Education and Training in Autism and Developmental Disabilities

Focusing on individuals with autism, intellectual disability and other developmental disabilities

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March 2019

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Effects of TEACCH Structured Teaching on Independent Work Skills among Individuals with Severe Disabilities

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Ewha Womans University

Abstract: To support employment of individuals with severe disabilities, instructional approaches for improving independent performance are urgently needed. The purpose of this research was to assess the effects of TEACCH structured teaching on the independent work skills of individuals with severe disabilities in a job setting. A multiple probe across participants design was used for this study. Results demonstrated that structured teaching was effective in enhancing engagement and reducing disruptive behavior in three individuals with severe disabilities in the absence of adult prompting. In addition, their performance was generalized in a different job setting.

For many individuals with disabilities, having a job is a significant stepping stone in life (Goh & Bambara, 2013; Holwerda, van der Klink, Groothoff, & Brouwer, 2012; Lee & Kim, 2014). Aside from providing for a means toward independent living, employment enables them to develop meaningful relationships, experience the feeling of success, participate in communities, and increase the quality of their lives. However, it is unrealistic to expect that every individual with a disability who reaches the proper age to work will find a job (Erickson, von Schrader, Bruyère, Van-Looy, & Matteson, 2014; Lee & Kim, 2014). In particular, finding a job is more complicated and challenging for individuals with severe disabilities (Trembath, Balandin, Stancliffe, & Togher, 2010). In South Korea, more than 63% of individuals with disabilities face unemployment or tremendous difficulties in finding a job (Korea Employment Agency for the Disabled, 2016), and the employment rate gap appears to be even wider when it comes to individuals with severe disabilities compared with other disabilities (Jo & Kang, 2012).

Researchers have reported several reasons for not employing individuals with severe disabilities, including insufficient work experience, limited job opportunities, and lack of employment policies (Shier, Graham, & Jones, 2009). Individuals with severe disabilities also have low motivation, poor self-monitoring skills, and serious problem behaviors (Park, Joe, & Hosp, 2013; Shier et al., 2009), and these characteristics often lead them to rely on adult prompts or corrections to remain engaged in work tasks. In order to obtain and retain employment, however, they must demonstrate job skills with a certain level of job independence (Goh & Bambara, 2013).

As independent work skills are recognized as critical for successful employment of individuals with severe disabilities, a substantial body of research has focused on instructional approaches for promoting independent performance (Snell, Brown, & McDonnell, 2015). Recently researchers have begun to use visual supports (e.g., photography schedules, video modeling) to teach individuals with severe disabilities to independently guide and maintain their work performance (Berenak, Ayres, Mechiling, & Alexander, 2012; Copeland & Hughes, 2000; Robinson & Smith, 2010; Wu, Wheaton, & Cannella-Malone, 2016). However, research that evaluates the effectiveness of visual supports has typically included additional instructional strategies such as behavioral rehearsal and adult corrections (e.g.,
Structured teaching as defined by Division TEACCH (Treatment and Education of Autistic and related Communication handicapped CHildren) is an instructional approach with a strong emphasis on visual components of structure that aims to increase and maximize independent work (Mesibov, Shea, & Schopler, 2005; Shopler, Mesibov, & Hearsey, 1995). It comprises four major components: (i) physical structuring (organizing the physical environment), (ii) visual schedules (visual information depicting where/when/what the activity will be), (iii) work systems (indicating what the individual will do in a work area), and (iv) visual organization (clear information on the goals and steps of a task) (Mesibov et al., 2005). TEACCH structured teaching has been demonstrated to be effective at enhancing independent performance in numerous studies that found that it increased engagement (Bennett, Reichow, & Wolery, 2011; Hume & Odom, 2007; Hume, Plavnick, & Odom, 2012; Taylor & Preece, 2010) and reduced problem behaviors (Bennett et al., 2011; O’Reilly, Sigafoos, Lanciali, Edrisinha, & Andrews, 2005) in educational settings. However, to date, scant research has empirically validated its positive effects on enhancing independent work skills in individuals with disabilities in job settings. Additionally, few published studies have shown that structured teaching can be applied to individuals with severe disabilities.

Despite strong recommendations to use structured teaching as a comprehensive model (Mesibov et al., 2005), a pool of previous research has experimentally tested its individual components, including visual schedules (Bryan & Gast, 2000; Pelios, MacDuff, & Axelrod, 2003), task organization (Mavropoulou, Papadopoulou, & Kakana, 2011), and work systems (Car-nahan, Hume, Clarke, & Borders, 2009; Hume & Odom, 2007; Hume et al., 2012). However, little is known regarding how structured teaching functions as a comprehensive model. The purpose of the present study was to examine the effects of TEACCH structured teaching as a comprehensive program on independent work skills in individuals with severe disabilities in a job setting. The following research questions were addressed:

1. Does TEACCH structured teaching increase engagement among individuals with severe disabilities in a job setting?
2. Does TEACCH structured teaching decrease disruptive behavior among individuals with severe disabilities in a job setting?

Method

Participants

The participants were three individuals with severe disabilities who lived in South Korea. They were served in a day program with vocational emphasis at G Rehabilitation Center. The criteria for participation were (i) diagnosis of severe disability, (ii) no fine motor disability, (iii) low engagement in work tasks, (iv) high problem behaviors, and (v) no prior experience with structured teaching. Written consent was obtained from the parents of the three participants after the study procedures were explained.

Kim was a 22-year-old male for whom the Korean Wechsler Adult Intelligence Scale-IV (K-WAIS-IV; Hwang, Kim, Park, Choi, & Hong, 2012) indicated an IQ of 44. On the Korean Community Integration Skills Assessment (CIS-A; Kim, Park, & Lee, 2004), he tested at an overall score of 67, which placed him in the severely below average range of function related to adaptive behavior. He also scored in the moderately autistic range on the Korean-Childhood Autism Rating Scale (K-CARS; Kim & Park, 1996). Kim could speak in sentences with two or three words and read simple words. He also could match the numbers 1–10 to relative quantity. He tended to refuse or avoid non-preferred or unfamiliar activities.

Yu was a 29-year-old male for whom the K-WAIS-IV (Hwang et al., 2012) indicated an IQ of 40. On the CIS-A (Kim et al., 2004), Yu tested at an overall score of 67, placing him in the severely below average range of function related to adaptive behavior. He also scored in the moderately autistic range on the K-CARS (Kim & Park, 1996), and he had vision problems. He could communicate his basic needs in one word but often demonstrated self-injurious behavior (e.g., slapping his face, yelling) and damaged property as a means of communication.
Lee was a 24-year-old female. On the K-WAIS-IV (Hwang et al., 2012), she was rated as having an IQ of 40. On the CIS-A (Kim et al., 2004), her overall score was 81, placing her in the low range of functioning in adaptive behavior. She also scored in the severely autistic range on the K-CARS (Kim & Park, 1996). Lee exhibited problem behaviors, including self-injury, escape, and refusal. She could speak some urgent needs in one word, but she was more likely to use problem behavior to communicate her needs.

