expression

Play-based curricula mostly focus on creative processes rather than on end-products. For example, play centers are more likely to include a wide range of open-ended art materials (e.g., paint and markers) than an art project with a single objective outcome (e.g., making clown faces that all turn out the same) (Frost et al., 2001). Johnson, Christie, and Yawkey (1999) found positive relationships between play and creativity, which means that play promotes creative thinking. In addition, findings showed that divergent thinking occurred when children regularly engaged in make-believe.

In other words, a key factor of play’s contribution to creativity is symbolic transformations occurring in make-believe play (Johnson et al., 1999). Moreover, divergent thinking fostered by play enhances children’s possession of an ability to generate varied ideas in language interactions and art. Divergent thinking even contributes to more effective problem solving since play experiences enable children to generate more solutions to problems.
Variations in Approaches to Play

From the review of related theories, four types of approaches to play emerge. Table 2.4 describes these types.

Table 2.4  
Approaches to Play

<table>
<thead>
<tr>
<th>Approach to Play</th>
<th>Key Theorists</th>
<th>Underlying Assumptions</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonplay approach</td>
<td>Bereiter &amp; Engelmann (1966); Skinner (1966)</td>
<td>Play is distinct from and less important than learning or work. Because it is enjoyable, play can serve as a reward for working hard in school.</td>
<td>A teacher assigns workbook activities to first grade children. If they finish their work quickly and carefully, she allows them to play games for several minutes.</td>
</tr>
<tr>
<td>Hands-off play approach</td>
<td>Axline (1947); Freud (1961)</td>
<td>Children benefit most from self-guided play with open-ended play materials. Adult intervention interferes with self-expression.</td>
<td>A kindergarten teacher provides a traditional “house-keeping corner,” equipped with home-related play props. The teacher observes children playing themes or issues of concern or interest but does not intervene.</td>
</tr>
<tr>
<td>Narrowly focused play intervention</td>
<td>DeVries et al. (in press); Lsenberg &amp; Jalongo (1997); Neuman &amp;</td>
<td>Certain types of play are most useful to children, especially sociodramatic play,</td>
<td>A preschool teacher sets up a dramatic play center as a pretend restaurant.</td>
</tr>
<tr>
<td>Broad-based developmental approach</td>
<td>Biber (1977); Bodrova &amp; Leong (1998); Gandini (1997); Hohman &amp; Weikart (1995); Trawick-Smith (1994a, 1994b)</td>
<td>All types of play activities are useful to children. As children play, they acquire a broad range of cognitive, social and play skills. Teachers can intervene to promote all areas of development.</td>
<td>A second grade teacher moves to a group of children who are arguing about the outcome of a card game. Asking questions guides children in quantifying and conflict resolution.</td>
</tr>
</tbody>
</table>

As children play there, intervention is for encouraging more make believe, verbalization, social interaction, and persistence.

As children play there, intervention is for encouraging more make believe, verbalization, social interaction, and persistence.

Non-play Curriculum Models

In non-play curriculum models, teachers often offer play opportunities infrequently. When they do allow play in the classroom, it is often used as a reward to encourage non-play work. In this situation, play and learning are mutually exclusive since learning is the ultimate goal of education and is more important than play.

Non-play curriculum models mostly include direct adult instruction, programmed workbooks, and tangible rewards for appropriate behaviors and learning. Play is deemphasized or prohibited. These curriculum models devote themselves to intensive, adult instruction in academic skills, and children are encouraged, induced to persevere doing rather austere learning tasks to gain rewards and adult praise. For example, the

teacher may only teach oral and written language directly by presenting words and sentences. Children receive rewards for restating or rereading the words and sentences aloud (Frost et al., 2001). However, the non-play curriculum models have received criticism because they fail to address the importance of nonacademic areas of development, such as social development and creativity.

The “Hands-Off” Play Curriculum

In the “Hands-Off” play curriculum, teachers provide rich materials and ample space in order to encourage children to play with complete independence. The “Hands-Off” play curriculum is an approach that is uniform in its adherence to the psycho-analytical theory, which states that the overall goals of the curriculum are to promote social development and mental health.

According to Freud’s theory of play, the classroom is the place in which children can spend most of their time expressing themselves in open-ended ways with toys and art media (Frost et al., 2001). In other words, the teachers in the “Hands-Off” play curriculum serve as attachment figures who always respond with warmth and interest when children need attention and reassurance or assistance. Furthermore, teachers can help children with conflict and anxiety resolutions through talking or playing.

Narrowly Focused Play Interventions

Numerous play models have designs to enhance specific types of play, which, in a typical play-based classroom with a full complement of play activities and centers emphasize sociodramatic play. In the Forst et al., study (2001), the three types of narrowly focused play interventions included: (a) Smilansky’s Sociodramatic Play Intervention, (b) Roskos and Neuman’s Literacy Play Model, and (c) Kamii’s and
DeVries’s Group Games. Each type is described below.

Smilansky’s Sociodramatic Play Intervention

The Smilansky’s model has four key assumptions (Frost et al., 2001):

1. Sociodramatic play is related to social and cognitive development and school success.
2. Not all children engage in sociodramatic play; some do perform play enactments that are less social, imaginative, verbal, or organized.
3. Absence of sociodramatic play abilities among children of low socioeconomic status may explain their academic difficulties in later childhood.
4. Adult intervention can increase the quantity and quality of sociodramatic play and enhance overall cognitive development.

As socio-dramatic play is primarily assimilative, children engage with rich experiences (e.g., field trips and story). Also, all the interventions aim to preserve and enhance the ongoing sociodramatic play theme, but teachers should only intervene for a short time and withdraw after enhancing one or two play skills. In addition, the goal of Smilansky’s sociodramatic play intervention is enriching self-directed play rather than providing full adult-guided make-believe.

Roskos’ and Neuman’s Literacy Play Model

Roskos’ and Neuman’s literacy play model assumes that children engage in literacy routines during sociodramatic play activities. For example, when children create a make-believe grocery store, they may be able to write a grocery list. The role of teachers is to facilitate literacy by providing props, modeling children’s use, and encouraging peer interactions when a child has trouble reading another’s words or letters.
Kamii’s and DeVries’s Group Games

Influenced by Piaget’s theory of play and development, Kamii’s and DeVries’s (1980) group games assert that games are especially challenging cognitively and socially, since children must think about and adhere to rules and accept the perspectives of peers during play (Frost et al., 2001). The role of the teacher is to ask interesting questions during the game, guide children’s problem-solving, facilitate clashes of opinion that inevitably arise, and prompt children to establish the game and negotiate rules.

Broadly Focused Developmental Models

In broadly focused developmental models, teachers provide materials and intervene in children’s play to enhance a wide range of concepts and skills, such as language or social competencies. Children’s play is not the sole focus for intervention. Three types of developmental models are: (a) The Bank Street Approach, (b) The High/Scope Program, and (c) The Vygotskian Play Models.

The Bank Street Approach

The Bank Street approach respects the child as a person and citizen. This is evident in all aspects of the program, which were influenced strongly by John Dewey. It is a fully elaborated play-based approach in early childhood education (Sluss, 2005). A modern Bank Street classroom includes centers for all academic subjects, especially those emphasizing language and literacy. In other words, the philosophy of Bank Street supports a developmental interaction curriculum, which is more directed and focused on literacy.

In the Bank Street programs, children interact more often with peers to express more higher-order cognitive statements and questions and show more autonomy in
thought and action (Frost et al., 2001). Moreover, this model’s focus is learning through
daily experience in indoor (e.g., art, sensory experiences, music) and outdoor (e.g., field
trips) environments.

*The High/Scope Program*

The High/Scope program’s design is cognitively based, with more emphasis on
cognitive development than on socio-moral development (Sluss, 2005). In other words, a
specific set of cognitive abilities is the target for intervention, which makes High/Scope
different from other approaches that focus on concepts and enhancing skills (e.g., Bank
Street program). High/Scope has its own feature named “plan-do-review” schedule. In an
initial planning session, children decide which play activities they will pursue during a
free-choice period, then play in centers in the “do” portion, and recall the activities they
have completed in the “review” session (Frost et al., 2001). However, High/Scope has
faced arguments that teachers’ questions are often completely outside the children’s
intended play goals or interests.

*The Vygotskian Play Models*

Similar to Bank Street and High/Scope, the Vygotskian models view play as a
context for acquiring general cognitive processes, not just narrow play skills. Play is
regarded as a primary mechanism for the acquisition of symbolic thought. In Vygotskian
models, adult involvement “may only be necessary for specific children or groups of
children who are having trouble sustaining their interactions” (as cited in Frost et al.,
2001). Furthermore, the goal is to enrich what children are currently doing, not to prompt
other, extraneous modes of thinking and learning. The unique feature of Vygotskian play
models is the scaffolding that teachers provide in the way of gentle guidance to children’s
activities based on the level of support needed within a given context during children’s play. This is called the “zone of proximal development” in which learning and development occur.

In summary, no matter which play approach is used, teachers should not only enhance specific types of play, such as sociodramatic play, literacy, and games, but also provide classroom space and materials to promote different kinds of play and those types of play which best enhance children’s cognitive and social development.

**Ways of Developing Play in Children within the Autistic Spectrum**

Play develops competence. However, the most crucial part of enhancing capacities of children with autism is for them to understand and be familiar with the social world, and ultimately to participate in peer culture. A starting point is helpful for planning structured opportunities for improving the play of autistic children.

However, children with autism are not actually deficient in the ability to play. They simply appear to lack direction, and they need to be encouraged and motivated to play (Sherratt & Peter, 2002). Duffy (1998) suggested that the following needs to occur: (a) create a condition within which children are inspired to be creative and imaginative and (b) develop children’s creativity and imagination through interaction with them (Sherratt & Peter, 2002, p. 39).

First, adults must create conditions for purposeful play. Even though relationships are mediated, and attitudes towards oneself and the social world form meaningful personal experiences with adults, children with autism can share experiences and interact with the thoughts and feelings of other children. In other words, children with autism can develop social play and gain pleasure from sharing play activities in which they become
an emotional shareholder. In this context, adults must provide shared attention by making contact and imitating children in order to reinforce autistic children’s spontaneous reactions. In this way, adults model appropriate play interactions.

Second, adults must create interactions in the play process with autistic children. By adults providing direct experiences, objects, artifacts, materials, and a selection of ideas, children with autism become aware of creative possibilities and support adults’ initiatives. Duffy (1998) developed a useful four-stage model of the creative process to support children with autism as they endeavor to master play activities (Sherratt & Peter, 2002, p. 42) Table 2.5 clarifies the adult’s role in supporting children at different stages of the play process.

Table 2.5
Supporting the Play Process

<table>
<thead>
<tr>
<th>Play Process</th>
<th>Child</th>
<th>Student Context</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curiosity</td>
<td>What is it?</td>
<td>• Capturing interest and attention</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Providing stimulus (play materials)</td>
</tr>
<tr>
<td>Exploration</td>
<td>What can it do?</td>
<td>• Encouraging and reinforcing initiative</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Demonstrating and modeling other possibilities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Supporting imitation by the child</td>
</tr>
<tr>
<td>Consolidation</td>
<td>What can I do with this?</td>
<td>• Reminding (prompting recall) of the play experience</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Sensitively supporting the child practicing the play strategy</td>
</tr>
</tbody>
</table>
Free Play Context

Creativity  What else can I do with this?
- Providing play materials within a defined play space
- Prompting recall of previous play experience
- Discussing play intention
- Being available to support as necessary – especially a new development & initiative
- Evaluating the experience with the child


In sum, what is critical is that play contexts are structured at an appropriate level so that children learn to flex their minds and make creative choices and decisions within the boundaries in which they feel secure.

Integrated Play Groups Model

The Integrated Play Groups Model is a way for supporting children with autism during play. The concept for Integrated Play Group Model grew in response to the need to develop a comprehensive play intervention for children with autism (Wolfberg, 1999). It specifically incorporates variables documented as affecting play and social interaction in children with autism and related social communicative needs. Guided participation is a major feature of the Integrated Play Groups Model. Children with autism participate in play activities with socially competent peers, supported by adults. The goal is to facilitate mutually enjoyed and reciprocal play among autistic and non-autistic children.

Also, some researchers in Taiwan tried to determine if the Integrated Play Groups Model could be successfully adopted for children with autism in home and school settings and within different cultures and languages (i.e., within Taiwan where the
dominant culture/language is Chinese/Mandarin) (Yang, Wolfberg, Wu, & Hwu, 2003). While the results of this pilot study are preliminary, they found that the children made notable gains in both social and symbolic play while participating in play groups. Also, they found that a reasonable expectation was that this could remain a prominent feature of play for children with autism since functional play was evident for both types of children at the outset of the study.

Based on the research results from both western and eastern countries, play is the most meaningful context for supporting children with autism. And play is, perhaps, the ultimate context for enhancing socialization and imagination.

**Peer Implementation**

In discussing the research on social play activities for improving social interaction abilities of children with autism, adults (e.g., parents and teachers) were used to prioritize considerations for a strategy for producing collateral effects on autistic children. Regarding involvement of adults in the play social activities, the research (e.g., Koegel, Bimbela, & Schreibman, 1996) demonstrated that implementation of an adult training format by employing naturalistic teaching paradigms may generate two-way effects for improving the social behaviors of children with autism and the interactive relationship between the children and adults with whom the children are intimate. To the contrary, Weiss and Harris (2001) mentioned that using adults for increasing social behaviors of children with autism created unconditional efficacy. However, the efficacy seemed to disappear after the adults faded from the study. Also, implementing adults as mediation for interacting with children with autism caused an exceedingly dependent mental state for the children toward the adult. The result was that the frequency of social interaction of children with autism diminished
after the adults abandoned engagement. Accordingly, some studies (e.g., Choi, Jobling, & Carroll, 2000; Feng, 2004; Chang, 2006; Happer, Symon, & Frea, 2008; Kuhn, Bodkin, Devlin, & Doggett, 2008; Pierce & Schreibman, 1995, 1997a, 1997b; Roeyers, 1996; Strain, Kerr, & Ragland, 1979) projected the value of implementing peers as mediators for enhancing the social interaction abilities of children with autism. The studies also considered that implementing peers to interact with children with autism may not only avoid the situations arising from using parents, but also enable autistic children’s engagement of an age-appropriate learning atmosphere, which, under the guidance of peers, improves autistic children’s social behaviors. Table 2.6 shows the related research on implementing peers in social play activities for enhancing social interaction capabilities among children with autism.

