TRAINING TEACHERS TO PROMOTE PRETEND PLAY IN CHILDREN WITH DISABILITIES

By

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To my mom and dad, I couldn't have done it without you.

To my amazing brother and sister, Brian and Anna, I love you both.

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CHAPTER I

INTRODUCTION

Pretend Play in Young Children

Recommended practices promote the inclusion of children with disabilities in early intervention contexts (Sandall, Hemmeter, Smith, & McLean, 2005). Children with disabilities may benefit from inclusive environments for at least three reasons. First, competent peers provide opportunities for social learning and positive social interactions (Bricker, 1978). Inclusive environments provide access to peers who can act as intervention agents (Odom & Strain, 1984; Strain, McGee, & Kohler, 2001), model target behaviors (e.g., Garfinkle & Schwarz, 2002; McGee, Morrier, Daly, 1999), or provide generalization situations (Belchic & Harris, 1994; Pierce & Shreibman, 1995). Second, inclusive environments provide an important context for implementing effective intervention practices (McGee et al., 1999; Strain et al., 2001). Inclusive environments provide a context for embedding learning opportunities into naturally occurring activities and routines throughout the day (e.g., Pretti-Frontczak & Bricker, 2004; Losardo & Bricker, 1994; Venn et al., 1993; Venn & Wolery, 1992). Third, inclusive environments can promote high levels of child engagement (Odom & Bailey, 2002) and social interactions (Martin, Brady, & Williams, 1991).

A primary level of engagement for children in classroom environments is differentiated play with objects (McWilliam, 1998; McWilliam & Bailey, 1992). Children with typical development spend a considerable portion of time playing with

objects in inclusive classrooms. Appropriate IEP objectives for children with disabilities often involve teaching children with disabilities the behaviors that occupy the time of their peers to ensure access to the environment and provide normalized and contextually relevant experiences. One such skill is play with objects. Thus, play with objects is a functional skill, and is often an appropriate behavioral target or IEP objective for children with disabilities.

For children with disabilities, play with objects may provide a normalized context for positive social interactions and embedding learning opportunities (Langley, 1985; Tiegerman & Primavera, 1981; Wolery, Ault & Doyle, 1992). Play sets the occasion for social interactions and communication with peers (McConnell, 2002) across multiple settings (Wolery, 1989). Play provides a context for implementing evidence-based practices such as activity based interventions (Prett-Frontczak & Bricker, 2004), embedded learning opportunities (Sandall & Schwarz, 2002), high-probability procedures (Santos, 2001), and time delay procedures (Wolery, 2001). All of these are recommended practices for young children with disabilities (Sandall et al., 2005). Play with objects may increase learning and engagement in inclusive settings (Bussye, Wesley, Keyes, & Bailey, 1996; Lieber, 1993; Morrison, Sainato, Benchaban, & Endo, 2002). For children with disabilities, play with objects also may result in higher sociometric ratings by peers with typical development (Strain, 1985). Furthermore**,** play provides a context for assessing other skills (Fewell & Kaminski, 1988), and may offer a foundation for developing leisure skills thereby positively impacting the quality of life.

Children with disabilities engage in less object play than children with typical development (Blasco, Bailey, & Burchinal, 1993). Children with autism, in particular,

engage in fewer play behaviors and display less variety in their play behaviors (e.g., Charman, Baron-Cohen, 1997; Jarrold, Boucher, & Smith, 1996; Ungerer & Sigman, 1981; Sigman & Ungerer, 1984). Hence, play with objects must be taught to children with disabilities (Blasco et al., 1993; Reid, DiCarlo, Shepis, Hawkins, & Stricklin, 2003).

Play with objects can take many forms, and frequently involves the use of objects in a non-literal manner. Non-literal means using pretense in your behaviors (e.g., putting a miniature bottle to a doll's mouth). Most taxonomies define this type of play as pretend play. The object play of typical children often involves pretend play. Several play taxonomies include a definition for pretend play. Likewise, several published studies have measured and taught pretend play to children with disabilities (e.g., Jarrold et al., 1996; DiCarlo & Reid, 2004).

Traditional play taxonomies include different categories and definitions of non-literal play with objects (e.g., Chance, 1979; Sherrat & Peter, 2002; Smilansky, 1968; Wheman, 1977). However, consistencies across the taxonomies exist. These include: (a) a developmental sequence, (b) symbolic or substitution behaviors (e.g., using a wooden rod as a baby bottle), (c) markers of complexity, and (d) the use of inference to interpret the behavior as pretense.

Two primary inconsistencies in the measurement of pretend play exist in the literature. First, pretense behaviors are not operationalized consistently across taxonomies. Definitions include the following: (a) the non-literal use of miniature objects without a reality based outcome, (b) using one object as if it were another, (c) acting as if an object is present in the object's absence, and (d) assigning false attributes to an object or person. Most pretend play reports defined pretend play with one or more of these

characteristics; therefore, the precision with which pretense is defined is inconsistent. Second, differences between functional play and functional pretend play are not often distinguished. Definitions of functional play often overlap with definitions of pretend play across studies (e.g., DiCarlo & Reid, 2004; Kasari et al., 2006; Jarrold et al., 1996). Non-literal play with dolls or with miniature objects was defined as pretend, symbolic, or functional play depending the report (e.g., Charman & Baron-Cohen, 1997; DiCarlo & Reid, 2004; Libby, Powell, Messer, & Jordan, 1997; Riguet et al., 1981). Williams et al. (2001) included a category for elaborated functional play behaviors, that (a) reflected the functional use of objects; (b) associated two or more objects together; (c) was accompanied by a gesture, or vocalization; or (d) was directed toward a doll. Both Taylor and Iancono (2003) and DiCarlo and Reid (2004) included functional play with pretense behaviors in their definitions of pretend play. Taylor and Iancono defined pretend play as "not carrying out an activity to their usual outcome" and "non-literal" (p. 84). In their study, functional play with pretense and substitution behaviors (i.e., using an object to represent something else or referring to an absent object) were measured together as forms of pretend play. DiCarlo and Reid defined pretend play as an action, which "imitated a real-life situation involving objects that corresponded to the toys used in the action" (p. 199). DiCarlo and Reid described pretend play with functional play with pretense behaviors. Rutherford and Rogers (2003) recognized the ambiguity in the literature regarding the definitions of functional play versus pretend play. In an effort to avoid excluding all functional play behaviors, which may involve pretense, they defined pretend play behaviors as any functional play behavior, which "might have demonstrated pretend play or was likely to involve pretend play" (p. 294).

Functional play with pretense is recognized in the various reports reviewed as a form of play that differs from symbolic and functional play. Yet, functional play with pretense was not consistently operationalized across the reviewed studies.

Taxonomy of Pretense Behaviors

Twenty-nine reports were identified which measured or taught pretend play to children with disabilities. All 29 reports and the pretense behaviors each report measured are shown in Table 1. For the present study, a pretense taxonomy was created based on the behaviors defined as pretend play in these 29 reports. This taxonomy defines four categories and three subcategories of pretense behaviors (i.e., functional play with pretense, substitution behaviors, sequences, and vocalizations). All 29 reports measure behaviors from at least one of the first two categories in the pretense taxonomy (i.e., functional play with pretense and substitution behaviors). The following sections describe the categories associated with the pretense taxonomy. The taxonomy is shown in Table 2.

Table 1

Pretend Play Report by Pretense Behavior

Reference	Functional Play with Pretense	Substitution	Sequences	Vocalizations
Blanc et al. (2005)	FPP	OS AAA		
Charman & Baron-Cohen (1997)	FPP	OS		CV
DiCarlo & Reid (2004)	FPP			
Doctoroff (1997)	FPP			SV
Goldstein & Cisar (1992)	FPP			SV
Goldstein et al. (1988)	FPP			SV
Ingersoll et al. (2006)	FPP	OS IOA AAA		
Jarrold et al. (1996)	FPP	OS IAO AAA		CV
Kasari et al. (2006)	FPP	OS IAO AAA		SV CV
Kim et al. (1989)			OS FPP	
Lieber & Beckman (1991)	FPP	OS	R OS FPP	
Lewis & Boucher (1995)	FPP	OS IAO AAA	OS FPP	
Libby et al. (1997)		OS IAO	R T OS FPP	
Lifter et al. (2005)	FPP		FPP	
Lifter et al. (1993)	FPP		R FPP	
MacDonald (2005)	FPP	AAA		
Malone & Langone (1998)	FPP			
Mundy et al. (1987).	FPP	OS IAO AAA		CV
Neville & Bachor (2002)	FPP	OS	R OS FPP	
Riguet et al. (1981)	FPP	OS		
Rutherford & Rogers (2003)	FPP	OS AAA		
Sherrat (2002)	FPP*	OS IAO AAA		
Sigman & Ungerer (1984)	FPP	OS IAO AAA	FPP OS	CV
Stahmer (1995)		OS IAO AAA	T OS	
Taylor & Iacono (2003)	FPP	OS IAO AAA		CV
Thorp et al. (1995)	FPP	OS IAO	T FPP OS	CV
Ungerer & Sigman (1981)	FPP	OS IAO AAA	FPP OS	CV
Williams et al. (2001)	FPP		FPP	
Zercher et al. (2001)	FPP	OS		

Note. FPP = Functional play with pretense. OS = Object Substitution. IAO = Imagining Absent Objects. AAA = Assigning Absent Attributes. R = Routines. T = Themes. CV = Confirmatory vocalizations. SV = Scripted vocalizations.

Table 2

Pretend play taxonomy

Play type Subcategory	Definition
Functional play with pretense (FPP)	Non-literal use of actual or miniature objects in the manner in which they were intended without the reality-based outcome
Substitution	
Object Substitution (OS)	Using one objects as if it was a different object
Imagining Absent Objects (IAO)	Performing an action as if an object was present in the object's absence
Assigning Absent Attributes (AA)	Assigning dramatic roles or emotions to the self, others, or inanimate objects
Sequences	
Themes (T)	A stretch of play organized around a theme or more than one action with objects duplicating or based on the same theme
Routines (R)	More than one action with objects duplicating a routine
Object Substitution (OS)	A series of at least two object substitution actions related to same theme or routine
Functional Play with Pretense (FPP)	A series of at least two functional play with pretense actions related to same theme or routine
Vocalizations	
Confirmatory Vocalizations (CV)	Identifying a specific role the child is acting out, assign attributes to themselves, or plan, map, or confirm pretend play behaviors
Scripts (S)	Verbalizations taught by the script (targeted behaviors)

Functional Play with Pretense

Functional play with pretense is the first category. This category includes functional play behaviors involving the non-literal use of objects (i.e., using a small cup to give a doll a drink). Functional play with pretense behaviors (a) involve the functional use of objects, (b) are non-literal, thus involve pretense, and (c) are not symbolic. Functional play with pretense is different from other forms of play. Functional play with pretense and symbolic behaviors are both non-literal. However, functional play with pretense involves the non-literal use of actual or miniature objects in the manner in which they were intended. This includes placing a doll into a small bed, putting an empty cup up to a doll's mouth, or putting a spoon up to the child's own mouth (e.g., Charman & Baron-Cohen, 1997; Lieber & Beckman, 1991). Neither functional play, nor relational play requires the non-literal use of an object. Substitution involves the substitution of actual objects for other objects, absent objects for actual objects, or absent attributes for actual attributes.

This category was created because several intervention reports stated their purpose was to teach pretend play to children with disabilities, yet the target behaviors were the appropriate use of objects imitating real life routines. These target behaviors would fit into functional play or pretend play categories of numerous taxonomies. Several studies targeted similar functional play with pretense behaviors, which often included feeding (i.e., self, a doll, or figure), grooming, or daily routines. However, the specific actions were different across reports (i.e., placing food on a toy elephant's mouth, licking a representational ice cream cone [Taylor & Iacono, 2003]; talking on a toy telephone, stirring a toy spoon in an empty toy bowl [DiCarlo & Reid, 2004]; putting a hat on a doll,

putting a cup to the doll's mouth, brushing a dog, placing a spoon to a doll's mouth [Lifter et al., 2005]). Targeted scripted behaviors, such as the child "reads" a magazine or "applies" polish to a shoe, were included in the functional play with pretense category (e.g., Goldstein, Wickstrom, Hoyson, Jamieson, & Odom, 1988).

Substitution

The second category in the pretend play taxonomy is substitution. This category is often referred to as symbolic play in the literature; However, some definitions for symbolic play include functional play with pretense behaviors. The characteristics of symbolic play include: (a) using one object as if it was another object, (b) imagining absent objects, or (c) assigning absent attributes to self or objects (e.g., Blanc, Adrien, Roux, & Barthelemy, 2005; Stahmer, 1995; Ungerer & Sigman, 1984). In the present taxonomy, the category is labeled substitution, and is best described with three subcategories. The three subcategories align with the characteristics of symbolic play and are (a) object substitution, (b) imagining absent objects, and (c) assigning absent attributes. Object substitution includes using one object as if it were another (e.g., Charman & Baron-Cohen, 1997; Jarrold et al., 1996; Lifter et al., 2005). This includes using a block as a car, using a rod as a spoon to feed a doll, or using a block as a cup and taking a sip. Imagining absent objects are behaviors resembling activities performed with objects or performed as if an object was present (e.g., Jarrold et al, 1996; Sherratt, 2002; Sigman & Ungerer, 1984). This can include bringing hands to lip as if eating, moving hands as if playing the violin, or moving fingers up and down as if using a scissors. Assigning absent attributes can be focused on the self, others, or inanimate objects;

typically involve a vocalization; and have to involve an observable behavior. For example, the child may pretend to be a mother with a vocalization confirming this (e.g., "I am the mommy"), the child may give another child the role of mother with a vocalization (e.g., You are the mommy") and material exchange (e.g., gives peer a baby), or the child may indicate a figure is the mother with a vocalization (e.g., "the girl is the mommy") or mother-related behavior (e.g., has the figure hold a baby or has the figure put a bottle to a baby's mouth). Non-examples include vocalizations without an accompanying behavior (e.g., "I going to the office" or "Lets be workers" with no movements). Attributes also can include emotions or feelings (e.g., 'I am sad' and the appropriate change in facial expression when pretending to be sad, or the doll is sad with crying noises). Assigning absent attributes can also include using a doll as an agent of action (e.g., having the doll drive a car or feed itself [Lifter et al., 1993; Mundy et al., 1987; Sigman & Ungerer, 1984; Ungerer & Sigman, 1981]). Imagining absent objects and assigning absent attributes often were not measured separately from object substitution in the literature (i.e., Lewis & Boucher, 1995; Stahmer, 1995; Taylor & Iancono, 2003; Thorp, Stahmer, Shreibman, 1995).

Sequences

The third category is sequences of pretense behaviors. This category includes two or more functional play with pretense or substitution behaviors. The most basic sequences involve more than one action duplicating a routine, narrative, or based on the same theme. These include functional play with pretense, substitution, or verbalizations involving pretense. These were measured and operationalized differently across reports

and referred to as play complexity, persistence, or complex pretend play. Definitions included a stretch of play organized around a theme (Libby et al., 1997); joining two or more substitution behaviors (Lieber & Beckman, 1991); three actions related to the same theme (Stahmer, 1995); and carrying out play actions from beginning to end with more than three separate behaviors (Thorp et al., 1995). Play sequences may be a marker of a more advanced pretend play repertoire (e.g., Libby et al., 1997; Lieber & Beckman, 1991; Thorp et al., 1995). In the present taxonomy, pretense sequences typically involve a series of different but related pretense behaviors, and should occur within 3 s of each other. Sequences of routines or themes are important to measure because they may provide further evidence to support the inference of pretense. When coupled with sequences of pretense behaviors, vocalizations may provide additional evidence to support inferences about pretense.

Pretense with Vocalizations

The fourth category is vocalizations involving pretense. This category is separated in this taxonomy because (a) some reports measured verbalizations separately, (b) verbalizations do not require any props or motor movements as the other categories do, and (c) such verbalizations serve the same function as other pretend play behaviors (i.e., are non-literal and imply pretense). These verbalizations can (a) identify a specific role the child is acting out (e.g., Goldstein & Cisar, 1992); (b) assign attributes to themselves or objects (e.g., Taylor & Iancono, 2003; Thorp et al., 1995); or (c) plan, map, or confirm pretend play behaviors (Charman & Baron-Cohen, 1997; Jarrold et al., 1996). Language measures were included as markers of pretense (e.g., as an indicator in Jarrold et al.,

1996; as confirmation of pretense in Charman & Baron-Cohen, 1997) and as specific behaviors in reports using script training (e.g. Goldstein & Cisar, 1992; Goldstein et al., 1988). Vocalizations with pretense were defined across the reports as vocalizations related to the pretend play behavior, including naming the action or making appropriate noises (e.g. “I am feeding the baby”, or a drinking noise), as signals of the non-literal nature of the behavior (e.g., child uses a different voice or mannerism to play a role) (e.g., Charman & Baron-Cohen, 197; Taylor & Iancono, 2003).

Teaching Pretend Play

The 29 reports were resorted to identify reports measuring and teaching pretend play behaviors to children with disabilities. Sixteen reports were identified and further analyzed. Across these 16 reports, the interventions were generally effective in increasing pretense behaviors using modeling or prompting. However, few reported removal of prompts, procedural fidelity, maintenance data, or generalization data across settings, people, or toys. Few reports systematically programmed for generalization. The interventions primarily took place within classrooms and used materials found in classrooms. Fourteen reports used single subject experimental designs and two used group experimental designs. A description of these reports is shown in Table 3.

Table 3

Intervention reports

Reference	Participants		Measurement Context	
	Age (in months)	Diagnosis	With prompts only	Reported without prompts
DiCarlo & Reid (2004)	26 - 30	Developmental Delay	X	
Doctoroff (1997)	60	Developmental Delay	X	
Goldstein & Cisar (1992)	36 - 60	Autism	X	
Goldstein et al. (1988)	44 Š 80	Speech / Language Delay	X	
Ingersoll et al. (2006)	29 Š 41	Autism	X	
Kasari et al. (2006)	36 Š 48	Autism		X
Kim et al. (1989)	65 Š120	Autism	X	
Lifter et al. (2005)	48 Š 60	Autism / PDD	X	
Lifter et al. (1993)	48	Autism / PDD	X	
MacDonald et al. (2005)	48, 84	Autism		X
Neville & Bachor (2002)	36 Š 60	Developmental Delay	X	
Sherrat (2002)	60 Š 72	Autism		X
Stahmer (1995)	51 Š 85	Autism	X	
Taylor & Iacono (2003)	36	Developmental Delay	X	
Thorp et al. (1995)	60, 96, 108	Autism	X	
Zercher et al. (2001)	75	Autism	X	

Two major methodological limitations across these studies were documented. First, as was discussed and documented in the previous section, operational definitions and the precision of the pretense measurement varied across these reports. For example, Lifter et al. (1993) measured only functional play with pretense and assigning absent attributes as pretend play. DiCarlo and Reid (2004) did not define the target behaviors with replicable precision (i.e., "a single step action that appeared to imitate a real life situation involving objects that corresponded to the toys used in the action" (p. 199). They included a variety of examples, but did not include any non-examples. It is difficult to discern which behaviors were *not included* as pretend play behaviors.

Second, the presence of prompts during the measurement of pretense impacts the demonstration of changes in pretense behaviors. Only 3 of 16 reports removed all prompts from the measurement context (Kasari et al., 2006; MacDonald et al., 2005; Sherrat, 2002). The use of prompts during measurement limits conclusions about whether pretense behaviors changed because the measurement context may constitute a condition different from baseline or control conditions. Thus, only 3 of 16 reports attempted to demonstrated changes in pretense without prompts. Furthermore, only 2 of these 3 established experimental control (Kasari et al., 2006; MacDonald et al., 2005). Neither of these two studies demonstrated increases in spontaneous, unprompted pretend play. Overall, studies demonstrated children with disabilities can perform pretense actions when prompted, or within treatment sessions directly after prompting.

Interventions

Prompts were used to teach pretend play behaviors in all 16 studies. Three types of prompting procedures were used: (a) most to least, (b) least to most, and (c) modeling

and prompting within naturalistic teaching procedures. In 3 of the 4 script training studies, a most to least prompting hierarchy was used to teach children with disabilities to enact a specific script with peers (Doctoroff, 1997; Goldstein & Cisar, 1992; Goldstein et al., 1988). Across these studies, triads including children with disabilities and their typical peers were taught to enact specific scripts (e.g., barbershop, hamburger stand, magic show, pet store). Goldstein et al. instructed two triads to enact a hamburger stand script. One triad was instructed as a group and the children in the other triad were instructed individually. This study was replicated as a second experiment within the report. The differences in the second experiment included (a) all the children had language delays, and (b) a barbershop script was used. Goldstein and Cisar taught three triads (each containing two children with typical development and one child with autism) across three different scripts. Doctoroff taught three triads across two different scripts. In all three studies, the pretense behaviors maintained only during the sessions including prompts (i.e., by teachers or peers). The percentage of independent responses did increase across participants. However, neither the operational definitions for independent performance (e.g., unprompted behaviors) was not provided nor reported for all sessions in two studies (i.e., for 4 of 8 sessions [Goldstein et al., 1998], and only for training sessions, not post training sessions [Goldstein & Cisar, 1992]).

In 8 of the 16 studies, adults embedded modeling and prompting into naturalistic play interactions to teach pretense behaviors. A variety of teaching procedures was implemented and levels of prompting (i.e., modeling versus hand over hand prompting) varied across these 8 studies. However, in all 8 studies, naturalistic teaching techniques were used (e.g., contingent imitation, linguistic mapping, following the child's lead, and

child interest). Ingersoll and Shreibman (2006) combined naturalistic and behavioral techniques to teach reciprocal imitation, including pretend play behaviors, to children with autism. The intervention procedures interspersed contingent imitation and linguistic mapping with modeling of new actions to promote pretend play behaviors. Prompted pretend play behaviors did increase across 4 of the 5 children with autism within training sessions. However, there was no treatment effect for unprompted, spontaneous pretend play.

Kim, Lombardino, Rothman, & Vinson (1989) paired adult modeling of play with specific toys with vocalizations at levels slightly higher than the child's current repertoire. An increase in prompted play occurred (including pretend play behaviors). However, the authors only reported changes based on measurements during training sessions with prompts. The authors did not report data from contexts without prompts (i.e., unprompted pretense).

Zercher, Hunt, Schuler, & Webster (2001) trained children with disabilities and their peers to engage in pretend play using the integrated play group model (e.g., Shuler & Wolfberg, 2000). The play themes related to the child's interest, and they trained peers to provide prompts (i.e., cues and coaching) to the children with disabilities. The authors reported increases in pretend play during training sessions with adults simultaneously coaching the peers to prompt, and in sessions with the peer prompting but no adult coaching. The authors did not report measures of pretend play outside of the training sessions.