**Settings and Materials**

**Settings.** The sessions in the baseline and intervention conditions were conducted in a workroom at the day program setting in which the three participants were provided job training and leisure activities. The workroom contained a round table, work tables, and chairs, and mats and cushions were also placed in a corner.

Generalization probes were conducted in a job setting similar to a sheltered workshop at the G Rehabilitation Centre.

**Materials.** A variety of materials were created for individual participants based on TEACCH guidelines for physical structuring, visual schedules, work systems, and task organization (see Table 1). Other materials used in this study included a visual timer, a stopwatch, and a webcam.

**Target Work Tasks**

Several steps were used to select target work tasks for the intervention. First, recommendations of potential target tasks were obtained from service providers in the day program that the providers considered would promote the possibility of employment. Second, participants were observed in the day program setting to assess their current work performance. Finally, three work tasks were identified that participants continued to require adult prompting or corrections to stay on. The task selected for Kim was to pack letters into envelopes, the task for Yu was to separate items into different recycling bins, and the task for Lee was to sort bolts and nuts.

**Dependent Measures**

Engagement and disruptive behavior were observed to measure the participants’ independent work skills in this study. Engagement was defined as the participant’s appropriately participating in the work task without adult prompting. It was recorded if the participant maintained physical orientation toward the work tasks and manipulated work materials appropriately (e.g., separating recycle items, putting finished materials into the finish box) in the absence of adult prompting. Disruptive behavior was defined as inappropriate behavior that was unrelated to the task. It was recorded if the participant used materials in an inappropriate way or displayed problem behaviors (e.g., aggression, self-injury).

All sessions were recorded with a webcam during the baseline, intervention, and generalization conditions. For Kim, 10-minute samples of engagement and disruptive behavior were collected, and 5-minute samples were collected for Yu and Lee. Two dependent variables were recorded by 15-s partial interval

### TABLE 1

<table>
<thead>
<tr>
<th>Materials Used for Work Tasks</th>
<th>Kim</th>
<th>Yu</th>
<th>Lee</th>
</tr>
</thead>
<tbody>
<tr>
<td>- partition</td>
<td>- partition</td>
<td>- partition</td>
<td></td>
</tr>
<tr>
<td>- visual schedule</td>
<td>- visual schedule</td>
<td>- visual schedule</td>
<td></td>
</tr>
<tr>
<td>- laminated cards with written &amp; picture symbols illustrating steps needed to pack a set</td>
<td>- two recycling boxes with objects (a milk carton, a bottle of yogurt) adhered to them</td>
<td>- colored bolts and nuts</td>
<td></td>
</tr>
<tr>
<td>- letter paper and envelopes made with color paper and kraft board paper</td>
<td>- two colored iron containers</td>
<td>- laminated bolt and nut pictures</td>
<td></td>
</tr>
</tbody>
</table>

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recording, by placing “+” for occurrence and “−” for nonoccurrence. The ratios of engagement and disruptive behavior were estimated using the number of occurrences divided by the total number of intervals multiplied by 100.

**Experimental Design**

A multiple probe across participants design (Horner & Baer, 1978) was used to examine the effects of structured teaching on engagement and disruptive behavior. The first step of this design was to evaluate levels of target behavior under baseline conditions until stable baselines were established. The intervention was then applied in a staggered fashion until all three participants had received it. It was completed when the participant displayed high engagement (80% or more) for at least three consecutive sessions. Generalization sessions were conducted within 10 days after the intervention.

**Procedure**

**Pre-baseline.** The trainers in this research were two service providers who provided training in the day program at G Rehabilitation Centre. They had no experience with structured teaching and were unfamiliar with behavior intervention; they received one training session of 2.5 hours. During the session, research objectives were introduced and the major components of structured teaching were explained. Information was also given in a detailed manual to aid in better understanding and applying structured teaching, and feedback was delivered to the trainers across intervention sessions.

**Baseline.** During baseline, participants were observed in the workroom during times when independent work was expected. A trainer guided the participant to the work table, and provided only general instructions (e.g., “let’s start your work.”) with target tasks. Prompts were given when the participants engaged in behavior that was dangerous to themselves or others (e.g., calling a participant’s name, grabbing a participant’s hands). The sessions were videotaped, and data collection began when the participants were instructed to begin the work task.

**Intervention.** The intervention occurred during times when independent work was expected. Independent work time typically occurred in the morning during 20-minute periods, and the intervention for this study was conducted two to three times a week.

The intervention consisted of four components of TEACCH structured teaching (i.e., physical structuring, visual schedules, work systems, and task organization), and the components were adapted to the individual needs of each participant. Physical structuring was defined as the organized environment that provided a visually distinct area for work tasks and removed distractions (Mesibov et al., 2005; Schopler et al., 1995). To organize the physical environment, a work table was placed against one side of the wall and partitions were built around the table.

The visual schedules presented what and when activities would be using symbols (Mesibov et al., 2005; Schopler et al., 1995). The visual schedules in this study showed a sequence of activities that occurred in the morning, and the sequence of scheduled activities consisted of greeting, independent work, and the preferred activity (e.g., walking, viewing video). Information on the participants’ preferred activities was obtained from interviews with service providers, and then an individual visual schedule was made for each participant. The visual schedule (4 × 19 cm) for Kim and Lee was made with considering “readability and portability.” A larger schedule (23.5 × 36.5 cm) was made for Yu because of his vision difficulties. All of the visual schedules included words and/or pictures that represented different activities; they were adhered to the wall where the work table was placed to provide participants with information on what they would do in the work area and what the next activity would be.

The work system was defined as a visually organized space to inform an individual of work tasks, amount of work to be completed, and total work time (Mesibov et al., 2005; Schopler et al., 1995). The work systems in this study consisted of placing boxes of task materials and a visual timer on the table. Boxes of materials required for the work task were placed to the participants’ left, and materials were always visible. This setup allowed for to visually communicating how much the
participants should work and what progress they were making. With respect to the packing task for Kim, because it included several steps, boxes of materials required for individual steps and a finished box were placed on the table in sequential order from left to right. In addition, a visual timer was used to communicate total work time and passage of time.