<table>
<thead>
<tr>
<th>Studies</th>
<th>Year</th>
<th>Research Subjects</th>
<th>Research design/Intervention</th>
<th>Research results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strain, Kerr, &amp; Ragland</td>
<td>1992</td>
<td>Four low-functioning autistic children with one peer trainer (all participants’ age range was 9-11 years-old)</td>
<td>A withdrawal-of-treatment design was employed.</td>
<td>Autistic children’s motor-gestural and vocal-verbal behaviors positively increased.</td>
</tr>
<tr>
<td>Goldstein, Kaczmarek, Pennington, &amp; Shafer</td>
<td>1992</td>
<td>Five children (identified as target children; age range was 35-82 months) with disabilities and 10 typical peers were assigned to triads consisting of one target child and two peers.</td>
<td>An ABCB reversal design replicated across five triads was applied.</td>
<td>The frequencies of social interactions increased during the play activities.</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Year</td>
<td>Methodology</td>
<td>Results</td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Odom, Chandler, Ostrosky, McConnell, &amp; Reaney</td>
<td>1992</td>
<td>Six children (served as target children) had mental retardation and 10 children without disabilities were recruited.</td>
<td>A combined sequential and partial withdrawal design was applied. The target children’s social interactions with peers increased.</td>
<td></td>
</tr>
<tr>
<td>Kamps, Barbetta, Leonard, &amp; Delquadri</td>
<td>1994</td>
<td>Three high-functioning autistic children with 14 peers (6 were children with learning disabilities and 8 were typical children) were recruited.</td>
<td>A multiple baseline design, across subjects with a reversal was employed. All peers were trained for three 45-min sessions on the Classwide Peer Tutoring (CWPT) procedures. The majority of students’ reading fluencies and correct responses to reading comprehension questions positively increased through CWPT.</td>
<td></td>
</tr>
<tr>
<td>Pierce &amp; Schreibman</td>
<td>1995</td>
<td>Two children with autism and two typical children were involved (all children were 10 years old).</td>
<td>A multiple baseline design across subjects was employed. Peer-implemented Pivotal Response Training (PRT) was used as an intervention. Both children improved their language use after PRT. Both children increased engagement in joint attention.</td>
<td></td>
</tr>
<tr>
<td>Roeyers</td>
<td>1996</td>
<td>Eighty-five handicapped children and 48 non-handicapped children were participants of the study.</td>
<td>Experimental design with random assignment of subjects to treatment and control conditions was employed. Children of the treatment group played in a dyad. The handicapped children assigned to a treatment group were found to gain significant improvement in social behaviors.</td>
<td></td>
</tr>
<tr>
<td>Pierce, &amp; Schreibman</td>
<td>1997a; 1997b</td>
<td>Two children with autism (both ages ranged 7-8 years old). and eight typical peers</td>
<td>A multiple baseline design across subjects and across peer</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>The two children with autism displayed in</td>
<td></td>
</tr>
<tr>
<td>Study</td>
<td>Year</td>
<td>Participants</td>
<td>Intervention</td>
<td>Outcome</td>
</tr>
<tr>
<td>-----------------------</td>
<td>------</td>
<td>------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Choi, Jobling, &amp; Carroll</td>
<td>2000</td>
<td>Five children with autism (ages ranged 4-6 years old) and 13 children (ages ranged 8-9 years old) were participants of the study.</td>
<td>Typical peers were trained with PRT. An AB design with two groups was used.</td>
<td>High levels of interactions, initiations, and toy play.</td>
</tr>
<tr>
<td>Wu</td>
<td>2003</td>
<td>Two children with autism (ages ranged 5-6 years old) and six typical children were recruited. (Each group consisted one autistic child and three typical children.)</td>
<td>Qualitative research method was employed. Group round teaching techniques.</td>
<td>The autistic children’s behaviors for social interaction improved. They even actively expressed their concerns for the peers. The peers’ impression of autistic children was positively reversed.</td>
</tr>
<tr>
<td>Feng</td>
<td>2004</td>
<td>One autistic child and four typical peers were recruited (Peers were 11 year-olds).</td>
<td>A multiple probe design across peer-trainers was applied. Peers trained with PRT.</td>
<td>The autistic child’s behavior for social interaction was enhanced.</td>
</tr>
<tr>
<td>Chang</td>
<td>2006</td>
<td>Two children with autism and four typical peers were engaged in the study (all children ages ranged 10-11 years old).</td>
<td>A multiple baseline across settings was used. Peers trained with PRT.</td>
<td>The autistic children’s spontaneous social interactions increased.</td>
</tr>
<tr>
<td>Harper, Symon, &amp;</td>
<td>2008</td>
<td>Two children with autism and six typical</td>
<td>A concurrent multiple baseline</td>
<td>Both children with autism</td>
</tr>
</tbody>
</table>
Frea children were recruited (all children were 8 years old). design across two subjects was used. improved their behavior in peer social interactions.

Kuhn, Bodkin, Devlin, & Doggett 2008 Two children with autism and five typical children were participants of the study. - A multiple baseline design across peer groups was implemented. Peers were taught with PRT. Results indicated improved social interaction for children with autism. Increased number of opportunities for initiation of conversations and play were noted.

Obviously, the foci of the listed studies were peer implementations for enhancing social interactions of children with autism. And, the findings of these studies manifested the value of using peers as mediators, not only for improving social interaction behavior of autistic children, but also for positively reversing the impressions typical children have of children with autism. However, most of the research disregarded the generalization of autistic children’s social behaviors between different settings. Thus, how to use peers to capitalize on their advantages, not only for improving social behavior of children with autism, but also for assisting them to generalize behavior for different settings, is worthy of discussion.
Summary

Children with autism are known to have profound deficits for social behavior development. In play activities, apparently, children with autism lack make-believe ability because of their lack of basic representational skills, while other children with severe mental retardation may not have the same deficit. In other words, autistic children are unable to have one object represent another or to represent themselves in make-believe mental states with dolls or imaginative play scenarios (Frost, Wortham & Reifel, 2001). Children with autism tend to engage in repetitive and stereotypical manipulation of toys and object-play, rather than using toys in appropriate ways or even in complex play. Moreover, autistic children are believed to have the ability to represent or symbolize through instructions, but not in spontaneous play. They are believed to lack the ability to engage in symbolic play due to a corresponding lack of motivation. This deficit means that poor social contact and levels of receptive language skills might influence the absence of the ability to engage in symbolic play. The play of autistic children can be rigid and unimaginative due to missing peer interaction, likely resulting in the disabled child’s remaining isolated from nearby group play.

However, more and more studies focused on implementing either adults or peers in play activities for enhancing the behavior involving social interactions of autistic children. Although most studies began to shift their attention to using peers, since peers provide more opportunities of age-appropriate learning of children with autism, the studies showed greater consideration for generalizing autistic children’s social behaviors in different settings. Such peer implementation in social play activities may identify the value of enhancing social interactions of children with autism.
CHAPTER 3

METHODOLOGY

The purpose of this study was to assess the effects of social play activities when using peer mediated Pivotal Responses Training (PRT) with typically developing children to increase the social behaviors of children with autism. The main research questions were: Will social skills intervention enhance social development of children with autism? To what extent can the efficacies of social skills intervention be evaluated? The research findings are summarized by answering the sub-questions: (a) Do peers with Pivotal Response Training affect a high-functioning autistic child’s skills for maintained interactions? (b) Do peers with Pivotal Response Training affect a high-functioning autistic child’s skills for initiated conversations? (c) Do peers with Pivotal Response Training affect a high-functioning autistic child’s skills for initiated play?

The target participants for this study were three autistic children, their special education teacher and parents, and three non-autistic children; each autistic child had a non-autistic child as a play-peer in an inclusive environment in an elementary school in Taipei City, Taiwan. This chapter describes the methods and procedures involved in this study: (a) Research Design, (b) Research Procedures, (c) Subjects, (d) Setting and Training Materials, (e) Dependent Measures, (f) Interobserver Agreement and Reliability, (g) Experimental Design and Conditions, (h) Instruments, and (i) Summary

Research Design

This research study aimed to investigate the effectiveness of the implementation of PRT with non-autistic children as play-peers for promoting the social skills and social interactions of high-functioning autistic children. Based on the purpose of the study, a
multiple-baseline, across-subjects and across peers design (Tawney & Cast, 1984) analyzed social behavior before peer PRT training (baseline) and after peer PRT (intervention) during play sessions. Further, the research recorded observations of the particular play behaviors of each dyad (an autistic child and a non-autistic) during the play session before the PRT, as baseline data, and observed the social behaviors from the social play activities after instructing non-autistic children in PRT.

Simply defined, Pivotal Responses Training (PRT) is a set of instructional sessions that aim to teach peers of autistic children the strategies for guiding pivotal responses from autistic children to increase the latter’s complex behavior. To elaborate, the non-autistic children as play peers were taught to implement PRT in an effort to increase the social and play skills of their classmates with autism (See Appendix D).

Given the elements of the multiple-baseline design, the effects are demonstrated by introducing the intervention to different students at different points in time (Kazdin, 1982). In this study, observations were of the occurrences and frequencies of the expected social skills, which include maintaining/sustaining interactions (e.g., following a request, complying with a response or answering questions), initiating conversations (e.g., saying “the block is green”), and initiating play (e.g., handing the peer a toy) during the play activities in each play session. For instance, after the play-peers (three non-autistic) had been taught the strategies of PRT, these three play peers implemented what had been taught in the play activities of each play session, and the principal observation is the performance of the three autistic children to see if the PRT did improve their social skills and behaviors while interacting with the non-autistic play-peers.

From a general perspective, this research design was essentially based on the
principles of embedded design. The embedded design is a mixed-methods-design in which one data-set provides a supportive, secondary role in a study based primarily on the other data types for the data analysis. In this particular study, using this method means that the results were primarily interpreted based on the quantitative data; whereas, the qualitative data is used as support (Creswell & Clark, 2007). The experimental embedded design includes qualitative data for several reasons: to develop a treatment to examine the process of an intervention or the mechanisms that relate variables, or to do a follow-up analysis of the results of an experiment. Moreover, the experimental embedded design generally includes the collection of both quantitative data as primary data, and qualitative data as secondary data, but one of the data types, the qualitative data, play a supplemental role within the overall design. In terms of this study, the qualitative data as secondary data, based on the perspectives of the teacher and parents, serves as proof of the effectiveness of the intervention which further enhances the implications of the study.

The following figure depicts the general research design used in this research (See Figure 3.1).
Interviews with the teacher and parents provide their perspectives, etc.

The data gained from the observation (multiple-baseline design).

Second interviews with the teacher and parents provide further insight of effectiveness of the social skills curriculum for high-functioning autistic children.

Interpretation based on quantitative results

Figure 3.1 Embedded design

Research Procedures

In terms of the application of the embedded design, the basic technique is collection of both qualitative and quantitative data in each phase of the study. The source of qualitative data is two-fold and is gathered in a successive manner.

The first step, before the subjects became involved in the play activities in the intervention phase, was an interview with the special education teacher who works with all the three autistic children and knows their personalities well (See Appendix A). The interview provided an opportunity to recruit the minor participants and obtain information about the potential participants. Then, interviews with the parents of three autistic children allowed understanding of their current levels of social skills, and the occurrences and frequencies of targeted social behaviors during the play activities before the intervention phase (See Appendix B).

The second step, to acquire quantitative data involved observations before the intervention, during the intervening, and the maintenance play sessions. Since each of the three groups’ play sessions comprised the social interactions that occurred between one autistic child and an assigned play-peer, data became the counted occurrences and frequencies of expected social behaviors, recorded on a standard chart (See Appendix C). This information became the basis for intervention design and follow-up data analysis.

The last step, for the second part of the qualitative data collection constituted second interviews after the maintenance phase, again, with the special education teacher and the parents of the autistic children who were earlier recruited for this research. The interviews were meant to have parents and teachers express their particular perspectives on the subjects’ progress or changes in social skills through the social play activities after
the intervention. Besides interviews, transcriptions also recorded the interactions and
dialogues from all play sessions in order to capture the qualitative differences in verbal
selections and non-verbal movements demonstrated by each dyad. Therefore, one more
type of data from all the play sessions could be used for examination along with the
quantitative data (to be discussed next) later to see how intervention operated to improve
the current level of social behavior of the three autistic children.

In this study, interviews and observations were gathered as necessary data, and
expectedly, provided findings that might prove beneficial for future intervention efforts
for social development and social improvement of children with autism. Therefore, data
from observations could more accurately pinpoint the changes in social behavior of an
autistic child in an inclusive setting, which were also compared with those social
behaviors occurring in the play activities before the intervention through the observations
which were recorded with counting the occurrences. Moreover, interview data, regarding
differences in children’s social skills before and after the intervention, qualitatively
captured the perspectives of the special education autistic child in an inclusive setting.
The previous data of the teacher and the parents perspectives of the targeted subjects are
compared with observed and recorded social behavior occurring in play activities prior to
and after the intervention. With all the qualitative and quantitative data collected, the
findings helped determine whether or not the PRT, using peer mediation, was effective in
promoting the social skills of the autistic children.

Subjects

Due to limited time, resources, and other contextual factors, the sample population
consisted of three autistic children, with each child paired with a non-autistic child as a
play-partner, and each dyad from three different inclusive classrooms in an experimental elementary school in Taipei City, Taiwan. Also, the special education teacher and the parents of the three autistic children were recruited for interviews.

**Characterizations of the School**

The school is affiliated with a large, renowned university in Taipei City, the capital of Taiwan, and is considered representative of other, similar educational contexts throughout the country. Also, the school, by promoting honesty, self-discipline, and kindness, is devoted to creating a campus of “Equality, Efficiency, and Excellence.” Everyone in the school is not only an educator, but also a student. Thus, the principles and teaching philosophy of the school provided a particularly conducive environment for the research.

As legislated in Taiwan, children with disabilities, regardless of level of severity or degrees of disability, all attain “zero reject” status and are able to enter ordinary classes, thus allowing achievement of fully integrated placement in an educational setting. Accordingly, this elementary school places the children with autism in typical classes with peers without disabilities. Students with autism in this school then attend the same class schedule as peers without disabilities, and they are given 5 hours, on a weekly basis, of special education instruction implemented by a special education teacher. Moreover, given the fact that school itself is an experimental school with liberal educational philosophy, the teachers and the parents alike show a higher inclination toward acceptance of, and assistance with, special needs children, such as the targeted participants with autism. Thus, this particular school is an ideal research site for the study.
Three autistic children and their respective non-autistic play partners were all 7- to 8-year-olds at the time of the research. The three autistic children in this study, operationally defined, were: (a) diagnosed as autistic by a public or private hospital, (b) studying in an inclusive educational setting in elementary school, (c) challenged by a range of impairments to the normal development of communication and social capacities, (d) children of parents who agreed to participation in this research, (e) scored on the Wechsler Intelligence Scale for Children-III (WISC-III) (Chinese version) not lower than the mean value following two standard deviation, and (f) scored on the Peabody Picture Vocabulary Test-Revised (PPVT) not lower than the mean value following one standard deviation. In this particular study, the information of the identified characteristics of the Wechsler Intelligence Scale for Children III (WISC-III) and the Peabody Picture Vocabulary Test-Revised (PPVT) were obtained from the school. Therefore, the three autistic children in this study were diagnosed, as such, beforehand, based on the test results administered by a local hospital.

The three non-autistic children, who were the play-partners for the three autistic children in this study, were in the second grade and attended the same class in the same elementary school with each of the three autistic children. The selection of such participants to be involved in the intervention phase arose from initial contact and observation. These three non-autistic children were nominated by their homeroom teachers, who were general education teachers in the elementary school. Moreover, during the daily play activities in the classroom, observation revealed who tended to be patient, friendly and treated the three autistic children fairly and the quality of interaction.
between them was positive. Moreover, these typically developing children generally had leadership ability (e.g., they take good care of the children with autism, and guide the autistic children in any learning context). In other words, these typical children gave the autistic children the opportunity to be involved in more daily play activities. Based on such selection, the selected non-autistic children were assumed to have the leadership abilities to learn to provide autistic children with the opportunity to interact more effectively and frequently by playing games and doing activities in the intervention phase. Furthermore, the three autistic children and three non-autistic children were grouped as three dyads. Each dyad resided in the same inclusive classroom.

In addition, an unexpected gain from the teacher of each dyad deserves mention: The three general education teachers of each dyad are those who work with the three children with autism and three non-autistic children. These teachers are the ones who are familiar with the children’s particular behavior and know the best situation which may fit those children’s needs. These teachers in the inclusive classrooms all have several years of teaching experience involving children with disabilities. Mainly, the teachers have attended workshops which were related to special education to enhance their knowledge in this field and the relevant training to create a wholesome learning environment while accommodating children of special needs in their normal-student, inclusive classrooms. Furthermore, in terms of dealing appropriately with all kinds of difficult situations that might arise from the special needs students, the teachers do not hesitate to make the necessary accommodations or changes required for equal education in the inclusive classroom.
Background Information of the Parents

The parents of three children with autism had difficulty accepting the fact that their children were diagnosed autistic, but they were not discouraged. They were diligent in allowing their children to enter the ordinary school/class for learning with typically developing children. Also, the parents cooperated willingly with teachers’ instructions so that the autistic children were able to experience the same opportunities in school and at home. The collaboration between parents and teachers made possible the autistic children’s amicable integration into their respective inclusive classrooms.

