Article

Use of Video Modeling to Teach Developmentally Appropriate Play With Korean American Children With Autism

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Abstract

Given the increased number of students with disabilities who have culturally and linguistically diverse backgrounds in the United States, there has been growing attention to the cultural responsiveness of evidence-based behavioral interventions. The current study examined the effects of video modeling intervention on social play and interactions of three Korean American children with autism. Developmentally and linguistically appropriate social and play levels were identified for each child prior to the intervention and applied to set individualized intervention goals. The children watched video clips of their mothers and the researcher engaging in appropriate social play prior to play sessions with their mothers. The results indicate that scripted verbalizations and play actions increased among all children with autism and were maintained at high levels when measured 2 weeks post intervention. Generalization across novel players and toy sets was also observed at relatively lower, but still increased levels. The procedures and results can assist practitioners and researchers in better understanding how to consider designing and implementing culturally responsive behavioral interventions for culturally and linguistically diverse children with autism and their families.

Keywords

autism, video modeling, Korean American, developmentally appropriate play, generalization

Play is one of the primary media through which language and social skills are developed (Vygotsky, 1978). Previous research has indicated a strong correlation between the development of complex play skills, language skills, and social interactions (Bates, Benigni, Bretherton, Camaioni, & Volterra, 1979; Rubin, 1986). Social play skills, for example, are often developed in the context of social interaction with others, including adults, siblings, and peers. Through play, children can learn diverse social skills from simple behaviors, such as turn-taking, to more complex social repertoires based on fairness, such as negotiation, competition, and compromise (Ashiabi, 2007; Frost, Wortham, & Reifel, 2001). Children's interaction over "play rules" could build the groundwork for social thinking and behaviors (Frost et al., 2001). These skills are typically developed from infancy to early school age. At around 10 years, children begin to change or invent their own rules in play (e.g., game rules) and acquire cooperative skills and social competence through play (Frost et al., 2001; Schreibman, Stahmer, & Pierce, 1996). Play skill development also serves as a

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foundation for many other significant developmental areas such as language, communication, and social skills (Schreibman et al., 1996).

Individuals with autism spectrum disorders (ASD), however, often exhibit significant deficits in these skills, including social play and interactions (American Psychiatric Association, 2000). The play traits of children with autism are often marked by repetitive behaviors and a lack of social quality (MacDonald, Sacramone, Mansfield, Wiltz, & Ahearn, 2009). Identifying and providing effective interventions to promote social play engagement for children with autism may be a vital task for researchers and practitioners (Delano, 2007).

Video modeling intervention (VMI), an evidence-based intervention (EBI), has been established as effective in teaching a wide variety of behaviors (e.g., functional living skills, social behaviors, academic skills, and conversational skills; Charlop, Gilmore, & Chang, 2008; Gena, Couloura, & Kymissis, 2005; Kinney, Vedora, & Stromer, 2003; Maione & Mirenda, 2006; Nikopoulos & Keenan, 2004; Shipley-Benamou, Lutzker, & Taubman, 2002) and play skills (e.g., functional play, pretend play, and symbolic play; Charlop-Christy, Le, & Freeman, 2000; Dauphin, Kinney, & Stromer, 2004; Ganz, Earles-Vollrath, & Cook, 2011; MacDonald et al., 2009) to children with autism. Bellini and Akullian (2007) reported that VMI represents a highly desired intervention strategy for students with autism, possibly working to improve the child's motivation, attention, and self-efficacy. The rationale for video-based interventions derives from the premises that (a) observational learning is a basic learning mechanism that has been broadly applied to teaching new skills, and (b) the visual perception abilities of students with autism are often documented as an area of strength (Bellini & Akullian, 2007; see also Bandura, 1977). VMI has been recognized as a versatile intervention that capitalizes on child strengths and motivation and is well suited to address the educational needs of children with autism (National Autism Center, 2009).

As the student population has become more culturally and linguistically diverse (CLD) in the United States, there has been increased attention to consideration of the cultural responsiveness of behavioral interventions for individuals with disabilities (Arzubiaga, Artiles, King, & Harris-Murri, 2008). EBIs, including VMI, have been built based on sufficient and concrete scientific validation, but there is limited evidence that EBIs can be equally effective across all student populations with disabilities. In other words, as many researchers have highlighted, human developmental research, including EBIs, has been developed within the dominant cultural and linguistic context in Europe and North America (i.e., the middle-class white community). Consequently, it is still not evident whether EBIs can also be applicable for students who are from other cultural contexts and have typically not been included in research (Artiles, Kozleski, Trent, Osher, & Ortiz, 2010; Arzubiaga et al., 2008; Bernal, Jiménez-Chafey, & Rodriguez, 2009; Ortiz & Yates, 2008; Padilla, 2004; Rogoff, 2003). Thus, investigation of the effectiveness of EBIs within diverse cultural and linguistic communities might be the crucial next task for EBI researchers, so that researchers can avoid overemphasis on the efficacy of interventions. By doing so, researchers will better understand the need and potential for adaptation and accommodation with regard to the expectations and values of multicultural communities, as well as investigate the external validity of EBIs (Artiles et al., 2010; O'Connor & Fernandez, 2006; Rogoff, 2003).

According to Trainor and Bal (2014), intervention researchers can better reflect the social and cultural responsiveness of an intervention first by considering the participants' cultural and contextual factors. They suggest that in culturally responsive research, examining in-depth information about children with autism and their families and taking into account details about the cases, prior to designing the intervention, are most critical. Researchers' accurate and unbiased assessment of participants' strengths and needs is therefore also required from the sampling process to the intervention implementation (see also Wells, Merritt, & Briggs, 2009).

Caregivers are one of the most critical natural agents who can provide naturalistic social stimuli in the participants' natural environment (Hong, Ganz, Gilliland, & Ninci, 2014). This is especially important for young children with disabilities as they start to learn from and practice basic social skills with parents at home. In previous VMI studies, parents of children with autism successfully implemented the VMI with high fidelity and also played important roles as social play models and partners (Cardon, 2012). Parents of CLD children with autism might also have the same level of influence on their children's social skill

development as other parents. In fact, CLD parents' roles can be more significant and unique, given the general understanding that all children learn culturally valued social skills from their parents and the communities in which they belong (Cartledge & Loe, 2001). Therefore, when an intervention is designed for CLD students and their families, it is critical to consider the cultural responsiveness of the social behavioral intervention to meet the values and contextual needs of families and communities.