Two studies implemented adapted versions of Pivotal Response Training (PRT; Koegel et al., 1989) to teach pretend play to children with autism (Stahmer, 1995, Thorp

et al., 1995). The investigators adapted PRT to target pretend play behaviors (i.e., object substitution, imagining absent objects, & assigning absent attributes) instead of language targets. Components of PRT included shaping, child interest, modeling, prompting, and positive reinforcement, which were systematically incorporated into the play context. Stahmer and Thorp et al. reported increases in pretend play across 10 participants in these two studies. Further, Stahmer and Thorp et al. reported generalization measures across settings, people, and toys, which may further validate evidence for the use of PRT. However, the demonstration of a treatment effect is spurious for two reasons. First, adult prompting in the sessions outside of training was not reported, but could have been high. Second, data are not reported for the training sessions, which presents a threat to internal validity.

Sherrat (2002) also measured pretend play in contexts without the independent variable. Adults modeled and physically prompted pretend play behaviors based on specific scripts (i.e., the story of the three little pigs). Interventionists systematically removed the prompts across three phases. The third phase constituted the context without the independent variable; thus, did not include scripts or toys suggestive of previous scripts. Sherrat reported increases in pretend play based on positive changes in the means across the three phases of the study. However, threats to internal (e.g., history & maturation due to no control group or baseline data) and external ‘[=-validity (e.g., extremely small sample size of 5) limit conclusions that can be discussed as experimental control was not established.

Taylor and Iancono (2003) used model prompts and time delay to teach scripted pretend play behaviors to a child with language delays. The scripts were based on three

themed toy sets (playground, zoo, and house). The scripts had 10 target play behaviors with corresponding target vocabulary words. Initially, the adult modeled the 10 scripted behaviors and target vocabulary. After modeling the script three times, the adults inserted a 10-s time delay between each step of the script. Changes in functional play and symbolic play were reported. However, neither of the dependent measures was operationalized with replicable precision. For example, functional play included the appropriate use of an objects, and symbolic play included behaviors usually performed by someone else. A treatment effect for functional play was demonstrated. However, changes in symbolic play were not evident. The distinction between these behaviors was ambiguous, making the results difficult to interpret.

Neville and Bachor (2002) implemented a systematic prompting hierarchy similar to the system of least prompts to teach pretend play to children with disabilities based on specific scripts (i.e., model, verbal, hand over hand). The authors incorporated prompts into two different play interactions: with peers or without peers. Neville and Bachor reported increases in pretend play behaviors of children with disabilities increased only during sessions with prompts (i.e., from peers or adults).

One of the 16 studies used video modeling to teach scripted pretend play behaviors to children with autism (MacDonald et al., 2005). The children watched videos of adults acting out sequences of pretend play across specific scripts (i.e., town, ship, house). Interventionists taught two children to perform 16 scripted behaviors with video models. The scripted behaviors maintained during probes in sessions without the video. Three limitations were present in this study. First, the children did not demonstrate changes in unscripted pretense behaviors. Second, generalization across toys was not

measured. Third, only two data points were reported for 4 of 6 of the probe conditions. Addressing these limitations may increase the rigor of this experiment.

Four of the 16 studies use a least to most prompting procedure to teach pretend play to children with disabilities (DiCarlo & Reid, 2004; Kasari et al., 2006; Lifter et al., 1993; Lifter et al., 2005). DiCarlo and Reid used a verbal prompt as the first prompting level, followed by modeling and hand over hand assistance. Moderate increases in independent pretend toy play were reported across 2 of 3 participants using a multiple baseline design. Independent pretend toy play was defined as a pretend play action more than 5-s after a prompt. DiCarlo and Reid did not report pretend play behaviors from contexts other than the training context (i.e., including the adults prompts). The authors replicated across 2 additional participants. However, experimental control was not established because the replication was conducted using an A-B design.

Kasari et al. (2006) taught pretend play to children with autism in a clinic using discrete trial training and naturalistic techniques. The adults initially primed the target skills (i.e., pretend play behaviors) using procedures similar to the system of least prompts (i.e., using a least to most prompt hierarchy). This table top training was immediately followed by a session on the floor with the same adult and the same target behaviors. However, during the floor sessions, the adult used naturalistic teaching procedures similar to PRT and milieu teaching (Kasari et al., 2006; Koegel et al., 1989; Warren & Kaiser, 1986). The adult followed the child's lead, contingently imitated motor and verbal behaviors, focused on the child's interests, expanded the child's utterances, and arranged the environment to promote child engagement. The results showed a treatment effect for play type. However, the play type did not reach pretend play levels

and the authors only reported a treatment effect for pretend play types during the mother-child measurement context, which may have included prompts for play.

Lifter et al. (1993) used a least to most prompting hierarchy to teach pretend play behaviors to children with autism. The adult waited until the child held eye contact with or touched a toy for 3 seconds. The adult then brought a second, complementary object into the child's view, waited 3 s, and if the child did not respond, the adult placed her hand over the child's and physically prompted the pretend play response. The results showed a treatment effect for developmentally appropriate unprompted pretense behaviors (i.e., if the child selected the toy and exhibited the response without prompts). However, these results are difficult to interpret because the behaviors were only measured in contexts that included adult prompts.

In a systematic replication, Lifter et al. (2005) used the least-to-most prompting hierarchy (Sulzer-Azaroff & Mayer, 1991) to promote pretend play across specific toy sets with children with Pervasive Developmental Disorder (PDD). Results showed an increase in spontaneous target pretend play across 2 of 3 children. As with the previous study, these results should be taken with caution because the authors only reported measures for spontaneous pretend play from the training context that included prompts.

In summary, the extant literature suggest children with disabilities can be taught pretense behaviors. However, only 3 of these 16 studies reported results from measurement contexts that differed from the training contexts (Kasari et al., 2006; MacDonald et al., 2005; Sherrat, 2002). This is a limitation for two reasons. First, the training contexts (which were the measurement contexts in all but 3 studies) were different from baseline or control conditions to which comparisons are made. Thus, the

results are difficult to interpret and confound the demonstration of a treatment effect. Second, the target behavior across these studies, pretend play, must be inferred based on specific observable behaviors (i.e., functional play with pretense, object substitution, imagining absent objects, and assigning absent attributes). Spontaneous and varied behaviors provide more support for the inference of pretense. Spontaneous pretense only can be measured in contexts without prompts. There are few demonstrations of changes in spontaneous pretend play in this group of studies, and in those studies where the measurement of pretense occurred without prompts the results are difficult to interpret.

Pretense reports provided an estimate of unprompted pretense, but the criterion varied (e.g., DiCarlo & Reid, 2004; Lifter et al., 2005; Lifter et al., 1993; Taylor & Iancono, 2003), or the criterion was vague (e.g., Kasari et al., 2006; Stahmer, 1995; Thorp et al., 1995). DiCarlo and Reid required behaviors to occur 5 s after a prompt to be coded as unprompted. Lifter et al. (2005) and Lifter et al. (1993) coded unprompted behaviors as any behaviors not occurring immediately after a prompt for the behavior or with a different toy. Taylor and Iancono recorded unprompted pretend play as any behavior not occurring directly after a prompt. Kasari et al. did not describe the prompting used by mothers in their mother-child interaction session, and all child behaviors were considered unprompted. Likewise, Stahmer (1995) and Thorp et al. (1995) did not describe the level of prompting during one-to-one sessions with adults, and all child behaviors were considered unprompted. In all three of these studies (i.e., Kasari et al., 2006, Stahmer, 1995; Thorp et al., 1995), the adults were engaged with the children, but the levels of prompting were not specifically described or measured. This may confound results, because levels of prompting may be highly variable across

sessions with each study, and differentially influence the child's behaviors within and across sessions.

Furthermore, only 3 of the 16 reports described procedural fidelity. Only 1 of these 4 met basic standards for procedural fidelity assessment (i.e., Kasari et al., 2006). Procedural fidelity provides an estimate of how closely the experimenters followed the procedures for independent variable manipulation (Billingsley, White, & Munson, 1980). Procedural fidelity is an index of the extent to which the independent variables were implemented (Billingsley et al., 1980). Procedural fidelity increases confidence the observed changes between experimental phases are due to manipulations of the independent variable (Bear, Wolf, Risley, 1968; as cited in Billingsley et al., 1980). Kasari reported adequate estimates for procedural fidelity (i.e., above 90%), but did not report fidelity across all treatments (Kasari et al., 2006). The other two reports adapted a specific manual as their intervention protocol (Stahmer, 1995; Thorp et al., 1995), but failed to provide a measure of procedural fidelity (e.g., compliance with the manual's procedures).

System of Least Prompts

Adult prompting has been used to teach a variety of behaviors including language (Kaiser, Yoder, & Keetz, 1992), positive social interactions (e.g., McEvoy, Odom, & McConnell, 1992), and adaptive skills (e.g., Collins, Gast, Wolery, & Holcombe, et al., 1993). The pretend play empirical literature supports the use of adult prompts to teach play to children with disabilities. The empirical results suggest prompting specific play behaviors in a play context supports pretend play. Adult prompting was implemented in

all 16 intervention studies reviewed to teach pretense behaviors to children with disabilities. Most of these studies used adult prompting as the primary intervention strategy. Exceptions included using peers (Zercher et al., 2001), peers and scripts (Doctoroff, 1997; Goldstein et al., 1988; Goldstein & Cisar, 1992), and video (MacDonald et al., 2005) to teach pretense behaviors. However, even in threes studies adult prompting was part of the intervention. Various forms of adult prompting strategies were used. For instance, the script training reports used the most-to-least prompting strategy (Doctoroff, 1997; Goldstein et al., 1988; Goldstein & Cisar, 1992). Four reports used least to most prompting hierarchy to increase pretense behaviors (e.g., Lifter et al., 1993; Lifter et al., 2005). The remainder of the reports integrated adult prompting into the child's play with toys. Several of these reports used choices, adult modeling, and positive reinforcement (Stahmer, 1995; Thorp et al., 1995).

The purpose of a prompting procedure is to systematically transfer stimulus control to something other than the adult prompt (e.g., toys, peers). However, the reviewed studies did not provide a schedule for removing adult prompts. Removing adult prompts is essential to avoid prompt dependency (Wolery, Ault, & Doyle, 1992) and ensure the transfer of stimulus control so children will respond to environmental stimuli without adult prompts (Filla, Wolery & Anthony, 1999). Thinning adult prompts may be crucial when teaching pretense behaviors to children with disabilities, because unprompted pretense behaviors may provide more support for the inferring pretense.

The system of least prompts is an effective strategy for removing adult prompts based on the child's response. The system of least prompt presents the least intrusive prompt initially, followed by increasingly more intrusive prompts. The level of

intrusiveness corresponds to the degree to which the prompt controls the child's response. For example, the prompt hierarchy may have four levels with a few seconds provided between each level. The first level is always the presentation of the target stimulus, which can be naturally occurring (i.e., the presence of specific materials) or an additional task direction (i.e., asking a child to read a sight word written on an index card). The target behaviors dictate the nature of the target stimulus (Doyle et al., 1988). For example, discrete skills such as object naming often use a visual or verbal stimulus to indicate the start of the trial. Whereas, chained tasks, such as washing hands, often use naturally occurring stimuli (e.g., environmental cues related to routine transition to mealtime) to indicate the start of the trial. Most studies using the system of least prompts use four levels, such as (1) the materials (independent level), (2) a verbal mand, (3) a model (physical or verbal), and (4) hand over hand controlling prompt. Reinforcement is delivered contingent upon the child's correct response. Consequences for errors or no responses are the more intrusive prompt. Essentially, the child learns how to learn; because the child's response indicates which prompting level is needed to produce the correct response. Prompts are only delivered when the child is attending to the stimuli (Wolery et al., 1992).

The system of least prompts has been studied extensively. Several reports have demonstrated the system of least prompts is an effective strategy for increasing functional behaviors of children with disabilities (Doyle, Wolery, Ault, & Gast, 1988). The system of least prompts has been effective in teaching a variety of skills to a variety of learners (Doyle et al., 1988; Wolery, Ault, & Gast, 1992). The system of least prompts has been used in preschool classrooms to increase children's conversations (Filla et al., 1999), to

increase children's object manipulation (Fox & Hanline, 1993), and to teach sight words to preschoolers with developmental delays (Doyle, Wolery, Gast, & Ault, 1990). An extensive review of the reports using the system of least prompts, indicated learners met criterion level performance in over 85% of the studies (Doyle et al., 1988). Furthermore, when taught using the system of least prompts children demonstrated increases in generalized responses (e.g., Doyle et al., 1990; Taylor, Collins, Schuster, & Kleinert, 2002).

The reports comparing the system of least prompts with time delay procedures suggest the system of least prompts was not as efficient (e.g., trials to criterion, number of errors, total instructional time) as time delay procedures (i.e., constant or progressive time delay; Ault, Wolery, Gast, Doyle, et al., 1988; Ault, Wolery, Doyle & Gast, 1989; Doyle et al., 1988; Godby, Gast, & Wolery, 1987; West & Billingsley, 2005). However, the system of least prompts may have more utility in producing unprompted or spontaneous play behaviors because it does not interrupt the play interaction. The system of least prompts can be effectively embedded directly into typical adult-child play or interactions, and build from the child's current play repertoire and interests. Allowing the child to direct the play interaction, and embedding prompts based on the play interaction, may provide motivation for the child to engage in new play behaviors (Bricker, 1986; Koegel et al., 1989).

Training Teachers to Implement the System of Least Prompts

Reports of procedural fidelity indicate teachers use the system of least prompts with high fidelity when applied in classrooms with young children (e.g., Ault et al., 1988;

Doyle et al., 1992; Doyle et al., 1990; Filla, et al., 1999; Fox & Hanline, 1993; Godby et al., 1987). However, only one of these reported teacher training procedures. Filla et al. individually trained teachers using a 4-page manual and a 20-35 minute training session. The manual described the prompting procedure; and during the training session, the instructor provided examples of each prompting level. Two of the 3 teachers used the prompting procedure effectively after this training. The third teacher required more training, due to low fidelity with the prompting procedures. The instructor showed the third teacher three videotapes of sessions and provided verbal feedback on correct and incorrect uses of the prompting procedures. By the eleventh session, this teacher met criterion for correct use of the system of least prompts.

Evidence for effective practices to change teacher behaviors suggested adults learn new skills with some combination of the following: (a) manuals, (b) role playing, (c) feedback, and (d) videos. Filla et al. (1999), for example, used a manual and role-playing to train three teachers to implement the system of least prompts with conversation behaviors in young children. Moore et al. (2002) and Codding, Skowron, and Pace (2005) used performance-based verbal feedback, modeling, and rehearsal to train teachers to implement functional analyses and to teach special education teachers to develop appropriate IEP objectives using curriculum based measures, respectively.

Videos have been used to train adults to implement a variety of procedures with high fidelity. For example, videos have been used to train undergraduates and teachers to conduct functional analyses (e.g., Iwata et al., 2000; Moore et al., 2002), assistant teachers to conduct preference assessments (Lavie & Sturmey, 2002), and paraprofessionals to conduct functional analyses (Moore & Fisher, 2007).

The empirical evidence indiecates changing teacher behaviors without feedback was ineffective (Joyce & Showers, 1980; Rose & Church, 1998; Wade, 1985). Feedback can be delivered verbally, or in a written or graphical format. Several studies examined the use of feedback in changing adult behaviors in classroom settings. Results from the studies examined suggest immediate, verbal and written feedback was effective in training teachers to implement instructional procedures. For instance, O'Reilly et al. (1992) demonstrated immediate feedback may be more effective than delayed feedback for pre-service teachers when the target behavior is a system of instructional procedures.

Verbal feedback can range from extensive (i.e., involving statements about implementation, error corrections, component analyses, solicitation of questions, verbatim examples, and expressions of gratitude) to minimal (i.e., praise and error correction). Extensive verbal feedback related to increased correct use of embedded instruction by preschool teachers (Schepis, Ownbey, Parsons, & Reid, 2000; Schepis, Reid, Ownbey, & Parsons, 2001) and increased treatment integrity of behavior intervention plans (Codding et al, 2005; Jones, Wickstrom, & Friman, 1997). Minimal verbal feedback (i.e., praise contingent upon correct implementation; and clarification or redirection contingent upon incorrect performance) related to correct implementation of discrete trial instructional procedures with children with autism by paraprofessional staff members (LeBlanc, Ricciardi, & Luiselli, 2005).

Written feedback has been effective for increasing the observing, planning, and monitoring of instructional tasks for students with disabilities by elementary school teachers (Maher, 1981/ 1982; Reedy, Luiselli, & Thibadeau, 2001). For instance, Reedy et al. demonstrated a computer-assisted method of written feedback related to increases in

the correct documentation of instructional activities by staff at a residential home for children with disabilities.

Research Questions

In this study, a manual, role-playing, video, and immediate written feedback were used to train teachers to identify pretense behaviors and use the system of least prompts with contingent motor imitation. Pre-session coaching and feedback were incorporated into the instructional conditions across toy sets. Addressing five major methodological limitations in the pretense literature was of particular interest. First, the teacher's use of the system of least prompts to teach pretense behaviors to children with disabilities directly in their classrooms was examined. Second, only three reports measured whether pretend play of children with disabilities maintained in sessions without adult prompting. This study examined pretend play behaviors of children in contexts without adult prompts during the instructional condition. Third, this study examined the generalization of pretense behaviors to an untrained toy set. Fourth, the investigator trained teachers using the specific behaviors in the pretense taxonomy and using these pretense behaviors to measure child outcomes. Fifth, this study examined whether the use of a manual, role-playing, video, and immediate feedback were effective in training teachers to use the system of least prompts.

Five research questions were asked in this study:

1. Will the use system of least prompts (i.e., with three levels: materials, model, controlling hand-over-hand prompt) and contingent imitation (i.e., motor

imitation to encourage the child's attention to the toys) increase the frequency and diversity of pretense behaviors in children with disabilities?

2. Will the pretense behaviors of children with disabilities generalize to measurement contexts with the same toy sets, but without prompts and with another person?
3. Will the pretense behaviors of children with disabilities maintain in measurement contexts with the same toy sets, with the same teacher but without prompts?
4. Will the pretense behaviors of children with disabilities generalize to measurement contexts without prompts, with the same person and with different toy sets?
5. Can teachers be trained to use the system of least prompts to teach functional play with pretense and objects substitution behaviors to children with disabilities?

CHAPTER II

METHODS

Participants

Child participants. Child participants were recruited from three classrooms of consented teachers within the Susan Gray School of Peabody College, Vanderbilt University. Four preschool-age children with disabilities participated in this study. The teachers recommended students from their classrooms who would benefit from a pretend play intervention. The teachers described the recommended children as demonstrating limited pretend play behaviors and infrequent engagement with the toys in the dramatic play centers (e.g., dolls and kitchen toys).

Participant descriptions are shown in Table 4. Inclusion in this study was based on the following criteria: (a) a diagnosed disability based on school report, (b) a chronological age of less than 5 years based on teacher report, (c) a minimum mental age of 18 months as determined by the *Mullen Scales of Early Learning* (Mullen, 1989), (d) history of consistent attendance in school (i.e., 80% attendance for previous month based on teacher report), (e) ability to attend to a play-based activity with an adult for 8 min based on direct observation, and (f) a score of less than 8 different unprompted play behaviors and no unprompted substitution behaviors (i.e., object substitution, imagining absent objects, and assigning absent attributes) during an adapted version of the *Structured Play Assessment* (SPA; Ungerer & Sigman, 1981).

The mental age requirement was established because children without disabilities begin engaging in functional play with pretense and object substitution at around 18 months to 2 years (e.g., Belsky & Most, 1981; Fein, 1981). In children without disabilities, pretend play behaviors have been first observed around the second year of life (Brown & Murray, 2001; Fein, 1981; Nicolich, 1977; Morelock, Brown, & Morrisey, 2003; Ogura, 1991). The play behavior criterion was based on the number of behaviors exhibited by children without disabilities in previous reports with the SPA assessment (e.g., Sigman & Ungerer, 1984; Ungerer & Sigman, 1981). The participants in the SPA study had a mean mental age of 24 mos. (16-25 mos.), and no diagnosed disability. For the present study, use of this criterion ensured pretense behavior was an appropriate target based on the child's current play repertoire (as measured by the SPA) The last two criteria (i.e., e and f) were measured during a 10-min videotaped play assessment.

Table 4

Participant Descriptions

Child	Gender	Disability	C. A.[a]	Mullen[a]
Daniel	Male	Language Delay	43	36
Anna	Female	Autism	43	23
Liz	Female	Developmental Delay	50	27
Brian	Male	Autism	30	18

[a] Reported in months.

Daniel. Daniel was a 43-month-old European American male and the fraternal twin of Anna (also a participant). Daniel demonstrated a mental age of 36 months based on the *Mullen Scales of Early Learning* (Mullen, 1995). Daniel was the highest functioning of the participants. His language was the most sophisticated and flexible. Daniel regularly used 3- to 5-word phrases to express his wants and needs, as well as to comment and narrate his play. Daniel scored 6 and 7 months below his chronological age on the expressive and receptive language domains of the *Mullen,* respectively. Daniel received services from the local school district for speech and language delays. Daniel demonstrated infrequent social interactions with peers and adults. He used a picture schedule to transition across routines during the school day. Daniel was not yet toilet trained; however, during the third instructional condition of this study, Daniel's teacher implemented a toilet training intervention with him at school and at home. Daniel's teacher recommended him for this study because he infrequently engaged with classroom toys or engaged in pretend play. The teacher described his object play as very rigid and

based one or two themes (e.g., the movies *Cars* or *Toy Story*). Daniel often brought toys from home to school and, when allowed, played exclusively with these toys (i.e., a stuffed car figure from the movie *Cars* or a Woody doll from the movie *Toy Story*). Daniel did not interact with peers while playing with these toys.

Anna. Anna was a 43-month-old European American female who had received an autism diagnosis at age 24 months. Anna demonstrated a mental age of 23 months based on the *Mullen Scales of Early Learning* (Mullen, 1995). Anna received special education, speech and language services, and occupational therapy services from the local school district. Anna had recently participated in a feeding intervention using progressive time delay to decrease her food selectivity behaviors. The edible reinforcers introduced during the first instructional condition in the present study were the non-preferred foods at the start of the feeding intervention. Anna did not initiate conversations. However, she was verbally imitative, and could repeat 3- to 4- word utterances.