The aim of task organization was to provide information on goals, steps, and materials regarding the task using pictures, colors, numbers, words, and objects (Mesibov et al., 2005; Schopler et al., 1995). In this study, visual instructions were provided with various symbols to explain how to perform tasks. For Kim, the task of packing letters and envelopes was analyzed into six steps, and visual symbols (pictures, numbers, letters) were used to illustrate the steps for completing the task. For Yu’s task, in front of him were recycling boxes that corresponding objects adhered to. For Lee’s task, bolts and nuts were coated with two different colors (i.e., red, blue), and each of two containers was colored with the same color as the bolts and nuts; pictures were also attached to the containers to indicate which one should be put where.

A trainer provided general instructions (e.g., “let’s start your work.”) with target tasks. She also provided gestural prompts (e.g., pointing) related to using the structured teaching system (e.g., indicating the work area, attending to visual instructions, transitioning to the next activity) when necessary, and the prompts were faded as the participants used the system independently. The trainers did not prompt them to complete their task. As in the baseline condition, however, prompts were provided during the intervention when the participants engaged in behavior that was dangerous to themselves or others. All sessions were videotaped, and data collection began when the participants were instructed to begin their work tasks.

**Generalization.** Generalization probes were conducted in a job setting similar to a sheltered workshop within 10 days after the participants completed the intervention condition. All baseline procedures were used in the generalization probes.

**Interobserver Agreement**

The first author and the second observer independently rated participants’ recorded responses in 33% of the sessions across all conditions for each participant. The second observer had prior experience in teaching children with disabilities in agencies. Reliability was calculated by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100. An agreement was scored if both observers recorded the occurrence or nonoccurrence of dependent variables. Mean interobserver agreement (IOA) was 93% for engagement (range = 85–100%) and 90% for disruptive behavior (range = 85–100%). Regarding the IOA for each participant, the average for Kim was 88% for engagement (range = 85–100%) and 90% for disruptive behavior (range = 85–100%). For Yu, average IOA was 94% for engagement (range = 85–100%) and 91% for disruptive behavior (range = 85–100%). Average IOA for Lee was 98% for engagement (range = 95–100%) and 90% for disruptive behavior (range = 85–100%).

**Procedural Integrity**

Procedural integrity data were collected on all intervention sessions for each participant. The procedural integrity survey used 10 items in yes/no format (e.g., placing all required materials in a planned manner, preparing individual work area). Procedural integrity was calculated by dividing the number of items implemented correctly by the total number of items completed, multiplied by 100. Procedural integrity across intervention sessions was 96.5% for Kim (range = 90–100%), 98.4% for Yu (range = 90–100%), and 97.0% for Lee (range = 90–100%).

**Results**

Independent work skills, as measured by engagement and disruptive behavior, improved for all three individuals with severe disabilities. The findings indicated that TEACCH structured teaching was effective in increasing
engagement and decreasing disruptive behavior for the three participants (see Figure 1). During the baseline condition, Kim showed engagement behavior in a mean of 27.5% of
the intervals (range = 0–42.5%), and he engaged in disruptive behavior in an average of 35% of the intervals (range = 15–82.5%). In the baseline condition, Kim’s disruptive behavior was slightly above 80% of the intervals for the first sessions but decreased for the last three sessions. It was partly due to his tendency to avoid unfamiliar activities or tasks. During the intervention, his rate of engagement increased to 77.6% (range = 52.5–92.5%), and his disruptive behavior decreased to 14.4% of the intervals (range = 2.5–52.5%). In the generalization probes, Kim’s mean for engagement behavior was 81.8% of the intervals (range = 80–85%), and his average disruptive behavior was 1.6% of the intervals (range = 2.5–4%) with two of four sessions being 0%.

Yu initially demonstrated engagement behavior in 53% of the intervals (range = 45–55%) and disruptive behavior in 68% of the intervals (range = 35–85%) with an increasing trend during the baseline conditions. During the intervention, Yu’s engagement behavior increased to 92.3% of the intervals (range = 75–100%) with an immediate level change. His disruptive behavior varied, ranging between 20% and 85% of the intervals with the average rate of 52.8%. However, Yu’s disruptive behavior revealed a decreasing trend for the last five sessions. It was noted that his mood and behavior were affected by health conditions. During the intervention, he had sleeping issues that could have caused the variability in his disruptive behavior. In the generalization sessions, Yu’s average engagement behavior was 92.3% of the intervals (range = 85–100%), and his disruptive behavior dropped to 32.5% of the intervals (range = 10–55%).

During the baseline condition, Lee exhibited engagement behavior in 0.4% of the intervals (range = 0–5%), and disruptive behavior occurred in all sessions, with an average rate of 100%. The introduction of structured teaching resulted in an immediate level change in engagement, with eight of 10 sessions being above 70%. Her mean rate of engagement behavior was 78.2% (range = 55–100%), and her disruptive behavior decreased to 41.4% of the intervals (range = 5–85%). Lee’s engagement behavior increased to 90% of the intervals (range = 90–90%) during the generalization probes, whereas she showed disruptive behavior in 40% of the intervals (range = 25–50%) with a decreasing trend.

Discussion

This study demonstrated that TEACCH structured teaching was effective at keeping all three participants with severe disabilities independently engaged with their work tasks and at reducing their disruptive behavior. Their performance was also generalized into a different job setting. These positive findings support literature on using structured teaching as an effective intervention for children with severe disabilities to enhance independent performance (O’Reilly et al., 2005; Panerai, Ferrante, Caputo, & Impellizzeri, 1998; Taylor & Preece, 2010).

A number of factors may explain why structured teaching was effective for improving independent work skills in individuals with severe disabilities. First, individual work areas helped the participants to pay their attentions to their tasks. The participants in this study had typically shared a work table for job activities in a day program setting, and this could have introduced extraneous environmental stimuli that impeded the participants’ ability to engage in work tasks. However, at the beginning of this study, the setting was designed to minimize visual distractions. A work table was placed against one side of the wall, and partitions were used to designate an individual work area. This setup enabled the participants to devote their attention to their work tasks without adult prompting.

Second, visual schedules including preferred activities might have increased the participants’ motivation. A visual activity schedule affixed to the wall in the work area included “the next activity,” which was a preferred activity that followed the work task. During the intervention, the participants frequently checked their visual schedules, and this could have led them to expect what was coming when the tasks were done, resulting in increasing their engagement and mitigating disruptive behavior.

Third, the work systems may have contributed to the effectiveness of the intervention. In the work systems, there were work boxes with their contents visible, which enabled participants to self-evaluate their progress. These
findings confirms findings from previous studies that showed that self-monitoring was an effective strategy for increasing independent performance (Coughlin, McCoy, Kenzer, Mathur, & Zucker, 2012; Ganz & Sigafoos, 2005; Hume, Loftin, & Lantz, 2009).