In this study, Korean American parents implemented a VMI for their children's social play behaviors at their homes. Following Trainor and Bal's (2014) suggestions, each participant's interests and needs for social play learning, as well as those of his or her family, were examined first through informal parental interviews and researchers' direct observation. Those stakeholders' values were then reflected in intervention goals, play level, and play scenarios. This process was designed to help respond to the stakeholders' perceptions and life experiences through intervention goals and procedures and address their needs throughout the intervention (Kim, 2015; Trainor & Bal, 2014). This process also allowed for consideration of the individual's preferences, ecological contexts, and level of language and play, which can enhance the cultural responsiveness of research (Trainor & Bal, 2014). To better understand and match needs and values with each participant's current play level, each participant's developmental level was assessed and addressed using a developmental play assessment (DPA; Lifter, 2000). Social validity measurement further allowed the researcher to quantitatively evaluate families' subjective satisfaction and values in terms of the goals, procedures, and outcomes of the intervention.

The purpose of this study was to examine the effect of VMI on developmentally appropriate social play skills of three Korean American children with autism. The effects of VMI on skill generalization across subjects and stimuli were also measured. In addition, parents' assessment of the social validity of VMI was examined. Korean Americans belong to an understudied group of Asians who are overrepresented in autism diagnoses (Marks & Kurth, 2013). For example, Marks and Kurth (2013) analyzed data from the U.S. Department of Education and found that in 2008, the prevalence of autism in Asian/Pacific Islander students was significantly high (1 in 186) compared with other racial/ethnic groups such as White (1 in 221), Hispanic (1 in 342), and Black (1 in 255). Studying the effectiveness of VMI among the fairly represented but underserved Asian population would, therefore, add strength to existing VMI research and its efficacy. Also, the procedures and results of VMI with this population would provide researchers and educators with practical evidence to effectively generate and implement more culturally responsive behavioral interventions.

Method

Participants, Settings, and Materials

Participants included three Korean American children with autism. Each focus child had different levels of strengths, interests in play, and/or needs for play intervention. Korean American participants with autism were recruited by contacting schools, nonprofit organizations, and church communities in the Midwest United States. Parents and children participated in this study with parents' informed consent. Descriptions of the three subjects follow.

Amy is a 6-year-old girl with severe autism (Childhood Autism Rating Scale-II; CARS-2). She exhibits a severely low level of receptive vocabulary (Peabody Picture Vocabulary Test, Fourth Edition; PPVT-4) and expressive/pragmatic language skills. She also has a functional communication level age equivalency of 13 months, according to the Test of Early Communication and Emerging Language (TECEL). According to her recent Individualized Education Program (IEP), she does not display interest in her peers. While she maintains an appropriate proximity to peers during class activities without engaging in disruptive behaviors, she sometimes pulls an adult toward a desired item/activity. She inconsistently follows a few simple one-step directions given by adults. She does not engage in functional play with others and she does not typically interact with or respond to others. She understands only English and speaks few words in English (e.g., *mommy, ice, "I want"*).

Jin-Su is a 7-year-old boy with moderate autism as categorized on CARS-2. He exhibits a severely low level of receptive vocabulary (PPVT-4) and expressive/pragmatic language skills. According to a recent

Table 1. Parents' Characteristics.

	Mothers (implementers)				Fathers (generalization play partners)			
Child	Age range	Years in USA	Profession	Language	Age range	Years in USA	Profession	Language
Amy	30-39	15	Professor	Korean/English	30-39	35	Technician	English
Jin-Su	30-39	10	Stay-at-home mother	Korean	30-39	28	Dentist	Korean/ English
Leo	40-49	13	Stay-at-home mother	Korean	40-49	13	Technician	Korean/ English

evaluation of his English language ability using the Verbal Behavior Milestones Assessment and Placement Program (VB-MAPP), he is able to respond to his own name and look at, touch, or point to the correct family member. He can select correct items from an array of 4 to 20 different objects or pictures. He understands both Korean and English, but his primary language is Korean. He speaks only one or two words to respond to others in English (e.g., *Yes, No, Okay*). He communicates more fluently with his parents and a sibling, saying short sentences in Korean (e.g*., Mom, I am hungry. Can I have dinner now?*). He consistently follows directions by parents or other adults and performs routines with minimal verbal cues without any severe challenging behaviors; however, he shows limited ability to perform motor actions on command without a visual prompt. He mostly spends time alone with a few preferred items and sometimes exhibits self-stimulatory or challenging behaviors (e.g., stimming or crying) when requests or directions are given. He had been homeschooled by teachers, who primarily spoke Korean, up through the previous school year, but began participating in a school program this year. The school is an English dominant program.

Leo is a 9-year-old boy with autism categorized as severe on CARS-2. He exhibits a significantly low level of receptive vocabulary (PPVT-4) and expressive vocabulary skills (Expressive One-Word Picture Vocabulary Test, Fourth Edition; EOWPVT-4). Leo's language abilities are in the developmental age range of 18 to 30 months (VB-MAPP). He speaks a few words and short sentences (e.g., *"Mommy, I want yogurt"*) to initiate or respond to others. He understands and speaks both in Korean and English. According to his recent IEP, he performs routine tasks with minimal verbal cues and without any severe challenging behaviors. He spends most of his time alone with a few preferred items, and often exhibits self-stimulatory behaviors (e.g., stimming, hand flapping) when no preferred items or stimuli are presented in the classroom. He also exhibits intense echolalia.

The mothers of the three participants implemented VMI and were the main play partners. The fathers also participated in the study as generalization play partners. The fathers were untrained for VMI. Detailed descriptive information about the parents is shown in Table 1.

The treatment and generalization measures took place in each focus child's home. The materials used for the intervention were selected based on each child's interests, and appropriate play for the focus children was selected based on parental interviews and direct observations. Materials included cooking and animal or zoo play toy sets. Details of the materials used by each child are shown in Table 2.