During the course of the intervention, Anna's teachers began using a visual picture schedule to increase compliance and reduce time between transitions. Anna had an assistant assigned to work with her during the school day. The one-to-one assistant shadowed Anna throughout the school day and assisted her in following her picture schedule and engaging in learning tasks. Anna's assistant used positive reinforcement along with the picture schedule to help Anna follow the classroom routines. Musical toys and edibles functioned as reinforcements for Anna. Anna did not initiate interactions with peers unless prompted by an adult. Anna rarely engaged with classroom toys without adult prompting. Anna was often observed in the book or music areas of the classroom where she sat alone and flipped through books or played with musical instruments. Anna

demonstrated a precocious ability to read words from books and in the environment. Anna recognized and labeled colors, shapes, letters, and numbers. Based on parent report, Anna and her fraternal twin, Daniel rarely interacted with each other at home except to chase each other.

Liz. Liz was a 50-month-old European American female diagnosed with developmental delays. She demonstrated a mental age of 27 months based on the *Mullen Scales of Early Learning* (Mullen, 1995). Liz received services for speech and language therapy and occupational therapy from the local school district. Liz was verbal, and often used gestures, signs, and one-word utterances to request preferred items. Liz rarely used language to comment during school. However, she was observed to use 3- to 4-word phrases to comment or request during one-to-one sessions with adults. For example, during the *Mullen* protocol Liz used 3- to 4- word phrases to comment on the administrator's shoes and clothing. Liz demonstrated fine motor delays and often required hand over hand assistance in activities involving gluing, cutting, painting and coloring. Liz rarely independently engaged with the toys in the classroom. However, when prompted she could put together cloze puzzles and stack blocks. Liz rarely initiated conversations or interactions with adults or peers. The majority of Liz's social interactions were verbal or motor responses to adult behaviors.

Liz participated in a feeding program each morning during the course of the intervention in the present study. She displayed a few rigid play behaviors with the housekeeping toys, which emulated her feeding program. For example, she used a spoon to scrape the inside of a bowl and then brought the spoon up to her mouth. She rarely elaborated on this play scheme without adult prompting. Further, her unprompted

behaviors during this study often emulated the feeding program (e.g., scraping the inside of a cup with a spoon).

Brian. Brian was a 30-month-old African-American male. Brian demonstrated a mental age of 18 months based on the *Mullen Scales of Early Learning* (Mullen, 1995). He was diagnosed with autism and received services for speech and language therapy from the local early intervention provider. Brian had recently been adopted. Brian had been living with his adoptive mother since he was 10 months old. Prior to this placement, based on caregiver report, Brian was exposed to drugs and possibly neglected by his biological mother. Brian exhibited echolalia and unintelligible speech, which he used to request objects and attention from adults. He rarely initiated interactions with peers, unless he was attempting to retrieve a preferred object or toy. He often ignored peers attempts to interact with him. Brian frequently moved around the room and attended to tasks for brief durations (15 – 30 s) and demonstrated more activity than his classroom peers. Brian displayed a few play behaviors with the housekeeping toys, which replicated mealtime activities, such as feeding himself and cleaning plates. However, these play schemes were rigid and brief. Brian often used vocalizations and gestures to request adult attention or to be picked up and held.

Based on classroom observations and teacher reports, Brian typically sat in a chair at the tables for meals and snacks for 5 – 7 min before attempting to leave. Brian did not independently sit at tables for art activities. Brian spent the majority of his time during free play engaged with materials in the sensory table (e.g., shaving cream, Jell-O ^{TM}) or the carpeted area with the cars and trucks. During the present study, it was necessary for Brian to remain proximal (i.e., within 12 – 24 inches) of the teacher and the materials for

8 min per session. Based on pre-study observations, Brian was able to sit with the teacher for 8 min and met inclusion criteria. However, once this study commences it was clear this was not a fluent skill. During Probe Condition I and instruction with Toy set 1, Brian regularly attempted to escape after 2 minutes. The teacher blocked his escape attempts and by the second instructional condition Brian rarely attempted to escape. However, Brian was not required to sit for the duration of the 8 minutes. Brian was allowed to stand up as long as he remained proximal, because sitting during activities was a separate goal for Brian and outside the scope of this intervention. Brian's adoptive mother abruptly removed him from school before the study ended.

Teacher participants. Four females participated as the teachers. Each teacher was currently employed by the Susan Gray School. Inclusion criteria for the teachers were: (a) minimum of 1 year of experience in the classroom, (b) no previous instruction in pretense behaviors, and (c) study eligible children enrolled in their classroom. One teacher was assigned to a child participant in her classroom. Characteristics of the teacher participants are shown in Table 5.

Table 5

Descriptions of teacher participants

Teacher Participant	Child Participant	Age	Education	Years paid exp. w/ children	Formal Title
Darcy	Daniel	28	B. A. in speech pathology	6	Lead Teacher
Amy	Anna	27	M.A. in school psychology	3	Lead Teacher
Lucy	Liz	48	HS Diploma +2 years college	24	Co-Teacher
Beth	Brian	24	M. Ed. in Special Education	3	Co-Teacher

Children without disabilities. Four typical children were recruited based on teacher recommendation. The teachers were asked to recommend children with typical play skills. The inclusion criteria for children without disabilities was (a) no diagnosed disability and (b) teachers judgment of age-appropriate play skills. The purpose of observing the play of the children without disabilities was to estimate the typical rate of pretend play behaviors for peers (i.e., matched on mental age) with the experimental toys in a classroom. Vanessa was a 30-month-old European American female. Nathan was a 35-month-old Asian American male. Emily was a 48-month-old European American female. Alex was a 39-month-old Asian American male.

Settings

Various areas of the classroom were used to conduct the experimental sessions; these included (a) the housekeeping area, (b) the carpeted area, and (c) the book area. In each area, the following conditions occurred: (a) the initial probe sessions, (b) the instructional sessions (c) daily generalization probes across people, and (d) probe conditions. During each session, other adults and children engaged in the typical daily routines for each classroom. The generalization probes were conducted in the same areas of the classroom, with the same toys and a non-teacher adult. The initial teacher training took place in a separate room in the school, and follow-up training took place in teachers' classrooms.

Materials

Instructional toy sets. The stimuli in this study were three toy sets; these are described in Table 6. The first toy set contained materials related to familiar routines (i.e., spoons, forks, plates, dolls, bottles). The second toy set contained theme-based toys (i.e., a Little People™ doll house). The third toy set included toys often located in the sensory table (e.g., cups, large utensils, bowls, people figures, and plastic tubes). The same toys were used across each child and teacher dyad. The training toy sets were selected because they provided an opportunity for the child to engage in pretense behaviors as listed and defined in the taxonomy. In addition, the toys are typically available in early childhood classrooms, and they have been used in previous pretend play intervention studies (e.g., Lifter et al., 1993; Lifter et al., 2005; Stahmer, 1995; Thorp et al., 1995).

Generalization toy set. The generalization toy set was selected to be different from the instructional toy sets. For instance, the dolls were smaller in size and different colors, the bowls were more shallow and different colors, and the sponges were larger and square shaped, not rectangles as is the instructional toy sets. Thus, the toys were similar in function not form. These toys were appropriate for use in each setting. The same generalization toys were used across each child and teacher dyad. The generalization toys are listed in Table 6.

Table 6

Toy Sets

	Instructional Toy Sets			Generalization Toy Set	SPA toys
	Toy Set #1	Toy Set #2	Toy Set #3		
Toys	2 baby dolls	Doll house	2 people figures	2 baby dolls	2 baby dolls
	2 bottles	Dad figure	2 sponges	2 cloths	doll house
	2 sippy cups	Mom figure	4 plates	2 bowls	2 plates
	2 sponges	Baby figure	4 bowls	2 cups	2 cups
	2 plates	Cat figure	2 teaspoons	2 Sponges	2 sippy cups
	2 sheets of paper	Dog Figure	2 forks	2 large spoons	2 stacking rings
	2 bowls	2 bear figures	2 serving spoons	2 trays	1 doll bottle
	2 pieces of ribbon	doll house fence	2 spatulas	2 people figures	3 small wooden rods
	2 square blocks	2 doll house chairs	2 ladels	Animal figures	2 pieces of white paper
	2 wooden rods	doll house bed		Blocks	2 cars
	2 small lotion bottles	baby stroller			2 small telephones
		rubber bands			2 small cars
		4 toothbrushes			2 brushes
		2 sheets of card stock			2 sponges
		2 paper coin rollers			2 square blocks
		2 Tupperware container lids			2 rectangle blocks

Data collection equipment. Data were collected using a digital video recorder (Sony HardDiskDrive Model DCR-SR40). Data were analyzed using ProCoderDV (Tapp & Walden, 2000) and INTMAN software (Tapp et al., 2006). A paper form was used to provide feedback to teachers (i.e., the daily feedback form for teachers is shown in Figure 1). This form was used to review the session performance with teachers, and to record and analyze procedural fidelity.

Response Definitions and Measurement

All experimental sessions were video recorded. The PI coded the videotapes of the child pretense behaviors after each instructional session. The child behaviors were coded and analyzed with ProCoderDV software. Child dependent variables as shown in Table 7.

Pretense behaviors. An event recording system was used to measure four pretense behaviors: functional play with pretense, object substitution, imagining absent objects,

and assigning absent attributes during initial probe conditions, instructional sessions, daily generalization across people probe sessions, probe conditions, and generalization across toys probe sessions. These four behaviors were mutually exclusive and exhaustive. The definitions are shown in Tables 2, 7 and 8.

Table 7

Child Dependent Variables

Outcome measure	Definition	Metric
Prompted pretend play	Pretend play behaviors within 5 s after teacher model or physical prompt	Number per 8 min or 5 min session
Unprompted pretend play	Pretend play behaviors without a prompt in the previous 5 s	Number per 8 min or 5 min session
Same pretense behavior	A pretense behavior occurring previously within each play session	Number per 8 min or 5 min session
Different pretense behavior	A novel pretend play behavior from within each play session	Number per 8 min or 5 min session
Prompted type / token ratio	The number of different prompted behaviors divided by total number of prompted pretend play behaviors	Percentage
Unprompted type / token ratio	The number of unprompted different behaviors divided by total number of unprompted pretend play behaviors	Percentage
Length of sequences	More than one action with objects duplicating or based on the same theme or routine	Number and length of sequences per 8 min or 5 min session
Prompted vocalization	Identifying a specific role the child is acting out, assign attributes to themselves, or plan, map, or confirm pretend play behaviors with a prompt in the previous 5 sec	Number per 8 min or 5 min session
Unprompted vocalization	Identifying a specific role the child is acting out, assign attributes to themselves, or plan, map, or confirm pretend play behaviors with a prompt in the previous 5 sec	Number per 8 min or 5 min session

Table 8

Child Pretense Behaviors

Play type Subcategory	Definition
Functional play with pretense (FPP)	Non-literal use of actual or miniature objects in the manner in which they were intended without the reality-based outcome
Substitution	
Object Substitution (OS)	Use of one object as if it was a different object
Imagining Absent Objects (IAO)	Performing an action as if an object was present in the object's absence
Assigning Absent Attributes (AA)	Assigning dramatic roles or emotions to the self, others, or inanimate objects

First, each pretense behaviors were coded as prompted or unprompted. This was important for determining the number of spontaneous pretense behaviors and provided some evidence of the transfer of stimulus control. In the present study, pretense behaviors were coded as unprompted if they occurred without a prompt in the previous 5 seconds. Pretense behaviors were coded as prompted if they occurred within 5 s of a teacher prompt. However, instituting a time component does not ensure a pure measure of unprompted, generalized pretense responses. Additional sessions with no prompts (i.e., daily generalization probes across people) were included to obtain a measure of unprompted, generalized pretense responses. This code was mutually exclusive and exhaustive.

Second, each pretense behavior was coded as same or different. Behaviors were coded as different if they had not occurred previously in the session. Behaviors were coded as the same if they had occurred previously in the instructional session. From this code the total number of prompted same, unprompted same, prompted different, and unprompted different pretense behaviors were generated for each 8-min instructional, 8-min probe, and 5-min generalization session. Two type token ratios were calculated by dividing the total number of unprompted or prompted behaviors by the number of different unprompted or prompted pretense behaviors. Type tokens ratios have been used to measure pretense behaviors in group design studies, but not in single subject design studies (e.g., Kasari et al., 2006; Kim et al., 1989). The purpose calculating the number of unprompted different behaviors and the type token ratios was to examine the diversity of unprompted play behaviors (i.e., total number of unprompted pretense behaviors divided

by the total number of different unprompted play behaviors). This code was mutually exclusive and exhaustive.

Third, the pretense behaviors were coded by category (i.e., functional play with pretense, object substitution, imagining absent objects, and assigning absent attributes). The four different categories of pretense behaviors are shown in Table 8 and defined in the taxonomy in Table 2. Each 5 and 8-min session generated the total number of occurrences of functional play with pretense, object substitution, imagining absent objects, and assigning absent attributes. This code was mutually exclusive and exhaustive.

Fourth, the number and length of sequences of pretend play were measured. The sequences consisted of at least two related pretense behaviors occurring within 3 s of each other. Fifth, each child vocalization related to a pretense behavior was recorded. Vocalizations were coded as prompted if they were imitative of a teacher vocalization and occurred less than 5 s after the teacher vocalization, or unprompted if they were not imitative of a teacher vocalization or occurred more than 5 s after a teacher vocalization.

Adapted version of the SPA. Each child with a disability participated in an adapted version of the SPA as a pre- post-test. The initial scores were used as part of the inclusion criteria; the latter assessment was used as a post-test measure. The SPA has been used in several studies to provide a measure of optimal play skills (e.g., Kasari et al., 2006; Mundy, Ungerer, & Sigman, 1987; Sigman & Ungerer, 1984; Ungerer & Sigman, 1981). The SPA provides a measure of the frequency of object play types, frequency of spontaneous use of objects, and diversity of play behaviors in a structured one-to-one session with an adult. The sessions were videotaped and later coded for play types. These

scores are useful for observing and assessing the child's play repertoire and object use in a structured context. The SPA was adapted for use in this study by redefining the behaviors to include a separate definition of functional play with pretense. Thus, this adapted SPA measured seven different categories of play (rather than six). These included: simple manipulation, relational, functional, functional play with pretense, object substitution, imagining absent objects, and assigning absent attributes (see Table 9). Functional play was redefined to separate it from functional play behaviors with pretense. The last three categories were re-defined to align with the pretense taxonomy.

The SPA was conducted in a separate room in the school. The investigator presented the child with groups of related items on the floor. The objects are listed in Table 6. If the child did not play with the objects in a functionally appropriate manner, the PI delivered a verbal prompt to the child (e.g., "feed the baby with the spoon"). If the child did not comply with this verbal prompt, the investigator physically modeled the behavior. The investigator did not deliver a physical hand-over-hand prompt during the SPA. The child's spontaneous (i.e., unprompted) play with the objects, responses to the verbal cues (i.e., prompted), and responses to the models (i.e., prompted) were recorded. Each session generated a total score for the prompted (i.e., within 5 s of an adult prompt) or unprompted occurrence of each type of play (i.e., simple manipulation, relational, functional, functional with pretense, object substitution, imagining absent objects, and assigning absent attributes), and number of different play behaviors. The number of different unprompted functional play with pretense, and the number of different unprompted substitution play behaviors (i.e., object substitution, imagining absent

objects, and assigning absent attributes) were used as inclusion criteria and for pre- post-test comparisons.

Table 9

Adapted SPA Child Behaviors

Play Behavior	Definition	Example
Simple manipulation of one object	Non-functional use of an objects	Mouthing, spinning, banging
Relational manipulations of more than one object	Relating objects in a non-functional manner	Stacks blocks, bangs the car on the table
Functional play	Functional use of one object or the functional association of two or more objects without pretense	Closes doors on house, putting the cup on the plate, placing the doll in the house
Functional play with pretense*	Non-literal use of actual or miniature objects in the manner in which they were intended without the reality-based outcome	Puts the spoon up to the dolls mouth
Substitution Behaviors		
Object substitution*	Use of one object as if it was a different object	Puts the block up to the dolls mouth (as if it was a bottle)
Imagining absent objects*	Performing an action as if an object was present in the object's absence	Puts hands on doll as is changing the dolls diaper
Assign absent attributes*	Assigning dramatic roles or emotions to the self, others, or inanimate objects	Makes crying noises as if coming from the doll

*These are pretense behaviors and were used for inclusion criteria and analyzed for the pre- post-assessment

Pretend play of children without disabilities. Probe sessions (i.e., sessions with no adult prompting) were conducted with Vanessa, Nathan, Emily and Alex (i.e., the 4 children without disabilities) during the final probe condition with the three toy sets. These sessions were conducted in the same manner as the probe conditions with a non-

teacher adult. The total number of unprompted pretense behaviors, all four pretense behaviors (i.e., functional play with pretense, object substitution, imagining absent objects, and assigning absent attributes), the number of different pretense actions, and the number of unprompted vocalizations were measured for each child.

Definition and measurement of teacher behaviors. The teachers were instructed to remain engaged with the child through the instructional session using contingent motor imitation or the prompting sequence. The teacher behaviors measured in this study included the following: contingent motor imitation, correct use of model prompts, correct use of physical prompts, errors with the model prompt, and teacher errors. Two additional teacher behaviors (i.e., presentation of toys and presentation of a picture) were measured with Amy; and one additional behavior (i.e., presentation of a choice) was measured with Lucy. Teacher behaviors are described in Table 10.

Table 10

Teacher Dependent Variables

Behavior	Definition
Contingent Imitation	The teacher doing the behavior (motor or vocal) the child is doing
Correct Model	The teacher doing (verbal description and physical behavior) a pretense behavior with the appropriate toys within 12 s but not more than 20 s after a prompt or pretense behavior
Correct Physical Prompt	The teacher using hands to guide the child's hands through a pretense behavior 5 s after the model if the child does not exhibit a pretense behavior
Correct Visual	The teacher presents a picture to the child depicting a pretense behavior within 12 s but not more than 20 s after a prompt or pretense behavior
Correct Toy Presentation	The teacher places two or three toys into the child's lap within 12 s but not more than 20 s after a prompt or pretense behavior
Correct Choice	The teacher verbally and physically holds two appropriate toys in front of a child within 12 s but not more than 20 s after a prompt or pretense behavior
Errors	
Model	No model, models a non-pretense behavior, or outside of the appropriate time window
Physical Prompt	No prompt, physically prompts a non-pretense behavior, or outside of the appropriate time window
Visual	No visual, or no vocalization accompanying the visual
Presentation	No presentation, or presents only one toy
Choice	No choice, or gives a choice of only one toy
Sequence	Prompts in the wrong order
Missed opportunity	Each time more than 20 s elapses without a pretense behavior by the child and no physical model or prompt by the teacher

Contingent motor imitation was defined as the teacher's simultaneously performing the child's action with a toy. Previous studies have defined contingent imitation as vocalizations or motor imitation (e.g., Ingersoll & Shreibman, 2006). However, in this study, the teachers were instructed to contingently imitate the child's motor actions, not vocalizations. The procedures allowed the teacher to imitate the child contingently throughout the session to promote play interactions and encourage the child

to attend to the toys. Correct modeling was recorded when the teacher modeled a pretense behavior after 12 – 20 s without a pretense behavior. Correct use of the physical prompts was recorded when the teacher physically prompted 5-s after a model if the child did not engage in a pretense behavior. Visual prompts were only measured with Amy and were recorded when the teacher presented a picture to the child depicting a pretense behavior and a written description of the action within 12 s but not more than 20 s after a prompt or pretense behavior. Presentation of toys also was measured with Amy, but only with the third toy set. Presentation of toys was recorded when the teacher placed two or three appropriate toys into the child's lap within 12 s but not more than 20 s after a prompt or pretense behavior. Appropriate toys included any toy from the toy set which was depicted in a picture. This was meant to ensure the next prompt level was appropriate (i.e., the presentation of a picture). The presentation of a choice was only measured with Lucy and only measured during the first instructional condition. The presentation of a choice was recorded when the teacher verbally and physically offered a choice of two appropriate toys within 12 s but not more than 20 s after a prompt or pretense behavior. In this case, appropriate toys were defined as any toy from Toy Set 1.

Teacher errors included: (a) a physical model before or after the 12 – 20 s window, (b) physical prompts less than 5 s after the model prompt or more than 5 s after the model prompt, and (c) physical prompts delivered before the physical model. Two additional teacher errors were measured for Amy: (a) visual presentation before or after the 12 – 20 s time window or no vocalization accompanying the picture, and (b) presentation of toys before or after 12 – 20 s time window (only with the third toy set) or presents only one toy. One additional teacher error was measured for Lucy: presentation

of a choice before or after the 12 – 20 second time window or gives a choice of only one toy. The investigator recorded missed opportunities to provide prompts (i.e., each time more than 20-s passes without a prompt by the teacher or a pretense behavior by the child) on the daily feedback form for the teacher, using an event-recording system. Additionally, the total number of teacher prompts was measured, and the percentage of compliance with the system of least prompts procedure was calculated for each session.

Interobserver Agreement

A graduate assistant coded at least 20% of the videotaped sessions per toy set and condition across each child. The percentage agreement scores were calculated by dividing the smaller number by the larger number and multiplying the quotient by 100. This gross method of calculating interobserver agreement (IOA) is appropriate for event recoding systems (Tawney & Gast, 1984). INTMAN software was used to generate these numbers.

Design and Procedures

A multiple probe design across toys sets was replicated across 4 children with disabilities (Tawney & Gast, 1984). The design began with an initial probe condition where all children were measured across all three instructional toy sets. After stability was established for unprompted pretense behaviors (based on visual analysis) during the initial probe condition, the pretense instruction commenced by the teacher with the first toy set (i.e., the routine toys) in the housekeeping setting. Daily generalization sessions across persons (i.e., with the same toys) were conducted in each probe condition as well as each instructional condition, which were 5 minutes. Once the total number of

unprompted pretense behaviors demonstrated a shift for multiple sessions with the teacher, probe conditions were conducted across all three instructional toy sets. Following this probe condition, pretense instruction commenced for the second toy set (i.e., theme based toys) in the carpeted area. This process was replicated with each child with a disability. During the Probe IV, an 8 min generalization probe across toys and adults was conducted.

A multiple probe design was used because pretense behaviors may not be readily reversible. The irreversibility of pretense has been demonstrated in intervention reports using withdrawal designs (Goldstein et al., 1988; Neville & Bachor, 2002). Multiple baseline design across participants or toys was not used to reduce the need for prolonged baseline measures and avoid satiation on the toys sets.