Fourth, visual supports provided concrete cues and information on goals and appropriate steps of the work tasks. Visual supports have been considered effective for promoting independence (Mechling, 2007; Robinson & Smith, 2010) in that they enable individuals with disabilities to better understand work tasks. This study used several visual cues and symbols to address the participants’ individual needs. For example, for Lee’s task, pictures of bolts and nuts were attached to two corresponding containers. This visually accessible information might have promoted her understanding of the task and prevented task avoidance. These findings suggest that providing visual prompts should be considered an intervention component for improving work independence in individuals with severe disabilities.

As did previous research in this area (Hume et al., 2012; Mavropoulou et al., 2011; Pelios et al., 2003), this study provided evidence that TEACCH structured teaching was effective in promoting generalization of independent work skills for individuals with severe disabilities. These positive results may be attributed to a number of features of structured teaching. First, structured teaching enabled the individuals with severe disabilities to rely on visual cues within the environment to remain engaged in their tasks. Thus, once they were familiar with components of structured teaching, the participants might have responded to similar visual cues in the different setting. Another possible explanation for the generalization could be the continued practice that took place during structured teaching. During the intervention condition, the participants were provided with opportunities to repeatedly perform simple work tasks (e.g., sorting bolts and nuts), which allowed them to have job skills with a certain level of proficiency. It has been shown that proficiency and automaticity enhance generalization of skills (Gray, 2004).

During the intervention, the trainers were not instructed to alter their typical prompting (e.g., calling a participant’s name, grabbing a participant’s hands) in response to the participants’ dangerous behavior (i.e., self-injurious behavior, harming others). While this increased intervention feasibility, the trainers’ prompting might have affected the participants’ disruptive behavior. However, dramatic changes in their behavior were observed between the baseline and intervention conditions for Kim and Lee. With respect to Yu, disruptive behavior showed a slight decline during the intervention and reached its lowest mean rate in the generalization. These findings suggest that structured teaching, rather than the trainers’ prompts, is responsible for decreasing disruptive behavior.

A major concern is the extent to which benefits of scientific research are translated into best practices in actual job settings (Volkmar, Lord, Bailey, Schultz, & Klin, 2004). Therefore, it is essential that structured teaching can be easily implemented in natural job settings. The service providers in this study were provided training and a manual about structured teaching to be prepared as trainers. They indicated that the detailed manual was useful in implementing the intervention, and they strongly recommended the intervention at the end of the study. This finding suggests that if appropriate training and a detailed manual are provided to personnel in job settings, they may successfully implement structured teaching.

Limitations and Future Research

Several limitations in this study should be addressed. First, structured teaching is an instructional approach with multiple components that might have affected enhancing the participants’ independent work skills. However, it is possible that some components are not necessary for an individual with severe disability to increase engagement and reduce disruptive behavior. Component analyses of structured teaching may be helpful in determining if all of the components used in this study are essential for replicating these outcomes. Second, trainer prompting was not controlled perfectly during the intervention sessions. The trainers were guided not to provide prompting related to the work tasks. However, it was observed that the trainers intermittently prompted the participants to complete their tasks at the beginning of the intervention. Future research should make an
effort to provide a clear protocol to guide frequency and type of prompting. Third, interpreting the results is limited by the absence of generalization measures at actual job sites. The authors asked permission to conduct generalization probes in the sheltered workshop at the rehabilitation centre that the participants were attending, but it was not feasible because the center had regulations on program administration. Thus, additional research is necessary to investigate the efficacy of structured teaching in actual job settings. Finally, social validity data were not obtained in this study. Efforts should be made to obtain data from parents or other relevant people (e.g., center staffs).

Despite these limitations, this study extended the current literature on TEACCH structured teaching by evaluating its effects on engagement and disruptive behavior in individuals with severe disabilities in a job setting. The findings of this study suggest that components of structured teaching may be a means of assisting individuals with severe disabilities in performing independently in job settings.

References


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Curricula to Teach Skills Associated with Self-Determination: A Review of Existing Research

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Abstract: Researchers have linked the promotion of skills associated with self-determination with positive school and post-school outcomes for students with disabilities, and there is an ongoing need to promote greater access to instruction that enhances student self-determination. To that end, curricula were developed that provide teachers with content and strategies to promote skills associated with self-determination. The purpose of this literature review was to examine empirical studies of curricula to teach skills associated with self-determination for students with disabilities with an anticipated outcome of enhanced self-determination. The intent was to synthesize what is known about existing curricula, their implementation, and outcomes of conducted interventions. Five different curricula were identified across seven studies. The results suggest that curricula associated with increasing self-determination are limited in availability and research in this area is declining. Implications for practice and future research are discussed.

Research over the past 20 years has shown that self-determination is linked to positive outcomes for people with and without disabilities (Hoffman & Field, 1995; Shogren, Lopez, Wehmeyer, Little, & Pressgrove, 2006; Shogren, Wehmeyer, Palmer, Rifenbark, & Little, 2015; Wehmeyer, 1996; Wehmeyer, Palmer, Shogren, Williams-Diehm, & Soukup, 2013). Further, enhancing skills associated with self-determination (i.e., decision-making, goal-setting, problem solving) has been shown to improve academic (Lee, Wehmeyer, Soukup, & Palmer, 2010), postsecondary education (Kleinert, Harrison, Mills, Dueppen, & Trailor, 2014), and employment and independent living (Martorell, Gutierrez-Rechacha, Pereda, & Ayuso-Mateos, 2008) outcomes. Research has also shown that an individual’s self-determination predicts quality of life and life satisfaction (Nota, Ferrari, Soresi, & Wehmeyer, 2007).

Recently, self-determination has been re-conceptualized through the lens of Causal Agency Theory, an empirically-validated theoretical framework for understanding self-determination and developing and enhancing supports to enable people to develop greater self-determination (Shogren et al., 2015a). Causal Agency Theory defines self-determination as a “dispositional characteristic manifested as acting as the causal agent in one’s life” (Shogren et al., 2015a, p. 258). Causal Agency Theory maintains that self-determination is an enduring tendency that is shaped over time by contextual factors (i.e., personal, school, community factors) that impact the development and expression of skills associated with self-determination. Skills associated with self-determination include choice-making, problem solving, goal-setting and attainment, self-management skills, planning, self-advocacy, and self-awareness and self-knowledge. When teachers provide instruction and opportunities for the development of these skills, their students engage in self-determined action, thus contributing to the development of self-determination. One means through which to provide instruc-
The use of curricula to promote self-determination.