Video Clip Recording and Models

The specific play goals and scenarios for each focus child were set up after parental interviews, with informal pre-assessment of play level by the researcher's direct observation using a Developmental Play Assessment (Lifter, 2000). To develop the play scripts, the children's language developmental level and children's and mothers' dominant languages were also considered. The models in the video clips were each focus child's mother and the researcher. The mothers were selected as models because (a) the mothers were the actual play partners in the video modeling sessions, and (b) VMI has shown effectiveness across types of models (e.g., adults, peers, and children themselves; Bellini & Akullian, 2007; Delano, 2007).

Table 2. Play Materials.

Child	VMI	Generalization
Amy	Zoo play set	Cooking set
Jin-Su	Cooking set	Playground set
Leo	Dollhouse	Animal dolls

Note. VMI = video modeling intervention.

For Amy, the video clip captured the two models playing using zoo play sets to teach her pretend play, particularly, the category of "doll-as-agent," in which a child "move[s] doll figures as if they are capable of action" (Lifter, 2000, p. 230). Amy likes to play with the toys, but only stacks the animals without verbalizations or exhibiting other ways of playing. The video vignette for Amy was recorded in English. Both of her parents also spoke only in English during the VMI session and generalization probes.

The video clip for Jin-Su captured the models' cooking play. The goal for Jin-Su was to teach pretend play that relates to using an object's conventional function during social play (Lifter, 2000). In the video clip, the models present several verbalizations and actions, including cooking foods, feeding each other, asking about favorite foods to cook, washing dishes, and so forth. The video clip for Jin-Su was recorded in Korean with a little English. At home, Jin-Su used honorific Korean language with his parents. Because of this, the scripts in Korean for Jin-Su captured the use of honorific language. The child's scripts (not the mother's) were recorded with the use of honorific language with his mother. For example, in many cases, the ending of a verb was changed by adding one or more syllables to indicate the honorific connotation. His father, during generalization probes, also spoke both languages.

For Leo, the models played several home routines such as cooking, dining, and cleaning using a dollhouse and dolls. The goal for Leo was to teach functional and basic pretend play (Lifter, 2000). The models used both Korean and English to record the video clip and the father predominantly spoke in Korean during generalization. No honorific Korean language was used.

A video clip was developed for each child. The duration of the video clips was 1.5 to 2 min each, and each video clip included 15 to 17 verbalizations and 9 to 10 play actions that the child was intended to learn. A Samsung F90 was used to record the video clips, which were shown to each child via a laptop computer in their home settings.

Dependent Measures

Data were collected in 5-min play sessions, two to three times a week over three months. The researcher was present at the sessions and collected data based on direct observations. Each focus child's behaviors was scored by tallying the frequency of each dependent variable. Dependent variables included (a) scripted verbalization, (b) unscripted verbalization, (c) scripted play action, and (d) unscripted play action. The researcher adopted definitions and examples of the dependent variables used by MacDonald et al. (2009) and Maione and Mirenda (2006) in their VMI research.

Scripted verbalization. Scripted verbalization is defined as verbal interaction that exactly matches verbalizations by the video models. These include both initiation and response. Scripted verbal interaction was also scored if the verbalization was slightly different, but contextually acceptable (e.g., adding or omitting one or two words, substitution of verbs or adjectives). For example, if the scripted interaction was "Thank you, Mommy," and a focus child said "Thanks, Mommy," the statement was considered a correct scripted verbal interaction. Also, a child's statement "This is fun," when the script was "This is so fun" was scored as correct. Repetition of comments was not considered.

Unscripted verbalization. Unscripted verbalization is defined as verbal interaction that does not match verbalizations by the video models, but is contextually acceptable. These include both initiation and response to the

play partner. Negative unscripted verbalizations such as rejection of play, screaming, verbalizations contextually unrelated to play, and unintelligible murmuring were not scored. Substitution of more than two verbs or adjectives was considered as unscripted verbal interaction. For example, a child's statement, "You are cute," when the modeled script was "You are a pretty doggy" was scored as unscripted verbalization. Any play-related comments that were contextually appropriate were also considered (e.g., "looks good"). Repetition of comments was not considered; however, in most cases, unscripted verbal interactions were simplified forms of scripted verbal interactions (e.g., child's statement: "Strong"; modeled: "I am so strong").

Scripted play action. Scripted play action is defined as motor initiation and response that was modeled in the video. The scripted play action should result in the same consequence as in the video. There were single actions (e.g., nodding, walking, grasping a toy) as well as actions with play sequences modeled in the video. A child's action with play sequences was scored only when the child completed all of the actions in the modeled sequence. For example, feeding soup to the mother is scored when the child pretends to be scooping the soup with a spoon and bringing it near the mother's mouth.

Unscripted play action. Unscripted play action is defined as motor initiation or response that was not modeled in the video but is contextually appropriate. For example, when the modeled action was feeding a monkey, if the child tried to feed several other animals that the child and the mother were playing with as well, the action was scored as unscripted.

Interobserver Agreement

Over one third of each focus child's sessions (34%) in each phase were scored by two observers independently by direct observation. The observers included the researcher and a graduate student in Bilingual Education. Both observers were bilingual in Korean and English and so were able to accurately score sessions implemented in either or both languages. Reliability was calculated for scripted and unscripted verbal interactions and scripted and unscripted play actions by the rate of agreement on each dependent behavior (i.e., total number of agreements divided by total number of agreements plus disagreements). Interobserver agreement for scripted verbalization was 88% (range = 78%-100%) and for unscripted verbalization was 88% (range = 83%-100%). Lower than 80% of interobserver agreement occurred only one time (78% for scripted verbalization) during Leo's VMI session. The mean agreement was 100% for scripted play action and 94% for unscripted play action (range = 86%-100%).

Experimental Design and Conditions

To obtain detailed information on individual children, a multiple baseline design across children was used (Kratochwill et al., 2010).

Pre-assessment and video recording. To find socially and developmentally appropriate play goals and each child's favorite play items, the researcher conducted direct observations using Lifter's DPA scale prior to the intervention. Based on the identified information, the parents and the researcher created play scenarios and recorded the video clips. Mothers were trained to perform their parts of verbalizations and play actions.

Baseline. All required play materials were placed in each focus child's bedroom at home; the mother was also present. Children were told to play. VMI was not provided during baseline. As in the study by Taylor, Levin, and Jasper (1999), the mothers spoke their portion of the script or demonstrated scripted behaviors and waited for the focus children's responses, initiations, or other behaviors. This allowed children with autism and their mothers to have controlled opportunities to comment and interact across the four dependent measures and conditions. Mothers did not provide any additional prompts or reinforcements to their children. Children's scripted/unscripted verbalizations and play actions were measured. The baseline observation occurred for 5 min for each session.