Setting and Training Materials

Each non-autistic child received a 15-minute PRT session before each play session (See Appendix D). The training session provided non-autistic children with strategies or skills to enhance interactions in the following play session. The non-autistic children were taught with PRT strategies or in a room without the three autistic children for 15 minutes before each play session. Each non-autistic child received a handout with models and explanations for each target strategy for that particular play session with an autistic child. The procedure verbally explained what these strategies were and provided examples through role-play. Then, after 15 minutes, the peers exhibited their understanding of each strategy through role-play. After the peers successfully demonstrated knowledge of the procedures, they were paired with an autistic child and told to play with the autistic partner based on what had been taught. Moreover, training and generalization materials that all children play with during the intervention phase consisted of approximately 15 toys. The selections of toys as the medium for the
expected interaction were indicated from interviews with the teacher and parents of all three autistic children.

**Dependent Measures**

Three indicators from the data collections became dependent measures. Dyads (an autistic child and a non-autistic child) were videotaped during 15-minute play sessions before, during, and after PRT, once per day for 15 minutes. The tapes were subsequently scored, according to 10-second segments, for the three dependent measures: (a) maintained interactions, (b) initiated conversation, and (c) initiated intentions to play. Each targeted behavior is defined as below (Definitions adapted from Pierce and Schreibman, 1997).

**Maintained Interactions**

This behavior was defined as the autistic child’s continued engagement in the same verbal or nonverbal activity as the non-autistic peer. During intervals of peer initiations, positive responses (e.g., complying with or responding to a request or by answering questions) were recorded.

**Initiated Conversations**

This behavior refers to verbalizations that are not in direct response to a preceding question or do not occur at least 5 seconds after a previous verbalization. For example, “The car has wheels.” Or “I like dogs,” are scored as conversation initiations.

**Initiated Intention to Play**

This behavior refers to any verbal or nonverbal initiation of novel play. For example, an autistic child’s handing the non-autistic peer a ball or saying, “Play cars,” while engaged with a different toy is considered displaying play initiation.
Interobserver Agreement and Reliability

Interobserver Agreement

In order to avoid the influence of subjective factors and to enhance observer reliability, another observer, a special education teacher, was invited to participate to test interobserver reliability.

The special education teacher who participated in the observations of the research study has special education background and four years of teaching experience in the special education field. Also, she studied and participated in a similar research study. In terms of this study, she had been informed of its overall design to ensure full knowledge of the data collection procedure and criteria for the baseline and intervention phases of the study.

Ideally, all play sessions of the three dyads would be observed by two individuals throughout the data collection segment of the research. Clearly, the two observers marked the behaviors appearing during each play activities on the interval data collection sheet (IDCS). For example, when targeted behaviors, appeared and considered to be maintained interactions, then the observers marked it onto the column of “maintained interactions” and the row of the interval in which the behaviors had been noticed. Due to schedule conflicts, the special education teacher could not participate in all observations of all the play sessions. Immediately after the observation of each play session, the observers compared the result of the counting of the occurrences for that session. If any major difference occurred, the commands on the Interval Data Collect Sheet remained unmodified for further discussion. A discussion and question-and-answer session
followed each play session in order to avoid any misunderstanding that might occur between the observers.

**Reliability**

Interobserver reliability was calculated for 60% of the sessions across all the phases of this study. Reliability was determined by calculating the scores for these sessions and counting the number of agreements between the two observers divided by the number of agreements plus disagreements multiplied by 100 (Tawney & Gast, 1984; Bock, 2007). The agreement data were independently recorded on each dependent measurement and calculated using a point-by-point method and the formula:

\[ \text{Percent of Agreement} = \left( \frac{\text{Agreements}}{\text{Total Intervals}} \right) \times 100 \]

The interobserver agreement data appears in Table 3.1.
Table 3.1
*Percentage of Interobserver Agreement for Each Autistic Child Through Phases*

<table>
<thead>
<tr>
<th>Participants</th>
<th>Baseline</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maintained</td>
<td>Initiated</td>
<td>Initiated Play</td>
</tr>
<tr>
<td></td>
<td>Interactions</td>
<td>Conversations</td>
<td></td>
</tr>
<tr>
<td>Paul</td>
<td>81%</td>
<td>88%</td>
<td>90%</td>
</tr>
<tr>
<td>Wendy</td>
<td>78%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Jim</td>
<td>88%</td>
<td>90%</td>
<td>90%</td>
</tr>
<tr>
<td>Mean</td>
<td>82%</td>
<td>93%</td>
<td>93%</td>
</tr>
<tr>
<td>Intervention</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paul</td>
<td>92%</td>
<td>95%</td>
<td>92%</td>
</tr>
<tr>
<td>Wendy</td>
<td>85%</td>
<td>90%</td>
<td>90%</td>
</tr>
<tr>
<td>Jim</td>
<td>95%</td>
<td>96%</td>
<td>92%</td>
</tr>
<tr>
<td>Mean</td>
<td>91%</td>
<td>94%</td>
<td>91%</td>
</tr>
<tr>
<td>Maintenance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paul</td>
<td>98%</td>
<td>97%</td>
<td>98%</td>
</tr>
<tr>
<td>Wendy</td>
<td>95%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Jim</td>
<td>95%</td>
<td>98%</td>
<td>96%</td>
</tr>
<tr>
<td>Mean</td>
<td>96%</td>
<td>98%</td>
<td>98%</td>
</tr>
</tbody>
</table>

*Note.* Each percentage was rounded off when the value over 5 (e.g., 98.33% = 98% or 90.6% = 91%)
Experimental Design and Conditions

This research was a single-subject design which entails the participants’ behaviors during the baseline phase becoming the control group, without the inclusion of any other, separate control group (Neisworth & Wolfe, 2005). A multiple-baseline design across subjects and across peers was used (Kazdin, 1982) for this research. Multiple-baseline means that each individual’s behavior is observed. In terms of this research, three phases are included and implemented:

**Baseline.** Before the peers (the three non-autistic children) were exposed to Pivotal Response Training (PRT), each non-autistic child was asked for consent to participate in follow-up play sessions in which an autistic child would be taught how to play. During the baseline phase, the toys were placed in the middle of the room and each dyad was asked to play together. No other instructions or prompts were given. The baseline phase was held for two weeks. During the two weeks, observations provided baseline data for the performances of the current level of social skills of each the three autistic children.

**Intervention: Peer PRT.** According to Pierce and Schreibman (1997), three important aspects of the peer-training strategies are: *when* the peers are taught the intervention, *what* the intervention is, and *how* is it taught to the peers.

*When.* Each peer was taught with PRT strategies. Nevertheless, Peer 1 remained in the baseline until the target behavior was relatively stable, after which time the peer was taught with PRT strategies. Peer 2 remained in the baseline until changes in target behaviors were noted with Peer 1, after which time Peer 2 was taught with PRT strategies. Finally, Peer 3 remained in baseline until changes in target behaviors were noted with the
second peer trainer, after which time, Peer 3 was taught with PRT strategies (Pierce & Schreibman, 1997).

What. Based on the training manual of Pivotal Responses Training (PRT) (Koegel, Schreibman, Good, Cerniglia, Murphy, & Koegel, 1989), each peer was given a modified handout of PRT strategies, and it was modified to accommodate the ages and the comprehension of the peers in this research study. (Definitions are adapted from Pierce and Schreibman, 1997, pp. 210-211):

1. **Paying attention**- Ensure that the target child is attending before delivering a prompt or suggestion.
2. **Child’s choice**- Give choices between different play activities to keep motivation high.
3. **Vary toys**- Try not to play with the same toys repeatedly.
4. **Model appropriate social behavior**- Provide frequent and varied examples of appropriate play and social skills.
5. **Reinforce attempts**- Verbally reinforce any attempt at social interaction of functional play.
6. **Encourage conversation**- Withhold desired play object until the target child emits a verbal response related to that object or activity.
7. **Extend conversation**- Ask questions or encourage conversation centered on tangible objects in the room.
8. **Turn taking**- Take turns during play to provide examples of appropriate play, promote sharing, and increase motivation.
9. **Narrate play**- Provide descriptions of play actions and scripts.
10. Teach responsivity to multiple cues - comment on object properties and require the target child to talk about object properties whenever possible.

The definitions above were the bases for this research to study the peers’ PRT strategies by modified handout, with modeling, role playing, storytelling, etc. Peers were provided feedback of their practice of the strategies. The detailed explanations are in the “How” section, as follows:

How. Peer trainers (non-autistic children) were taught with PRT strategies or in a room without the three autistic children for 15 minutes before each play session. Each non-autistic child received models and explanations for each target strategy for that particular play session with an autistic child. The procedure verbally explained what these strategies were and provided examples through role-play. Then, the peers exhibited their understanding of each strategy through role-play. After the peers successfully demonstrated knowledge of the procedures, they were paired with an autistic child and told to play with the autistic partner based on what had been taught. After each 15-minute training session, each peer was given feedback and suggestions by watching a videotape of the activity. Finally, when the peers were noticed to be successfully implementing the PRT procedures in the play sessions, feedback and suggestions were discontinued.

Maintenance. The maintenance period took two weeks, after the four-week intervention phase ended. Continuing observations of interactions in play sessions for the two weeks determined sustained effectiveness of the intervention. Further, the interviews with the special education teacher and parents of the three children with autism a week later provided the adults’ perspective on the presence of improvement in the three autistic children.
Instrumentation

Interview Questions of Social Interaction Situations

The preliminary phase of this study included interviews with the special education teacher and the parents of three autistic children. The interview with the teacher provided information of the participants' play patterns, interests, and particular behaviors that have occurred during daily play activities in the classes. A week after the 8-week play sessions ended a second round of interviews with the teacher and the parents of the participants provided their feedback and an opportunity to express their concerns. The duration of this interview was about 30 minutes.

Since the interviews were semi-structured, necessary or extra question(s) were added as previous answers indicated a need for clarification.

Interval Data Collection Sheet (IDCS)

The interval data collection sheet (IDCS) was used to briefly and consistently check the targeted social behaviors that occurred between the participants in each play session. This record was also used to collect both the baseline and intervention data during the study. For the baseline data, the IDCS showed the current social level of the three children with autism before the intervention and a comparison with the data collected during the intervention phase. At the end, the data collected by the IDCS from the intervention phase were labeled as an "intervention" data and were compared with the "baseline" data to see if the monitored social interactions did occur after the play activities were designed and implemented as intervention.

In principle, a whole interval system of data collection was used to monitor behaviors expected to improve. The whole interval data collection method was generally
applied to estimate the quantitative changes of the target behaviors, which rendered it ideal for monitoring behaviors that occurred continuously and were expected to increase or improve. For the whole interval method of data collection, each 15-minute session was divided into ninety 10-second segments (i.e., interval). Intervals were segmented when the participants interacted with each other in the designed play activities for the entire 15-minute period. In this study, the whole interval data recording system was used in collecting on-task behavior data.

*Materials and Equipment*

Since this study utilized observation and interviews with the teachers and parents of the subjects, data from both sources were documented with the aid of technological devices. All the observed interactions during the 8-week period were video recorded. Also, the interviews with the teacher and the parents were tape recorded. A stopwatch was also used during the observations to make sure each play session begins and ends within the prescribed 15 minutes.

In addition, all of the toys and materials needed for the play activities were chosen, collected, and prepared prior to the play sessions by the researcher of the study.

*Data Analysis*

The study collected both quantitative and qualitative data for the observed targeted behaviors, and its summary appears in Table 3.2.
Table 3.2
Summary of Data Analysis Used in the Study

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Independent Variables</th>
<th>Dependent Variables</th>
<th>Observed Phases</th>
<th>Analysis Methods</th>
</tr>
</thead>
</table>
| Do peers with pivotal response training (PRT) affect high-functioning autistic children’s social skills for maintained interactions? | Social play activities implemented by peers with PRT | Maintained interactions | Baseline phase | ● Percentage  
- Mean  
- Medium  
- Visual analysis  
- Condition length  
- Level-range  
- Level-change  
- Trend-direction  
- Percentage of overlap  
- Qualitative data |
| Do peers with pivotal response training (PRT) affect high-functioning autistic children’s social skills for initiated conversations? | Social play activities implemented by peers with PRT | Initiated conversations | Baseline phase | ● Percentage  
- Mean  
- Medium  
- Visual analysis  
- Condition length  
- Level-range  
- Level-change  
- Trend-direction  
- Percentage of overlap  
- Qualitative data |

Baseline phase
- Mean
<table>
<thead>
<tr>
<th>Do peers with pivotal response training (PRT) affect high-functioning autistic children’s social skills for initiated play?</th>
<th>Social play activities implemented by peers with PRT</th>
<th>Initiated play</th>
<th>Intervention phase</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Visual analysis</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Condition length</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Level-range</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>- Level-change</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>- Trend-direction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maintenance phase</td>
<td>- Percentage of overlap</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Qualitative data</td>
</tr>
</tbody>
</table>
Summary

In sum, the sample population of the study consisted of three autistic children, with each child paired with a non-autistic child as a play-partner. Each dyad was from a different inclusive classroom in an experimental elementary school in Taipei City, Taiwan. As this research study aimed to investigate the effectiveness of the implementation of PRT with non-autistic children as play-peers for promoting the social skills and social interactions of high-functioning autistic children, and based on the purpose of the study, a multiple-baseline, across-subjects and across peers design analyzed social behavior before peer PRT (baseline) and after peer PRT (intervention) during play sessions. In addition, interviews and observations were gathered as necessary data and expectedly provided findings that might prove beneficial for future intervention efforts for the social development and social improvement of children with autism. Therefore, data from observations more accurately pinpointed the changes in social behavior of an autistic child in an inclusive setting. The social behavior was also compared with those social behaviors occurring in play activities before the intervention through the observations which were recorded with counted occurrences. Moreover, interview data, regarding differences in children’s social skills before and after the intervention, qualitatively captured the perspectives of the parents and teachers of the special education autistic children in an inclusive setting.
CHAPTER 4

RESULTS

The results for each group presented in this chapter respond to the following research questions: Will peers with pivotal response training (PRT) help to affect social development of autistic children by engaging in social play activities with them? To what extent can the efficacies of social skills intervention be evaluated? A summary of the research findings in the following sections answer the sub-questions: (a) Do peers with pivotal response training affect a high-functioning autistic child’s skills for maintained interactions? (b) Do peers with pivotal response training affect a high-functioning autistic child’s skills for initiated conversations? (c) Do peers with pivotal response training affect a high-functioning autistic child’s skills for initiated play? Moreover, the data applicable to the questions arose from the teacher’s and parents’ perspectives regarding social skills performance of autistic children in an inclusive education classroom.

In addition, the data that appeared as figures and were analyzed by using the visual analysis techniques to describe the data in more detail.