Defining Curriculum

Curriculum has been defined as the what of instruction (Sands, Adams, & Stout, 1995). As such, curriculum defines the content of instruction and typically begins with goals and objectives, then moves on to content as a means of delivering information (Squires, 2002). To meet these aims and objectives, specific interventions are embedded within curriculum to teach skills. The 1997 and 2004 Amendments to the Individuals with Disabilities Education Act made clear that curricular decisions for students with disabilities should be based upon two sources: (a) the general education curriculum, defined as the same curriculum provided to all other students; and (b) the student’s unique learning needs (Browder, Spooner, & Meyer, 2011).

Teaching skills associated with self-determination provides a means to address students unique learning needs, as well as the general education curriculum, as research has demonstrated that skills associated with self-determination (e.g., goal-setting, problem-solving, decision-making) are embedded in general education curriculum standards for all students (Wehmeyer, Field, Doren, Jones, & Mason, 2004). Organizing instruction in the specific skills associated with self-determination into a standalone curriculum provides a means to ensure students learn and develop these skills. Alternatively, teaching models treat the curriculum, or the what in teaching, as a variable affecting the basic process of teaching (Squires, 2002). A teaching model serves as a framework within which multiple content areas can be taught through imitation of the basic framework, while a standalone curriculum provides a framework for instruction to enhance specific skills. Recent reviews (Lee, Wehmeyer, & Shogren, 2015) have focused on the existent research examining the implementation and outcomes of teaching models, specifically the Self-Determined Learning Model of Instruction (SDLMI; Mithaug, Wehmeyer, Agran, Martin, & Palmer, 1998) to enhance self-determination. Furthermore, curricula can be compared based on the number of skills associated with self-determination that are targeted (e.g., goal-setting, planning, and self-monitoring). Recently, teaching multiple skills concurrently (i.e., multi-component interventions) has demonstrated efficacy in fostering self-determination (Cobb, Lehmann, Newman-Gonchar, & Morgen, 2009). However, there has not been a recent review of standalone curricula designed to teach multiple skills associated with self-determination. Therefore, the purpose of this review is to examine the implementation and outcomes of existing curricula intended to promote skills associated with self-determination.

Purpose

In the late 1990s, Wood, Test, Browder, Algozinne, and Karvonen (1999) initiated the Self-Determination Synthesis Project (SDSP) with the support of the U.S. Department of Education Office of Special Education Programs. The objective of SDSP was to synthesize and disseminate knowledge of best practices of the time in promoting skills related to self-determination for students with disabilities. The SDSP identified 450 published articles related to teaching skills and 60 curricula that targeted specific skills associated with self-determination through the synthesis (Test, Karvonen, Wood, Browder, & Algozinne, 2000). Given the length of time since this review, as well as subsequent research suggesting that the efficacy of multi-component interventions in enhancing overall self-determination (Cobb et al., 2009), an examination of the currently available curricula that promote the development of self-determination is warranted.

Therefore, the goal of this review was to explore available curricula designed with the intent of increasing overall self-determination and the degree to which there have been changes in the availability and implementation of curricula since the SDSP. As such, it is significant to note that this examination was not intended to identify the most effective curriculum associated with increasing self-determination; rather, the authors intend to provide an overview of the available curricula and descriptions of their use within the literature. Specifically, we were interested in (a) the characteristics of samples that have been represented within research of curricula associated with self-determination, (b) the types of
available curricula intended to increase overall self-determination, (c) the patterns of both the described use and implementation of curricula related to self-determination, and (d) the reported outcomes of curricula implementation.

Method

Search Procedures and Inclusion Criteria

A comprehensive review of the literature was conducted using the following electronic databases: EBSCOhost, PsycInfo, and Web of Science. The search terms included “self-determination” and “disabilities” as keywords and were combined with: “curriculum,” “curricula,” “curriculum intervention,” “curriculum instruction,” “program,” “program instruction,” and “program intervention.” The electronic search parameters included articles published between 2000 and 2016 to capture relevant curricula used in educational research since Wood et al. (1999). Article inclusion criteria included: (a) published in a peer-reviewed journal, (b) included participants ages 3 to 21 who were identified as having disabilities, (c) provided empirical data on the implementation of a specified curricula, (c) included at least one outcome related to enhanced self-determination, and (d) reported on the outcomes of an implemented intervention using a specified curriculum associated with self-determination. Studies that included students without disabilities were included so long as the sample contained students with disabilities as well.

Procedure

The initial search yielded 1,434 studies that required further screening for inclusion. After eliminating duplicates, a total of 573 articles were assessed for their alignment with the inclusion criteria and those that did meet the criteria were selected for further review (n = 76). The first and second authors reviewed the abstracts of these 76 articles and excluded 50 articles for not meeting the inclusion criteria. Full-text records of the remaining 26 articles were independently examined and coded on the inclusion criteria by the first and second authors separately, resulting in the identification of four articles with 100% agreement. Of the 22 excluded articles, four did not include an outcome related to enhancing overall self-determination (e.g., Agran, Wehmeyer, Cavin, & Palmer, 2008), four did not report on an intervention (e.g., Karvonen, Test, Wood, Browder & Algozine, 2004), and eight did not use a specific, defined curriculum to teach self-determination (e.g., Finn, Getzel & McManus, 2008). Further, the participants in three other articles were not students ages 3 to 21 (e.g., Pascual-García, Garrido-Fernández, & Antequera-Jurado, 2014). Lastly, one reference was identified as a conference communication and did not meet the peer-reviewed criteria, and a final article was not translated into English.

To find additional articles that may not have been identified through the search or were published recently and not yet indexed, we conducted an ancestral search of the reference lists of the 2016 volumes of two, top-ranked Special Education journals: Exceptional Children and Remedial and Special Education, and of the two journals where most of the included articles were published: The Journal of Special Education and Career Developmental for Exceptional Individuals. Further, the reference lists of these newly identified articles were crosschecked with the previous search. The ancestral search resulted in the identification of nine additional articles from which ultimately three aligned with the inclusion criteria. Thus, seven total articles were identified that met inclusion criteria (marked with * in the references).

Data Extraction

The first and second author coded the seven articles that met inclusion criteria in two domains: (1) relevant study information, and (2) intervention procedures and characteristics. The first domain included variables associated with study design and the samples of each study, including: (a) sample size, (b) participant age(s), (c) disability categories, and (d) the inclusion of students without disabilities. The second domain included variables intended to provide an overview of the intervention implemented, including: (a) research design, (b) location of delivery, (c) implementation length, and (d) facilitator of the imple-
The findings of the implementation of curricula associated with self-determination across the seven selected studies are displayed in Table 1. Almost all the curricula were implemented in segregated settings, such as a self-contained special education classroom (n = 5; e.g., Seong et al., 2015), with the total intervention length ranging from 10 weeks (Lee et al., 2011) to 3 years (Wehmeyer et al., 2013). Further, implementation facilitators were primarily special education teachers (n = 6 studies; e.g., Wehmeyer et al., 2011). Self-determination outcomes were assessed through the use of the Arc’s Self-Determination Scale (SDS; Wehmeyer & Kelchner, 1995; n = 7 studies) and the AIR Self-Determination Scale (AIR; Wolman, Campeau, Dubois, Mithaug, & Stolarski, 1994; n = 4 studies). Only one study included measures of social validity in the form of student and teacher feedback forms (Lee et al., 2011).