VMI session. Each child's mother showed the video clip to their child in their room, with all required play materials in place, and then the children were told to play with their mothers. The mothers spoke their portions of the script or demonstrated scripted behaviors and waited for the focus children's response, initiation, or other behaviors. The mothers did not provide any additional prompts or reinforcements to their children. After the video clips were shown, the play session occurred for 5 min.

Maintenance. Two probes were conducted to test for maintenance 2 weeks after the VMI was withdrawn. Conditions were identical to baseline sessions.

Generalization. Two types of generalizations were measured. First, as noted, the unscripted play actions and verbalizations of each child with autism (i.e., response generalization) were measured. Second, stimulus generalization across novel play partners (i.e., fathers) and novel toy sets were measured without VMI. The researcher measured the skill generalization through intermittent probes with fathers who were neither trained with VMI nor familiar with the intervention and play scenarios. The fathers and the children played with the same toy sets that were used by the mothers for each child in their VMI sessions. Each generalization probe with the fathers occurred for 5 min, twice across conditions. In addition, to measure the generalization across novel toy sets, additional toy sets were also chosen based on the children's interests and level of play. The mothers and the children played with the novel toy sets without watching video clips. Table 2 depicts the novel toy sets for generalization. Children's generalization was observed for 5 min each, once across conditions. All generalization probes also occurred in each child's room.

Treatment Integrity

To ensure treatment integrity, the researcher completed a checklist after each session (based on the researcher's direct observation) to check whether the mothers followed the VMI protocol accurately during the VMI sessions. The checklist included (a) whether or not the mothers showed the video clip to their children before play sessions and (b) whether or not there were additional adult prompts or reinforcement during the play besides the scripted verbalizations or actions. Treatment fidelity was 100% throughout the VMI sessions.

Social Validity

The researcher assessed social validity via a questionnaire that was initially developed by Kennedy (1994, 2005) and modified for the present study. The researcher provided the questionnaire to parents at the end of study. The questionnaire asked about parents' perceptions of the intervention (e.g., whether or not the intervention was beneficial, whether or not parents were satisfied with the outcomes, whether or not the procedures and goals were feasible and acceptable).

Results

As depicted in Figures 1 and 2, all three participants showed immediate increases in scripted verbalizations and play actions with VMI. Their increased social behaviors were substantially sustained during maintenance probes. Although stimulus generalization was observed at a low level (i.e., unscripted verbalizations and play actions), the participants' acquired skills somewhat generalized across novel players and toys.

Figure 1 displays the frequency of verbalizations for the three participants. During baseline sessions, all three participants exhibited low levels of both scripted and unscripted verbalizations. Upon introduction of VMI, all of the children acquired scripted verbalizations immediately. Particularly, Jin-Su and Leo showed immediate improvement with upward trends. Although Jin-Su's level decreased slightly during the maintenance probes, all participants maintained the acquired behavior. Despite gains in scripted verbalizations, unscripted verbalizations for all three children remained at a low level during VMI and maintenance probes.

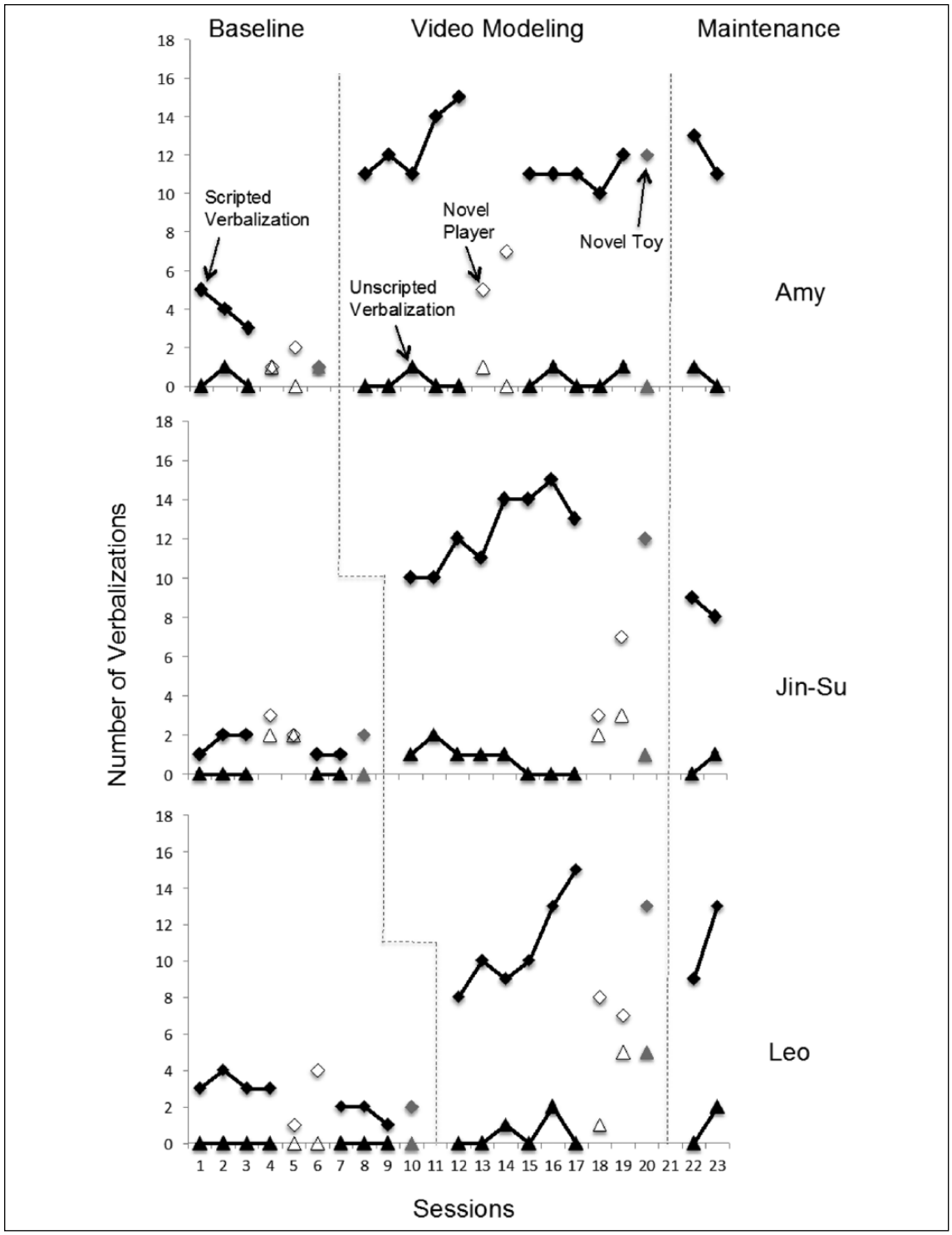

Figure 1. Number of verbalizations.