Based on that mentioned above, the following sections are: (a) Results of Social Behaviors Performed from Maintained Interactions, (b) Results of Social Behaviors Performed from Initiated Conversations, (c) Results of Social Behaviors Performed from Initiated Play, (d) Qualitative Data Analysis, (e) Discussion of Findings and (f) Summary. Each is described below.
Results of Social Behaviors Performed from Maintained Interactions

Analysis of Percentage Data of Maintained Interactions

The percentages of interval engaged in maintained interactions of each dyad appear in Figure 4.1 (See p. 77). Also, the trend-lines displayed within each phase of the maintained interactions for each dyad appear in Figure 4.2 (See p. 84). During the baseline phase, Paul and Jim performed in a descending trend for maintaining interactions, and Wendy performed an increasing trend during the phase. In the intervention phase, both Paul and Jim performed with a slightly descending trend, but Wendy performed at an increasing trend with a stable line during the last four data collection points. In addition, both Paul and Wendy performed in a slightly increasing trend after the intervention’s withdrawal, and Jim’s data displayed a descending trend during the maintenance phase.

From the mean and range percentage of maintaining interactions of each dyad, Paul had a mean of 13.15% (range = 4.44 ~ 25.56%) (See Table 4.3, p. 87) during the baseline. When intervention was instituted, Paul’s intervention data showed a slightly decreasing trend with a mean of 18.89%. (range = 4.44 ~ 30%); for the data after the intervention’s withdrawal, the mean was 19.82% (range = 13.33 ~ 28.89%) in the maintenance phase. Wendy’s baseline data was highly variable with a mean of 10.93% (range = 2.22 ~ 25.56%) (See Table 4.3). When intervention was implemented, Wendy’s data showed a slight increase with a mean of 11.54% (range = 4.44 ~ 20%). Also, Wendy’s maintenance data indicated an increasing trend with a mean of 6.11% (range = 1.11 ~ 10%). In addition, Jim’s baseline data showed a slightly descending trend with a mean of 1.67% (range = 0 ~ 4.44%) (See Table 4.3). The intervention data showed some variability with
a mean of 8.03% (range = 0 ~ 18.89%), also had a decreasing trend within. Moreover, Jim’s data in the maintenance phase also showed high variability with a mean of 22.41% (range = 11.11 ~ 41.11%) and had a decreasing trend within. Yet, generally, the results indicated that the intervention had influences on the performance of maintaining interactions among the three high-functioning autistic children, as the trend-lines display slight increases for each dyad, as shown in Figure 4.1 (See p.77).
Figure 4.1. Percentage of maintaining interactions for each dyad
Within and Between Adjacent Conditions Analysis of Maintained Interactions

In order to analyze the percentage interval engaged in maintained interactions, further illustration of the change in level and trend occurred through visual analysis of each dyad during each observation phase—baseline, intervention, and maintenance, as shown in Tables 4.1 (See p. 85) and 4.2 (See p. 86), respectively.

(1) Paul

(1.a) Baseline

From Table 4.1, the level-range of Paul’s performed behaviors of maintained interactions was 4% to 26%, and the level-change was -17% (26% ~ 5%). The trend within the phase displayed a slightly descending tendency, with trend-stability at 0% (<75), which means the collected data were not reaching a stable condition. However, the study continued toward the intervention phase after collecting six data points.

(1.b) Intervention

Collected data included 13 points during the intervention phase. Paul’s behavior percentage ranged from the 4% to 31%, and the level-change was -5% (13% ~ 8%) (See Table 4.1). The level-stability, within the phase was 23% (<75%) and became defined as a variable. Moreover, the trend-direction displayed an increasing pattern with trend-stability at 38% (<75%); both the level-stability and the trend-stability appeared as variable conditions.

In addition, from Table 4.2, the change in trend-direction and effect resulted in a defined negative, which means that Paul’s behavior for maintaining interaction had not increased after intervention implementation.
(1.c) Maintenance

From Table 4.1 (See p. 85), within the six collected data points, Paul’s performance for maintaining interactions ranged from 13% to 29%, with a level-change of +11% (13% ~ 24%). The ascending direction for both the trend-and level-stabilities were 0% (<75%) and represented variable conditions. Also, the trend-direction indicated Paul’s performances for maintaining interactions were increasing within the phase (See Figure 4.2, p. 84).

In addition, from Table 4.2 (See p.86), the percentage change from the intervention to the maintenance phase was +5% (8% ~ 13%). Also, the percentage of overlap within the intervention and the maintenance phases was high, at 100%, which means the intervention had an effect on the Paul’s behavior for maintaining interactions during the social play activities.

Overall, Paul’s behavior, performed in maintained interactions, increased after introducing the intervention. Yet, the change in level between the baseline and intervention phase also showed +4% (See Table 4.2), which means Paul’s behavior was improving. However, the change in trend did not show explicit increase or decrease between baseline and intervention phases or intervention and maintenance phases, over time. The effect of the intervention on Paul’s behavior on the maintenance of interactions may not be obvious, but was irrefutable.

(2) Wendy

(2.a) Baseline

From Table 4.1, the level-range of Wendy’s performance of behavior for maintaining interactions was 2% to 26%, and the level-change was +19% (7% ~
26%). The trend within the phase showed an ascending pattern with trend-stability of 67% (<75%), which means the collected data were not arriving at a steady condition. However, the intervention phase proceeded since Wendy’s behavior showed a gradual increase for behavior for maintaining interactions.

(2.b) Intervention

The collected data of Wendy’s behavior for maintaining interactions during the intervention phase included 13 points. The percentage of Wendy’s behavior for maintaining interactions were 4% to 20%, and the level-change was +4% (10% ~ 14%) (See Table 4.1, p. 85). The level-stability, within the phase was 38% (<75%), defined a variable. However, the trend’s direction showed an increasing pattern with the trend’s stability at 77% (>75%), which clarifies Wendy’s behaviors during the intervention as improving in stability.

In addition, from Table 4.2 (See p. 86), the change in trend-direction and effect defined a positive, which means Wendy’s behavior continued to increase after instituting the intervention. However, the percentage of overlap between the baseline and intervention phase was high at 100% which means the behavior’s change from the baseline to the intervention was not remarkable.

(2.c) Maintenance

From Table 4.1, six data points collected on Wendy’s behavior for maintaining interactions showed a level-range of 1% to 12% with the level-change of +9% (1% ~ 10%). The trend-direction was ascending with a trend-stability of 33% (<75%), which means the presence of an unexpected drop within the six data points.

In addition, from Table 4.2, the percentage changed from the intervention to the
maintenance phase was -13% (14% ~ 1%), which suggested that the intervention’s
effect on Wendy’s behavior from the intervention to the maintenance phase was not
convincing. However, the percentage of overlap was 67%, lower than the 100%
between the baseline and intervention phase, which means the intervention, might
have had retention effects for Wendy’s behavior for maintaining interactions after the
intervention faded.

To sum up, Wendy’s behaviors for maintaining interactions were not strongly
improved after implementation of the intervention. Moreover, the change in level
between the baseline and intervention phases showed -16% (See Table 4.2, p. 86), which
means Wendy’s behaviors did not improve after introducing the intervention. Yet, the
change in trend did not show an explicit increase or decrease between the baseline and
intervention phases or intervention and maintenance phases. Thus, the effect of the
intervention on Wendy’s behavior for maintaining interactions was not operative.

(3) Jim

(3.a) Baseline

From Table 4.1 (See p. 85), the level-range of Jim’s behavior for maintaining
interactions was 0% to 4%, and the level-change was -2% (2% ~ 0%). The
trend-direction within the phase showed a slight decrease with a trend-stability of
17% (<75%), which means that the 6 data points representing Jim’s behavior during
the baseline phase had not reached stability. However, gradual movement in the
intervention phase occurred as Jim performed stably in the last two observation
periods.

(3.b) Intervention
Jim’s performance encompassed 13 data points for maintaining interactions during the intervention phase. The percentage of Jim’s behavior for maintaining interactions ranged from 0% to 19%, and the level-change was -7% (7% ~ 0%) (See Table 4.1, p. 85). The level-stability, within the phase was 67% (<75%), is represented as being variable. Moreover, the trend-direction showed a decrease with the trend-stability of 62% (<75%), which illustrated Jim’s behavior regarding maintaining interactions as being unstable after instituting the intervention.

In addition, from Table 4.2 (See p. 86), the change in trend-direction and effect, defined a negative, meaning that Jim’s behavior for maintaining interactions did not show any improvement in both baseline and intervention phases. However, the percentage of overlap between the baseline and intervention phases was 31% lower. The data during the intervention phase did not overlap significantly with that from the baseline phase. That means the intervention on Jim’s behavior for maintaining interactions evidently changed between baseline and intervention phases.

(3.c) Maintenance

From Table 4.1, Jim’s behavior for maintaining interaction provided observation data for six data points. The level-range was 11% to 41% with the level-change of -8% (19% ~ 11%). The trend-direction defined a decline with the trend-stability of 50% (<75%), which means Jim behaved unstably.

Moreover, from Table 4.2, the percentage changed from the intervention to the maintenance phase showed +19% (0% ~ 19%), which indicated that the intervention had an imperceptible effect on Jim’s behavior for maintaining interactions as shown by the descending pattern during the phase. Yet, the percentage of overlap was 67%
(<75%), higher than the one between the baseline and intervention phases. This means, the intervention’s effect on Jim’s behavior continued through the intervention phase to the maintenance phase.

Based on Jim’s data, Jim’s behavior for maintaining interactions increased during the baseline phase to the end, after the intervention faded. In addition, the change in level between both baseline and intervention phases or intervention and maintenance phases showed +7% and +19%, respectively, demonstrated Jim’s improved behavior for maintaining interactions. Moreover, the change in trend within the three phases showed clear alteration, which means the effect of the intervention on Jim’s behavior for maintaining interactions was evident.
Figure 4.2. Trend-line displays within each phase of maintaining interactions for each dyad.
Table 4.1
*Within Condition Analysis: Maintaining Interactions of Each Dyad*

<table>
<thead>
<tr>
<th>Conditions (In sequence)</th>
<th>Paul</th>
<th>Wendy</th>
<th>Jim</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>6</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td>B1</td>
<td>6</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td>C1</td>
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<td>6</td>
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<td>13</td>
<td>6</td>
</tr>
<tr>
<td>B2</td>
<td>6</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>C2</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>A3</td>
<td>13</td>
<td>6</td>
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</tr>
<tr>
<td>B3</td>
<td>6</td>
<td>6</td>
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</tr>
<tr>
<td>C3</td>
<td>6</td>
<td>13</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Condition Length</th>
<th>Paul</th>
<th>Wendy</th>
<th>Jim</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trend-Direction</td>
<td>_</td>
<td>_</td>
<td>_</td>
</tr>
<tr>
<td>Trend-Stability</td>
<td>0%</td>
<td>38%</td>
<td>0%</td>
</tr>
<tr>
<td>Data paths within Trend</td>
<td>_</td>
<td>_</td>
<td>_</td>
</tr>
<tr>
<td>Level-Stability</td>
<td>Variable</td>
<td>Variable</td>
<td>Variable</td>
</tr>
<tr>
<td>Level-Range</td>
<td>4 – 26</td>
<td>4 – 31</td>
<td>13 – 29</td>
</tr>
<tr>
<td>Level-Change</td>
<td>26 – 9</td>
<td>13 – 8</td>
<td>13 – 24</td>
</tr>
</tbody>
</table>

*Note.* A1, A2 and A3 represent baseline phases of each dyad; B1, B2 and B3 represent intervention phases of each dyad; C1, C2 and C3 represent maintenance phases of each dyad.
Table 4.2
Between Adjacent Conditions Analysis: Maintaining Interactions of Each Dyad

<table>
<thead>
<tr>
<th>Condition Comparison</th>
<th>Paul</th>
<th>Wendy</th>
<th>Jim</th>
</tr>
</thead>
<tbody>
<tr>
<td>B3/A3</td>
<td>C3/B3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of Variables Changed</th>
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<th>1</th>
<th>1</th>
<th>1</th>
<th>1</th>
<th>1</th>
<th>1</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Change in Trend-Direction and Effect</th>
<th>Negative</th>
<th>Positive</th>
<th>Positive</th>
<th>Positive</th>
<th>Negative</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(−)</td>
<td>(+)</td>
<td>(−)</td>
<td>(+)</td>
<td>(−)</td>
<td>(−)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Change in Trend-Stability</th>
<th>Variable To Variable</th>
<th>Variable To Variable</th>
<th>Variable To Variable</th>
<th>Variable To Variable</th>
<th>Variable To Variable</th>
<th>Variable To Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in Level</td>
<td>(9 – 13) +4</td>
<td>(8 – 13) +4</td>
<td>(26 – 10) -16</td>
<td>(14 – 1) -13</td>
<td>(0 – 7) +7</td>
<td>(0 – 19) +19</td>
</tr>
<tr>
<td>Percentage of Overlap</td>
<td>77%</td>
<td>100%</td>
<td>100%</td>
<td>67%</td>
<td>31%</td>
<td>67%</td>
</tr>
</tbody>
</table>

Note: A1, A2 and A3 represent baseline phases of each dyad; B1, B2 and B3 represent intervention phases of each dyad; C1, C2 and C3 represent maintenance phases of each dyad.
Table 4.3
*Mean and Range Percentages of Maintaining Interactions of Each Dyad*

<table>
<thead>
<tr>
<th>Participants</th>
<th>Baseline</th>
<th></th>
<th></th>
<th></th>
<th>Intervention</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Maintenance</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>Md</td>
<td>R</td>
<td>StD</td>
<td>M</td>
<td>Md</td>
<td>R</td>
<td>StD</td>
<td>M</td>
<td>Md</td>
<td>R</td>
<td>StD</td>
</tr>
<tr>
<td>Wendy</td>
<td>10.93</td>
<td>8.33</td>
<td>2.22~25.56</td>
<td>8.18</td>
<td>11.54</td>
<td>11.11</td>
<td>4.44~20</td>
<td>4.32</td>
<td>6.11</td>
<td>6.11</td>
<td>1.11~10</td>
<td>4.86</td>
</tr>
<tr>
<td>Jim</td>
<td>1.67</td>
<td>1.11</td>
<td>0~4.44</td>
<td>1.96</td>
<td>8.03</td>
<td>6.67</td>
<td>0~18.89</td>
<td>5.56</td>
<td>22.41</td>
<td>17.78</td>
<td>11.11~41.11</td>
<td>11.08</td>
</tr>
</tbody>
</table>

*Note.* M: Mean; Md: Median; R: Range; StD: Standard Deviation
Results of Social Behaviors Performed from Initiated Conversations

Analysis of Percentage Data of Initiated Conversations

The percentages of interval engaged in the behaviors from the initiated conversations of each dyad appear in Figure 4.3 (See p. 90), and the trend-lines displayed within each phase of the initiated conversations for each dyad appear in Figure 4.4 (See p. 97). During the baseline phase, Paul’s and Jim’s performances represented a descending trend for the behavior of the initiated conversations, and Wendy performed at a stable line of 0% during the phase. In the intervention phase, both Wendy and Jim performed with an ascending trend, but Paul performed at a slightly descending trend. In addition, Paul performed with an increasing trend after withdrawal of the intervention, and Wendy performed at a slightly increasing trend in the maintenance phase. However, Jim performed with a descending trend during the phase.