Across included articles, five curricula associated with self-determination were identified, almost all of which were incorporated in Wehmeyer et al. (2013) which evaluated the impact of using curricula associated with self-determination in general instead of one specific curriculum. Therefore, and unlike the other studies included in this review, Wehmeyer et al. (2013) provided teachers with a variety of research-based curricula to choose from, and teachers were able to select the curricula they would implement based on the needs of their students. As the primary purpose of the study was to evaluate the impact of interventions related to enhancing self-determination, not specific curricula, student participants of Wehmeyer et al. (2013) may have received instruction from multiple curricula.
TABLE 1
Results Related to the Self-Determination Curriculum Used in the Selected Studies

<table>
<thead>
<tr>
<th>Reference</th>
<th>Curriculum Name</th>
<th>Measure of SD Used</th>
<th>Location</th>
<th>Length</th>
<th>Facilitator</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lee et al. (2011)</td>
<td>WFA</td>
<td>SDS, AIR, WFA and Knowledge Test</td>
<td>Special education class</td>
<td>10 weeks</td>
<td>Special education teachers</td>
<td>All students benefited from the intervention. Students who used technology to access WFA instruction demonstrated a significant improvement than those who did not, particularly in the self-regulation component element.</td>
</tr>
<tr>
<td>Palmer et al.</td>
<td>WFA</td>
<td>SDS</td>
<td>18-21 program</td>
<td>2 academic years</td>
<td>Special education teachers</td>
<td>All students benefited from the intervention and showed statistically significant gains in SD scores over time.</td>
</tr>
<tr>
<td>Seong et al.</td>
<td>Self-directed IEP</td>
<td>SDS and AIR</td>
<td>Special education class</td>
<td>2 academic years</td>
<td>Special education teachers</td>
<td>No significant changes in SD scores were found, but there were increase perceptions of their levels of autonomy after the intervention.</td>
</tr>
<tr>
<td>Wehmeyer et al.</td>
<td>WFA</td>
<td>SDS</td>
<td>Community college</td>
<td>Not reported</td>
<td>Project and school staff</td>
<td>A causal relationship between the intervention and participant self-determination skills was established.</td>
</tr>
<tr>
<td>Wehmeyer et al.</td>
<td>WFA</td>
<td>SDS, AIR and WFA Knowledge Test</td>
<td>Special education class</td>
<td>Not Provided</td>
<td>Special education teachers</td>
<td>Results demonstrated that students in the treatment group over the 3-year period showed an increase on determination scores than students in the control group.</td>
</tr>
<tr>
<td>Zhang (2001)</td>
<td>Next S.T.E.P.</td>
<td>SDS</td>
<td>Special education class</td>
<td>A semester</td>
<td>Special education teachers</td>
<td>Students who received the interventions showed more positive patterns of growth in their self-determination scores, though measures varied depending on the instrument used (increases on scores in AIR, but SDS did not reflect differences on students in the intervention or control group).</td>
</tr>
</tbody>
</table>

Note: SDS = Arc’s Self-determination Scale (Wehmeyer & Kelchner, 1995); AIR = AIR Self-determination Scale (Wolman et al., 1994); WFA = Whose Future is it Anyway? (Wehmeyer et al., 2004).
Curricula descriptions. Whose Future is it Anyway? (WFA; Wehmeyer et al., 2004) was the most frequently used curriculum among studies (n = 5 studies; e.g., Lee et al., 2011). WFA is designed to promote student involvement in transition planning and consists of 36 sessions to enable students self-instruct to (a) develop disability awareness, (b) make decisions regarding transition-related outcomes, (c) identify community supports, (d) communicate effectively, and (d) develop skills to become an effective team member or self-advocate.

The ChoiceMaker Curriculum (Martin & Marshall, 1994) and its components, the Self-Directed IEP (Individualized Education Program; Martin, Marshall, Maxson, & Jerman, 1996), were used in two studies (i.e., Wehmeyer et al., 2013; Seong et al., 2015). The ChoiceMaker Curriculum is divided into three sections: (a) choosing goals, (b) expressing goals, and (c) taking action. Lessons related to choosing goals are intended to enable students to learn the skills necessary to self-select goals based on their own interests. The second set of lessons are from the Self-Directed IEP (Martin et al., 1996) and intend to teach students necessary leadership skills to manage their annual IEP meetings by communicating their interests and goals with the IEP team. Lessons related to students taking action guides students in breaking up their goals into specific and achievable action plans that together result in attainment of the final goal.

Steps to Self-Determination (Hoffman & Field, 2005) was used as a curriculum option in Wehmeyer et al. (2013) and is composed of 16 classroom-based lessons intended to teach skills related to self-determination, such as setting and attaining goals, self-advocacy, and decision-making. Lessons are designed to improve adolescents’ and young adults’ insights about their goals, and how to set them and deal with upcoming obstacles during the transition to adulthood (e.g., post-secondary education, employment). Through these lessons, students are guided in learning about their strengths, areas of improvement, interests, and preferences as well as how skills including goal-setting, communicating, accessing resources and supports can help them reach their goals or adjust previously made plans and set new goals.

The Next S.T.E.P. Curriculum (Halpern, Herr, Doren, & Wolf, 2000) was used in two included studies: Zhang (2001) and Wehmeyer et al. (2013). This curriculum is designed to enable students to learn necessary skills to successfully participate in a self-directed transition planning process. The curriculum consists of 19 lessons that teach students to self-evaluate the targeted skills and choose personally selected goals across four domains: (1) personal life, (2) education, (3) employment, and (4) living on your own. Collectively, these lessons are intended to lead students into their personal transition planning meeting, then take action based on decisions made, and keep track of their progress.

Finally, the Self-Advocacy Strategy (Van Reusen, Bos, Schumaker, & Deshler, 2002), was also used as a curriculum option in Wehmeyer et al. (2013) and is composed of seven instructional stages intended to increase a student’s sense of control and empowerment over their own learning. The Self-Advocacy Strategy is designed to help students prepare for and participate in education or transition planning conferences, which are often IEP meetings. Using this curriculum, it is intended that students learn to determine and list their perceived strengths, areas of improvement, education and transition goals, and necessary accommodations. Further, students are prompted to share their lists during conferences or meetings, listen and respond to others, ask questions, and communicate their goals to various stakeholders.