Experimental control was established with (a) stable performance in probe conditions prior to the instructional sessions, (b) consistent change in dependent variables with the onset of the independent variable, and (c) no changes in performance of the untreated tiers. However, changes in subsequent tiers during the probe conditions were anticipated as generalized learning across toy sets. Unprompted pretense behaviors in the instructional sessions provided the primary data for decisions about condition changes. The total number of pretense behaviors in the unprompted daily generalization probes sessions was used as a secondary measure for decisions about condition changes.

Initial probe sessions. These sessions took place in the classroom at the start of the study. The investigator instructed the teachers to play with the children “as they normally would” with the toys in the toy set. The teachers modeled, physically prompted,

and verbally prompted the children to play with the toy sets. These sessions lasted 8 minutes. The child's behaviors were videotaped and later coded.

Teacher training. Teacher training took place immediately after the initial probe condition. The goals of the teacher training sessions were to teach the teachers to (a) use contingent imitation during play with the child, (b) use the system of least prompts with each instructional toy set, (c) to discriminate non-pretense behaviors from pretense behaviors, and (d) to identify examples of four different types of pretense (i.e., functional play with pretense, object substitution, imagining absent objects, and assigning absent attributes). The independent variable for the teachers had two components: (a) one didactic training session with practice and feedback, and (b) ongoing feedback during daily instructional sessions. The initial training sessions involved three of the teachers. A separate training session was conducted for the fourth teacher, after she consented to participate. Subsequently, individual training sessions were conducted for each succeeding toy set (i.e., theme based toy and mixed toy set). The procedures are delineated as follows.

Setting.

Teacher training sessions took place either in a separate room in the school or individual classrooms. Three of the teacher participants (Darci, Amy, & Beth) were trained together in a separate room in the school with the first toy set at the end of one school day. The teachers rehearsed the prompting procedures in the after-care program with non-participant children. After the first instructional condition, shorter (i.e., 20 – 30 min) review sessions were conducted individually in the teachers' respective classrooms for each teacher with each new toy set.

Materials.

The materials for training the teachers included a manual and videotapes. The 6-page manual included a description of the pretend play intervention with (a) a rationale for the procedures and for teaching pretense, (b) a description of the prompts and prompting procedures, (c) a definition and description of contingent imitation, (d) examples of teacher vocalizations to model along with pretense behaviors, and (e) examples of pretense behaviors from each of the four categories with Toy Set 1. The manual included two supplements: (a) a review of the prompting procedure and (b) examples of each of the four pretense behaviors for each toy set. A copy of the manual is in Appendix A.

The video included two components. During the first component, the investigator demonstrated contingent imitation and the prompting sequence with a child with typical development. During the second component, a typically developing child played with the respective toy sets and engaged in non-pretense behaviors and each of the four types of pretense behaviors. Each of these components lasted approximately 10 minutes.

Didactic training.

The three teachers received the manual three days prior to the initial 45-min, didactic training session with the first toy set. For the first 30 min of this training session, the teachers and the investigator discussed and reviewed the manual and watched both components of the video. Following this discussion, the teachers rehearsed the prompting procedures with non-participant children and the investigator provided verbal corrective feedback. The purpose of the didactic training was to train the teachers to (a) contingently imitate, (b) use physical modeling with verbal statements within 12-20 sec of the last

prompt or pretense behavior by the child, (c) use physical hand over hand prompting with verbal prompting within 5 sec of the model, (d) discriminate pretense from non-pretense behaviors, (f) prompt four different types of pretense behaviors, and (e) provide contingent praise for pretense behaviors.

Contingent imitation and the three levels of the prompting sequence were described (i.e., the materials, the verbal and physical model, and verbal and full physical prompting) and demonstrated during the first component of the video. Examples of all four categories of pretense were described in the manuals and demonstrated on the video. Discriminations between pretense and non-pretense behaviors were demonstrated on the videos for all three settings and training toy sets. Teachers were asked to identify the behaviors as pretense or non-pretense, and classify the four different categories of pretense. During the second component of the video, the teachers observed the typical child playing with the toy sets and practiced discriminating pretense behaviors from non-pretense behaviors. In the after care setting, the teachers had an opportunity to practice using contingent imitation, the prompting sequence in the correct order with the appropriate amount of time between prompt levels, and providing specific praise for all attempts to comply with the prompt.

Training for Toy Sets 2 and 3.

When each child participant met criterion on the first toy set (i.e., the first tier of the design), the child's teacher participated in an individual training session with the second toy set. When each child achieved criterion on the second toy set (i.e., the second tier), the teacher was trained to use the pretense prompting sequence with the third toy set. These second and third training sessions were shorter (i.e., 20 – 30 min) and were

conducted in the teachers' respective classrooms. The goals of these sessions were to review the levels of a system of least prompts, the time intervals between prompt levels, and practice discriminating pretense from non-pretense behaviors with the new toy sets. The PI reviewed the manuals and highlighted specific pretense behaviors with the new toy set. The components of these shorter training sessions included (a) a review of the manual, (b) live demonstration of the four categories of pretense with the new toy sets, and (c) a chance to practice the prompting sequence briefly with the new toy set and non-participant children. Training for the teachers did not occur for the generalization toys.

Performance feedback.

Before each session started, the PI gave the teachers a checklist with examples of the specific pretense behaviors to be modeled and physically prompted with the specific toy set (see Appendix A). The list included at least two examples of each of the four categories of behaviors. The investigator provided performance feedback after each instructional session with the daily feedback form (see Figure 1). The investigator recorded verbatim examples of correct use of the prompting sequence across each of the four categories of pretense, and the number of missed opportunities for a prompt on the daily feedback form. Additionally, the investigator verbally reviewed correct instances of the prompting sequences, examples of each of the four types of pretense, and the number of missed opportunities. The investigator provided verbal performance feedback if the teachers made errors with the prompting procedure. Thus, the intensity of this feedback decreased as the teachers became more proficient with each toy set.

Daily Feedback Form for Teachers

Observer: _____D ate: _____

Toy Set: ___ Teacher Code: _____Ch ild Code: _____

Verbatim examples of your appropriate use of the prompting sequence across each of the pretense behaviors:

Functional play with pretense	**Object substitution**	**Imagining Absent Objects**	**Assigning Absent Attributes**

Number of missed opportunities* for a prompt: _____

(When more than 20-s passed without the child displaying a pretense behavior.)

Was this form reviewed with you immediately following the pretense training session? _____ (Initial)

Figure 1. Daily feedback form for teachers.

Instructional condition for child participants. These instructional sessions lasted 8-min and were incorporated into classroom routines. During the instructional sessions, the teachers prompted four different types of pretense behaviors (i.e., functional play with pretense, object substitution, imagining absent objects, and assigning absent attributes) across each the toy set. A *system of least prompts* was used to increase the frequency and diversity of pretense behaviors. Initially, three levels of prompts were used for each participant. The *system of least prompts* is illustrated in Figure 2. This first level (independent level) constituted the presentation of the materials (i.e., the specific toy set) and the verbal statement "let's play." The teacher waited 12 – 20 s while contingently imitating and observing the child before giving a prompt. If the child did not engage in a pretense behavior, the teacher physically modeled a pretense behavior with a verbal description (e.g., "The doll is drinking juice," while putting a cup up to the doll's mouth). If within 5 s after the model the child did not imitate the physical model or engage in a different pretense behavior, the teacher used the controlling prompt, full physical hand over hand prompting, to prompt the child to engage in the pretense behavior. For Daniel, the controlling prompt was changed to placing the toy in or near his hands because he consistently resisted the teacher's touch.

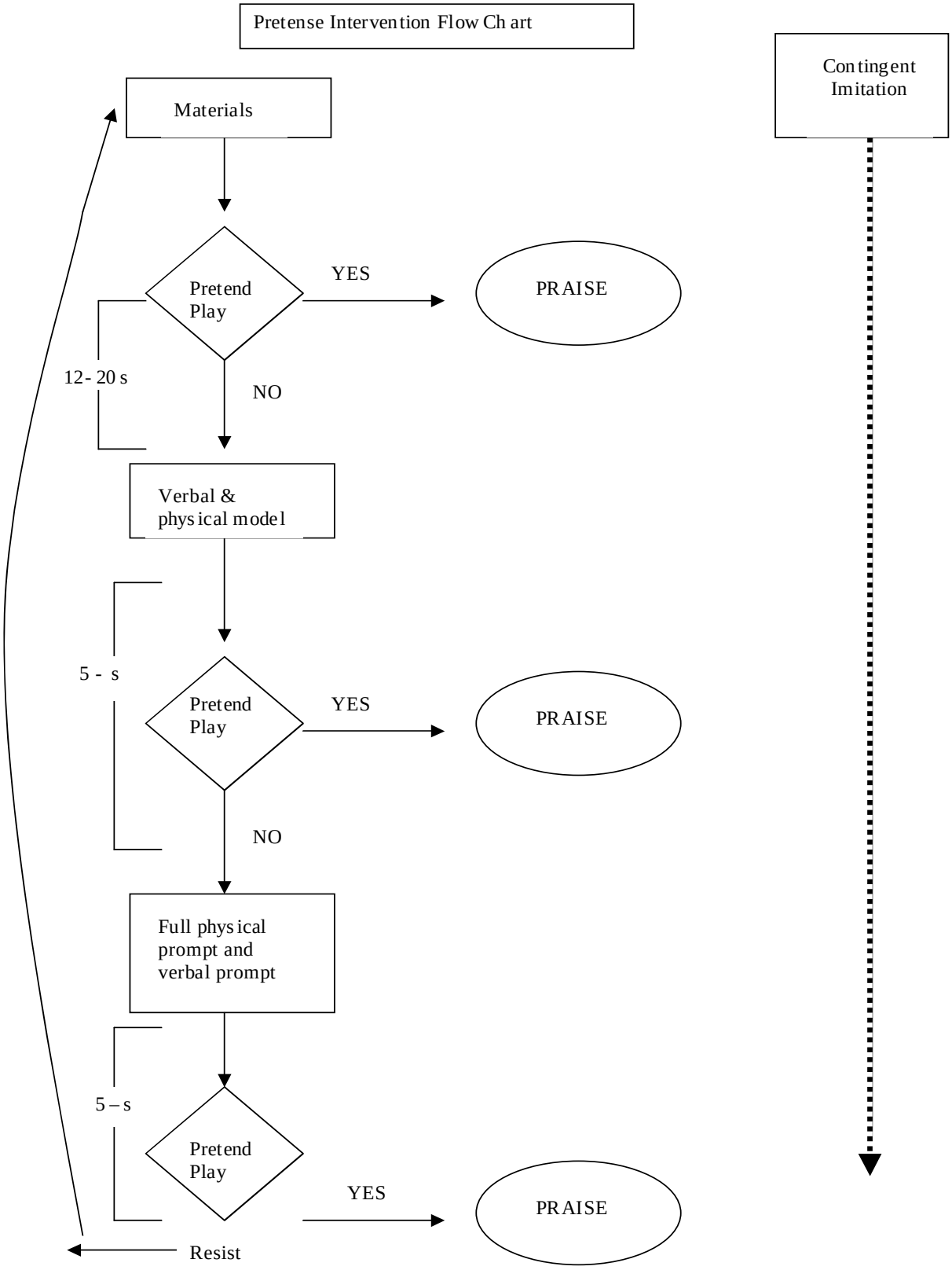


Figure 2. The prompting sequence for a system of least prompts with three levels.

The prompting sequence was based on the child's initial behaviors. For instance, if the child was holding a spoon and banging against the floor, the teacher immediately imitated child's action with the spoon, waited 12 – 20 s, picked up the doll, put the spoon to the dolls mouth, and said, "Let's feed the baby." If at any point the child engaged in an unprompted pretense behavior, the teacher provided specific praise (i.e., "Good feeding the baby, Liz"). The specific praise was not functioning as a reinforcer for Anna. The investigator conducted a preference assessment and determined edibles to be a highly preferred item, so the teacher presented a small edible to Anna after each prompted and unprompted pretense behavior.

For two participants (i.e., Anna and Liz), the investigator introduced additional levels of support before the physical model due to low rates of responding. For Anna the two additional levels were: (a) presentation of specific materials (only introduced during Toy Set 3) and (b) a picture with a written description of the pretense behavior (introduced during Toy Set 1 and included with Toy Sets 2 and 3). For Liz, a choice was included only during the first instructional condition.

If Anna did not engage in pretend play for 12 – 20 s the teacher provided a visual prompt. The visual prompt was a picture of the specific materials with the printed corresponding action words. The teacher ensured Anna attended to the picture by placing it in her hands and reading the written description. The teacher used seven different pictures with the first toy set. These included: feed the baby, which was a picture of the doll and the bottle; wash the baby, which was a picture of the doll and the sponge; give the baby a drink, which was a picture of the doll and a cup; and comb the baby's hair, which was a picture of the doll and a hair brush. The teacher also used seven different

pictures with the second and third toy sets. Pictures with the second toy set included: feed the bear, which was a picture of the bear and a toothbrush; feed the woman, which was a picture of a woman figure at a small table; the woman goes potty, which was a picture of a woman figure on the dollhouse toilet. During Toy Set 2, the visual prompts were removed beginning with session 11. Anna began spending 10 – 20 s looking at each picture presented, which impeded her attention to and engagement with the toys. The teacher began using the original prompting sequence (i.e., model prompt then physical prompt) for the remainder of instructional sessions with Toy Set 2. Pictures with the third toy set included: brush the boy's hair, which was a picture of a boy figure and a fork; wash the bowl, which was a picture of a bowl and a small sponge; give the girl a bath, with was a picture of the girl figure in a bowl. An additional level was included for the third toy set, to ensure the least intrusive prompt was delivered immediately after the independent level (i.e., presentation of the materials). For the third toy set the prompting levels were presented as follows after the presentation of the materials: (1) the teacher placed two toys from the toy set directly in the child's lap, (2) the teacher presented a picture of a pretense behaviors with the two toys, (3) the teacher physically modeled the pretense behaviors, and (4) the teacher physically prompted the pretense behaviors. The teacher stopped the prompting sequence when Anna displayed a pretense behavior and delivered the positive reinforcement (i.e., the edible item).

If Liz did not engage in pretend play for 12 – 20 s, the teacher provided a choice between two objects from the toy set. The teacher held the two objects (e.g., the spoon or the cup) in front of Liz and asked, "Do you want the spoon or the cup to feed the baby?"

For Liz, the teacher only used the additional level during the first instructional condition (i.e., with the Toy Set 1).

Unprompted daily generalization probes across adults. Child pretense behaviors were observed regularly, in a play sessions with a non-teacher adult. The sessions were conducted prior to the daily instructional session and lasted 5 minutes. For two participants (i.e., Liz and Anna) these generalization sessions were conducted intermittently (e.g., every third instructional session) to avoid toy or session satiation. During these sessions the non-teacher adult presented the same toy set that was currently being used in the instructional sessions, but did not deliver prompts or engage in contingent imitation. Contingent reinforcement, in the form of verbal praise, was delivered approximately every 20 s if the child remained in the specific area. Due to high rates of escape attempts, specific praise (e.g., "I like the way you are sitting with me") was delivered more often to Brian for staying in the area to gain control over this behavior. The purpose of these sessions was to demonstrate increases in pretense behaviors during sessions without teacher prompts with a different adult. These sessions demonstrated stimulus control transferred from the adult and adult prompts to the toy sets.

Probe conditions. Probe conditions were conducted immediately following each instructional condition with each toy set with the teachers. Each probe condition lasted a minimum of 3 sessions per toy set. The probe conditions provided a measured of the target behaviors in the absence of the independent variable (i.e., the use of the system of least prompts by teachers). The teachers were instructed to refrain from prompting any play behaviors or using the system of least prompts. Teachers provided contingent verbal

praise for remaining the area and playing with the toys. All child pretense behaviors were measured in these conditions.

Generalization across materials and adults probes. Generalization sessions were conducted during the final probe condition. Stimulus generalization was measured (i.e., the same response with similar toy sets; Sidman, 1960). The non-teacher adult conducted the probes using a generalized toy set, and did not deliver prompts. Generalized toys were selected based on their (a) appropriateness to the setting, (b) ability to elicit all four categories of pretense, and (c) likelihood the child had not played with the toys in the classroom previously. Generalization toys are listed in Table 6.

CHAPTER III

RESULTS

Procedural Fidelity

Three forms of procedural fidelity data were recorded in this study. First, a checklist was used to assess the procedural fidelity of the teacher training sessions. This checklist is shown in Table 11. The four teachers indicated the investigator conducted all 12 steps for each training session conducted. For Darci, Amy and Lucy, 3 training sessions were conducted. For Beth, only 2 training sessions were conducted, because the child she was intervening with, Brian, was withdrawn from school and could not finish the study.

Second, the procedural fidelity of the daily feedback provided to the teachers was assessed. After the PI reviewed the use of the prompting sequence and provided performance feedback with the daily feedback form (see Figure 1), the teachers were asked to initial the form. The daily feedback forms were reviewed and the teachers initialed 100% of the forms for each instructional session.

Table 11

Teacher Training Checklist

Teacher	Darci			Amy			Lucy			Beth	
Toy Set	1	2	3	1	2	3	1	2	3	1	2
Did the PI review the manual?	√	√	√	√	√	√	√	√	√	√	√
Did the PI describe each category of pretense?	√	√	√	√	√	√	√	√	√	√	√
Did the PI show video of an example of each category of pretense?	√	√	√	√	√	√	√	√	√	√	√
Did the PI review the difference between pretense and non-pretense with video?	√	√	√	√	√	√	√	√	√	√	√
Did the PI review the prompting procedures?	√	√	√	√	√	√	√	√	√	√	√
Did the PI show video of the prompting procedures?	√	√	√	√	√	√	√	√	√	√	√
Did the PI demonstrate and practice counting to 5 s after a physical model?	√	√	√	√	√	√	√	√	√	√	√
Did the PI attend to and answer your questions?	√	√	√	√	√	√	√	√	√	√	√
Did the PI review examples of sequences?	√	√	√	√	√	√	√	√	√	√	√
Did the PI review examples of vocalizations?	√	√	√	√	√	√	√	√	√	√	√
Did the PI provide an opportunity to practice the prompting with children?	√	√	√	√	√	√	√	√	√	√	√
Did the PI provide you with immediate feedback after practicing the prompting sequence?	√	√	√	√	√	√	√	√	√	√	√
Total completed (out of 12)	12	12	12	12	12	12	12	12	12	12	12

Third, the investigator coded the videos of the teacher behaviors after each instructional session. The teacher behaviors were coded and analyzed with ProCoderDV software. The teacher's dependent variables are listed in Table 10. The investigator recorded percent of correct compliance to the pretense intervention based on four criteria: (a) the prompt was given at the appropriate time (between 12 – 20 seconds from last prompt or pretense behavior), (b) the model prompt was given before physical prompting, (c) the appropriate consequence was applied after the model (i.e., praise if the child demonstrated a pretense behavior, or physical prompting after at least 12 s), and (d) no more than 20 s elapsed before the correct prompt was given. The frequency of correct compliance of the prompts, error prompts, missed opportunities and total number of prompts was graphed per session.

A graduate assistant re-coded at least 20% of these videos across teachers and conditions to provide a measure of IAO for the teacher behaviors. IOA was calculated using the gross method and averaged for each session across all teacher behaviors. IOA for Darci's procedural fidelity was 94% (81- 100%) for Toy Set 1; 100% for Toy Set 2; 100% for Toy Set 3. IOA for Amy's procedural fidelity was 88% (81 – 100%) for Toy Set 1; 100 for Toy Set 2; 100% for Toy Set 3. IOA for Lucy's procedural fidelity was 93% (86-100%) for Toy Set 1; 91% (83- 100%) for Toy Set 2; 95% (88 - 100%) for Toy Set 3. IOA for Beth's procedural fidelity was 100% for Toy Set 1; 92% (90 - 100%) for Toy Set 2.

Table 12 displays the teacher's mean percentage correct implementation with the prompting sequence and total number of prompts across toy sets. The percentage compliance score was calculated for each session by subtracting the number of errors

(i.e., sequence errors, model errors, physical prompt errors, and missed opportunities) from the total number of prompts and was divided by the total number of prompts. The scores for all sessions were averaged across toy sets to obtain the mean percentage per toy set. The mean number of prompts per toy set was calculated by averaging the total number of prompts for each session across toy set. The number and types of errors were recorded for each teacher (Table 10 describes the teacher dependent variables with the types of errors). The mean number of prompts is expected to decrease during the instructional condition. This occurred for three of the teachers (i.e., Amy, Lucy, & Beth). Table 13 displays the mean number of prompts in the first and second halves of each instructional condition.

Table 12

Mean Number of Prompts and Percentage Correct Implementation Per Session Across Toy Sets and Teacher Participants

Teacher	Toy Set #1		Toy Set #2		Toy Sets #3	
	M # of Prompts per session	Mean % Correct Compliance	M # of Prompts per session	Mean % Correct Compliance	M # of Prompts per session	Mean % Correct Compliance
Darci	15	91	6	100	7	100
Amy	17	82	9	100	10	100
Lucy	8	87	8	94	6	100
Beth	12	83	9	100		

Table 13

Mean (Range) Number of Teacher Prompts per Instructional Session for the First Half and the Second Half of the Instructional Condition for Each Toy Set

Teacher	Toy Set #1		Toy Set #2		Toy Set #3	
	M First half	M Second half	M First half	M Second half	M First half	M Second half
Darci	15 (12-18)	17 (4-21)	5 (4-7)	8 (6-9)	7 (4-11)	7 (5-9)
Amy	21 (6-31)	13 (8-20)	12 (9-15)	6 (1-9)	17 (14-19)	6 (0-13)
Lucy	8 (4-11)	9 (4-12)	10 (6-12)	7 (5-8)	8 (4-9)	6 (3-5)
Beth	13 (11-16)	11 (9-15)	10 (9-10)	8 (6-11)		

Results indicate the teachers did learn to use a system of least prompts with pretense behaviors with the use of a manual, role-playing, video, and immediate performance feedback. Darci, Amy, Beth and Lucy demonstrated adequate (i.e., 91, 82, 83, and 87%, respectively) percentages of compliance with the system of least prompts with the Toy Set 1. Darci, Amy, and Beth demonstrated 100% compliance with the Toy Set 2. Lucy demonstrated 94% compliance with Toy Set 2. Darci, Amy and Lucy demonstrated 100% compliance with the Toy Set 3. All four teachers had more model errors than the other types of errors. Darci had 15 model errors, 3 physical prompt errors, and 1 missed opportunity across the 11 instructional sessions with Toy Set 1. Darci had zero errors with Toy Sets 2 and 3. Amy had 43 model errors, 29 physical prompt errors, 7 missed opportunities, 2 sequence errors, and 2 visual prompt errors across the 28 instructional sessions with Toy Set 1. Amy had zero errors with Toy Sets 2 and 3. Lucy had 8 model errors, 2 physical prompt errors, and 4 missed opportunities across the 13 instructional sessions with Toy Set 1. She had 3 model errors with Toy Set 2 and zero errors with Toy Set 3. Beth had 12 model errors, 3 missed opportunities, 3 sequence errors, and 1 physical prompt error across the 8 instructional sessions with Toy Set 1. Beth had zero errors with Toy Set 2. Table 13 displays the mean number of prompts for the first and second halves of the each instructional condition. For all teachers, except Darci, the mean number of prompts decreased during the second half of the instructional condition.