From the mean and range percentages of initiating conversations of each dyad, Paul had a mean of 5.19% (range = 2.22 ~ 10%) (See Table 4.6, p. 110), during the baseline phase. When intervention was instituted, Paul’s intervention data showed a slightly decreasing trend with a mean of 4.96%. (range = 0 ~ 12.22%), but with an increasing trend of his mean data which showed 12.97% (range = 4.44 ~ 23.33%) in the maintenance phase. Wendy’s baseline data showed no trend with a mean of 0% (range = 0~ 0%) (See Table 4.6). When intervention was implemented, Wendy’s data showed a slight increase with a mean of 4.27% (range = 0 ~ 8.89%). However, Wendy’s maintenance data indicated a barely obvious increasing trend with a mean of 1.3% (range = 0 ~ 3.33%). In addition, Jim’s baseline data showed a descending trend with a mean of 10.74% (range = 3.33 ~ 23.33%) (See Table 4.6). The intervention data showed some variability with a mean of 16.07% (range = 4.44 ~ 55.56%), and
with an increasing trend. Moreover, Jim’s data showed high variability with a mean of 21.67% (range = 12.22 ~ 47.78%), and with a decreasing trend after withdrawal of the intervention. However, overall, the results indicated that the intervention had an influence on the performance of initiating conversations of the three high-functioning autistic children as the trend-lines display a slight increase in each dyad, as Figure 4.3 shows (See p.90).
Figure 4.3. Percentage of initiating conversations for each dyad
Within and Between Adjacent Conditions Analysis of Initiated Conversations

In order to analyze the percentage interval engaged in initiating conversations further, the change in level and trend were illustrated by visual analysis of each dyad during each observation phase—baseline, intervention, and maintenance, respectively, as shown in Tables 4.4 (See p.98) and 4.5 (See p. 99).

(1) Paul

(1.a) Baseline

From Table 4.4, the level-range of Paul’s performed behavior for initiating conversations was 2% to 10%, and the level-change was -5 (7% ~ 2%). The trend within the phase showed a slightly descending pattern with a trend-stability of 83% (>75%), which means Paul’s behavior for initiating conversations showed stability. After collecting six data points, the investigation moved to the intervention phase.

(1.b) Intervention

Paul’s behavior consisted of 13 data points for initiating conversations during the intervention phase. The percentage of Paul’s behavior for initiating conversations was 0% to 12%, and the level-change was -6% (0% ~ 6%) (See Table 4.4 p. 98). The level-stability within the phase was 54% (<75%) and was defined as variable. Moreover, the trend-direction showed a decrease with a trend-stability of 62% (<75%), demonstrated that Paul’s behavior for initiating interactions was more unstable than in the baseline phase.

Yet, from Table 4.5, the change in trend-direction and effect, defined as negative, indicates Paul’s behavior for initiating interactions had increased after implementing the intervention. The high percentage of overlap of 77% between the baseline and intervention phase confirms the finding.
(1.c) Maintenance

From Table 4.4 (See p. 98), six data points represent Paul’s behavior for initiating conversations, and the level-range was 4% to 23% with a level-change of +10% (13% ~ 23%). The trend-direction defines defined an acceleration with a trend-stability of 67% (< 75%), which showed that Paul’s behavior for initiating conversations increased even after the intervention faded.

In addition, from Table 4.5 (See p. 99), the percentage change from the intervention phase to the maintenance phase displayed an ascending trend of +13% (0% ~ 13%), which corresponds to the result shown in Table 4.4; the trend-direction is ascending. Yet, the percentage of overlap was 50%, and therefore lower, which means that Paul’s behavior did not remain after the intervention and into the maintenance phase. However, Paul’s behaviors showed an ascending trend during the maintenance phase, indicating that Paul’s behavior showed an increase for initiating conversations.

According to the data, Paul’s behavior for initiating conversations increased, yet, the change in level between and within the three phases clearly showed a increase of +4% and a +13%, respectively (See Table 4.5), which means Paul’s behavior for initiating conversations improved after introducing the intervention, and even improved after withdrawal of the intervention. Moreover, the change in trend illustrated the trends had changed over the course of the phases, which means a manifest effect of the intervention on Paul’s behavior for initiating conversations.

(2) Wendy

(2.a) Baseline

The collected six data points in Table 4.4 obviously show that Wendy had not behaved at all during the baseline phase.
(2.b) Intervention

Wendy’s behavior, represented by 13 data points of performance for initiating conversations during the intervention phase, showed a level-range of 0% to 9%, and the level-change was +9% (0% ~ 9%) (See Table 4.4, p. 98). The level-stability within the phase was 0% (<75%), and was defined as variable. However, the data showed Wendy performed stably in two periods within the ascending trend during the phase. In addition, the trend-direction showed ascension with a trend-stability of 17% (<75%), which is lower than that of the baseline phase.

Again, from Table 4.5 (See p. 92), the change in trend and effect are positive, which means Wendy’s behavior for initiating conversations showed no decrease after applying the intervention. However, as Wendy remained at 0% during the baseline phase, the evidence showed that the improvement of Wendy’s behavior for initiating conversations was not strong. Nevertheless, the percentage of overlap during the baseline and intervention phases was 23% which is low and not particularly significant for showing improvement of Wendy’s performance in initiating conversations during the phase.

(2.c) Maintenance

From Table 4.4, six data points represent Wendy’s behavior for initiating conversations, and the level-range was 0% to 3% with a level-change of +3% (0% ~ 3%). The trend-direction was slightly ascending with a trend-stability of 33% (<75%), which means the improvements Wendy made for initiating conversations were unstable after withdrawal of the intervention.

Besides, from Table 4.5, the percentage change from the intervention phase to the maintenance phase showed a decrease of -9% (9% ~ 0%), which means Wendy had not made positive improvement by the beginning of the maintenance
phase. However, the percentage of overlap was a high, 100% which means the intervention had a positive effect on Wendy’s behavior for initiating conversations through the intervention phase and until the intervention ceased.

Based on these results, Wendy’s behavior for initiating conversations increased. Wendy’s behaviors, although, not showing much increase during the maintenance phase, but compared to the initial intervention phase, still showed a pattern of slight increase compared to the baseline and intervention phases. Thus, the intervention had ameliorated Wendy’s behavior for initiating conversations. Moreover, the change in level between the baseline and intervention phases displayed 0 (See Table 4.5, p. 99), which means Wendy’s behavior for initiating conversations did not appear after implementing the intervention. Yet, the change in trend over the course of phases did not show an explicit increase or decrease. The effect of the intervention on Wendy’s behavior for initiating conversations may not be powerfully demonstrated.

(3) Jim

(3.a) Baseline

From Table 4.4 (See p. 98), the level-range of Jim’s behavior for initiating conversations was 3% to 23%, and the level-change was -10% (23% ~ 13%). The trend within the phase showed a descending pattern with a trend-stability of 50% (< 75%), which means Jim’s behavior for initiating conversations was unstable. The investigation moved to the intervention phase after collecting six data points.

(3.b) Intervention

Thirteen data points represented Jim’s behavior for initiating conversations during the intervention phase. The percentage of Jim’s performance for initiating conversations was 4% to 56%, and the level-change was -1% (11% ~ 10%) (See Table 4.4). The level-stability within the phase was 23% (< 75%) and defined as
variable. Yet, the trend-direction displayed an ascending pattern with a trend-stability of 62% (<75%), which means Jim’s behavior for initiating conversations did not reach a stable situation.

Again, from Table 4.5 (See p. 99), the change in trend-direction and effect reached a definition of negative, which means Jim’s behavior for initiating conversations improved from the baseline phase to the intervention phase. However, the percentage of overlap was 85% higher, which means the effect of intervention had no intensive effect on increasing Jim’s behavior for initiating conversations.

(3.c) Maintenance

From Table 4.4 (See p. 98), six data points represent Jim’s behavior for initiating conversations after the intervention faded. The level-range was 12% to 48% with a level-change of +0 (16% ~ 16%). The trend-direction defined a deceleration with a trend-stability 83% (>75%), which means Jim’s behavior for initiating conversations increased stably. However, since the drops were large within the first three collected data points, that caused the high trend-stability within the phase; thus, no powerful demonstration for proving Jim’s stability for increasing initiation of conversations exists.

In addition, from Table 4.5, the change in level between the intervention and the maintenance phases showed an increased alteration of +6% (10% ~ 16%), which means Jim’s behavior at the end the intervention phase increased until the beginning of the maintenance phase. Yet, the percentage of overlap between the intervention and maintenance phase was 100%, which shows the effect of the intervention remained until withdrawal of the intervention.

According to the evidence, Jim’s behavior for initiating conversations increased.
Yet, the *change in level* between the baseline phase and the intervention phase and the intervention phase and the maintenance phase showed the percentages of a -2% and a +6%, respectively (See Table 4.5, p. 99), which means Jim’s behavior for initiating conversations created a slightly decreasing shift from baseline to intervention phases; however, the behavior made an increasing shift from the intervention phase to the maintenance phase. Moreover, the *change in trend* showed a distinct increase over time within the three phases. Thus, the effect of the intervention on Jim’s behavior for initiating conversations was strongly demonstrated.
Figure 4.4. Trend-line displays within each phase of initiating conversations for each dyad
Table 4.4
*Within Condition Analysis: Initiating Conversations of Each Dyad*

<table>
<thead>
<tr>
<th>Conditions (In sequence)</th>
<th>Paul</th>
<th>Wendy</th>
<th>Jim</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>B1</td>
<td>C1</td>
<td>A2</td>
</tr>
<tr>
<td>Condition Length</td>
<td>6</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td>Trend-Direction</td>
<td>/</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Trend-Stability</td>
<td>83%</td>
<td>62%</td>
<td>67%</td>
</tr>
<tr>
<td>Data paths within Trend</td>
<td>(−)</td>
<td>(=)</td>
<td>(−)</td>
</tr>
<tr>
<td>Level-Stability</td>
<td>33% Variable</td>
<td>54% Variable</td>
<td>67% Variable</td>
</tr>
<tr>
<td>Level-Range</td>
<td>2 – 10</td>
<td>0 – 12</td>
<td>4 – 23</td>
</tr>
<tr>
<td>Level-Change</td>
<td>7 – 2</td>
<td>6 – 0</td>
<td>13 – 23</td>
</tr>
</tbody>
</table>

*Note.* A1, A2 and A3 represent baseline phases of each dyad; B1, B2 and B3 represent intervention phases of each dyad; C1, C2 and C3 represent maintenance phases of each dyad.
<table>
<thead>
<tr>
<th>Condition Comparison</th>
<th>Paul</th>
<th>Wendy</th>
<th>Jim</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1/A1</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>C1/B1</td>
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<td></td>
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<td>B2/A2</td>
<td></td>
<td></td>
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<td>C2/B2</td>
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<td></td>
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<tr>
<td>B3/A3</td>
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<td></td>
<td></td>
</tr>
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<td>C3/B3</td>
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<td>Number of Variables Changed</td>
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<td>1</td>
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<tr>
<td>Change in Trend-Direction and Effect</td>
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<td>(−)</td>
<td>(−)</td>
</tr>
<tr>
<td>Negative</td>
<td>Positive</td>
<td>Positive</td>
<td>Positive</td>
</tr>
<tr>
<td>Change in Trend-Stability</td>
<td>Variable To Variable</td>
<td>Stable To Variable</td>
<td>Variable To Variable</td>
</tr>
<tr>
<td>Change in Level</td>
<td>(2 − 6) +4</td>
<td>(0 − 13) +13</td>
<td>(0 − 0) +0</td>
</tr>
<tr>
<td>Percentage of Overlap</td>
<td>77%</td>
<td>50%</td>
<td>23%</td>
</tr>
</tbody>
</table>

Note: A1, A2 and A3 represent baseline phases of each dyad; B1, B2 and B3 represent intervention phases of each dyad; C1, C2 and C3 represent maintenance phases of each dyad.
Table 4.6
*Mean and Range Percentage of Initiating Conversations of Each Dyad*

<table>
<thead>
<tr>
<th>Participants</th>
<th>Baseline</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Intervention</th>
<th></th>
<th></th>
<th></th>
<th>Maintenance</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>Md</td>
<td>R</td>
<td>StD</td>
<td>M</td>
<td>Md</td>
<td>R</td>
<td>StD</td>
<td>M</td>
<td>Md</td>
<td>R</td>
<td>StD</td>
</tr>
<tr>
<td>Paul</td>
<td>5.19</td>
<td>5</td>
<td>2.22~10</td>
<td>2.96</td>
<td>4.96</td>
<td>4.44</td>
<td>0~12.22</td>
<td>3.23</td>
<td>12.97</td>
<td>12.78</td>
<td>4.44~23.33</td>
<td>6.07</td>
</tr>
<tr>
<td>Wendy</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4.27</td>
<td>3.33</td>
<td>0~8.89</td>
<td>4.03</td>
<td>1.3</td>
<td>1.11</td>
<td>0~3.33</td>
<td>1.48</td>
</tr>
</tbody>
</table>

*Note.* M: Mean; Md: Median; R: Range; StD: Standard Deviation
Results of Social Behaviors Performed on Initiated Play

Analysis of Percentage Data of Initiated Play

The percentages of interval engaged in the behaviors of the initiated play of each dyad appear in Figure 4.5 (See p. 103). The trend-lines displayed within a phase of the initiated play for each dyad appear in Figure 4.6 (See p. 110). During the baseline phase, Paul’s data within the phase showed a slightly descending trend; Wendy exhibited a barely obvious ascending trend during the initiated play, and Jim exhibited an ascending trend during the phase. In the intervention phase, all the three children with autism performed with ascending trends. In addition, Paul exhibited a slightly descending trend during the maintenance phase, and both Wendy and Jim exhibited a slightly ascending trend after withdrawal of the intervention.

From the mean and range percentages of the initiated play of each dyad, Paul had a mean of 1.67% (range = 0 ~ 6.67%) during the baseline (See Table 4.9, p. 113). When intervention was instituted, Paul’s intervention data showed an increasing trend with a mean of 10%. (range = 0~ 43.33%), in which the small alterations of his mean data showed as 8.7% (range = 6.67 ~ 11.11%) in the ensuing maintenance phase. Wendy’s baseline data showed a barely obvious increasing trend-line with a mean of 0.56% (range = 0 ~ 2.22%) (See Table 4.9). When intervention was implemented, Wendy’s data showed an increasing trend with a mean of 1.11% (range = 0 ~ 17.78%) during the phase. However, Wendy’s maintenance data indicated a barely obvious decreasing trend with a mean of 2.04% (range = 0~ 6.67%). In addition, Jim’s baseline data showed a slightly ascending trend with a mean of 5.19% (range = 1.11 ~ 12.22%) (See Table 4.9). The intervention data for Jim’s performance for initiating play showed some variability with a mean of 13.5% (range = 0 ~ 38.89%), and with an increasing trend. Yet, Jim’s data in the maintenance phase also showed a slightly
increasing trend with a mean of 11.67% (range = 7.78 ~ 15.56%). Overall, the results indicated that the intervention had an influence on the performance for initiating play among the three high-functioning autistic children as the trend-lines display a slight increase for each dyad as shown in Figure 4.5 (See p.103).
Figure 4.5. Percentage of initiating play for each dyad
**Within and Between Adjacent Conditions Analysis of Initiated Play**

In order to further analyze the percentage interval engaged in initiating play, the investigation illustrates the percentage change in level and trend by visual analysis as shown in Tables 4.7 (See p. 111) and 4.8 (See p. 112), which present each dyad during each observation phase: baseline, intervention, and maintenance, respectively.

(1) Paul

(1.a) Baseline

From Table 4.7, the level-range of Paul’s behavior for initiating play was 0% to 7%, and the level-change was -2% (2% ~ 0%). The trend within the phase showed a slightly descending pattern and became stable toward the end of the phase with a trend-stability 33% (<75%), which means Paul’s behavior for initiating play had not reached a stable condition. Paul behaved stably at the end of the baseline phase, and six data points were collected for Paul’s behavior, allowing transition to the intervention phase.

(1.b) Intervention

Thirteen data points represented Paul’s behavior for initiating play during the intervention phase. The percentage of Paul’s behavior for initiating play was 0% to 43%, and the level-change was +14 (3% ~ 17%) (See Table 4.4). The level-stability was 0% (<75%) and was defined as variable. Moreover, the trend-direction displayed an ascending pattern with a trend-stability of 85% (>75%), which means Paul behaved in a stable, increasing pattern for initiating play during the intervention phase.