Also, it is worth noting that two teaching models were used in conjunction with previously described curricula to teach skills associated with self-determination in several studies, including Beyond High School (Wehmeyer et al., 2006) and the SDLMI. Beyond High School has been used across included articles simultaneously with other curricula including Next S.T.E.P Curriculum (Wehmeyer et al., 2006). Beyond High School is a multi-step teaching model designed to promote student self-determination and involvement in educational planning throughout the transition process by enabling students to set short- and long-term goals, self-directed action planning, and evaluate program implementation. Simi-
larly, the SDLMI is a teaching model for practitioners to use across content areas to teach students skills related to self-determination that will subsequently enable students to self-direct the instructional process by setting goals, planning action, and evaluating progress to then make adjustments accordingly.

Curricular Interventions Outcomes

Although the purpose of this review was not to evaluate the quality of available curricula, the outcomes of the included studies were summarized to explore their reported efficacy. Overall, reported outcomes highlighted the efficacy of curriculum associated with self-determination across studies, regardless of the specific curriculum implemented. Only one study reported no significant changes in self-determination scores after implementation of the Self-directed IEP curriculum (i.e., Seong et al., 2015). However, the authors of this study did report an increase in students' perceptions of their levels of autonomy. Differences in assessment scores of self-determination were identified depending on the measure of self-determination used as the AIR demonstrated differences in the capacity to engage in self-determined action and the opportunity to act in a self-determined way while the SDS demonstrated a global snapshot of self-determination (Wehmeyer et al., 2013; Zhang, 2001). Additionally, other skills that are not directly associated with self-determination were improved through the use of the identified curricula, such as transition empowerment (n = 2 articles; e.g., Seong et al., 2015), and students’ knowledge about the transition planning process and self-efficacy for educational planning (i.e., Lee et al., 2011).

Discussion

As mentioned previously, the purpose of this review was not to examine and report on the quality of existing curricula associated with self-determination; rather, it was intended to describe the available curricula that specifically intend to increase overall student self-determination and their associated implementation outcomes. In contrast to Wood et al.’s (1999) comprehensive review of self-determination literature and Test et al.’s (2000) subsequent identification of over 60 available curricula that targeted skills associated with self-determination (e.g., self-advocacy, goal-setting), this review found that curricula intended to promote overall self-determination have been scarcely examined in the research literature since the early 2000s as evident by the publication year ranges of the articles selected in this review. Simply stated, new curricula to promote overall self-determination have not been developed recently and existing curricula have been rarely used and examined in the research literature. Further, although reported outcomes of curricular interventions have demonstrated an increase in overall self-determination and transition-related skills, this finding is only supported by seven studies published in the last 16 years. As such, this finding implies that despite the evidence of positive outcomes related to self-determination curricula, they might not be the first option selected to teach skills related to self-determination.

Amongst the identified articles, curricula were primarily implemented with students with disabilities in segregated settings (e.g., self-contained special education classroom). However, this finding is in contrast to recent research that has demonstrated significant differences in student participation in general education and school- and community-based activities that are structured to promote inclusive practices (Hughes, Cosgriff, Agran, & Washington, 2013). Furthermore, a growing movement focused on school reform that supports the design and implementation of tiered models of support intended to provide high-quality support to all students in the general education classroom, including students with disabilities (Shogren, Wehmeyer, & Lane, 2016). Within multi-tiered systems of supports models, all students with varying support needs and from diverse cultural and linguistic backgrounds are a part of Tier 1 and receive academic instruction and behavioral supports in the general education classroom. Students that remain unsuccessful with only Tier 1 universally-designed instruction then receive additional, more intensive Tier 2 and 3 supports to address specific academic, behavioral, and social needs in the inclusive classrooms or educational setting (Sailor, 2009). As such, the results of this review suggest that available
curricula associated with self-determination have been utilized within research outside of inclusive settings and separate from the general education curriculum, demonstrating a need for further consideration of how to incorporate curricula designed to teach skills associated with self-determination into multi-tiered systems of support models.

Future Research and Practice Directions

As inclusive practices are continually supported through policy and by national organizations (U.S. Department of Education and Health and Human Services, 2015), questions regarding the degree to which curricula intended to teach skills associated with self-determination should be utilized in inclusive settings must be asked. Specifically, should various curricula related to promoting self-determination be used outside of the scope of general education? Is it possible that specific curricula designed to teach skills associated with self-determination do not have a place in an inclusive setting? These are both questions raised given the findings of this review and their answers will significantly impact how skills associated with self-determination are taught in schools today.

Given the scarce use of curricula related to self-determination in research, it is important to consider other alternatives to teach skills associated with self-determination. As previously mentioned, researchers have identified teaching models as an alternative to stand-alone curricula to increase overall self-determination. Teaching models provide a framework for how teachers organize and deliver their instruction. One such teaching model, the SDLMI overlays instruction related to self-determination on other areas, which is unique in terms of relevance across domains. A number of research studies have recently evaluated the efficacy of the SDLMI when overlaid across curricular domain areas (e.g., academic, social, behavioral), settings (e.g., school, home; Lee et al., 2015; Wehmeyer et al., 2012), and individuals with a broad range of support needs. Interestingly, reviews of the SDLMI have found that it has been more widely used and examined across studies in recent years (Hagiwara, Shogren & Leko, in press). Therefore, models of teaching might be more appropriate in addressing multiple areas of need related to self-determination than other stand-alone curricula. As such, further research is needed to explore contexts in which curricula or teaching models may be most effective, or if there are ways to embed curricula within inclusive settings like teaching models intend to do, or pull apart elements of curricula to implement in the classroom.

References


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Effectiveness of Video Modeling Presented via Smartboard for Teaching Social Response Behavior to Children with Autism

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Abstract: This study aims to examine the effectiveness of video modeling presented via smartboard for teaching children with autism about social response in the form of gestures, and verbal and facial expressions indicative of happiness and anger, and evaluate the method in terms of maintenance and generalization. The study used a multiple probe design across participants. Three male subjects diagnosed with autism, ages 3 to 5, participated in the study. Results showed that with video modeling presented via smartboard, all three subjects were able to learn about social response in the form of gestures, verbal and facial expressions indicative of happiness and anger, and generalize their learning to different settings, materials and persons. In addition, maintenance sessions conducted in weeks four and six and month seven following the end of the instruction showed that subjects retained the learned behavior. Social validity results showed that mothers and teachers of the children had positive views about the study.