Note. The frequency of scripted and unscripted verbalizations are presented. The closed diamonds and triangles represent scripted verbalizations and unscripted verbalizations, respectively. The open diamonds and triangles represent the generalization of scripted verbalizations and unscripted verbalizations across novel players, respectively. The gray diamonds and triangles represent the generalization of scripted verbalizations and unscripted verbalizations across toy sets, respectively.

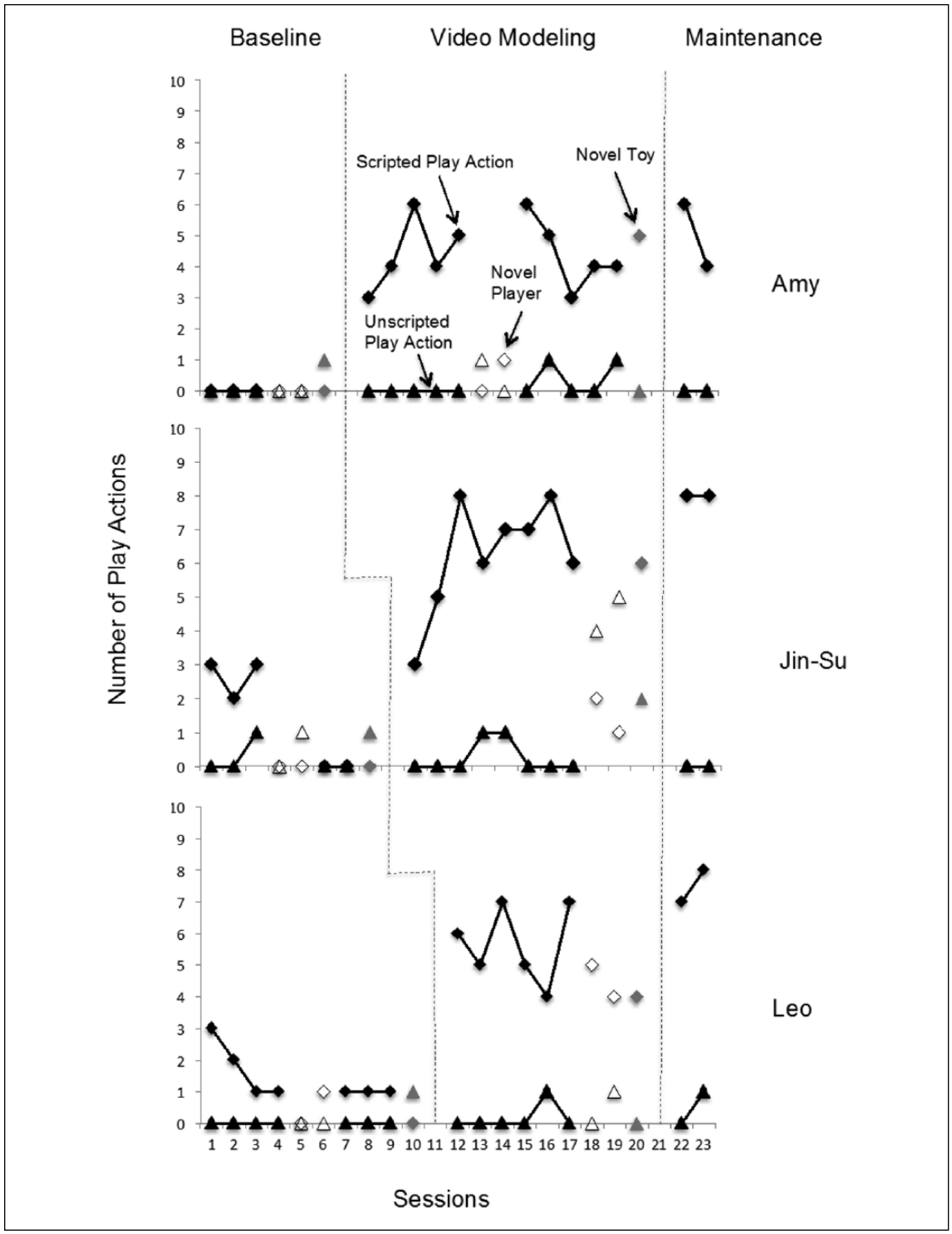

Figure 2. Number of play actions.

Note. The frequency of scripted and unscripted play actions are presented. The closed diamonds and triangles represent scripted play actions and unscripted play actions, respectively. The open diamonds and triangles represent the generalization of scripted play actions and unscripted play actions across novel players, respectively. The gray diamonds and triangles represent the generalization of scripted play actions and unscripted play actions across toy sets, respectively.

Table 3. Mean Percentage of Scripted Verbalization and Scripted Play Actions Completed Across Phases.

				Generalization across player		Generalization across toy set	
Variable	Baseline	VMI	Maintenance	Pre-VMI	Post-VMI	Pre-VMI	Post-VMI
Amy							
VZ	26.67	78.50	80.00	9.50	42.00	6.66	80.00
PA	0.00	55.20	62.50	0.00	6.25	0.00	62.50
Jin-Su							
VZ	8.23	72.79	50.00	14.70	29.41	11.76	70.59
PA	33.33	78.13	100.00	0.00	18.75	0.00	75.00
Leo							
VZ	17.14	72.56	73.34	16.67	50.00	13.33	86.67
PA	14.29	56.67	75.00	5.00	45.00	0.00	40.00

Note. VZ = verbalization; PA = play actions; VMI = video modeling intervention.