In addition, from Table 4.8, the change in trend-direction and effect constitutes a positive, which means Paul’s behavior for initiating play improved after institution of the intervention. However, the percentage of overlap between
the baseline and intervention phase was a high 77%, which means the intervention’s influence on Paul’s initiating play behavior was imperceptible.

(1.c) Maintenance

From Table 4.7 (See p. 111), six data points collected for Paul’s behavior for initiating play, produced a level-range of 11% to 9% with a level-change of -1% (10% ~ 9%). The trend-direction defined a slightly descending pattern with the trend-stability at a high, 100% (> 75%) after the intervention faded.

Moreover, from Table 4.8 (See p. 112), the percentage change from the intervention to the maintenance phase was -7% (17% ~ 10%). These responses, shown in Table 4.7, indicated that the trend was a deceleration. Further, the percentage of overlap between the intervention and maintenance phases was a high, 100% which means the effect of the intervention remained for the maintenance phase. However, as Paul performed a rapid ascension near the end of the intervention phase (See Figure 4.5, p.103), the rapid ascension, on the contrary, weakened the remaining effect from the intervention phase to the maintenance phase.

Overall, Paul’s behavior, performed for initiating play, increased after introducing the intervention. Yet, the change in level between the baseline phase to intervention phase and the intervention phase to maintenance phase showed a positive increase of +3% and -7% (See Table 4.8), which means Paul’s behavior was improving while the intervention was applied, but the behavior displayed a decrease after withdrawal of the intervention. Moreover, the change in trend showed an explicit increase over time, thus, demonstrating that the effect of the intervention on Paul’s behavior for initiating play was vigorous.
(2) Wendy

(2.a) Baseline

From Table 4.7 (See p. 111), the level-range of Wendy’s behavior for initiating play was 0% to 2%, and the level-change was +1% (0% ~ 1%). The trend within the phase displayed an imperceptible increasing pattern and with a trend-stability of 83% (> 75%), meaning Wendy’s behavior for initiating play approached a stable situation. Wendy performed with slightly increasing stability toward the end of the baseline phase, and the investigation moved to the intervention phase after collecting six data points.

(2.b) Intervention

Thirteen data points were collected for Wendy’s performance for initiating play during the intervention phase. The percentage of Wendy’s behavior for initiating play was 0% ~ 18%, and the level-change was +18% (0% ~ 18%) (See Table 4.7). The level-stability was 0% (< 75%) and was defined as variable. Yet, the trend-direction showed an increasing pattern, especially a rapid acceleration at almost the end of the intervention phase, with a trend-stability of 77% (> 75%), which means Wendy performed stably for initiating play during implementation of the intervention phase.

Furthermore, from Table 4.8 (See p. 112), the change in trend-direction and effect gained a positive definition, which means Wendy’s performance for initiating play improved after administering the intervention. However, the percentage of overlap was a high, 62%, which means the effects of the intervention were not powerful from the baseline phase to the intervention phase. Also shown in Figure 4.5 (See p. 103), Wendy performed lower at the beginning of the intervention phase, but the behavior apparently improved at the end of the
intervention phase.

(2.c) Maintenance

From Table 4.7 (See p. 111), again, the six data points collected for Wendy’s performance during the maintenance phase produced a level-range of 0% to 7% with a level-change of +1 (1% ~ 2%). The trend-direction defined a slightly descending pattern with a trend-stability of 67% (< 75%), which means the data collected for Wendy’s behavior did not show a stable situation.

In addition, from Table 4.8 (See p. 112), the percentage change from the intervention phase to the maintenance phase was -17% (18% ~ 1%), which means Wendy’s behavior for initiating play did not continue after the intervention faded. However, the percentage of overlap between the intervention phase and maintenance phase was a high, 100% which means that the effect of the intervention remained into the maintenance phase.

Overall, Wendy’s behavior performance for initiating play increased after instituting the intervention. Yet, the change in level between the baseline phase to the intervention phase and the intervention phase to the maintenance phase was -1% and -17% (See Table 4.8), which means Wendy’s behavior displayed a discontinuity in performance from the end of the baseline phase to the beginning of the intervention phase, and from the intervention phase to the maintenance phase, respectively. Moreover, the change in trend did not show an explicit increase over time. Thus, the effect of the intervention on Wendy’s behavior for initiating play may not be as significant as demonstrated.

(3) Jim

(3.a) Baseline

From Table 4.7, the level-range of Jim’s performance for initiating play was
1% to 12%, and the level-change was +8% (4% ~ 12%). The trend within the phase showed a slightly increasing pattern with a trend-stability of 83% (>75%), which means Jim performed in a stable, increasing situation for initiating play during the baseline phase and allowed the investigation to move into the intervention phase after collecting six data points.

(3.b) Intervention

Thirteen data points were collected for Jim’s behavior for initiating play during the intervention phase. The percentage of Jim’s performance for initiating play was 0% to 39%, and the level-change was +3% (3% ~ 6%) (See Table 4.7, p. 111). The level-stability was 0% earning a definition of variable. Moreover, the trend-direction displayed an increasing line, especially a rapid increase near the end of the intervention phase, with a trend-stability of 69% (<75%), which means Jim did not show in a stable situation for initiating play during the intervention phase.

Besides, from Table 4.8 (See p. 105), the change in trend-direction and effect was positive, which means Jim’s behavior for initiating play increased after implementation of the intervention. However, the percentage of overlap was a high, 62%, which shows the effects of the intervention were not remarkable from the baseline phase to the intervention phase.

(3.c) Maintenance

From Table 4.7, in the same measure, six data points collected for Jim’s behavior for initiating play during the maintenance phase produced a level-range of 8% to 13% with a level-change of +1% (8% ~ 9%). The trend-direction defined a slightly increasing pattern with a trend-stability of 50% (<75%), which means Jim did not perform in a stable situation during the phase.
Moreover, from Table 4.8 (See p. 112), the percentage change from the intervention phase to the maintenance phase was +2% (6% ~ 8%), which means Jim’s behavior for initiating play increased after withdrawal of the intervention. In addition, the percentage of overlap between the intervention phase and the maintenance phase was a high, 100%, which means the intervention did influence Jim’s behavior for initiating play.

According to the data, Jim’s behavior for initiating play increased by the intervention. Yet, the change in level between the baseline phase to intervention phase and the intervention phase to maintenance phase was -9% and +17% (See Table 4.8), respectively, which means Jim’s behavior displayed a discontinuity of performance from the end of the baseline phase to the beginning of the intervention phase, but Jim made a slight increase after withdrawal of the intervention. Moreover, the change in trend did not show an explicit increase over time. Thus, the effect of the intervention on Jim’s behavior for initiating play was not notable, as demonstrated.
Figure 4.6. Trend-line displays within each phase of initiating play for each dyad.
Table 4.7
Within Condition Analysis: Initiating Play for Each Dyad

<table>
<thead>
<tr>
<th>Conditions (In sequence)</th>
<th>Paul</th>
<th>Wendy</th>
<th>Jim</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>6</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td>B1</td>
<td>6</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>C1</td>
<td>6</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td>A2</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>B2</td>
<td>13</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>C2</td>
<td>6</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>A3</td>
<td>6</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>B3</td>
<td>13</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>C3</td>
<td>6</td>
<td>13</td>
<td>6</td>
</tr>
</tbody>
</table>

| Trend-Direction          | /    | /     | /   |
| Trend-Stability          | 33%  | 85%   | 100%|
|                          | 83%  | 67%   | 83% |
|                          | 69%  | 50%   |     |

<table>
<thead>
<tr>
<th>Data paths within Trend</th>
<th>(-)</th>
<th>(=)</th>
<th>(+)</th>
<th>(-)</th>
<th>(=)</th>
<th>(+)</th>
<th>(=)</th>
<th>(-)</th>
<th>(+)</th>
<th>(+)</th>
<th>(=)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level-Stability</td>
<td>17%</td>
<td>0%</td>
<td>50%</td>
<td>0%</td>
<td>0%</td>
<td>17%</td>
<td>33%</td>
<td>0%</td>
<td>50%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level-Range</td>
<td>0 – 7</td>
<td>0 – 43</td>
<td>9 – 11</td>
<td>0 – 2</td>
<td>0 – 18</td>
<td>0 – 7</td>
<td>1 – 12</td>
<td>0 – 39</td>
<td>8 – 13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level-Change</td>
<td>2 – 0</td>
<td>3 – 17</td>
<td>10 – 9</td>
<td>0 – 1</td>
<td>0 – 18</td>
<td>1 – 2</td>
<td>4 – 12</td>
<td>3 – 6</td>
<td>8 – 9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(-2)</td>
<td>(+14)</td>
<td>(-1)</td>
<td>(+1)</td>
<td>(+18)</td>
<td>(+1)</td>
<td>(+8)</td>
<td>(+3)</td>
<td>(+1)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 4.8

*Between Adjacent Conditions Analysis: Initiating Play for Each Dyad*

<table>
<thead>
<tr>
<th></th>
<th>Paul</th>
<th>Wendy</th>
<th>Jim</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condition</td>
<td>Comparison</td>
<td>Comparison</td>
<td>Comparison</td>
</tr>
<tr>
<td>B3/A3</td>
<td>C3/B3</td>
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<td></td>
</tr>
<tr>
<td>Number of</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Variables</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Changed</td>
<td>(+)</td>
<td>(-)</td>
<td>(+)</td>
</tr>
<tr>
<td>Change in</td>
<td>Positive</td>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td>Trend-Direction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>and Effect</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>To</td>
<td>Variable</td>
<td>To</td>
</tr>
<tr>
<td>Change in</td>
<td>Variable</td>
<td>Variable</td>
<td>Variable</td>
</tr>
<tr>
<td>Trend-Stability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in Level</td>
<td>(0 – 3 )</td>
<td>(17 – 10)</td>
<td>(1 – 0 )</td>
</tr>
<tr>
<td></td>
<td>+3</td>
<td>-7</td>
<td>-1</td>
</tr>
<tr>
<td>Percentage of</td>
<td>77%</td>
<td>100%</td>
<td>62%</td>
</tr>
<tr>
<td>Overlap</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* A1, A2 and A3 represent baseline phases of each dyad; B1, B2 and B3 represent intervention phases of each dyad; C1, C2 and C3 represent maintenance phases of each dyad.
Table 4.9
Mean and Range Percentages of Initiating Play for Each Dyad

<table>
<thead>
<tr>
<th>Participants</th>
<th>Baseline</th>
<th>Intervention</th>
<th>Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>Md</td>
<td>R</td>
</tr>
<tr>
<td>Paul</td>
<td>1.67</td>
<td>0.56</td>
<td>0~6.67</td>
</tr>
<tr>
<td>Wendy</td>
<td>0.56</td>
<td>0</td>
<td>0~2.22</td>
</tr>
<tr>
<td>Jim</td>
<td>5.19</td>
<td>5</td>
<td>1.11~12.22</td>
</tr>
</tbody>
</table>

Note. M: Mean; Md: Median; R: Range; Std: Standard Deviation
Qualitative Data Analysis

The study’s design was a multiple baseline analysis across subjects and across peers, and it was also an embedded design which basically collected both qualitative and quantitative data in each phase. Thus, the study considered the reliability of the observations. Besides, the study included interviews with the special education teacher and the parents of the three children with autism in order to maintain social validity for the study. The interviews occurred both before and after the observations. In addition, the interviews were semi-structured allowing addition of necessary extra questions based on participants’ previous answers (See Appendix A and B).

Perspectives on the Differences among Autistic Children’s Behaviors

Regarding Maintaining Interactions

Parents’ and teacher’s perspectives on any characteristics of maintaining interactions can be differentiated before and after the study’s interventions with the three high-functioning autistic children.

1) Paul

1.a) Perspectives of parents

Before Paul’s recruitment for the study, Paul ignored others’ attempts at verbal communication or only distractedly regarded others. When he engaged in play times at home, he often played alone and soliloquized and ignored any attempt at conversation from his younger sister. However, after Paul had been recruited into the study, his mother noticed that some interactions occurred between Paul and the sibling while they played with each other at home. For example, Paul said, “No” to his sibling when the sibling asked if he wanted to build a house with wooden blocks.
(1.b) Perspectives of the teacher

Paul actions in the classroom were almost the same as those at home. He used to ignore peers’ conversations and seemed to be in trance when asked to join activities. After a few weeks, as Paul became involved in the research, the teacher noticed that Paul became more active in responding to peers’ calls and requests, especially from the one who participated in the research study with him. For example, when Paul’s peer asked Paul if he would like to play, Paul responded, “Yes,” or to an even greater extent, “Yes! I want to play.”

(2) Wendy

(2.a) Perspectives of parents

Mostly, Wendy made passive responses to her family members at home, and rarely initiated verbal responses. She used to simply nod her head to express willingness to do the activities parents asked. After Wendy’s recruitment into the research, her mother noticed that Wendy complied with the requests of her parents more frequently. For example, Wendy replaced toys in their boxes when her mother asked her to do so.

(2.b) Perspective of the teacher

Wendy did not really react to her peers in the classroom. Sometimes, she would just turn around when her peers asked her to do some activity. However, the teacher noticed her maintenance of interactions with peers in the classroom increased after she participated in the research. For example, when peers asked Wendy to put books back on the bookshelf, she would do as asked.
(3) Jim

(3.a) Perspectives of parents

Before Jim’s recruitment into the research, he paid less attention to his parents’ requests, and did not even make any response to them at all. However, after he became involved in the research, after about four to five weeks, his mother noticed that his responses were becoming more frequent. For example, when Jim’s mother asked him to set the dinner table, Jim would be able to place the bowls and chopsticks on the table in the proper way.

(3.b) Perspectives of the teacher

Jim was very obstinate in the classroom. He ignored both the teacher’s or peers’ attempts at conversation, and was stubborn with his peers, being firm in his own views when in classroom activities. However, the teacher noticed that Jim became more active at reacting to his peers. For example, when Jim’s peers asked him to follow their steps, before he did it himself during the classroom activities, Jim would respond, “Yes,” or more expansively, “Yes! I do it, too.”

*Perspectives on the Differences among Autistic Children’s Behaviors*

*Regarding Initiating Conversations*

Parents and teacher’s perspectives on any characteristics of initiated conversations that can be differentiated before and after the intervention of the three high-functioning autistic children appear below.

(1) Paul

(1.a) Perspectives of parents

Paul would only look at people when some visitors came to his home. Also, he
would only smile without any word even if his mother tried to lead him to greet the visitor(s). However, his mother noticed that Paul more frequently initiated conversations after he had been recruited into the research. For example, Paul would show his favorite toy to the visitor and say, “This is my train; it is long.”

(1.b) Perspectives of the teacher

Paul would only smile at those who entered his classroom before he had been recruited for the study. However, the teacher noticed that he would make an active greeting to those who came into the classroom, and even pulled the person’s hands along and said, “Hi.” But the behavior was not frequent.

(2) Wendy

(2.a) Perspectives of parents

When Wendy’s cousins came to visit her family, she rarely interacted with those who were the same age. However, her mother noticed that Wendy’s behaviors included increased conversation initiation. For example, she would tell her cousin, “I’m dressing my doll.” Or she would say, “I like the playing-house,” to attract attention from her cousins.