Inter-observer Agreement

IOA data were collected for all child dependent variables and across probes and instructional conditions for four children. Two observers viewed and coded the

videotapes independently. For the sessions with the teacher, IOA was calculated for 23% (8 of 35) of the probe sessions, and 22% (6 of 27) of the instructional sessions for Daniel; 22% (8 of 36) and 22% (11 of 51) for Anna, respectively; 22% (8 of 37) and 20% (5 of 25) for Liz, respectively; and 22% (4 of 18) and 23% (3 of 13) for Brian, respectively. For the generalization sessions, IOA was calculated for 21% (7 of 33) of the probe sessions, and 21% (6 of 28) of the instructional sessions for Daniel; 21% (4 of 19) and 22% (2 of 27) for Anna, respectively; 24% (5 of 21) and 21% (4 of 19) for Liz, respectively; and 21% (4 of 19) and 20% (2 of 10) for Brian, respectively. The percentages of IOA are displayed in Tables 14 and 15. IOA was relatively high across all variables, and probe and instructional conditions.

Table 14

Mean (Range) Percentages of IOA for Sessions with Teachers

Participant Variable	Condition	
	Probe	Instructional
Daniel		
Prompted	100	95 (93-100)
Unprompted	97 (95-98)	95 (93-100)
Category	93 (85-100)	96 (95-100)
Same / Differ	96 (88-100)	97 (90-100)
Sequences	100	100
Vocals	95 (78-100)	96 (83-100)
Anna		
Prompted	96 (93-100)	94 (80-100)
Unprompted	98 (93-100)	95 (88-100)
Category	96 (90-100)	97 (93-100)
Same / Differ	91 (87-100)	97 (90-100)
Sequences	100	100
Vocals	100	100
Liz		
Prompted	87 (78-92)	88 (80-92)
Unprompted	99 (97-100)	90 (82-95)
Category	100	89 (82-100)
Same / Differ	100	88 (77-95)
Sequences	100	100
Vocals	100	100
Brian		
Prompted	89 (78-100)	97 (88-100)
Unprompted	98 (90-100)	95 (85-100)
Category	97 (88-100)	93 (88-100)
Same / Differ	100	100
Sequences	100	100
Vocals	100	100

Table 15

Mean (Range) Percentages of IOA for Generalization Across Adults Sessions

Participant Variable	Condition Probe	Instructional
Daniel		
Prompted	100	100
Unprompted	100	100
Category	100	99 (91-100)
Same / Differ	100	91 (80-95)
Sequences	100	100
Vocals	100	100
Anna		
Prompted	100	100
Unprompted	100	96 (80-100)
Category	100	100
Same / Differ	93 (89 – 99)	100
Sequences	100	100
Vocals	100	90 (82 – 98)
Liz		
Prompted	100	100
Unprompted	95 (94-100)	91 (85-100)
Category	93 (90-100)	91 (80-100)
Same / Differ	92 (89-100)	90 (80-100)
Sequences	100	100
Vocals	100	100
Brian		
Prompted	100	100
Unprompted	100	94 (80-100)
Category	100	91 (84-100)
Same / Differ	100	91 (82-100)
Sequences	100	100
Vocals	100	100

Effects on Pretense Behaviors

Unprompted pretense. The unprompted and prompted pretense behaviors for Daniel, Anna, Liz, and Brian are shown in Figures 3, 4, 5, and 6, respectively. Total unprompted pretend play included any of the four categories of pretense (i.e., functional

play with pretense, object substitution, imagining absent objects, and assigning absent attributes). As expected, unprompted pretend play increased with the introduction of the system of least prompts. Experimental control was established because unprompted pretense increased during each instructional condition, and the increases maintained during the probe conditions for the treated and not the untreated tiers.

For Daniel, Figure 3, his unprompted pretense behaviors were low (i.e., less than 3 behaviors) in each session of each toy set during Probe Condition I. He had a few prompted pretense behaviors during Probe Condition I, for each set. With the introduction of the instructional procedures for Toy Set 1, both his prompted and unprompted pretense behaviors increased. An accelerating trend is noted across the condition for unprompted pretense behaviors. With the introduction of Probe Condition II, his unprompted pretense behaviors for Toy Set 1 remained high (i.e., mean of 18.7 for the three sessions); there was a slight increase in unprompted pretense behaviors for Toy Sets 2 and 3. However, these remained below 5 behaviors. The introduction of the instructional procedures for Toy Set 2, resulted in an abrupt increase in the frequency of unprompted pretense behaviors. During Probe Condition III, unprompted pretense behaviors for Toy Set 2 remained high at about the lowest level of the instructional conditions; Toy Set 1 was lower than during Probe Condition II but higher than Probe Condition I, and Toy Set 3 remained low. With the introduction of instructional procedures for Toy Set 3, an accelerating trend in the number of unprompted pretense behaviors occurred and then leveled off at 15 per session. With the introduction of Probe Condition IV, the numbers of unprompted pretense behaviors were high across toy sets, although Toy Sets 2 and 3 were more variable than Toy Set 1. Thus, for each toy set, the frequency of unprompted pretense behaviors was low in probe conditions prior to

instruction, increased when instruction occurred, and remained at high levels across subsequent probe conditions.

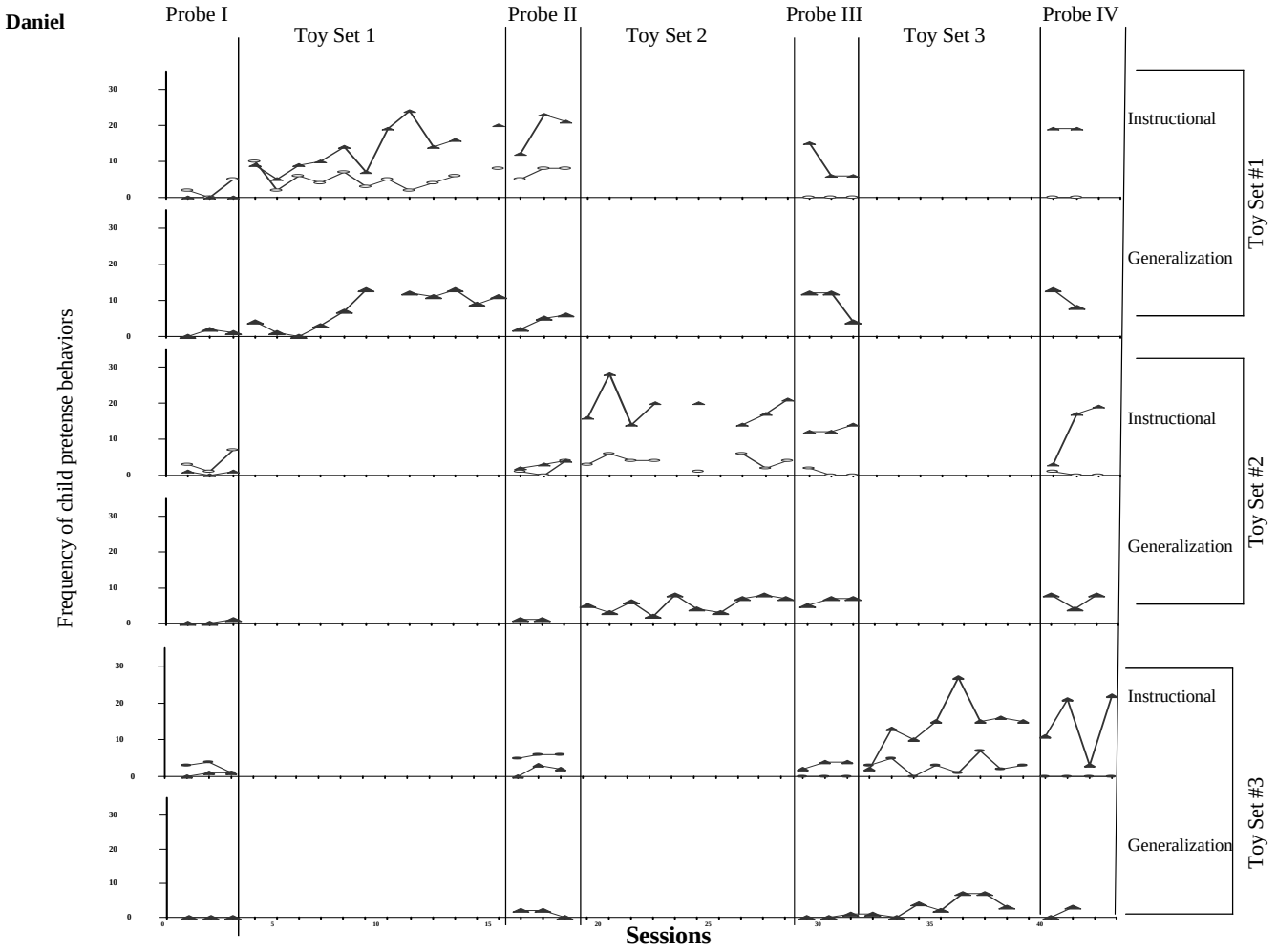


Figure 3. Frequency of pretense behaviors for Daniel.

For Anna, Figure 4, unprompted pretense behaviors were zero in each session of each toy set during Probe Condition I. She had a few prompted pretense behaviors during Probe Condition I for each toy set. With the introduction of the instructional procedures for Toy Set 1, both her prompted and unprompted pretense behaviors slightly increased. With the introduction of the visual (instructional session 14) and the edible

reinforcement (instructional session 18), prompted pretense behaviors increased and an accelerating trend is noted for unprompted pretense behaviors. With the introduction of Probe Condition II, her unprompted pretense behaviors for Toy Set 1 displayed an immediate and large increase in level (i.e., mean of 9.3 for the last three instructional sessions and a mean of 17.7 for the three probe sessions); unprompted pretense behaviors for Toy Sets 2 and 3 remained at zero. The introduction of the instructional procedures (including the visual and edible reinforcement) for Toy Set 2, resulted in an abrupt increase in the frequency of prompted pretense behaviors and a gradual increase in unprompted pretense behaviors. During Probe Condition III, unprompted pretense behaviors for Toy Set 2 remained high at a level slightly less than the last three sessions of the instructional conditions; Toy Set 1 remained at levels similar to Probe Condition II and higher than Probe Condition I, and Toy Set 3 remained at zero. With the introduction of instructional procedures for Toy Set 3 (including the presentation prompt, visual prompt, and edible reinforcement), an abrupt increase in prompted pretense and an accelerating trend in the number of unprompted pretense behaviors occurred. With the introduction of Probe Condition IV, an accelerating trend in the numbers of unprompted pretense behaviors occurred with the last point slightly higher than the last point during the instructional session, and Toy Set 1 remained at levels similar to Probe Conditions II and III, and Toy Set 2 remained at levels similar to Probe Condition III. Thus, for each toy set, the frequency of unprompted pretense behaviors was low in probe conditions prior to instruction, increased when instruction occurred, and remained at high levels across subsequent probe conditions.

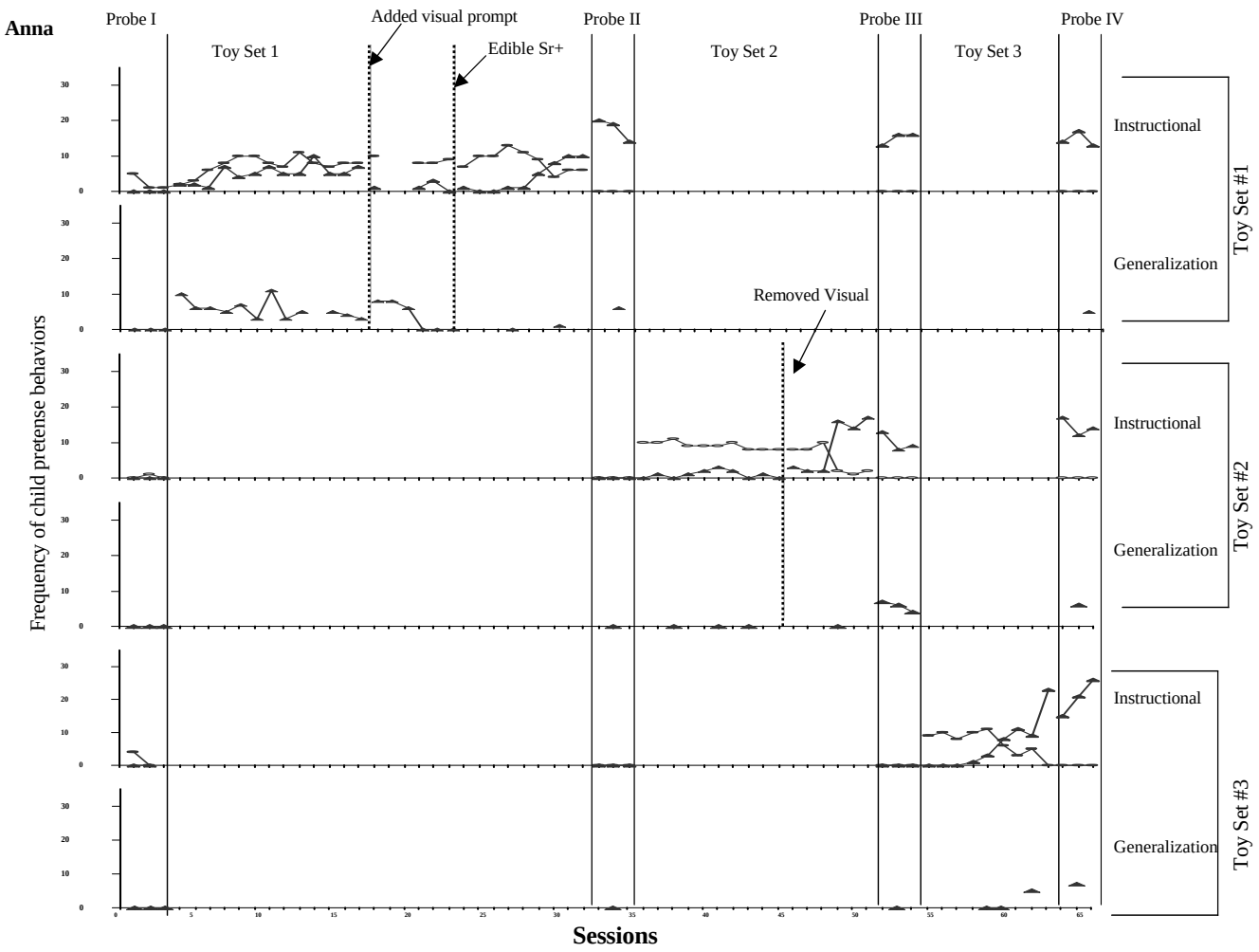


Figure 4. Frequency of pretense behaviors for Anna.

For Liz, Figure 5, her unprompted pretense behaviors were low (i.e., less than 6 behaviors) in each session of each toy set during Probe Condition I. She had a several prompted pretense behaviors during Probe Condition I, for Toy Sets 1 and 3 (i.e., between 10 and 20), and few prompted pretense behaviors for Toy Set 2 (i.e., less than 5). With the introduction of the instructional procedures for Toy Set 1, her unprompted pretense behaviors abruptly increased and eventually decreased. With the introduction of the choice, unprompted pretense increased slightly and leveled off around 13. With the

introduction of Probe Condition II, her unprompted pretense behaviors for Toy Set 1 remained high and displayed an abrupt increase (i.e., mean of 27 for the three sessions); there was no increase in unprompted pretense behaviors for Toy Sets 2 and a slight increase for Toy Set 3. These remained at zero behaviors for Toy Set 2 and below 6 behaviors for Toy Set 3. The introduction of the instructional procedures for Toy Set 2 (the choice prompt was not included), resulted in an accelerating trend in the number of unprompted pretense behaviors. During Probe Condition III, unprompted pretense behaviors for Toy Set 2 remained high, slightly below the level of the last datum point during instruction; Toy Set 1 started slightly lower than during Probe Condition II but showed a similar pattern with the last datum point at a level similar to Probe Condition II and higher than Probe Condition I. There was a slight increase for Toy Set 3. However, the number of unprompted pretense was less than 8. With the introduction of instructional procedures for Toy Set 3, an accelerating trend in the number of unprompted pretense behaviors occurred and then stabilized at a level higher than during Probe Condition III. With the introduction of Probe Condition IV, the numbers of unprompted pretense behaviors were high across toy sets, although slightly lower than during Probe Condition III for Toy Set 2. Thus, for each toy set, the frequency of unprompted pretense behaviors was low in probe conditions prior to instruction, increased when instruction occurred, and remained at high levels across subsequent probe conditions.

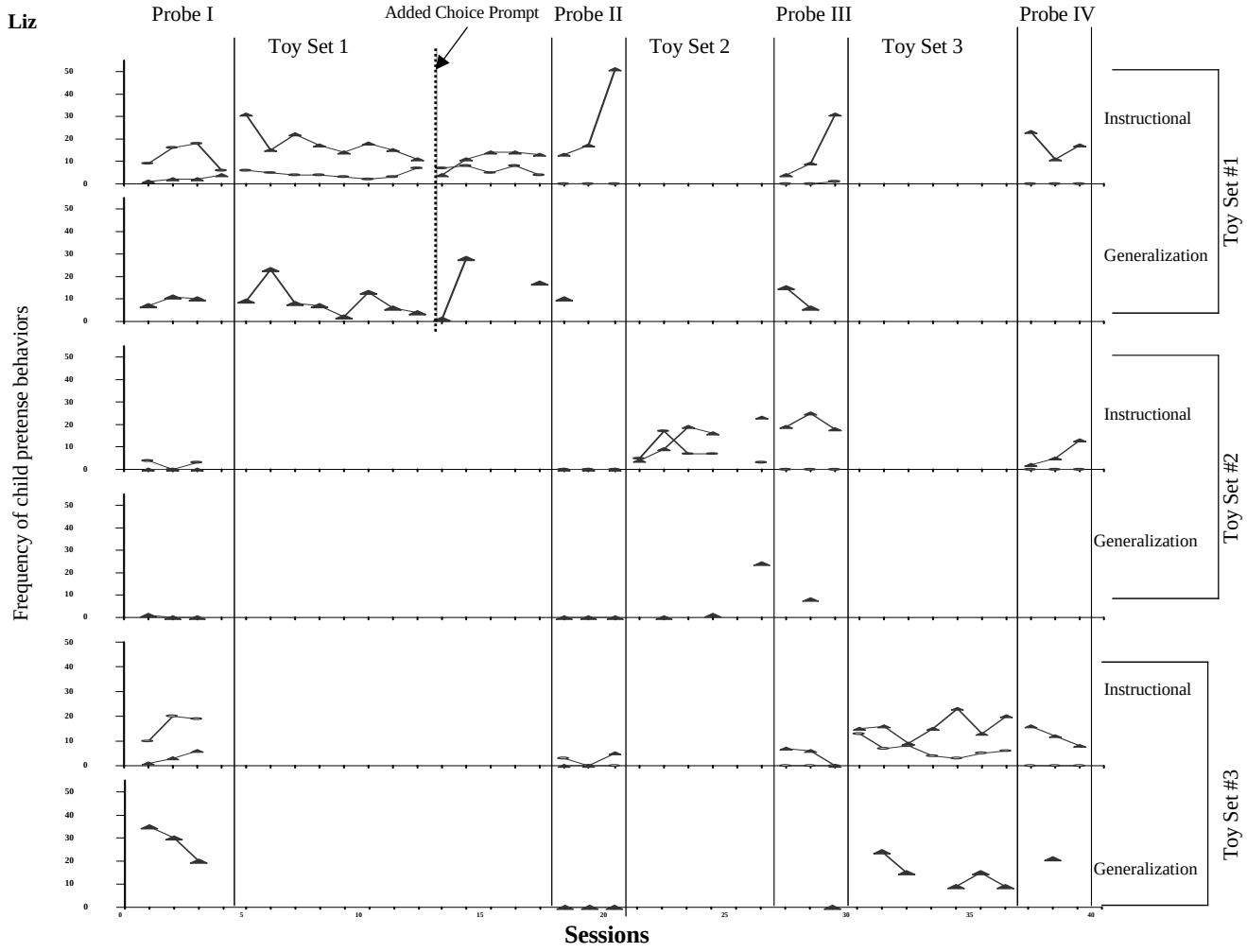


Figure 5. Frequency of pretense behaviors for Liz.

For Brian, Figure 6, his unprompted pretense behaviors were low for all toy sets in Probe Condition I. He had several prompted pretense behaviors during probe Condition I for Toy Set 1. With the introduction of instructional procedures with Toy Set 1, unprompted pretense behaviors immediately increased and prompted pretense behaviors decreased. During Probe Condition II, he had more unprompted pretense with Toy Set 1 than in Probe Condition I, but slightly lower than during instruction with Toy Set 1. Toy Sets 2 and 3 remained low during Probe Condition II. During instruction with Toy Set 2, the unprompted pretense behaviors increased to a higher level than during Probe Conditions I and II.