Generalization of scripted verbalizations across novel players occurred at a low level, while it occurred at a relatively higher level across novel toy sets for all three children after VMI. Jin-Su's generalization of scripted verbalizations increased only at the second generalization probe after VMI was introduced. Generalizations of unscripted verbalizations across novel players and toys occurred at zero to low levels for Amy and Jin-Su, but occurred at a relatively increased level for Leo following VMI.

Figure 2 depicts the frequency of play actions. During baseline sessions, all three participants exhibited a low level of scripted play actions. Amy, in particular, exhibited a zero level of scripted play actions. With the intervention, Amy and Leo displayed variable performance but immediate increases in play actions. In the first intervention session, Jin-Su did not show immediate progress compared with his baseline sessions ($M = 2.67$, range = 0-3), but he showed a progressive increase with variable performance in the following sessions ($M = 6.25$, range = 3-8). Increased scripted play actions were maintained at high levels for all three participants without VMI in maintenance probes. Unscripted play actions for all three children were at the zero level during baseline. They continued to exhibit infrequent unscripted play actions, remaining mostly at zero to low levels (range = 0-1) during the intervention and maintenance probes.

Generalization of scripted and unscripted play actions across novel players and toy sets barely occurred during baseline for all three children (range = 0-1). After VMI, Amy and Jin-Su's scripted play actions with new play partners remained at a low level, but their scripted actions with new toy sets increased. Leo exhibited slightly increased scripted play actions across both novel player and toy set. For Amy and Leo, generalization of unscripted play actions across new partners and toy sets remained at a lower level upon introduction of VMI. Jin-Su's generalization of unscripted play actions across toy sets remained at a low level, but he showed a slightly increased level of generalization with a new partner.

Table 3 depicts the mean percentage of scripted verbalizations and play actions completed by each child across phases. Percentages were calculated by dividing the number of completed scripted verbalizations or play actions by the total number of scripted verbalizations or play actions displayed on the video clip in each session. A mean percentage was then calculated across sessions within each phase (e.g., baseline, VMI, maintenance)

Among six parents who participated in this study, five completed the questionnaire at the end of study. The response to each question was scaled from 1 to 5 points, with higher scores indicating greater acceptability and positivity. The mean response rating across items on the questionnaires was 4.7 (range: 3-5). An open-ended question section to gather extended and unstructured answers was also included. Most parents reported that the intervention was helpful and supportive in increasing their children's social play behaviors, not only with the mothers, but also with fathers and siblings. They recommended that longer sessions and an extended intervention period would be more beneficial for teaching and maintaining the behaviors. Two mothers expressed that they appreciated the opportunities that their children had for play sessions with their

fathers and that fathers started having more of an interest in playing with their children at home. Two fathers suggested that this could be done using higher technology and other portable devices that are available for the families, besides simply using video cameras and laptop computers. Two parents also suggested that the intervention would be applicable for teaching various behaviors such as courtesy in the car and at a restaurant.

Discussion

This study investigated the effectiveness of VMI on the social play behaviors of three Korean American children with autism. Children's scripted verbalizations and play actions immediately increased with VMI and were maintained 2 weeks after the intervention. In addition, all three children showed generalized use of acquired scripted verbalizations and/or play actions across novel players and/or toy sets with the intervention (i.e., stimulus generalization), although unscripted verbalizations and play actions (i.e., response generalization) still remained at low levels in most children. The positive results of the current study with Korean American children with autism adds strength to previous VMI research and expands its efficacy with culturally diverse children.

The results of this study also support previous intervention research by demonstrating that parents were successful implementers of VMI as well as social play models and partners (Cardon, 2012; Ingersoll & Gergans, 2007). The children with autism also successfully learned from and practiced basic social skills with parents at their homes. Parents' involvement in social skills education for their children with autism, thus, might be a critical element not only for children's socialization but also for parenting. Learning play skills in natural settings, such as the home, with natural agents might also be beneficial for facilitating more successful maintenance and generalization of acquired skills.

Some children already exhibited scripted verbalizations and play actions during baseline observations, although the exhibitions were at low levels. Their play behaviors at this stage were shown because the play scenarios were set up based on the assessment of each child's current language (i.e., verbal communication and receptive language) and social play level. To illustrate, at the goal-setting stage, some parents indicated that their children could speak some words or short sentences but lacked pragmatism and consistency. Therefore, the intervention reflected the current level of language and play skills and sought appropriate use of non-verbal and verbal social skills in proper play situations, at proper timing, as well as further development of advanced play skills. With VMI, the children could practice their social language with parents and successfully learn how to use the social language appropriately in the play situation with their mothers.

Understanding family perception of and expectation for the intervention was crucial to set intervention goals and play scripts for each participant. This is particularly meaningful because each CLD participant and his or her family might have different or diverse values regarding children's play and social development. For the first example, researchers have found that Korean American heritage parents, compared with European-American parents, put less value on social play itself and more value on academic or functional skills learning (Farver & Lee-Shin, 2000). The Korean American parents in this study also hoped that through the play sessions, their children could learn how to use language in a more "practical" and appropriate way. Second, two mothers in this study said that they think that there are gender roles (within their families) at work during children's play and play development. For example, the mothers wrote in the open-ended question that the generalization sessions with fathers were meaningful for the families beyond children's learning because the fathers played with the children using play materials for the first time and previously had not been held responsible for their children's play development. Also, some of the fathers believed that there are gender differences in play (e.g., cooking sets for girls, Barbies® for girls). Last, honorific language in Korean may influence the ways of social interaction. Korean people often use honorific language when addressing elder people or people who have higher social roles. This eventually affects the construction of the hierarchical social relationship (Farver & Lee-Shin, 1997). During play at home with parents, this feature of language could be an important variable that affects some of the children's play. All of these identified factors feasibly relate to the selection of play themes and materials. Knowing stakeholders' social

values and preferences, therefore, might be a critical element that determines the development of a meaningful and culturally responsive intervention plan.