(2.b) Perspectives of the teacher

Before Wendy became involved in the study, she rarely initiated any conversation with peers in the classroom. However, the teacher noticed that Wendy became more active at greeting peers, especially when she entered the classroom in early morning. Moreover, during the classroom activities, Wendy would actively share the toy in her hand with the peer who was next to her. For example, she would say, “I use the clay to make a castle.”
(3) Jim

(3.a) Perspectives of parents

Jim, basically, would try to attract his parents’ attention when he would like to do something at home. But he would abandon his desire if he failed to obtain his parents’ attention. Yet, Jim’s mother noticed that Jim’s behavior for initiating conversations became more frequent after he participated in the research for a few weeks. For example, Jim would try harder to attract his parents’ attention. Or, he would say, “Look! I’m making sounds by playing the diabolo.”

(3.b) Perspectives of the teacher

Jim would try to share his toys with his peers in the classroom; however, he would give up when the peer he was talking to did not react to him. Nevertheless, after Jim became involved in the research, the teacher noticed he would try more times to cause a peer’s reaction, and sometimes, he would pull a peer’s clothing or touch a peer’s body in order to ask the peer listen to him. For example, he would pull peer’s hand and show the peer his pencil box.

Perspectives on the Differences among Autistic Children’s Behaviors

Regarding Initiating Play

Parents and the teacher’s perspectives on any characteristics of initiating play that can be differentiated before and after the intervention of the three high-functioning autistic children appear below.

(1) Paul

(1.a) Perspectives of parents

Paul has a younger sibling with whom he mostly plays with toys at home. Before
Paul’s recruitment in the research, he liked to play with toys alone, and he talked to himself. However, Paul’s mother noticed that Paul would ask his younger sibling to build an apartment with wooden blocks after Paul had become involved in the study for a few weeks.

(1.b) Perspectives of the teacher

Before Paul’s recruitment in the study, he passively participated in the play activities with peers in the classroom. However, Paul’s behaviors for initiating play increased after a few weeks’ involvement in the study. For example, he became more active when playing the chasing game with peers. Yet, he would ask a peer to play a card game with him during the 15-minute break time.

(2) Wendy

(2.a) Perspectives of parents

As Wendy is an only child at home the parents are the ones she mostly interacts with. Wendy’s mother mentioned that they do not play with her frequently at home; rather the parents spent most their time with Wendy dealing with her school assignments. However, after participating in the study for a few weeks, Wendy’s mother noticed that Wendy would ask her cousin to play toys with her when her cousin came to visit them. For example, Wendy asked her cousin to play with a doll house, and used a doll to touch her cousin’s face to pretend a kiss.

(2.b) Perspectives of the teacher

Wendy used to sit aside to watch peers play games during the 15-minute break time. However, the teacher noticed that she became more active in participating in play with peers a few weeks after she had been recruited into the study. For example,
she asked a peer to jump the rope with her and sing the children’s rhymes.

(3) Jim

(3.a) Perspectives of parents

Jim, basically, would ask his parents to play with him. However, the behavior for initiating play became more frequent after Jim participated in the study for a few weeks.

(3.b) Perspectives of the teacher

Jim’s teacher did not see many differences in Jim’s behavior for initiating play before or after his involvement in the study.

Based on the perspectives from both parents and the teacher of the three children with autism, obviously, the social play activities mediated by peers with the pivotal response training (PRT) enhanced the social interaction abilities of the three high-functioning autistic children. Besides enhancement of maintaining and initiating actions (i.e., maintains interactions, initiates conversation, initiates play, etc.), the parents also mentioned that the children generalized the actions into daily activities, although the transfer was not apparent on a regular basis. However, in viewing the concept of the situation as a whole, the three children with autism enhanced their behavior for social interaction not only within the school setting, but also outside the school setting.

**Summary**

Overall Chapter 4 represented the results of social behaviors performed from maintained interactions, initiated conversations, and initiated play. In the behaviors of maintained interactions, both Paul and Jim’s data appear as slightly ascending as shown in Figure 4.1 (See p. 77), but a decreasing trend line represented Wendy’s behaviors on
the maintained interactions. Figure 4.3 (See p. 90) showed increasing trend lines for each participant for behaviors related to initiated conversations which means the peers with pivotal response training enhanced the three high-functioning autistic children. The autistic children actively initiated conversation with peers during the social play activities. The data collected for behavior of initiated play also appeared to be ascending lines for all the participants as shown in Figure 4.5 (See p.103).

Moreover, as the research study qualitatively collected the perspectives from interviews with the teacher and parents of the three high-functioning autistic children, all the adults noticed improvements of each child for the three targeted behaviors from the beginning through the end of all the play sessions.
CHAPTER 5
DISCUSSIONS AND RECOMMENDATIONS

The purpose of this chapter is to present a concluding overview of the overall study. The three major sections are: Review of the Study, Limitations, and Recommendations. To begin with, the review of the study consists of the significance of the study, data collection, data analysis, and finally the discussion of findings. The limitations section discusses the research time, choice of research subjects, and choice of research settings. In the end, the recommendations include the importance of early intervention, more specific parameters for the selection of peers, and the follow-up tracking of peer’s performance.

Review of the Study

Significance of Study

The significance of this study was to deepen and broaden the scope of previous studies of similar issues of social interactions of high functioning autistic children. These previous studies generally investigated their motor-gestural and vocal-verbal behaviors, social interaction, and intention for conversations (Chang, 2006; Choi, Jobling, & Carroll, 2000; Feng, 2004; Strain, Kerr, & Ragland, 1992; Pierce & Schreibman, 1995; Wu, 2003). What was different with the current study is two-fold: the mediated guidance from normal peers embedded in play activities and the alternative approach for its data analysis.

First of all, since this study focused primarily on interactions and intention of the high functioning autistic children, it aimed to explore the effect brought by performances of the normal peers in a one-on-one dyad implementing the interventional strategies on
autistic children in the social play activities. Such a design was rarely seen in past studies given that the dominant design was to pair one autistic child or multiple autistic children with multiple normal children (Choi, Jobling, & Carroll, 2000; Kamps, Barbetta, Leonard, & Delquadri, 1994; Odom, Chandler, Ostrosky, McConnell, & Reaney, 1992). A scenario common to this design was that normal children were likely to group themselves and play along together without actually interacting with the autistic participants to do the requested activities. Therefore, in this study, one normal child and one autistic child were paired to prevent the aforementioned drawback so that they could be truly be engaged in the designed social activities.

Secondly, in terms of the follow-up data analysis, in most previous studies, visual analysis was often applied to present the calculation of the stability and range of participants’ changed behaviors (Chang, 2006; Feng, 2004; Pierce & Schreibman, 1995). However, in the current study, the trend line was estimated in order to track the three autistic children’s forward or backward performance of the targeted social behaviors. In the meantime, the “percentage of overlap” with each targeted social behavior was also calculated between phases (e.g., baseline and intervention phase, intervention and maintenance phase) to clearly interpret the positive effects induced by the social interactions that three high-functioning autistic children had with their peers.

Data Collection

The design of this study was a multiple baseline, across subjects and across peers, embedded design that collected both qualitative and quantitative data in each phase of the study.
Based on the purpose of the study, the study analyzed the data collected by observing social behavior before peer PRT (baseline) and after peer PRT (intervention) during play sessions. In other words, before PRT, observations of the particular play behaviors of each dyad (an autistic child and a non-autistic one) during the play session were categorized as baseline data. After the instruction to normal peers with PRT, observations of potentially improved social behaviors in the social play activities were the intervention data.

Besides observations on these three dyads, interviews with parents and the teacher were also conducted. One was before the autistic children’s involvement in the play activities before the intervention phase to gain information about their current levels of social skills, and the frequency of targeted social behaviors. The other was after the intervention phase to let parents and the teacher again express their particular perspectives on the subjects’ progress or change of targeted social behaviors in other contexts.

**Data Analysis**

Instead of the common approach, visual analysis, used for studies of similar topics for data analysis, this study utilized two other ways, trend-line and percentage of overlap, to illustrate whether the three high-functioning autistic children enhanced their social interactions skills with their gradual interaction with trained peers. For the quantitative data, the trend-line was first presented for each autistic participant, which indicated the individual increase/decrease of targeted social behaviors shown in interactions during the observed period. The other way of demonstrating the differences before and after intervention was the calculation of percentage of overlap between phases. The numerical
differences between adjacent phases of each high-functioning autistic child implied the direction and level of the influence which normal peers with PRT have had on autistic children from interactions.

In terms of qualitative data, collected from interviews with parents and the teacher, the interviews were analyzed with the content analysis approach as evidence of the change of autistic children’s social behaviors.

Discussion of Findings

This section presents the findings of the change of three autistic children’s performance on three target social behaviors, specific to this study from their interactions with guided by peers with PRT in social play activities. Overall speaking, the three targeted social behaviors improved. Such an improvement was also confirmed from parents’ and the teacher’s perspectives regarding these behaviors in other contexts such as at home or in regular classes. Findings of each target behavior are discussed below.

*Peers with Pivotal Response Training (PRT) Affected a High-functioning Autistic Child’s Skills for Maintained Interactions in Social Play Activities*

According to Figure 4.1 (See p. 77), the trend-lines displayed slight increase for the behavior for maintaining interactions of each autistic child. This meant that the peers with PRT enhanced autistic children’s behaviors for maintaining interactions in the social play activities and the results corresponded to the results of previous studies (Feng, 2004; Pierce & Schreibman, 1995; Pierce & Schreibman, 1997b). However, the result of the present study did not show 100% stability of continuous development in each autistic child, which might have resulted from time constraints for observations. Nevertheless, based on the results shown, among two of the three autistic children, the improvement of
their behavior for maintaining interactions was sustained from the baseline to the follow-up phrase. On the other hand, one of the high-functioning autistic children’s behaviors showed a slight decrease. Overall, the social play activities, whose interactions were guided by peers with the pivotal responses training, enhanced the three autistic children’s behavior for maintaining interactions.

**Peers with Pivotal Response Training (PRT) Affected a High-functioning Autistic Child’s Skills for Initiated Conversations in Social Play Activities**

The three high-functioning autistic children’s behaviors for initiating conversations improved generally as the data demonstrated. The trend-lines displayed in Figure 4.3 (See p. 90) were proof of the result of social behaviors for initiating conversations of each autistic child, and each trend-line displayed this increasing tendency as well. The results also corresponded to the findings in previous the studies (Pierce, & Schreibman, 1995; Pierce, & Schreibman, 1997b) that participants’ behavior of initiating conversations gradually increased with intervention. Since these high-functioning autistic children had not been particularly responsive in interactions before the intervention, their demonstration to initiate conversations was a huge achievement. Thus, the findings in this aspect manifested that peers with PRT had a positive impact on behavior of autistic children’s initiating conversations.

**Peers with Pivotal Response Training (PRT) Affected a High-functioning Autistic Child’s Skills for Initiated Play in Social Play Activities**

The trend-lines in Figure 4.5 (See p. 103) of each autistic child displayed a positive increase in their behavior to initiate play. The peers of this study practiced each social play activity before administering it with each autistic child. The practice mainly included
turn-taking, role play, and storytelling which helped the peers to comprehend the rules of PRT when interacting with children with autism in the social play activities. Thus, each peer imperceptibly mediated the principles of PRT to each autistic child, and the behaviors for initiating play among children with autism gradually increased.

From the data itself, the three high-functioning autistic children, basically, showed a positive tendency regarding their behavior for initiating play after the introduction of the intervention. All the improvements were sustained from the baseline to the follow-up phase. This obviously illustrated that the social play activities administered by the trained peers enhanced the three high-functioning autistic children’s behavior for initiating play.

The Parents’ and the Teacher’s Perspectives toward the Effects of the Trained Peers

The parents and the teacher of the three high-functioning autistic children reported a positive response toward the effects brought by the social play activities administered by the peers with the pivotal response training. The effects included not only the improved behavior of the three high-functioning autistic children in social interactions, but also their enhanced motivation to communicate with peers. This is a significant step for the autistic child who had had tremendous difficulty handling daily interactions with peers in the classroom. Moreover, parents and the teacher also noticed improvement of each high-functioning autistic child in the three target social behaviors outside the research setting. To be more specific, each high-functioning autistic child not only maintained the conversations with the assigned peer, but also showed an extending verbal repertoire with the content of the conversations. In another aspect, each high-functioning autistic child developed enhanced motivation to initiate play by actively grabbing the toys from the assigned peer, and further extended invitation to the peer to join the play
activities. Overall, from the descriptions of examples in interviews, the three children with autism enhanced their behavior for social interaction in other contexts such as home or regular classes as well as the research setting.

To sum up, the social play activities administered by the peers with pivotal response training enhanced the three high-functioning autistic children’s behaviors for maintaining interactions, initiating conversations, and initiating play. In addition, the improvements were noticed not only within the study setting but also more frequently in other daily contexts (i.e., within the home setting with their parents, within the school setting with peers and teachers). Given the generally positive results, there are still a few limitations that might hinder the generalizability of the study’s findings.

**Limitations**

The results of this research showed positive effects from the social play activities administered by the trained peers for the three high-functioning autistic children’s social interactions. However, several limitations emerged that might restrict general application of the research findings. The limitations might have resulted from three sources: the research time allotted, the choice of research subjects, and the choice of research setting.

*Limitations from the Research Time Allocated*

Generally, the greatest difference between social science and pure science is that alteration is hardly observable in social science contexts over the short-term. In this research, difficulty arose for identifying the transition point at which behavior changed due to applied intervention.

Basically, the intervention may allow research participants to perform effects from extending the period of time for baseline data collection, which is a requirement of
multiple-baseline research design (Tseng, 2005). In other words, participants’ behavior for maintaining interactions may begin to increase in participants prior to treatment. However, due to the time limitation, six points were established for data collection in the baseline phase. Thus, given the stable baseline across participants, expected effects were unlikely in this case.

Moreover, this study extended baseline and intervention periods. Consequently, insufficient time existed, due to tight school schedules, to investigate the effect on every participant during the maintenance phase. To be more specific, the amount of time was not enough to fully observe the social behaviors of each high-functioning autistic child’s performance of the three independent variables. Thus, the alterations of the behaviors of each child might not show powerful evidence.

**Limitations from the Choice of Research Subjects**

A few considerations impacted the choice of research subjects for this study, meaning that the generalizations should be considered cautiously. To begin with, the original plan was to recruit children younger than age 7 (1st grade). However, no students younger than age 7, diagnosed as high-functioning autistic in the study’s chosen elementary school, were available. Thus, the recruitment came from students from the 2nd grade to meet the research criteria.

Secondly, the subjects recruited for this research were those diagnosed as high-functioning autistic children. Further, the findings of this study may not represent a compelling case for children diagnosed with “Asperger Syndrome” as major differences exist between High-Functioning Autism and Asperger Syndrome. This caution applies to children diagnosed as mentally retarded or with ADHD, as well.
In addition, the subjects of this research study were all 2\textsuperscript{nd} graders in an elementary school in a neighborhood of Taipei City, Taiwan, which is an urban context. Thus, the research findings of this study is not considered to be a comprehensive representation for those high-functioning autistic children who are older than age 7 and/or represent other geographical areas.

\textit{Limitations from the Choice of Research Setting}

Two constraints, not entirely anticipated before the study began, became obvious. The constraints had more to do with the arrangement of this research’s setting, which was an urban elementary school, and the inaccessible observations of children’s interactions in general classrooms and incompleteness of some observation periods.

First of all, observations were conducted on each dyad separately where the play sessions took place in the special education classroom in this elementary school. What could be seen was the dyad’s performance during the designated 15-minute period. This meant that autistic children’s daily performance in the general (inclusive) classroom was not given access for further tracking. What these children did in other settings could only be gained from interviews with parents and the teacher even though they basically reported overall improvement of the autistic children’s targeted social behaviors. The reliability of this study would have been significantly enhanced observations in general classrooms as been possible, as well.