Brian

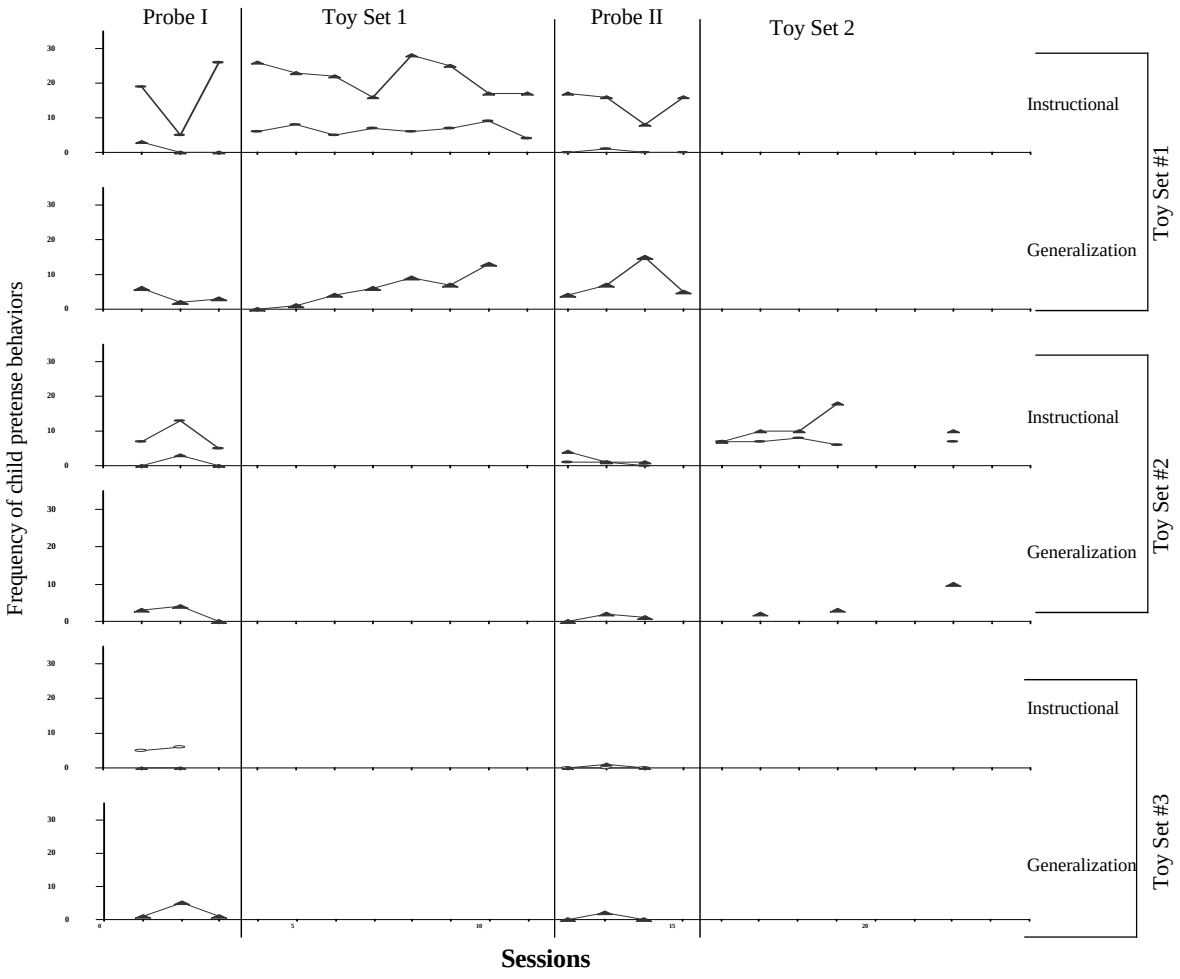


Figure 6. Frequency or pretense behaviors for Brian.

Generalization across adults. Unprompted pretense was measured in separate sessions with a non-teacher adult to provide further confirmation of the transfer of stimulus control from the teacher and the teacher prompts to the toys. For Daniel, Figure 3, his frequency of unprompted pretense behaviors in generalization across adults sessions were low for all toy sets in Probe Condition I. When Toy Set 1 was taught, the frequencies in the generalization sessions started to increase during the fourth session and remained high in subsequent sessions. During Probe Condition II, his frequencies on Toy Set 1 were above those in Probe Condition I, but slightly lower than during the days when Toy Set 1 was being taught by his teacher. Toy Sets 2 and 3 remained low during Probe Condition II. During instruction on Toy Sets 2 and 3, increases in unprompted pretense behaviors occurred in the generalization across adult sessions. In probe conditions before instruction, frequencies of unprompted pretense behaviors were low in generalization assessment sessions; in probe conditions after instruction for all toy sets, the frequencies occurred at higher levels than before instruction and maintained across subsequent probe conditions.

For Anna, Figure 4, her frequency of unprompted pretense behaviors in generalization across adult sessions was zero for all Toy Sets in Probe Condition I. When Toy Set 1 was taught, the frequencies in the generalization sessions increased immediately, decreased after the introduction of the edible reinforcer in the instruction session (the edible reinforcement was not provided in the generalization sessions). During Probe Condition II, her frequencies on Toy Set 1 were above those in Probe Condition I, but slightly lower than during the initial sessions when Toy Set 1 was being taught by her teacher. Toy Sets 2 and 3 remained at zero during Probe Condition II. During instruction on Toy Set 2, increases in unprompted pretense behaviors did not occur in the

generalization across adult sessions. However, during Probe Condition III, her frequencies on Toy Set 2 were at the same level as when Toy Set 2 was being taught by her teacher, and above those in Probe Condition I and II. During instruction with Toy Set 3, increases in unprompted pretense behaviors did not occur in the generalization across adult sessions. During Probe Condition IV, her frequency on Toy Set 3 was slightly lower than when Toy Set 3 was being taught by her teacher, and above those in Probe Condition I, II, and III. Furthermore, during Probe Condition IV, frequencies for Toy Sets 1 and 2 remained higher than Probe I, but slightly lower than when the respective toy sets were being taught by her teacher. In probe conditions before instruction, frequencies of unprompted pretense behaviors were low in generalization assessment sessions; in probe conditions after instruction for all toy sets, the frequencies occurred at higher levels than before instruction and maintained across subsequent probe conditions.

For Liz, Figure 5, her frequency of unprompted pretense behaviors in generalization across adult sessions was low for Toy Sets 1 and 2 in Probe Condition I. Her frequency of unprompted pretense behaviors in generalization across adult sessions was high for Toy Sets 3. When Toy Set 1 was taught, the frequencies in the generalization sessions was variable but remained near the levels observed during Probe Condition I. During Probe Condition II, her frequencies on Toy Set 1 did not change. Toy Sets 2 and 3 were zero during Probe Condition II. During instruction with Toy Set 2, increases in unprompted pretense behaviors did not occur until the last generalization across adult session. However, during Probe Condition III, her frequency on Toy Set 2 were slightly lower than when Toy Set 2 was being taught by her teacher, and above those in Probe Condition I and II. During instruction with Toy Set 3, increases in unprompted pretense behaviors did occur in the generalization across adult sessions.

During Probe Condition IV, her frequency on Toy Set 3 was at the same level as when Toy Set 3 was being taught by her teacher, and above those in Probe Conditions II and III. In probe conditions before instruction, frequencies of unprompted pretense behaviors were low in generalization assessment sessions for Toy Sets 1 and 2; in probe conditions after instruction for Toy Set 2, the frequencies occurred at higher levels than before instruction. In probe conditions II and III, frequencies of unprompted pretense behaviors were low in generalization assessment sessions for Toy Set 3; in probe conditions after instruction for Toy Set 3, the frequencies occurred at higher levels than before instruction.

For Brian, Figure 6, his frequency of unprompted pretense behaviors in generalization across adults sessions were low for all toy sets in Probe Condition I. When Toy Set 1 was taught, the frequencies in the generalization sessions displayed an accelerating trend. During Probe Condition II, his frequencies on Toy Set 1 were above those in Probe Condition I, but slightly lower than during the sessions when Toy Set 1 was being taught by his teacher. Toy Sets 2 and 3 remained low during Probe Condition II. During instruction with Toy Set 2, the frequencies of unprompted pretense behaviors in the generalization sessions displayed an accelerating trend in the generalization across adult sessions. Brian was removed from school before more data could be collected.

Categories of Pretense

Each of the four categories of pretense was measured (i.e., functional play with pretense, object substitution, imagining absent attributes, and assigning absent attributes). The percentages of each child's unprompted pretense behaviors by category across toy sets are shown in Table 16. For each child, the percentages of categories of unprompted

pretense behaviors were similar across instructional and generalization sessions within toy sets. Daniel displayed more unprompted object substitution than the other three categories with Toy Set 1, more assigning absent attributes with Toy Set 2, and similar percentages of object substitution, assigning absent attributes with Toy Set 3. Daniel displayed few unprompted functional play with pretense across the Toy Sets. Anna displayed more unprompted functional play with pretense than object substitution with Toy Sets 1 and 3. With Toy Set 2, Anna displayed more unprompted object substitution than functional play with pretense. Anna did not have any unprompted imagining absent objects or assigning absent attributes behaviors across all three toy sets. Liz displayed a similar pattern. She displayed more unprompted functional play with pretense than object substitution and assigning absent attributes with Toy Set 1. With Toy Set 2, Liz displayed more unprompted object substitution than assigning absent attributes, imagining absent objects and functional play with pretense. Liz displayed more functional play with pretense than object substitution, assigning absent attributes, and imagining absent objects. Brian displayed more functional play with pretense than object substitution, assigning absent attributes, and imagining absent objects with Toy Sets 1 and 2.

Table 16

Percentages of Unprompted Pretense Behaviors by Category Across Toy Sets During Instructional Conditions

	Toy Set 1				Toy Set 2				Toy Set 3			
Participant Session	FPP	OS	IAO	AAA	FPP	OS	IAO	AAA	FPP	OS	IAO	AAA
Daniel												
Instructional	1	73	20	5	4	34	3	59	8	39	23	30
Generalization	2	79	18	1	2	26	0	72	42	42	16	0
Anna												
Instructional	82	18	0	0	47	53	0	0	78	22	0	0
Generalization	89	11	0	0	0	0	0	0	80	10	0	0
Liz												
Instructional	72	16	0	12	5	55	8	32	74	17	2	7
Generalization	95	2	1	2	0	36	0	64	90	10	0	0
Brian												
Instructional	72	18	5	5	40	24	1	35				
Generalization	70	25	5	0	53	27	0	20				

Vocalizations

Although vocalizations were not specifically prompted in this study, each of the teacher prompt levels included vocalizations. For instance, when Amy modeled feeding the doll with a bottle, she said, “the doll is eating.” Unprompted vocalizations were measured in all instructional, probe, and generalization sessions. These were defined as vocalizations occurring within 3 s of a pretense behavior, and did not include imitations of the teacher’s vocalization if occurring within 5 s of the teacher vocalizations. Vocalizations for each child across toy sets during instructional and probe sessions as shown in Table 17.

For all children in all probe conditions across each toy set, no vocalizations occurred prior to instruction on the respective toy sets. For all children during each instructional condition, some vocalizations occurred; however, for all children except Daniel on Toy Sets 1 and 3, some instructional sessions had no vocalizations. Liz had fewer vocalizations than the other children during instruction and probe conditions. Vocalizations occurred for all children in all post-instruction probe conditions, except for Liz on Toys Set 2 (Probe Conditions III and IV). For all toy sets during Probe Condition IV, Daniel and Anna had vocalizations in every session. All four children had fewer vocalizations during generalization sessions than during instructional sessions, and all children had some generalization sessions with zero vocalizations.

Table 17

Mean (Range) Number of Vocalizations by Participant, Toy Set, and Condition

Participant Toy Set	Probe #1	Instructional TS#1	Probe #2	Instructional TS#2	Probe #3	Instructional TS#3	Probe #4
Daniel							
Toy set #1	0	8.1 (4-13)	6.5 (0-7)		3.3 (0-5)		13 (7-12)
Toy set #2	0		0	6.3 (0-13)	4.5 (1-8)		9.6 (3-14)
Toy set #3	0		0		0	8 (2-15)	9.5 (3-18)
Anna							
Toy set #1	0	.31 (0-6)	12.3 (10-14)		14.7 (13-16)		9 (8-10)
Toy set #2	0		0	2.4 (0-17)	9 (7-13)		9.3 (8-11)
Toy set #3	0		0		0	6.4 (0-18)	13 (6-18)
Liz							
Toy set #1	0	0 (0-1)	1.3 (0-4)		0 (0-1)		1.7 (0-3)
Toy set #2	0		0	.6 (0-4)	0		0
Toy set #3	0		0		0	1.3 (0-4)	1 (0-2)
Brian							
Toy set #1	0	2.9 (0-8)	.3 (0-3)				
Toy set #2	0		0	2.5 (0-6)			
Toy set #3	0		0				

Sequences

The number of sequences of pretense behaviors was measured as two or more related different behaviors within 3 s of each other. None of the children demonstrated sequences of behaviors during teacher sessions of Probe Condition I. Daniel displayed less than 2 sequences of 2 related behaviors during instruction on Toys Sets 1 and 3. He had less than 4 sequences of 2 or more behaviors during instruction with Toy Set 2. Anna displayed zero sequences with Toy Sets 1 and 2. She had 9 sequences of 2 related behaviors during instruction with Toy Set 3 and during Probe Condition IV. Liz displayed less than 10 sequences of two related behaviors with Toy Sets 1 and 3, and none with Toy Set 2. Brian displayed no sequences with Toy Sets 1 or 2.

Diversity of Pretense Behaviors

Different pretense behaviors. The mean number of different unprompted pretense behaviors and the type token ratios of unprompted pretense behaviors for each child during the probe condition are shown in Tables 18 and 19, for sessions with the teacher and generalization across adult, respectively. Behaviors were defined as different if they had not previously occurred in the session. The mean number of different behaviors increased in probe conditions after instruction and maintained through Probe IV across each toy set for all four children. Daniel had few to none unprompted different pretense behaviors with all three toy sets during Probe Condition I. After teaching with Toy Set 1, during Probe Condition II, his unprompted different behaviors for Toy Set 1 increased (mean of 7.3), and there was a slight increase in unprompted different pretense behaviors for Toy Sets 2 and 3. However, they remained below 3 behaviors. After teaching with Toy Set 2, during Probe Condition III, the unprompted different pretense behaviors for Toy Set 2 increased (mean of 8.3); Toy Set 1 were lower than during Probe Condition II but higher than Probe Condition I, and Toy Set 3 remained low. After teaching with Toy Set 3, during Probe Condition IV, his unprompted different behaviors for Toy Set 3 increased (mean of 5.0); and increased for Toy Sets 1 and 2 (means of 8.0 and 10.3, respectively). Thus, for each toy set, the frequency of unprompted different pretense behaviors was low in probe conditions before instruction, and increased across each subsequent probe condition.

Anna had no unprompted different pretense behaviors with all three toy sets during Probe Condition I. After teaching with Toy Set 1, during Probe Condition II, her unprompted different behaviors for Toy Set 1 increased (mean of 6.67), and unprompted different pretense behaviors remained at zero with Toy Sets 2 and 3. After teaching with

Toy Set 2, during Probe Condition III, her unprompted different pretense behaviors for Toy Set 2 increased (mean of 6), unprompted different pretense behaviors for Toy Set 1 increased (mean of 7.7) , and Toy Set 3 remained at zero. After teaching with Toy Set 3, during Probe Condition IV, her unprompted different behaviors for Toy Set 3 increased (mean of 11); and remained the same for Toy Sets 1 and 2 (means of 7.0 and 6, respectively). Thus, for each toy set, the frequency of unprompted different pretense behaviors was low in probe conditions before instruction, and increased across each subsequent probe condition.

Liz had few to none unprompted different pretense behaviors with all three toy sets during Probe Condition I. After teaching with Toy Set 1, during Probe Condition II, her unprompted different behaviors for Toy Set 1 increased (mean of 7.0), and unprompted different pretense behaviors for Toy Sets 2 and 3 remained low. After teaching with Toy Set 2, during Probe Condition III, the unprompted different pretense behaviors for Toy Set 2 increased (mean of 8.67); Toy Set 1 were lower than during Probe Condition II but higher than Probe Condition I, and Toy Set 3 increased slightly. After teaching with Toy Set 3, during Probe Condition IV, Liz's unprompted different behaviors for Toy Set 3 increased (mean of 5.67); increased for Toy Sets 1 (mean of 10.0); and decreased for Toy Set 2 (mean of 3.0), but remained above Probe Conditions I and II. Thus, for each toy set, the frequency of unprompted different pretense behaviors was low in probe conditions before instruction, and increased across each subsequent probe condition.

Brian had few unprompted different pretense behaviors with Toy Set 1 and none with Toy Sets 2 and 3 during Probe Condition I. After teaching with Toy Set 1, during Probe Condition II, his unprompted different behaviors for Toy Set 1 increased (mean of

7.67), and unprompted different pretense behaviors remained low with Toy Sets 2 and 3. Thus, for Toy Set 1, the frequency of unprompted pretense different pretense behaviors was low the probe conditions before instruction, and increased after instruction.

Type token ratios. The types token ratios per condition can be found in Table 18 for the instructional probe sessions, and Table 19 for the generalization probe sessions. Type token ratios were calculated by diving the total number of unprompted pretense behaviors by the number of different unprompted pretense behaviors for each session. Type token ratios provide the proportion of pretense behaviors, which were different. Across all children, the type token ratios for unprompted different pretense behaviors was low in probe conditions before instruction, and remained the same or increased across each subsequent probe condition. The children displayed the same or higher proportion of unprompted different behaviors after instruction with the toys sets, and this maintained during each subsequent probe condition as the total number of unprompted behaviors increased (which is described above). This indicates the children were not repeating the same pretense behaviors during each session. The increases in unprompted pretense behaviors represent increases in different behaviors, rather than increases in the number of times the children produced the same behavior.

Table 18

Mean (Range) Number of Different Unprompted Pretense Behaviors and Type Token Ratio by Probe Condition Across Toy Sets

Participant	Probe Condition 1		Probe Condition 2		Probe Condition 3		Probe Condition 4	
Toy Set	# Different	Type/Token	# Different	Type/Token	# Different	Type/Token	# Different	Type/Token
Daniel								
Toy set #1	0	0	7.3 (6-9)	.45 (.30-.75)	4.3(4-5)	.43 (.05-.92)	8.0 (7-9)	.47 (.37 - .56)
Toy set #2	.67 (0-1)	1.00 (0-1)	2.0	.72 (.05 –1)	8.3 6-11)	.75 (.57-.95)	10.3 (3-18)	.87 (.59-1)
Toy set #3	.33 (0-1)	.50 (0-1)	.67 (0-1)	.27 (0-.5)	2.6 (1-4)	.5 (0-1)	5.0 (1-9)	.37 (.33-.41)
Anna								
Toy set #1	0	0	6.67 (5-14)	.39 (.25-.5)	7.67 (6-9)	..52 (.38-.62)	7 (6-9)	.47 (.43-.53)
Toy set #2	0	0	0	0	6	.62 (.46-.75)	6	.43 (.35-.5)
Toy set #3	0	0	0	0	0	0	11 (5-12)	.37 (.33-.46)
Liz								
Toy set #1	1 (0-2)	.33 (0-.50)	7 (5-10)	.35 (.12-.59)	5.67 (4-8)	.68 (.16-1)	10(6-13)	.59(.55-.65)
Toy set #2	0	0	0	0	8.67 (6-11)	.44 (.24-.61)	3 (2-4)	.67 (.23-1)
Toy set #3	1.33 (1-2)	.61 (.17-1)	1 (0-3)	.2 (0-.6)	1.67 (0-5)	.25 (0-.43)	5.67 (5-7)	.51 (.31-.63)
Brian								
Toy set #1	.33(0-1)	.11(0-.33)	7.67 (4-11)	.56 (.5-.69)				
Toy set #2	0	0	1	.75 (.25-1)				
Toy set #3	0	0	0	0				

Table 19

Type Token Ratios Across Participants During the Generalization Probe Conditions

Participant	Probe Condition 1		Probe Condition 2		Probe Condition 3		Probe Condition 4	
Toy Set	# Different	Type/Token	# Different	Type/Token	# Different	Type/ Token	# Different	Type/Token
Daniel								
Toy set #1	.66 (0-1)	.25 (0-.5)	3.33 (2-5)	.87 (.6-1)	3.67 (2-6)	.42 (.25-.5)	1.5 (1-2)	.17 (.08-.25)
Toy set #2	0	0	1	1	4	.68(.57-.80)	4.3 (2-7)	.63 (.5-.88)
Toy set #3	0	0	1.5 (1-2)	.75 (.5-1)	.33 (0-1)	.33 (0-1)	1 (0-2)	.34 (0-.67)
Anna								
Toy set #1	0	0	4	.67				
Toy set #2	0	0	0	0	3.33	.64 (.43-1)	6	1
Toy set #3	0	0	0	0	0	0	5	.71
Liz								
Toy set #1	4 (2-6)	.26 (.20-.30)	4 (3-5)	.35 (.19-.50)	5(4-5)	.55 (.27-.83)		
Toy set #2	1.67 (1-3)	.36 (.33-.43)	0	0	6	.43		
Toy set #3	2.7 (1-4)	.09 (.05 -.13)	0	0	0	0	7	.35
Brian								
Toy set #1	3 (2-4)	.89 (.67-1)	4.33 (3-7)	.55 (.43-.75)				
Toy set #2	1.67 (0-3)	.47 (0-.75)	.67 (0-1)	.5 (0-1)				
Toy set #3	1.67 (0-4)	.6 (0-1)	.33 (0-1)	.33 (0-1)				

Generalization Across Toys

For Daniel, Anna, and Liz, generalization across toys and adults was assessed in an 8 min session with a non-teacher adult during the final probe condition. The toys are listed in Table 6. None of the toys in this generalization were used during the instructional conditions or SPA assessments. However, the toys were similar in form and function to the toy in the instructional toy sets. The numbers of pretense behaviors shown in Table 20. Daniel and Liz demonstrated relatively high levels of unprompted pretense behaviors during these sessions. Daniel demonstrated more object substitution, which corresponds to the results from the instructional conditions. Liz demonstrated more functional play with pretense, which also corresponds to the results from the instructional conditions. Both Daniel and Liz demonstrated higher numbers of unprompted different behaviors and type token ratios than during most of the probe conditions. This indicates Daniel and Liz acquired a diversity of pretense behaviors and generalized the behaviors to different toy sets and adults. Anna demonstrated few unprompted pretense behaviors with the generalized toy set.

Table 20

Number of Pretense Behaviors from Generalization Across Toys and Adults Sessions

Variable	Daniel	Anna	Liz
Unprompted	32	3	31
Prompted	0	0	0
FPP	2	2	26
OS	11	1	4
IOA	2	0	1
AAA	17	0	0
Type Token	.56 (18)	.67 (2)	.45 (14)
Vocalizations	24	0	1

Post SPA

The pre and post SPA scores are shown in Table 21; the toys used in this session are shown in Table 6, and the definitions of the behaviors are listed in Table 9. For the pre-test, Daniel had two functional play with pretense behaviors and no substitution behaviors. None of the other children displayed either type of behaviors at the pre-test. Brian did not participate in the post-test SPA because he was withdrawn from school. Daniel, Anna and Liz showed increased in the number of behaviors in each category at post-test. Daniel showed more substitution behaviors than functional play with pretense. Anna had more functional play with pretense than substitution behaviors. Liz had higher levels of functional play with pretense than substitution behaviors, but had high levels of both types.