Limitations

The limitations of this study are the lack of systematic generalization programming and long-term maintenance data (i.e., data were only collected for 2 weeks post intervention). Measurement of response and stimulus generalizations helped to determine whether children's acquired social languages and play actions could be applied when novel play partners and toy sets were present. To produce better generalization outcomes for children with autism, the current intervention occurred in the natural environment where the acquired skills would be used (Gresham, 2001). By doing so, the children acquired scripted play skills and showed increased levels of generalization after VMI. Generalization was, however, observed at relatively lower levels compared with the main intervention effects. Given that generalization and maintenance are widely considered as pervasive problems for children with autism, it might be more beneficial to further consider how to maintain the behavior change and how to facilitate generalized use of the acquired behaviors across different settings and people before beginning instruction (Stokes & Baer, 1977).

Implications

Leo and Jin-Su's receptive abilities in Korean were not balanced with their abilities in English; they showed higher levels in Korean. This factor affected the level of scripts for play as well as their learning process. Specifically, Jin-Su is fluent in Korean but shows limited English language comprehensive skills. His parents highlighted at the beginning of the intervention stage that the level of intervention needs to be set based on Jin-Su's linguistic and play skills exhibited using the Korean language. The parents expressed that their son has had low levels of intervention and education services due to his undervalued English skills, and most service providers were unsure if his play skill deficits resulted from an English language deficit or disability indicators (see also Moreno, Wong-Lo, Short, & Bullock, 2014). For CLD students with disabilities, researchers and practitioners might need to consider the accurate assessment of play and language skills using their native languages as necessary. Accurate assessment tools using diverse languages should be developed and used.

As mentioned, social validity was an important element of this study to investigate stakeholders' perceptions of the intervention and behavior changes. Parents indicated their satisfaction with the goal-setting process and intervention procedures. With cooperation from parents, play scenarios were individually developed for each child based on parents' interviews and informal play level assessments using DPA (Lifter, 2000). Parent involvement in developing and implementing the intervention and their direct observation might lead to more positive perceptions of the intervention and its outcome. Future intervention studies regarding CLD children with disabilities might investigate social validity using diverse methods and frequent measurement to ensure a better contextual fit of the intervention and provide more in-depth understanding of stakeholders' values.

Ultimately, given the limited evidence regarding whether EBIs can be applicable for all students across cultural groups, the importance of investigating the effectiveness of EBIs within diverse cultural and linguistic communities has been consistently highlighted (Artiles et al., 2010). As a response to this issue, the positive results of the current investigation with Korean American children with autism provide preliminary evidence for broader applicability and external validity of EBIs. The primary focus of the current study was not to generate a VMI strategy that works for all Korean Americans or students across other cultural backgrounds. Rather, the results and procedures of this study were intended to provide an example of an efficient way to adopt EBIs for a specific group of culturally diverse students, as well as a way to embrace stakeholders' unique contextual and cultural needs. Future studies might be made more meaningful with additional investigation of the effects of VMI on a variety of skills in diverse groups of children in order to meet their diverse needs as well as expand the efficacy and applicability of VMI.

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References

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.

Artiles, A. J., Kozleski, E. B., Trent, S. C., Osher, D., & Ortiz, A. (2010). Justifying and explaining disproportionality, 1968-2008: A critique of underlying views of culture. *Exceptional Children*, *76*, 279-299. doi:10.1177/001440291007600303

Arzubiaga, A. E., Artiles, A. J., King, K. A., & Harris-Murri, N. (2008). Beyond research on cultural minorities: Challenges and implications of research as situated cultural practice. *Exceptional Children*, *74*, 309-327. doi:10.1177/001440290807400303

Ashiabi, G. S. (2007). Play in the preschool classroom: Its socioemotional significance and the teacher's role in play. *Early Childhood Education Journal*, *35*, 199-207. doi:10.1007/s10643-007-0165-8

Bandura, A. (1977). *Social learning theory*. New York, NY: General Learning Press.

Bates, E., Benigni, L., Bretherton, I., Camaioni, L., & Volterra, V. (1979). *The emergence of symbols: Cognition and communication in infancy*. New York, NY: Academic Press.

Bellini, S., & Akullian, J. (2007). A meta-analysis of video modeling and video self-modeling interventions for children and adolescents with autism spectrum disorders. *Exceptional Children*, *73*, 264-287. doi:10.1177/001440290707300301

Bernal, G., Jiménez-Chafey, M. I., & Rodriguez, M. M. D. (2009). Cultural adaptation of treatments: A resource for considering culture in evidence-based practice. *Professional Psychology: Research and Practice*, *40*, 361-368. doi:10.1037/a0016401

Cardon, T. A. (2012). Teaching caregivers to implement video modeling imitation training via iPad for their children with autism. *Research in Autism Spectrum Disorders*, *6*, 1389-1400. doi:10.1016/j.rasd.2012.06.002

Cartledge, G., & Loe, S. A. (2001). Cultural diversity and social skill instruction. *Exceptionality*, *9*, 33-46. doi:10.1080/09362835.2001.9666990

Charlop, M. H., Gilmore, L., & Chang, G. T. (2008). Using video modeling to increase variation in the conversation of children with autism. *Journal of Special Education Technology*, *23*, 47-66.

Charlop-Christy, M. H., Le, L., & Freeman, K. A. (2000). A comparison of video modeling with in-vivo modeling for teaching children with autism. *Journal of Autism and Developmental Disorders*, *30*, 537-552. doi:10.1023/A:1005635326276

Dauphin, M., Kinney, E. M., & Stromer, R. (2004). Using video-enhanced activity schedules and matrix training to teach sociodramatic play to a child with autism. *Journal of Positive Behavior Interventions*, *6*, 238-250. doi:10.1177/10983007040060040501

Delano, M. E. (2007). Video modeling interventions for individuals with autism. *Remedial and Special Education*, *28*, 33-42. doi:10.1177/07419325070280010401

Farver, J. A. M., & Lee-Shin, Y. (1997). Social pretend play in Korean- and Anglo-American preschoolers. *Child Development*, *68*, 544-556. doi:10.2307/1131677

Farver, J. A. M., & Lee-Shin, Y. (2000). Acculturation and Korean-American children's social and play behavior. *Social Development*, *9*, 316-336. doi:10.1111/1467-9507.00128.

Frost, J. L., Wortham, S. C., & Reifel, R. S. (2001). *Play and child development*. Upper Saddle River, NJ: Merrill Prentice Hall.

Ganz, J. B., Earles-Vollrath, T. L., & Cook, K. E. (2011). A visually based intervention for children with autism spectrum disorder. *Teaching Exceptional Children*, *43*(6), 8-19.