Another concern was the incompleteness of some observation periods. Since the observations occurred within the 15-minute break in the daily school schedule, the time allotted for the play activities was likely to be reduced if the teacher dismissed the class late or some other factors interfered, unexpectedly. Furthermore, effort and negotiation
was necessary to reschedule the available time to make-up the incomplete or missed observation periods. Thus, the compromise with the fixed schedule needs to be taken into consideration beforehand and that alternatives are applied in similar situations.

**Recommendations**

Given that this research investigated whether or not the peer mediated strategies helped the autistic children’s performance for social interactions, it could shed some light on a few relevant issues. The three recommendations here are the geneses of the literature review and research findings, which are certainly worth serious considerations for future practitioners. The recommendations are: importance of early intervention, more specific parameters for peer selection, and the follow-up tracking of peers’ performance.

*Importance of Early Intervention*

When issues regarding children with autism are raised, one common yet heated debate goes to the question of when is a good timing for implementing interventions to enhance their social skills. That is, when the practice of early intervention plays a crucial role is in debate. Based on the viewpoints of proponents of early intervention, the congenital deficiency in learning abilities of children diagnosed as autistic can be ameliorated if the weaknesses are identified and interventions introduced as early as possible. Also, the frequency of unaccommodating or aggressive behavior may be decreased with earlier intervention. In addition, when introducing intervention to children with autism, future practitioners may be advised to focus on these goals in particular: to develop accommodating behavior, to develop social behaviors and social interpersonal relationships with others, and to avoid and decrease stereotypical behavior.
In terms of the participants in this research, three 7-year-olds with autism were recruited. Their age is younger than that of participants in other similar research (i.e., Chang, 2006; Feng, 2004; Pierce & Schreibman, 1995). From the research findings, advancing the time to a younger age for implementing interventions for children with autism may have more remarkable and positive benefits. Accordingly, future practitioners may attempt to institute intervention for those children with autism at younger ages (e.g., 4 or 5 year-old children) with the potential advantages of noticeable, significant changes in behavior.

**More Specific Parameters for Peer Selection**

During the peer-mediated play activities, peers are pivots as they interact with the children with autism in social play activities to enhance autistic children’s social abilities. Thus, ways of selecting peers to be recruited into the related research deserves discussion. In this research, the peers were nominated by their classroom teachers. Besides performing well in schoolwork, these peers also had positive personalities with supportive attributes (e.g. kind-hearted, friendly, and patient). Especially, they were all intimate with children with autism in their classrooms based on the teacher’s constant observation. However, from observations conducted during the research, these attributes were not entirely sufficient for peer-selection. Thus, besides the personalities, other criteria should be considered for peer selection in the future research.

First, peers are suggested to have a high level of compromising capability. This characteristic is urgently needed in the transition of the activity flow. When interacting with autistic children, peers sometimes need to operate in coordination to raise an autistic child’s motivation for social play activities. For example, in the social play activities, a
peer may initially recognize the need to provide an autistic child’s favorite toys or start a preferred activity, and then gradually shift the attention to the toys or activities that are designed for improving social interaction abilities.

Second, a peer is better when having a high level of awareness of flexibility to react to autistic children’s unexpected behaviors when interacting with them in the play activities. Controlling the situation in which only peers and autistic children are involved in play activities without adult involvement is not easy. Thus, peers may need to know how to measure accommodation to cooperate with the autistic children’s changes during play activities. In this way, peers may be able to keep children with autism on targeted goals.

According to the findings and assumptions, besides the peers’ personalities, when recruiting peers for social play activities and implementing the pivotal response training for children with autism, future practitioners may need to consider the capacity of compromise and flexibility thereby keeping autistic children on targeted goals or behavior that the research seeks to investigate.

*Follow-up Tracking of Peers’ Performances*

When peers are instructed with pivotal response training for the social play activities, the main factor influencing the efficacy of peers’ application of PRT is whether or not peers can accomplish the strategies from training to enhance the targeted behaviors of autistic children. Thus, the follow-up tracking of peers’ performance is crucial. For instance, in this research, a short period of time was spared between each training sessions and the ensuing play session. This short period was used to provide a basis for feedback to the peers to identify the valuable behavior and behavior which needed
improvement. This also allowed mutual discussion with the peer regarding the peer’s confusion or question about some strategies which are to be applied in play sessions later.

Based on the implementation of this tactic for this study, future practitioners may consider reviewing videotapes from training sessions and the actual play sessions to provide timely and constructive feedback to peers so that the peers know whether or not they guided the autistic child correctly or appropriately using the strategies of pivotal response training. Also, during peer training sessions, besides feedback, the teacher might demonstrate appropriate ways of dealing with autistic children’s negative behaviors or create possible scenarios beforehand for peers to act on. In addition, teachers may group peers (in the case of several peers recruited for a study) and lead them to discuss what they do when interacting with an autistic child in social play activities. Peers may develop ideas from each other and make changes for the next interactive activity with autistic children.
References


Education.


Appendix A: Interview Questions on Social Interaction Situations

(Teacher Version)

Child’s name: ____________________    Date interviewed: __________________
Interviewee: ____________________    Relationship to child: ________________

Objective:

The purpose of this questionnaire is to understand the play patterns and particular play behaviors the autistic child has during his/her daily play activities. You will be interviewed before and after the intervention activities designed by the investigator. This questionnaire is the one that will be used for the interview before starting the social play activities of the study. Moreover, as this is a semi-structured interview. The investigator will add necessary extra question for the participant based on previous answers.

1. How does the child interact with other peers in the classroom (e.g., alone, ignore other’s request, etc.)?

2. How does the child attract your or peers’ attention if other people are busy doing something else?

3. How does the child greet someone when that person is arriving or leaving the classroom?

4. Does the child have any particular social behavior while expressing his/her own demands?

5. Does the child like to play games with peers? How does the child ask a peer to play a game with him/ her or to keep the game going?

6. Please describe the play features demonstrated by your child during his/her social play activities, and provide examples.
Interview Questions on Social Interaction Situations
(Teacher Version)

Child’s name: ____________________    Date interviewed: __________________

Interviewee: ____________________    Relationship to child: ________________

Objective:

The purpose of this questionnaire is to understand the play patterns and behaviors the autistic child has performed during his/her daily play activities. You will be interviewed before and after the intervention activities designed by the investigator. This part of questionnaire will be used for the interview after the intervention. Moreover, since this is a semi-structured interview, the investigator will add necessary extra question(s) for the participant based on previous answers.

1. How does the child interact with other peers in the classroom after the intervention activities were implemented? Are there any characteristics that can be differentiated before and after the intervention?

2. If you think the child’s social interaction is enhanced, what might contribute to it in your opinion? On the contrary, if you don’t find the child’s social interaction improved, what reason do you think might it be?

3. In addition to the area of the social interaction, what other aspects do you think have also been influenced and demonstrated by your child, given his/her participation in the social play activities as intervention?

4. Given that your child has been involved in this study, what other thoughts or comments do you have for the further study?
Appendix B: Interview Questions on Social Interaction Situations

(Parents Version)

Child’s name: ____________________    Date interviewed: __________________

Interviewee: ____________________    Relationship to child: ________________

Objective:

The purpose of this questionnaire is to understand the play patterns and behaviors the autistic child has performed during his/her daily play activities. You will be interviewed before and after the intervention activities designed by the investigator. This part of questionnaire will be used for the interview before the intervention. Moreover, since this is a semi-structured interview, the investigator will add necessary extra question(s) for the participant based on previous answers.

1. How does the child interact with other member(s) when he/she is at home (e.g., alone, ignore other’s request, etc.)?

2. How does the child attract your or peers’ attention if other people are busy doing something else?

3. How does the child greet someone when that person is arriving or leaving home?

4. Does the child have any particular social behavior while expressing his/her own demands?

5. Does the child like to play games with parents or siblings? How does the child ask a peer to play a game with him/her or to keep the game going?

6. Please describe the play features demonstrated by your child during his/her social play activities, and provide examples.
Interview Questions on Social Interaction Situations  
(Parents Version)

Child’s name: ____________________    Date interviewed: ______________

Interviewee: ____________________    Relationship to child: ______________

**Objective:**

The purpose of this questionnaire is to understand the play patterns and behaviors the autistic child has performed during his/her daily play activities. You will be interviewed before and after the intervention activities designed by the investigator. This part of questionnaire will be used for the interview *after* the intervention. Moreover, since this is a semi-structured interview, the investigator will add necessary extra question(s) for the participant based on previous answers.

1. How does the child interact with other members at home after the intervention activities were implemented? Are there any characteristics that can be differentiated before and after the intervention?

2. If you think the child’s social interaction is enhanced, what might contribute to it in your opinion? On the contrary, if you don’t find the child’s social interaction improved, what reason do you think might explain this?

3. In addition to the area of the social interaction, what other aspects do you think have also been influenced and demonstrated by your child given his/ her participation in the social play activities as intervention?

4. Given that your child has been involved in this study, what other thoughts or comments do you have for the further study?
Appendix C: Interval Data Collection Sheet (IDCS)

Child’s Name: __________         Date and Time: __________  
Activity: _______________________________

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Appendix D PRT Training Sessions Outline (Example)

Session #1

First training session: ____Story Telling____

<table>
<thead>
<tr>
<th>Story Title</th>
<th>Session length</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Three Little Pigs</td>
<td>15 minutes</td>
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</table>

Session Goal

1. Help the non-autistic child to understand the principles of Pivotal Response Training (PRT).
2. Teach the non-autistic child to know how to make a shift from one object to another (e.g., from reading picture book to playing with clay).

Session Objectives

1. The non-autistic child will initiate the invitation to ask the autistic peer to participate in the play activity.
2. The non-autistic child will say “Let’s read the picture book before we play with clay?” (*Verbal movement*)
3. The non-autistic child will lead the autistic peer by gestures into the play activity. (*Non-verbal movement*)

Material

Picture book (The Three Little Pigs)

Story outline

Once upon a time there were three little pigs and the time came for them to leave home and seek their fortunes. Before they left, their mother told them “Whatever you do, do it the best that you can because that's the way to get along in the world.

The first little pig built his house out of straw because it was the easiest thing to do.

The second little pig built his house out of sticks. This was a little bit stronger than a straw house.

The third little pig built his house out of bricks.

..................................................

Teaching Strategies

T: Hi____________________ (Child’s name) 7 minutes

T: Teacher
C: Child
(I have a story that I want to share with you.)
Before I tell the story, I want to ask you a question. Can you briefly tell me what have you heard about the story “The Three Little Pigs”?  

C: *(Let child answer)*  

(After the child answers, the teacher begins to tell the story)

<table>
<thead>
<tr>
<th>Discussion/Practices</th>
<th><em>(Child briefly tells the teacher what he/she heard from the story.)</em></th>
<th>8 minutes</th>
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</thead>
</table>
| T: Takes the clay out.  
T: Asks the peer to pretend to be a child with autism, and T pretends to be the peer. T: Asks questions.  
1. ________ *(Child's name)*. What did you learn from story?  
2. Do you want to play with me? Do you want to make a house as strong as the third pig made? *(Verbal movement)*  
At this time, teacher may model for the child by taking the child’s hand to ask him/her for participation *(Non-verbal movement)* |

Note. The used image was retrieved from ed.fnal.gov/ntep/f98/projects/ornl/present.html
Appendix E Social Play Activity Outline in Session #1 (Example)

Participants: __________________________________   Date: _______________

<table>
<thead>
<tr>
<th>Session Title</th>
<th>Time</th>
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<tbody>
<tr>
<td>The Three Little</td>
<td>2:00~2:15 (15 minutes)</td>
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<tr>
<td>Pigs: Making a</td>
<td></td>
</tr>
<tr>
<td>Clay House</td>
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</table>

**Goal**
Maintains interactions (e.g., compliance, as response to answering questions)

**Objectives**
1. The autistic child will say, “I want to play.”
2. The autistic child will say “Yes! The door is red,” when the peer asks the color of the door he/she is making.
3. The autistic child will initiatively share what he/she made with the peer.

**Play materials**
1. Picture books: The Three Little Pigs
2. Clay (with varieties of color)

**Play activities**

- **Preparation phase**
  a.) The teacher sets up all the materials of “Making Clay House,” then tells both children to start with the game.
  b.) The teacher discusses the play activity with the non-autistic child as a reminder.
  (Please see Appendix PRT Training Session #1 for the strategies taught to the non-autistic child beforehand.)
  c.) The teacher reminds both children the rules of the game: Cannot take toys from each other by force.

- **Activity phase-Play House**
  a.) During the play activity, the teacher needs to pay attention to the interactions between the autistic and non-autistic child. While they are involved in the “Making Clay House” activity.

- **Wrap-up phase**
  a.) The teacher gives notice to both children for the ending of this activity and tells them to put the toys back.

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<tr>
<th>Time</th>
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<td>12 minutes</td>
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Date: February 26, 2008

From: Jacqueline K. Gardner, Compliance Coordinator

To: Ya-Lun Tsao

Subject: Results of Review of Proposal - Expedited (IRB #26993)

Approval Expiration Date: November 19, 2008

“The Impact of Social Play Activities on Promoting Social Interaction of High-Functioning Autistic Children in Taiwan”

The Social Science Institutional Review Board (IRB) has reviewed and approved your proposal for use of human participants in your research. By accepting this decision, you agree to obtain prior approval from the IRB for any changes to your study. Unanticipated participant events that are encountered during the conduct of this research must be reported in a timely fashion.

Enclosed is/are the dated, IRB-approved informed consent(s) to be used when recruiting participants for this research. Participants must receive a copy of the approved informed consent form to keep for their records.

If signed consent is obtained, the principal investigator is expected to maintain the original signed consent forms along with the IRB research records for this research at least three (3) years after termination of IRB approval. For projects that involve protected health information (PHI) and are regulated by HIPAA, records are to be maintained for six (6) years. The principal investigator must determine and adhere to additional requirements established by the FDA and any outside sponsors.

If this study will extend beyond the above noted approval expiration date, the principal investigator must submit a completed Continuing Progress Report to the Office for Research Protections (ORP) to request renewed approval for this research.

On behalf of the IRB and the University, thank you for your efforts to conduct your research in compliance with the federal regulations that have been established for the protection of human participants.

Please Note: The ORP encourages you to subscribe to the ORP listserv for protocol and research-related information. Send a blank email to: L-ORP-Research-L-subscribe-request@lists.psu.edu

JKG/jkg
Enclosure
cc: Thomas D. Yawkey
VITA
Ya-Lun Tsao

EDUCATION

Ph.D  Aug 2005 – May 2009  The Pennsylvania State University
Major: Curriculum and Instruction
Emphasis area: Early Childhood Education
Academic minor: Special Education

M. Ed  Aug 2004 – May 2005  The Pennsylvania State University
Major: Curriculum and Instruction
Emphasis area: Early Childhood Education

B.S  Jun 1996 – Jun 2000  Tamkang University
Taipei, Taiwan
Major: Japanese Literature

PROFESSIONAL EXPERIENCE

Jun 2006 – Aug 2006  Teaching Assistant/ Author of ECE courses syllabi
• Early Childhood Education courses designed
  -ECE 497 Children’s play
  -ECE 453 Parent Involvement

Jan 2006 – May 2006  Teaching Assistant;
  Even Start Program, State College, Pennsylvania
• Focusing on numbers recognition for children age from 3-5 years old

Jan 2001- Aug 2003  Teaching Assistant-After School Program
  Fu-Yo Kindergarten of Catholic Kuang Jen Cultural
  and Educational Foundation, Taipei, Taiwan
• Assisted to teach all subjects for children from kindergarten to 8 years old

JOURNALS


• Tsao, Y.L. (2008). Gender issues in young children’s literature. Reading Improvement, 45(3), 108-114