Table 21

Pre and Post Test Scores from the Adapted Version of the SPA

	SPA pre Unprompted Different Functional Play with Pretense	SPA pre Unprompted Different Substitution Behaviors	SPA post Unprompted Different Functional Play with Pretense	SPA post Unprompted Different Substitution Behaviors
Daniel	2	0	3	18
Anna	0	0	15	2
Liz	0	0	16	12
Brian	0	0	0	0

Comparisons to Children Without Disabilities

The results from the probes with the typical children from the same school as the participants with disabilities are displayed in Table 22. These children were coded using the same variables as the children with disabilities, which are listed in Tables 7 and 8. Vanessa, Nathan, and Emily demonstrated similar numbers of pretense behaviors across each toy set. These three children with typical development demonstrated the highest number of unprompted pretense behaviors with Toy Set 1 and most of the behaviors were functional play with pretense behaviors. Alex displayed no pretense behaviors with Toy Set 1. Vanessa and Nathan demonstrated low type token ratios (i.e., .15 for Vanessa, and .24 for Nathan) with Toy Set 1. This indicates the children repeated the same behaviors more than displaying novel pretense behaviors, and the repeated behaviors accounted for most of the pretense during the session. The children with disabilities demonstrated slightly fewer unprompted pretense behaviors, on average, than 2 of the 4 children with typical development (i.e., Vanessa and Nathan). However, the children with disabilities demonstrated higher type token ratios. This indicates, although Vanessa and Nathan demonstrated more pretense behaviors, the children with disabilities acquired more different behaviors during instruction; thus displaying more diversity in their pretend play. Furthermore, the children with disabilities demonstrated more different categories of pretense with Toy Set 1. Vanessa demonstrated 24 functional play with pretense behaviors and none from either of the other three categories; Nathan demonstrated 21 functional play with pretense behaviors (most were the same behaviors), 3 imagining absent objects, and 1 assigning absent attributes; and Emily demonstrated 5 functional play with pretense behaviors and 1 object substitution behaviors, and zero assigning absent attributes or imaging absent objects.

With Toy Set 2, Vanessa, Nathan, Emily, and Alex demonstrated relatively low levels of unprompted pretense behaviors (i.e., 4 for Vanessa, 3 for Nathan, 3 for Emily, and 9 for Alex), and most (i.e., 2 of 4 for Vanessa, 3 of 3 for Nathan, 2 of 3 for Emily, and 6 of 9 for Alex) were assigning absent attributes. The children with disabilities demonstrated more assigning absent attributes with Toy Set 2 than the other toy sets. However, the children with disabilities acquired more pretense behaviors with Toy Set 2. The children with disabilities demonstrated higher type token ratios than the children with typical development; thus demonstrated more diversity in their pretend play. The children with disabilities produced more vocalizations with Toy Set 2 than the children with typical development. Vanessa, Nathan, and Emily demonstrated zero pretense behaviors with Toy Set 3. Anecdotally, these typical children sorted, labeled, and stacked with Toy Set 3. Alex displayed 2 of the same functional play with pretense behaviors, and zero vocalizations related to these pretense behaviors. Conversely, the children with disabilities who were trained with Toy Set 3 (i.e., Daniel, Anna and Liz) acquired numerous pretense behaviors with Toy Set 3. Furthermore, these children produced the highest levels of vocalizations with Toy Set 3.

Table 22

Numbers of Pretense Behaviors for Children Without Disabilities from Sessions with a Non-teacher Adult

	Vanessa			Nathan			Emily			Alex		
	Toy Set 1	Toy Set 2	Toy Set 3	Toy Set 1	Toy Set 2	Toy Set 3	Toy Set 1	Toy Set 2	Toy Set 3	Toy Set 1	Toy Set 2	Toy Set 3
Unprompted	27	4	0	25	3	0	6	3	0	0	0	2
Prompted	0	0	0	0	0	0	0	0	0	0	9	0
FPP	27	1	0	21	0	0	5	3	0	0	0	2
OS	0	1	0	0	0	0	1	0	0	0	3	0
IOA	0	0	0	3	0	0	0	0	0	0	0	0
AAA	0	2	0	1	3	0	0	0	0	0	6	0
Diversity*	.15 (4)	1.0 (4)	0	.24 (6)	1.00	0	.60 (3)	.67 (2)	0	0	.67 (6)	.50 (1)
Vocalizations	0	4	0	9	2	0	2	0	0	0	6	0

* Diversity represents the type token ratio, with the number of different unprompted behaviors in parentheses.

CHAPTER IV

DISCUSSION

This study was designed to train teachers to use contingent imitation and the system of least prompts to teach pretense behaviors to young children with disabilities. The effects of the training were measured on teachers' use of the procedures and the number and diversity of pretense behaviors displayed by children. After correct implementation of the system of least prompts, the number and diversity of pretense behaviors increased across all four participants and across three different toy sets for 3 of the participants. Furthermore, pretense behaviors generally maintained during the probe conditions when prompts where removed, and generalized for 3 of the children to sessions with no prompts and a non-teacher adult and to sessions with a non-teacher adult and different toys. Numerous findings are apparent and are discussed below.

Systematic Prompting of Pretense

During the initial probe and each untreated probe condition, the children with disabilities demonstrated few instances of unprompted pretense behaviors and little diversity in their play. After the implementation of contingent imitation and a system of least prompts and contingent imitation, all four children demonstrated increased levels of unprompted pretense behaviors across the toy sets. Also, the children displayed more diversity in their pretense behaviors. This study systematically replicated others in which children with disabilities have been taught to use pretense behaviors with adult prompting (e.g., DiCarlo & Reid, 2004; Lifter et al., 1993; Lifter et al., 2005). These studies support

the use of systematic prompting for facilitating learning of play skills in children with disabilities, which is often considered natural to children with typical development (Lifter et al., 2005). These studies affirm the need for systematic instruction in early childhood special education (Wolery, 2000), and direct teaching of play behaviors within a child-directed context (Fox & Hanline, 1993), because children in the current study did not engage in frequent pretense behaviors (i.e., on untreated toy sets) until systematic instruction occurred.

For instance, DiCarlo and Reid found three children with disabilities in their study acquired rates of unprompted pretense (i.e., 0.6, 1.0, and .1 per minute across the three participants with 18. 13, and 17 training sessions, respectively) with the introduction of a responsive teaching program following a least to most prompting hierarchy. In the current study, Daniel averaged 1.7 unprompted pretense behaviors per minute with Toy Set 1, 2.3 with Toy Set 2, and 1.8 with Toy Set 3. Anna averaged .5 unprompted pretense behaviors per minute with Toy Set 1, .5 with Toy Set 2, and .8 with Toy Set 3. Anna displayed a delayed treatment effect so the mean takes into account several sessions at the start of the each with Toy Set with zero unprompted pretense behaviors. Liz averaged 1.9 unprompted pretense behaviors per minute with Toy Set 1, 1.8 with Toy Set 2, and 2.0 with Toy Set 3. Brian averaged 2.7 unprompted pretense behaviors per minute with Toy Set 1, and 1.4 with Toy Set 2 (during which he was abruptly removed from school). The higher rates of pretense in the current study may be due to the operationalized definitions of pretend play. DiCarlo and Reid defined pretend play with some ambiguity; thus, it is difficult to compare with the current study. However it is likely the younger developmental ages of their participants (i.e., with chronological ages of between 26 and 30 mos. and mental ages of between 16 and 22 mos.) is related to the lower rates pretend

play. Both Lifter et al. (2005) and Lifter et al. (1993) support considering the developmental age rather than the chronological age when teaching play behaviors to children with disabilities.

Participants demonstrated all four categories of pretense behaviors (as described by the pretense taxonomy in Table 2). However, Anna, Liz, and Brian displayed more functional play with pretense behaviors than the three substitution pretense behaviors. Furthermore, the children with typical development primarily displayed functional play with pretense behaviors. Conversely, Daniel had higher percentages of object substitution, assigning attributes and imagining absent objects; however, he was the highest functioning of the four participants. These findings support and extend previous research. For instance, Lifter et al. (1993) and Lifter et al. (2005) targeted developmentally appropriate play behaviors for young children with autism and PDD, respectively, and the target behaviors were functional play with pretense behaviors. Kasari et al. (2006) found children with autism in a play intervention demonstrated a significantly greater increase in different unprompted symbolic play behaviors (i.e., which fit into object substitution, imagining absent objects, assigning attributes categories). However, after treatment the overall play level of the group was at functional play with pretense. This suggests a sequence effect for teaching pretense behaviors. It may be important to teach functional play with pretense behaviors prior to teaching object substitution behaviors. Future research should examine if there is an optimal sequence for teaching pretense behaviors (i.e., should we teach functional play with pretense behaviors prior to substitution behaviors or vice versa).

The use of a modified system of least prompts produced increases in vocalizations across all participants, although vocalizations were not specifically prompted (see Table

17). This finding supports the use of pretend play as a context for embedding evidence-based practices across domains (Pretti-Frontczak & Bricker, 2004), and suggests the system of least prompts can be used to teach more than one behavior simultaneously when appropriate. The use of system of least prompts is related to increases in children's conversations (Filla et al., 1999). However, this study extends the literature to pretend play, because although vocalizations were measured in numerous pretense studies (see Table 1), vocalizations were not measured separately in the previous intervention studies. This study supports and extends these findings because vocalizations were not specifically prompted; the teachers paired vocalizations with each level of the prompt (i.e., the teacher provided a vocalization along with a model), but did not map or extend the child's language during play.

Measuring the Generalization and Maintenance of Pretense

The pretense behaviors of children with disabilities generalized to measurement contexts with the same toy sets, but without prompts and with a non-teacher adult. These generalization sessions were conducted during all conditions immediately prior to the instructional and probe sessions with the teacher. Sessions were conducted intermittently for Anna and Liz to avoid toy satiation. All participants demonstrated increases in pretense behaviors in this generalization context after the implementation of the intervention. Daniel displayed less than 3 pretense behaviors during the initial generalization probe and all untreated generalization probe conditions. Anna displayed zero pretense behaviors during the initial generalization probe and all untreated generalization probe conditions. Liz and Brian displayed some variability during the initial generalization probes and low levels during the subsequent untreated

generalization probes. After implementation of the intervention, Daniel, Anna, and Brian displayed higher than baseline levels across all Toy Sets. Daniel displayed an initial accelerating trend in generalization sessions during instruction with Toy Set 1 and increases in level for generalization sessions during instruction with Toy Sets 2 and 3, which maintained during generalization Probe Conditions III and IV. Anna, displayed slight increases in level or no change in generalization sessions during instructional conditions, but displayed clear increases in level during the generalization sessions during the Probe Condition II for Toy Set 1, Probe Condition III for Toy Set 2, and Probe Condition IV for Toy Set 3. Liz displayed no change during generalization sessions during instruction for Toy Set 1. During instruction with Toy Sets 2 and 3, Liz displayed increases in generalization sessions during instruction on Toy Sets 2 and 3 from during Probe Conditions III and IV. Brian displayed an initial accelerating trend in generalization sessions during instruction with Toy Sets 1 and 2, which maintained during the Probe Condition II for Toy Set 1. This clearly indicates a transfer of stimulus control to the materials within each toy set, because the children generalized to contexts with a different adult and no history of prompts.

One purpose of this study was to extend the literature on pretend play by measuring pretense behaviors in contexts without prompts. Thus all prompts were removed during Probe Conditions II, III, and IV and pretense behaviors were measured. All four children demonstrated maintenance in probe conditions with previous toy sets. This indicates the children continued to perform pretense behaviors with the materials in Toy Set 1, after instructional conditions for both Toy Sets 2 and 3. For instance, during Probe Condition IV Anna demonstrated an accelerating trend in pretense behaviors for Toy Set 3. However, she also displayed increases and maintenance in pretense behaviors

for Toy Sets 1 and 2, respectively. She demonstrated an increase in level of unprompted pretense behaviors for Toy Set 1, and maintained the instructional level for Toy Set 2.

Daniel and Liz demonstrated maintenance during the probe conditions with some variability. Although Daniel easily transitioned to the play sessions, towards the end of the study often, events or peers in the classroom distract him. Likewise, Liz displayed some variability during probes. This is most likely explained by satiation to the toy sets or play sessions. She often stopped attending to the toys during the probe sessions and tried to initiate unrelated conversations about her dad, sister, or shoes. For Liz, the number of generalization sessions across adults was reduced to avoid toy satiation.

The current study extends the pretend play literature, because unprompted pretense behaviors maintained during probe conditions where the prompts were removed. Only 3 of 16 intervention reports with children who have disabilities report data from a measurement context with no prompts (i.e., Kasari et al., 2006; MacDonald et al., 2005; Sherratt, 2002) and these studies had methodological limitations. In this study, participants maintained higher than baseline levels of unprompted pretense behaviors when prompts were removed. Furthermore, system of least prompts has been shown to be effective for a wide range of behaviors and with learners representing a variety of characteristics (Doyle et al., 1988). This study extends the literature by applying the system of least prompts in a play context. Further, studies (i.e., DiCarlo & Reid, 2004; Filla et al., 1999; Fox & Hanline, 1993) used the system of least prompts in preschool settings to teach pretend play, conversation skills, and object manipulation, respectively. This study supports and extends those studies by training preschool teachers to apply the system of least prompts to new skills (i.e., specific pretense behaviors) in their preschool classrooms.

The pretense behaviors of children with disabilities generalized to measurement contexts without prompts, with a different adult, and with different toy sets. Daniel and Liz displayed high levels of unprompted pretense behaviors with different toy sets and a non-teacher adult; and Anna displayed some, but not high levels. Furthermore, no prompts were used in these sessions. This indicates the children generalized pretense behaviors to untrained toys, similar in form and function to the trained toys. This has potential implications for practice because it suggests the children will engage with untrained toys, from the same response class, in classrooms without adult prompting. Several pretend play studies have examined generalization across toys. However, none measured in play contexts without adult prompting (e.g., Lifter et al., 1993; Stahmer, 1995; Thorp et al., 1995). This finding extends the research by measuring generalization across materials in contexts with no prompts and suggests pretense may generalize to naturally occurring stimuli (i.e., classroom materials). Furthermore, several studies have used the system of least prompts to transfer stimulus control to naturally occurring stimuli. The skills included sight word recognition or domestic skill instruction (e.g., Sandknop, Schuster, Wolery, & Cross, 1992; Taylor, Collins, Schuster, & Kleinert, 2002; Wolery Ault, Gast, Doyle, & Griffen, 1990). This study extends and supports the literature by using the system of least prompts in a preschool classroom to target pretense behaviors.

Teacher Implementation

The teachers learned to implement the system of least prompts to teach pretense behaviors to children with disabilities. The rates of correct implementation (see Table 12) are high for Toy Set 1, perfect for 3 of the 4 teachers for Toy Set 2, and perfect for all 3

of the teachers (Beth did not use Toy Set 3) for Toy Set 3. Further, the high rates for compliance also indicate the teachers were able to discriminate pretense from non-pretense behaviors. Previous research indicates teachers can learn to apply prompting procedures systematically when trained using video, role-playing, coaching and feedback (e.g., Filla et al., 1999). This study supports these previous studies.

However, one major limitation of this study was the intensive feedback required to ensure the teachers implemented the procedures with high fidelity. The investigator provided live verbal prompts to two of the teachers during several instructional session (i.e., reminding the teacher to deliver a prompt). Further, the teachers did not contingently imitate the children at equal rates across the sessions. When the teachers did contingently imitate, they often forgot to count the response interval (12 – 20 s) to wait before delivering the first prompt (i.e., model, visual, or presentation). Future research should examine effective procedures for training teachers to wait to deliver the first prompt. Counting may have impeded their ability to interact with the child. A more effective training procedure (e.g., use of a visual timer) may have increased the teacher's ability to deliver the first prompt independently with high fidelity.

A major strength of this study was implementation of the child intervention in the classroom as part of naturally occurring routines with the teacher. However, other children or adults in the classroom often distracted the teachers during the training sessions. The investigator decided against implementation by a non-teacher adult who demonstrated accuracy in using a system of least prompts and who was less likely to be distracted by ongoing classroom events, because doing so would have compromised generalization of pretense behaviors and applications for practice. The current study suggests teacher training may need to be more intensive than simple didactic sessions,

with manual, practice and written feedback. Teachers may require more intense feedback and in session reminders for accurate implementation (Zaslow & Martinez-Beck, 2005). All four teachers displayed more models errors than any of the other types of errors. This may indicate the teachers needed more training with determining when to deliver the first prompt in the context of a play interaction. Future research should examine the use of visual prompts or timers for teachers when implementing systematic prompting into a play context or the use of other types of performance feedback in adult learning (e.g., use of graphs).

Additional Limitations

There are several additional limitations to note. First, the sessions were one to one. Although the sessions did occur in the classroom, the interactions were not entirely natural because the teacher and child sat in an area of the classroom separated from the rest of the peers and materials. Also, the toys were not materials from the classroom, and the toys were not available outside of the experimental sessions. The study did not measure generalization of unprompted pretence outside the experimental sessions. Future research should examine embedding prompts into contexts with peers with typical development.

Third, although the number of instructional sessions was relatively low (compared with other pretense intervention studies; e.g., DiCarlo & Reid, 2004; Lifter et al., 1993; Lifter et al 2005) and decreased across toy sets, the criteria for changing conditions was not consistent across participants. For Daniel, Liz, and Brian, the criteria was a stable pattern of unprompted pretense at or higher than the level of typical peers. Whereas for Anna, the criteria was at least three consecutive sessions of unprompted pretense higher

than prompted pretense. This suggests the children were learning to learn as is often reported when using the system of least prompts (e.g., Doyle et al., 1988). Children with more experience with a system of least prompts often demonstrate more efficient acquisition of target skills. Using consistent criteria for changing conditions would strengthen this conclusion. Future research should examine the efficiency of learning pretense behaviors based on specific criteria. Future research also might examine which number of pretense behaviors children with typical development produce in a classroom is a sufficient criterion for children with disabilities. .

Fourth, there was no change in the number of sequence of behaviors produced by the children. This may be due to the definition of sequence in this study, which required the behaviors to occur within 3 seconds of each other. There may have been more sequences reported had the time been extended to 5 seconds. Daniel, Liz, and Brian frequently engaged in themes (i.e., going to the park, fixing the house, making a cake, fishing in a lake), which would suggest sequences of pretense behaviors occurred. However, this study's measurement system did not adequately represent these behaviors. Future research should examine sequences of pretense behaviors with and without a time component. Children with disabilities may require more than 3 s in between pretense behaviors when producing sequences of behaviors. Furthermore, the teachers did not prompt sequences of behaviors. Teachers stopped prompting when the child engaged in a pretense behavior. Future research should examine rates of pretense behaviors if the teacher expands on the child's pretense behaviors. For example, teachers can model a different related pretense behavior immediately after the child demonstrates a pretense behavior. The use of expansions with pretend play may create an interactive pretend play context for the child and teacher, and may result in more sequences of pretense behaviors.

Fifth, the number of prompted behaviors remained relatively consistent throughout the instructional conditions for Daniel, Liz, and Brian. This was not expected. Previous studies using a system of least prompts demonstrate a decrease in prompted behaviors with the introduction of the system of least prompts. However, few studies have used the system of least prompts to increase pretend play behaviors. Systematically applied prompts may be necessary to maintain play interactions between adults and children around pretend play. However, the maintenance of unprompted pretense behaviors during the Probe Conditions II - IV indicates this is probably not the case. The children demonstrated higher than baseline levels of unprompted pretense when prompts were removed. Future research may extend the instructional sessions to remove prompts entirely. However, caution should be taken as doing so might result in toy satiation. Another alternative to is to deliver prompts at a faster rate during initial instructional sessions (i.e., 10 – 15 s), and then increase the interval before the prompt (i.e., 25 – 30) in the later sessions.

Sixth, Liz and Brian demonstrated pretense behaviors during Probe Condition I. Liz demonstrated a counter-therapeutic trend of unprompted pretense during the generalization sessions of Probe I with Toy Set 3 (i.e., mean of 30), which reduced to zero during Probe II and III. After instruction with Toy Set 3, unprompted pretense behaviors increased during the during the generalization sessions. However the level never reached the lowest datum point during Probe Condition I. During Probe Condition I, she appeared to be emulating her feeding program. She demonstrated a mean type token ratio of .09 during this Probe Condition I; thus, was repeating the same behaviors. There is evidence Liz learned new pretense behaviors because the number of different unprompted pretense behaviors and the type token ratio (see Tables 18 & 19) increased

across the Probe Conditions I - IV. Future research may consider different baseline settings, such number of pretense behaviors during free play or in controlled settings with teachers and no prompts.

Brian demonstrated variable numbers of prompted pretense behaviors (i.e., mean of 16.67) during the teacher probe session with Toy Set 1. During instruction with Toy Set 1, prompted pretense behaviors were stable and unprompted pretense demonstrated an immediate shift in level. During the initial probes the teachers were instructed to play with the children as they normally would. Beth used hand-over-hand physical prompting often with Brian during the Probe Condition I. Thus some learning may have occurred during the Probe Condition I. However, Brian demonstrated an accelerating trend during the generalization sessions. This suggests a relation between using the system of least prompts and generalization of pretense behaviors to sessions with the same toys, a different adult, and no prompts. Replication of this treatment effect would strengthen this conclusion. However, Brian was removed from the school and did not complete the study.

Seventh, one major purpose of this study was to measure pretend play in a setting without prompts and with no history of prompts. Thus, pretense behaviors were measured in sessions with a different adult and the same toys. The adult did not provide prompts for play or contingently imitate play; thus, the interactions were somewhat unnatural. The children would often attempt to initiate play with the adult, and the adult did not respond with a play behavior. This may have deterred unprompted pretense behaviors as the study progressed. Future research might examine generalized pretend play in sessions without prompts and peers or caregivers. This may provide a more natural context in which children with disabilities can be expected to produce pretend play.

Implications for Practice

This study has several relevant implications for instruction of children with disabilities in inclusive classrooms. A system of least prompts is a method of instruction teachers can apply to various skills. The use of contingent imitation with the system of least prompt helped ensure the child directed the play interactions, yet included systematic adult prompting. Thus, this study indicates adult prompting can be embedded into child directed play interactions if the goal is to increase pretense behaviors. However, it may be difficult for teachers to both interact with the child and systematically prompt pretend play. Having peers involved may ensure a more natural play interaction.