Gena, A., Couloura, S., & Kymissis, E. (2005). Modifying the affective behavior of preschoolers with autism using in vivo or video modeling and reinforcement contingencies. *Journal of Autism and Developmental Disorders*, *35*, 545-556. doi:10.1007/s10803-005-0014-9

Gresham, F. M. (2001). Interpreting outcomes of social skills training for students with high-incidence disabilities. *Exceptional Children*, *67*, 331-344. doi:10.1177/001440290106700303

Hong, E. R., Ganz, J. B., Gilliland, W., & Ninci, J. (2014). Teaching caregivers to implement an augmentative and alternative communication intervention to an adult with ASD. *Research in Autism Spectrum Disorders*, *8*, 570-580. doi:10.1016/j.rasd.2014.01.012

Ingersoll, B., & Gergans, S. (2007). The effect of a parent-implemented imitation intervention on spontaneous imitation skills in young children with autism. *Research in Developmental Disabilities*, *28*, 163-175. doi:10.1016/j.ridd.2006.02.004

Kennedy, C. H. (1994). Manipulating antecedent conditions to alter the stimulus control of problem behavior. *Journal of Applied Behavior Analysis*, *27*, 161-170. doi:10.1901/jaba.1994.27-161

Kennedy, C. H. (2005). *Single-case designs for educational research*. Boston, MA: Pearson.

Kim, S. (2015). *Pivotal response treatment for prompting social behaviors of Korean American children with autism*. Manuscript submitted for publication.

Kinney, E. M., Vedora, J., & Stromer, R. (2003). Computer-presented video models to teach generative spelling to a child with an autism spectrum disorder. *Journal of Positive Behavior Interventions*, *5*, 22-29. doi:10.1177/10983007030050010301

Kratochwill, T. R., Hitchcock, J., Horner, R. H., Levin, J. R., Odom, S. L., Rindskopf, D. M., & Shadish, W. R. (2010). *Single-case designs technical documentation*. Retrieved from http://ies.ed.gov/ncee/wwc/pdf/wwc_scd.pdf

Lifter, K. (2000). Linking assessment to intervention for children with developmental disabilities or at-risk for developmental delay: The Developmental Play Assessment (DPA) instrument. In K. Gitlin-Weiner, A. Sandgrund, & C. Schaefer (Eds.), *Play diagnosis and assessment* (pp. 228-261). New York, NY: John Wiley.

MacDonald, R., Sacramone, S., Mansfield, R., Wiltz, K., & Ahearn, W. H. (2009). Using video modeling to teach reciprocal pretend play to children with autism. *Journal of Applied Behavior Analysis*, *42*, 43-55. doi:10.1901/jaba.2009.42-43

Maione, L., & Mirenda, P. (2006). Effects of video modeling and video feedback on peer-directed social language skills of a child with autism. *Journal of Positive Behavior Interventions*, *8*, 106-118. doi:10.1177/10983007060080020201

Marks, S. U., & Kurth, J. (2013). Examination of disproportionality of autism in school-aged populations in the U.S. *Journal of the International Association of Special Education*, *14*, 9-21.

Moreno, G., Wong-Lo, M., Short, M., & Bullock, L. M. (2014). Implementing a culturally attuned functional behavioural assessment to understand and address challenging behaviours demonstrated by students from diverse backgrounds. *Emotional and Behavioural Difficulties*, *19*, 343-355. doi:10.1080/13632752.2013.860682

National Autism Center. (2009). *The National Autism Center's national standards project*. Retrieved from http://www.nationalautismcenter.org/download/4596/

Nikopoulos, C. K., & Keenan, M. (2004). Effects of video modeling on social initiations by children with autism. *Journal of Applied Behavior Analysis*, *37*, 93-96. doi:10.1901/jaba.2004.37-93

O'Connor, C., & Fernandez, S. D. (2006). Race, class, and disproportionality: Reevaluating the relationship between poverty and special education placement. *Educational Researcher*, *35*(6), 6-11. doi:10.3102/0013189X035006006

Ortiz, A. A., & Yates, J. R. (2008). Enhancing scientifically-based research for culturally and linguistically diverse learners. *Multiple Voices for Ethnically Diverse Exceptional Learners*, *11*(1), 13-23.

Padilla, A. M. (2004). Quantitative methods in multicultural education research. In J. A. Banks & C. A. M. Banks (Eds.), *Handbook of research on multicultural education* (pp. 127-145). San Francisco, CA: Jossey-Bass.

Rogoff, B. (2003). *The cultural nature of human development*. New York, NY: Oxford University Press.

Rubin, K. H. (1986). Play, peer interaction, and social development. In A. W. Gottfreid & C. C. Brown (Eds.), *Play interaction: Contributions of play materials and parental involvement to children's development* (pp. 163-174). Washington, DC: Lexington Books.

Schreibman, L., Stahmer, A. C., & Pierce, K. L. (1996). Alternative applications of pivotal response training: Teaching symbolic play and social interaction skills. In L. K. Koegel, R. L. Koegel, & G. Dunlap (Eds.), *Positive behavioral support: Including people with difficult behavior in the community* (pp. 353-371). Baltimore, MD: Brookes.

Shipley-Benamou, R., Lutzker, J. R., & Taubman, M. (2002). Teaching daily living skills to children with autism through instructional video modeling. *Journal of Positive Behavior Interventions*, *4*, 166-177. doi:10.1177/10983007020040030501

Stokes, T. F., & Baer, D. M. (1977). An implicit technology of generalization. *Journal of Applied Behavior Analysis*, *10*, 349-367. doi:10.1901/jaba.1977.10-349

Taylor, B. A., Levin, L., & Jasper, S. (1999). Increasing play-related statements in children with autism toward their siblings: Effects of video modeling. *Journal of Developmental and Physical Disabilities*, *11*, 253-264.

Trainor, A. A., & Bal, A. (2014). Development and preliminary analysis of a rubric for culturally responsive research. *The Journal of Special Education*, *47*, 203-216. doi:10.1177/0022466912436397

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Wells, S. J., Merritt, L. M., & Briggs, H. E. (2009). Bias, racism and evidence-based practice: The case for more focused development of the child welfare evidence base. *Children and Youth Services Review*, *31*, 1160-1171. doi:10.1016/j.childyouth.2009.09.002

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