Teachers should carefully consider the levels of prompts when using a system of least prompts. In this study, five different types of prompts were used (i.e., visuals, presentation, model, hand over hand, choice) based on each child's learning style. Furthermore, teachers should carefully determine the level of prompts to ensure efficient learning. In summary, teacher may find a system of least prompts efficient in teaching new skills, because the prompts are naturally removed with the acquisition of the skill.

Teachers also may consider the developmental level of the children and the materials available when teaching pretend play. In this study, the highest functioning child, Daniel, displayed higher percentages of unprompted object substitution, imagining absent attributes, and assigning absent attributes than functional play with pretense behaviors. Anna, Liz, and Brian displayed higher percentages of unprompted functional play with pretense behaviors across all three Toy Sets. This suggests children with disabilities may acquire functional play with pretense behaviors, prior to object

substitution, imagining absent attributes, and assigning absent attributes behaviors; and may benefit from targeting functional play with pretense behaviors before object substitution, imagining absent attributes, and assigning absent attributes behaviors. Furthermore, Daniel, Liz, and Brian displayed more unprompted assigning absent attributes behaviors with Toy Set 2, and Anna, Liz, and Brian displayed more unprompted object substitution behaviors with Toy Set 2 than Toy Set 1, which may indicate a sequence effect for learning pretense behaviors. Otherwise, this may indicate specific toys differentially promote pretense behaviors. The materials in Toy Set 2 included a dollhouse and figures, which may promote assigning absent attributes more so than the materials in Toy Set 1.

To train the teacher participants, a treatment package was used in this study consisting of a manual, didactic sessions involving discussion and video examples, practice with immediate verbal feedback with non-participant children, and daily feedback after each instructional session. Nonetheless, two teachers required in-session verbal reminders to deliver the prompt hierarchy as planned. This treatment package likely exceeds what many inclusive classroom teachers receive from specialists (e.g., special educators, speech-language pathologists,) for implementing new and complex interventions. Similarly, this level of training likely exceeds what many pre-service teachers receive related to teaching pretend play. If the teacher participants are representative of some portion of the inclusive teaching force, then specialists may need to engage in relatively time-consuming and precise training to ensure interventions are correctly implemented for children with disabilities.

Appendix A

Teacher Manual

TEACHER MANUAL FOR USING A SYSTEM OF LEAST PROMPTS AND CONTINGENT IMITATION TO INCREASE THE FREQUENCY AND DIVERSITY OF PRETENSE BEHAVIORS

System of Least Prompts

The system of least prompts will be used to teach children with disabilities to engage in pretense behaviors. This strategy used prompts to teach children specific pretense behaviors from four different pretend play categories. Initially the child is given an opportunity to respond without prompts, and the subsequent prompts are rated from least to most intrusive. In this manner, the child *chooses* the level of prompt they need. This strategy was chosen because it allows the children an opportunity to "learn how to learn" (Doyle et al., 1990).

The system of least prompts involved four factors:

1. The prompt hierarchy with three levels
    a. The presentation of the objects (the target stimulus)
    b. The physical model of a pretense behavior within 12 – 20 seconds
        i. These will be from one of the four pretense categories
            1. Functional play with pretense
            2. Object Substitution
            3. Imagining absent objects
            4. Assigning absent attributes
    c. The physical hand over hand prompt (the controlling prompt) after 5 s
2. The objects (the target stimulus) should accompany each level of the prompt

3. A consistent amount of time (between 12 and 20 seconds) should be allocated before the model prompt
4. A consistent amount of time (5 seconds) should be allocated before the physical prompt
5. All pretense behaviors (correct response) should be reinforced with verbal praise.

Rationale

The goal of the intervention is to transfer stimulus control from your prompts to the objects. The children with disabilities should perform pretense behaviors in the presence of the objects.

Contingent Imitation

Adult contingent imitation has been used successfully to obtain the attention of children with disabilities. Contingent imitation is when the adult simultaneously imitates the child's motor action with the same or similar object. The object sets will have duplicates of objects to facilitate contingent imitation. Contingent imitation will be used to obtain the child's attention. Contingent imitation can last several seconds. The teacher should use contingent imitation to build a play interaction and to determine which pretense behaviors is appropriate to model and prompt. For instance, if the child were using a spoon and miniature food items, feeding a doll would be an appropriate pretense behavior to model. Once the child's attention is secured, immediately model the pretense behavior.

Prompts

The goal of this intervention is for the children to use pretense behaviors spontaneously, in the presence of the objects. If the child does not display a pretense behavior in 12-s to 20-s (you should be contingently imitating during this time) after presentation of the materials you should start the prompting sequence (i.e., model a pretense behavior). This intervention uses as adapted version of the *system of least prompts*. This instructional procedure varies the intrusiveness of prompts from least intrusive to progressively more intrusive. This system has been highly effective for *thinning adult prompts* and gradually *transferring stimulus control from adult to materials*. The system is set up so the children have access to the level of the prompt they require to produce the desired behavior. Thus, they are actually selecting the level of prompt they need!

Verbal prompts. There will be a range of receptive language skills with the target children, so a separate verbal prompt will not be included in this intervention. Verbal prompts *should* be provided simultaneously with modeling. If the child does not imitate your model, you should physically prompt the pretense behavior. Verbal prompting *should* be include in the prompting sequence along with modeling and physical prompting, but will not be used separately.

How to implement system of least prompts to teach pretense

1. Identify which behaviors you are going to prompt with specific object set. You should plan to prompt at least one behavior from each of the four pretend play categories. However, you should follow the child's lead and prompt pretense behaviors related to their play schemas. Thus, you will not be able to plan for all specific pretense behaviors.

2. Check the object sets and make sure you have all objects. You should have two of some objects to facilitate contingent imitation, and a selection of junk toys to elicit object substitution behaviors.
3. Ask the child to go to the appropriate settings. This will be different per condition. There are three instructional settings: the housekeeping area, the carpeted area by the blocks, and the sensory table. The generalization objects will be presented in these areas also.
4. Present the objects directly in front of the child.
5. Contingently imitate the children for 12 – 20-s to obtain their attention. The purpose of contingent imitation in this context is similar to mirroring in milieu teaching interventions where the interventionist follows the child lead. Contingent imitation should secure the child's attention and establish a play interaction to embed the instructional prompts (the physical model and prompt for pretense).
6. If the child does not exhibit a pretense behavior within 12 – 20 seconds, model a pretense behavior from on of the following four categories. The model *should* be accompanied by a verbal prompt or vocalization.
    a. Functional play with pretense
    b. Object substitution
    c. Imagining absent objects
    d. Assigning absent attributes
7. Wait 5-s. (Count in your head.)
    a. If the child imitates the model or exhibits a different pretense behavior, provide specific praise.

b. Start the procedures over again with contingent imitation. We also want to child to learn sequences of pretend play behaviors. This the next prompt should build on the child correct responses (appropriate pretense behaviors). For example, if the child imitated your model of stirring a spoon in a bowl, the next prompt should involve using this spoon to feed a doll or feed the self. Sequences and verbalizations are not specifically prompted in this intervention. However sequences and vocalizations are essential aspects of pretend play. Each of these will be discussed further below.

8. If the child does not model the behavior, use hand-over-hand physical prompts to guide the child to complete the behavior, *with a verbal prompt*.
    a. If the child complies, provide specific praise.
    b. Start the procedures over again with contingent imitation.
9. If the child resists the physical prompt and does not engage in a pretense behavior do not praise the child, but repeat the above sequence.

Examples of sequences

Play sequences may be a marker of a more advanced pretend play repertoire (e.g., Libby et al., 1997; Lieber & Beckman, 1991; Thorp et al., 1995). For example, Ungerer and Sigman (1981) and Sigman and Ungerer (1984) measured play integration as the number of sequences of related play acts, and play complexity as the number of different acts in these sequences. Sequences of routines or themes are important to measure because they may provide further confidence in the inference of pretense. The most basic sequences involve more than one action duplicating a routine, narrative, or based on the same theme. In this study sequences are not directly prompted, however, you should be

cognizant of the sequences when prompting. Use the child's correct responses (appropriate pretense behaviors) to build on and prompt related pretense behaviors. For example,

- If the child is feeding a doll with a spoon, wait 12 – 20 s and model wiping the dolls face with a junk object
- If the child is stirring food in a bowl, wait 12 – 20 s and model feeding a doll this food
- If the child is holding a doll, wait 12 – 20 s and model rocking the doll and put to bed

Vocalizations related to pretense

Some pretense behaviors will require vocalizations. There is not a language requirement for inclusion in this study, so the ability of target children to produce vocalizations may be variable. Adult contingent vocal imitation or verbal prompting is appropriate use in this intervention. However, verbal prompting should not be used separately. Verbal prompting *should* be given simultaneously with models and physical prompts. You can provide vocalizations such as:

- Sipping noises when drinking from a cup
- Chewing noises when holding fork or spoon to mouth
- "mmmmm" when moving mouth or swallowing
- modeling eating food and saying "Its hot!"

PRETENSE BEHAVIORS

Four different pretense behaviors, one from each of the four categories, should be prompted across the three Instructional toy sets. The pretense behaviors are the primary

child outcome. *The purpose of this intervention is to transfer stimulus control from the adult prompting directly to the objects to elicit these four behaviors.*

Pretense Behavior	Definition	Examples with routine objects	Non-example
Functional play with pretense	Non-literal use of actual or miniature objects in the manner in which they were intended without the reality-based outcome	1. spoon to your mouth 2. spoon to the dolls mouth 3. diaper a doll with materials 4. stir a spoon in a bowl 5. eating miniature food	1. hand to mouth 2. spoon in bowl without stirring 3. stacks plates or bowls 4. eating motions without food present
Object substitution	Use of one object as if it was a different object	1. rod up to mouth 2. block up to mouth 3. junk toy used as a bottle 4. banana up to ear	1. cup up to mouth 2. bottle to mouth
Imagining absent objects	Performing an action as if an object was present in the object's absence	1. fist to mouth, as if holding a utensil 2. diapering a doll without a diaper	1. cup to mouth 2. spoon to mouth
Assigning absent attributes	Assigning dramatic roles or emotions to the self, others, or inanimate objects	1. rocking baby with crying noise or statement 2. the food is hot with a quick touch and vocalization or blowing on the food	1. putting spoon to doll's mouth 2. laying the doll on a bed

Notes for Individual Teaching Sessions

a. The goal of each individual teaching session for the child to exhibit at least one pretense behavior from each of the four categories.

b. Review the checklist with examples of pretense behaviors across the four categories, before the start of each session.

c. Review the child previous performance. If the child appeared to be fluent in certain pretense behaviors, consider prompting the child to perform related but

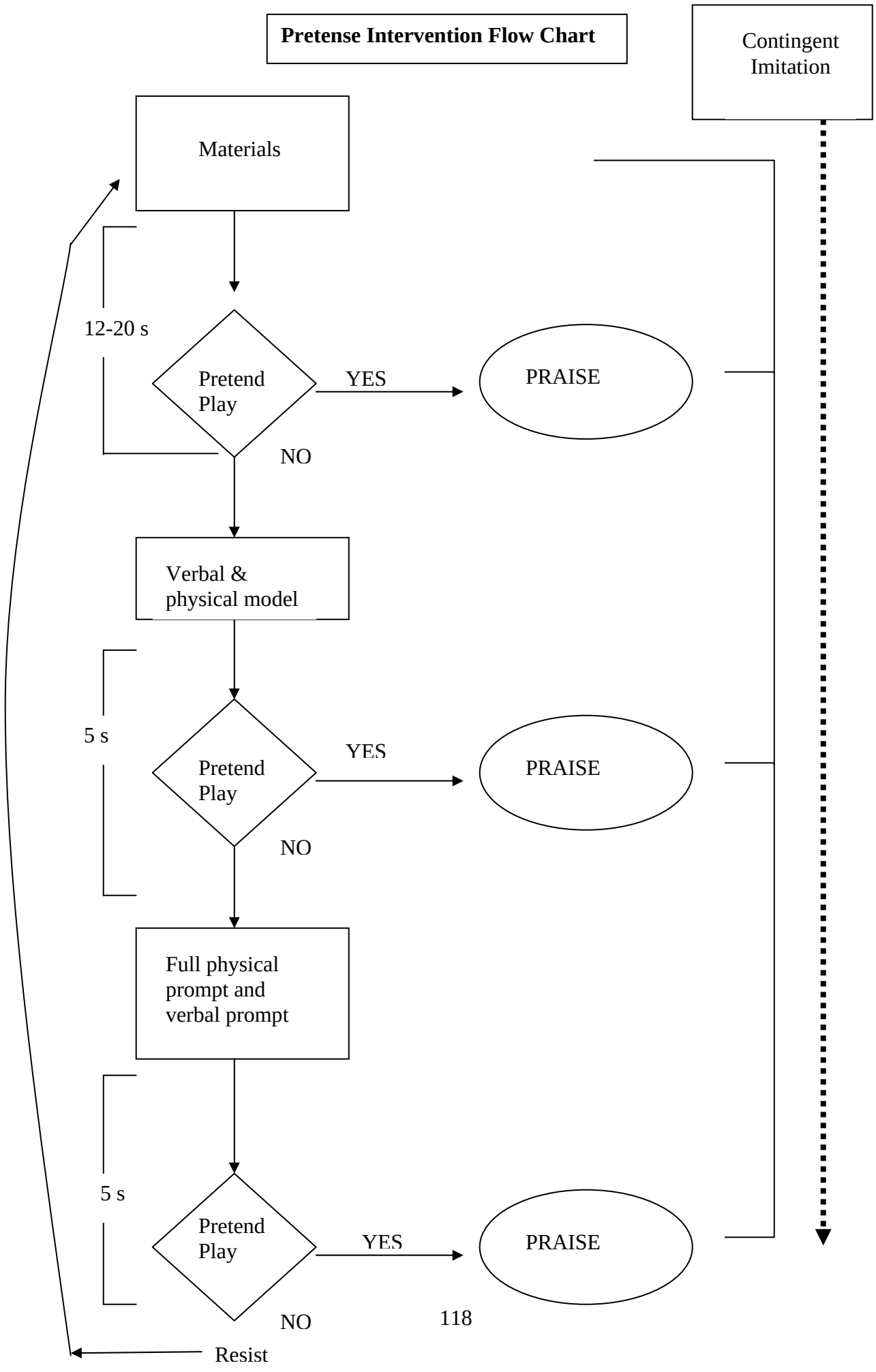
different behaviors across sessions. This will increase the diversity of their play schemas.

d. Consider and use the child's preferred play themes.

e. Recall the play interactions from the previous sessions and build on these.

f. Set out the appropriate object set and ensure all objects are present. You will need at least two of most objects to be able to appropriately contingently imitate. You should make sure some junk toys are present.

g. Attempt to allocate the same amount of time before modeling (12 – 20-s) or prompting (5-s).


Pretense Intervention Flow Chart
Contingent Imitation
Materials
12-20 s
Pretend Play
YES
PRAISE
NO
Verbal & physical model
5 s
Pretend Play
YES
PRAISE
NO
Full physical prompt and verbal prompt
5 s
Pretend Play
YES
PRAISE
NO
Resist

Toy Sets	Materials
1	2 identical girl dolls with brush; bottle and lotion; 2 identical plates; 2 identical bowls; 2 identical clear plastic forks; and spoons; 2 cups; 2 sheets of paper; 2 wooden blocks
2	Little People house with baby; man, woman and cat figures, 2 toothbrushes
3	3 sponges, animal figures, three different sized plastic Legos ™, boy and girl figure

Teacher Checklist

Pretense Behavior	**Two examples with Toy Set 1**
Functional play with pretense	
Object substitution	
Imagining absent objects	
Assigning absent attributes	

Pretense Behavior	**Two examples with Toy Set 2**
Functional play with pretense	
Object substitution	
Imagining absent objects	
Assigning absent attributes	

Pretense Behavior	**Two examples with Toy Set 3**
Functional play with pretense	
Object substitution	
Imagining absent objects	
Assigning absent attributes	

Appendix B

Coding Rules for Child Behaviors

Toy Set 1	FPP	OS	IAO	AAA	Non-Pretense
	• Combs baby's hair with comb	• Puts block in cup and shakes, says "ice:	• Moves hand around cup as is stirring	• Pats baby on back	• Putting shirt or pants on baby
	• Cup to baby's mouth	• Says blocks are fish and puts in bowl or toy box	• Puts empty hands to baby's mouth and says eat (or something related)	• Says cold while touching block	• Shaking block around cup
	• Puts lotion bottle on baby's hair or body	• Puts rod in cup and stirs	• Moves hand from plate to dolls mouth	• Puts baby on paper and says sleeping	• Banging block on plate
	• Picks up cup and stirs spoon in cup	• Puts sippy cup on sponge and says table	• Puts bottle over cup and says milk	• Has baby walk or dance	• Hugging baby
	• Pour one cup into the other cup or bowl without vocalization specifying what she is pouring	• Puts rod to dolls mouth			• Uses the car appropriately
	• Scrapes spoon on plate	• Puts block to doll mouth or her own mouth			• Tossing spoon onto plate
	• Pours bottle into sippy cup, bowl, or plate	• Moves rod around plate			• Opening and closing Velcro on the shirt
	• Pouring lotion	• Puts lotion			• Poking baby

	bottle onto plate	bottle up to dolls mouth			with spoon in stomach
	• Scrapes spoon on plate into toy box	• Puts bowl on head (can say hat)			• Moving baby's eye lids
	• Puts bottle, spoon, or cup to own mouth	• Puts comb to baby's mouth			• Stacking or sorting plates and cups
	• Puts spoon to teachers mouth	• Lays baby on stomach on piece of paper			• Stacking blocks
	• Pours sippy sup into bowl or cup without vocalization specifying what she is pouring	• Moving sponge around as if a car (can say vroom, vroom)			• Putting ribbon in own hair
	• putting ribbon in baby's hair	• putting ribbon over blocks (which were fish) and picking up block with hands, can say 'fishing'			• Tapping spoon on plate
	• putting small brush to their own hair	•			• Scraping fork or spoon onto carpet
Toy Set 2	FPP	OS	IAO	AA	Non-pretense
	• Toothbrush in back and forth brushing motion	• Puts coin holders through door and says	• Puts hand to hair moves up and down and	• Moves dog around behind cat and says	• Says I am going to work with no action

to cat's, dog's, or bear's mouth	'mail'	says 'comb'	'chase'	
• Toothbrush in back and forth brushing motion to any figures mouth	• Writes with a toothbrush over paper	• Puts table to mouth and says 'pizza'	• Moves figures up and down in walking motion	• Stacks blocks
• Toothbrush in back and forth brushing motion to own mouth	• Jumps figures up and down on lid and says trampoline	• Moves figure to sink in house and says 'get soap'	• Figure jumping up and down on lid ('trampoline')	• Uses bear to push over stacked blocks
• Puts figure or bear on toilet	• Holds lid in both hands and moves like a steering wheel		• Puts figure near house and says figure is ;'fixing house'	• Says the door is closed
• Puts figure in chair at table	• Puts block on house and has figures slide down		• Moves figures up and down through door	• Opens or shuts door or toilet lid
• Puts the figure in bed in the house	• Puts figure on chair and says potty		• Drops figure and toothbrush and says 'my wing is broken'	• Knocks over one figure with the other
• Puts table with food drawn on it up figure's mouth	• Puts toothbrush up to mouth and makes eating noises		• Moves figure around flying fast or slow	• Lines up the figures
• Puts baby in stroller and pushed stroller	• Puts toothbrush on figures back says 'wings' and		• Puts figure in stroller, moves stroller around,	• Sucks on toothbrush

moves figure around as if flying

- Pushed handle on toilet to flush
- Puts dog in stroller and pushes

- Move block up and down with a figure on top as if a rocket
- Combs hair with toothbrush
- Puts block to figures mouth
- Puts baby on chair and pushes
- Puts block in stroller and pushes
- Puts tooth brush to bears mouth
- Opens folded piece of paper and scans as if reading a book
- Puts figure in stroller and says its an ‘airplane’

and says ‘she is flying her airplane’

- Moves figure around house and says ‘she is cleaning’
- Pets the cat and says ‘good cat’

- Opens or closes fence
- Pushes figure off the house roof
- Stacks bears and blocks together
- Putts bear close to her own eyes
- Pushes figures in and out of the door
- Pets the cat or dog without vocalization

Toy Set 3	FPP	OS	IAO	AAA	Non-Pretense
	• Pours cup over plate	• Puts tube to mouth and talks like a telephone	• Moves bowl on top of plate and says, ‘there is a mouse on the plate’	• Moves figure up and down in the air as if flying, ;can say she is flying	• Bangs tube
	• Puts cup to mouth	• Turn tube into a circle and moves like a steering wheel	• Stirs spoon around bowl and says ‘stirring soup’	• Puts figure on plate and says ‘sleeping’	• Makes tube into various letters or shapes
	• Puts spoon to mouth	• Holds tube upright and has figure move up and says’ it’s a beanstalk’		• Move figure up and down as if walking	
	• Puts cup to the figures mouth	• Moves large spoon around the top of the blocks and says ‘it’s a fishing pole’		• Puts spoon near figures hands and moves around in bowl	
	• Puts spoon to the figures mouth	• Pus figure on bowl and says ‘he flew to the moon’			
	• Rubs figure with the sponge	• Holds up bowls and moves around and says. ‘it’s the planets’			
		• Puts bowls on			

head as if a hat

- Puts block to the figure's mouth
- Puts figure on sponge and moves sponge around as if a car
- Puts bowl on put, moves spoon up and down and says 'cut the cake'
- Put blocks on bowl (as cake) and blow on the blocks (as if candles; can say, blow out candles')
- Puts bowls on top of each other and says 'lets make a sand castle'
- Puts figure in bowl and moves around, can say she's in a boat or car

Additional coding rules

1. Code a new behavior if child has stopped for at least 3 seconds
   e.g., child jumping figure up and down on trampoline is one behaviors until the child stops for at least 3 second
2. Code **prompted** if within 5 seconds of a teacher prompt
   Code **unprompted** if more than 5 seconds after a teacher prompts
3. Code **different** if the child has not engaged in the pretense behavior with the same toy type (i.e., can be different colors of the same toy) within the same session
   Code **same** if the child has performed the behavior within this session (prompted or unprompted) with the same toy (i.e., can be different colors of the same toy)
4. Code **sequences** if within 3 seconds of each other
5. Code **vocalizations** only when within 3 seconds of a pretense behavior and follow same rules as above for prompted or unprompted

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