Children diagnosed with autism under DSM-5 have visible deficiencies in social communication and interaction (American Psychiatric Association-APA, 2013). Among the most visible deficits in this field include (a) deficits in initiating, engaging in or maintaining social interaction, (b) deficits or inability in making eye contact, using unusual gestures or facial expressions, and understanding and using gestures and facial expressions, and (c) deficits in dialogue and sharing interests and feelings (APA, 2013; Webber & Scheuermann, 2008). Limitations in the use of gestures and facial expressions, in particular, may prevent these individuals from engaging in successful social interaction, and create difficulties in forming and maintaining friendships with peers (Baron-Cohen, 1988; Leaf, Dotson, Oppenheim, Sheldon, & Sherman, 2010).

In child development, the ability to understand and express feelings in social contexts in which one is placed is an important concept. Giving the proper response both to discriminative stimuli in the social context and to affective behaviors of others is an important behavior for the development of interpersonal social interaction (Gena, Couloura, & Kymissis, 2005). This skill involves the ability to make connections between contexts, affective states and messages sent via facial and verbal expressions, intonation and gestures (Saymaz, 2008). These behaviors are also called social response behaviors. Social response behaviors include understanding and expressing emotions that have a social communicative function, and observable behaviors such as facial and verbal expressions, intonation and gestures (Buffington, Krantz, McClannaham, & Poulson, 1998; Gena, Krantz, McClannaham, & Poulson, 1996; Gena et al., 2005).

Facial expressions and gestures are among the most important social response behaviors. In children with autism, the development of gestures is affected by both qualitative and quantitative deficits. Children with autism have deficits in the natural and spontaneous use of gestures to express emotions depending on the social context, comprehending gestures used by others, and imitating gestures (Ingersoll, Lewis, & Kroman 2006; Plimley &
Facial expressions, which play an important role in the development of social competence, are considered to be the primary and most important source of information mediated via social affective and verbal communication (Balconi, Amenta, & Ferrari, 2012; Tardif, Laine, Rodriguez, & Gepner, 2007). Facial expressions, when used properly, reflect emotions and allow the transmission of emotions appropriate for the social context via the face. Expressing emotions using specific facial expressions is considered to play a very important role in social interaction and communication (Gena et al., 1996). In addition, the social context that gives rise to the emotion is considered to have an important effect when assigning meaning to facial expressions and emotions. For a child to learn about the affective responses that are appropriate for the social context, the ability to perceive the reasons and conditions that give rise to the emotion in question, known as affective experience in the literature, is also important (Akmanoglu, 2015; Balconi & Carrera, 2007; Balconi et al., 2012).

One of the well-known strengths of children with autism is that they are able to perceive visual stimuli more easily compared to other stimuli, and can use visual clues in a more meaningful way. In addition, some studies report that children with autism tend to be visual learners rather than auditory learners, and therefore watching videos is a pleasurable activity for them (Nikopoulos & Keenan, 2006; Quill, 1997; Schneider & Goldstein, 2010; Weiss, 2013). Because children with autism prefer visually presented stimuli and respond more positively to visual interventions, video modeling is an evidence based method used effectively to instruct children with autism (National Autism Center-NAC, 2015; The National Professional Development Center on Autism Spectrum Disorders-NPDC, 2014). Video modeling involves the child watching a video in which a model presents the target behavior or skill in an appropriate manner, and then independently performing this behavior by taking the behavior presented in the video as a model (Charlop-Christy, Le, & Freeman, 2000; Delano, 2007; Murray & Noland, 2013; NAC, 2015; Nikopoulos & Keenan, 2006). In a report published by the NAC (2015), modeling is considered to be effective in teaching higher order cognitive skills, academic skills, communication skills, interpersonal communication skills, interpersonal responsibility, play skills, problem behaviors, social affective skills and sensory control.

With the development of technology and easy access to devices, images used in video modeling started to be presented via various technological tools. The manner in which video modeling is presented depends, in addition to child characteristics and characteristics of the skill being taught, on the opportunities available to the trainer and the trainer’s experiences and preferences. Today, video modeling is presented via portable and newer technologies such as tablet computers, smart phones, laptop computers, and smartboards (Argott, 2012).

A limited number of studies show that video modeling can be used effectively for teaching social response behaviors to individuals with autism (Akmanoglu, 2015; Axe & Evans, 2012; Charlop-Christy & Daneshvar, 2003). We were able to find only a single study on the use of video modeling to teach all social response behaviors including, gestures, intonation, verbal and facial expressions. Charlop, Dennis, Carpenter, & Greenberg (2010) aimed to teach proper social response behaviors (gestures, intonation, verbal and facial expressions) during social interaction to three children with autism, using the video modeling method. In the study, video modeling was used to present the proper gestures, intonation, verbal and facial expressions during social interaction. The study was conducted with the participation of three children diagnosed with autism, ages 7 to 11. The study used a multiple baseline design across behaviors, a single subject design. Results of the study showed that video modeling was effective in teaching social response behaviors to all the participants with autism, and all subjects were able to generalize the acquired behaviors to different contexts, persons and stimuli. The study did not collect maintenance data.

These studies on the teaching of social response behaviors suggest that video modeling can be used to teach gestures, intonation, verbal and facial expressions, but they have some limitations. These limitations, which also justify the present study, are as follows: (a) In the one study on teaching all social response be-
Behaviors including gestures, verbal and facial expressions, social responses were taught without associating these responses with affective states or contexts related to these affective states (Charlop et al., 2010). This study (Charlop et al., 2010) did not include affective states associated with social responses or contexts in which emotions arise, which are known to be an important variable in the emergence of emotions and related social responses. Therefore, there is a need for studies that include social contexts associated with emotions that give rise to social responses. (b) As limitations of their study, Charlop et al. (2010) state that they did not collect generalization data on whether the social responses taught would be generalized to other contexts not included in the study, or maintenance data that would test the retention of the behaviors taught. Collecting generalization and maintenance data is important to remove doubts about the dependent variable (Kennedy, 2005). (c) A review of the literature shows that only about one third of the studies on the use of video modeling to teach social skills report social validity data. Failure to collect social validity data from the direct stakeholders in the study is an important limitation as it hinders the evaluation of the social acceptance of the behavior taught, the appropriateness of video modeling, and the significance of the effects (Acar & Diken, 2012; Banda, Copple, Koul, Sancibrian, & Bogschutz, 2010).

For these reasons, the present study aims to examine the effectiveness of video modeling presented via smartboard for teaching children with autism about social responses in the form of gestures, verbal and facial expressions indicative of happiness and anger. To this end, answers were sought to the following questions: (1) Is video modeling presented via a smartboard is effective in (a) the acquisition of social response behaviors in the form of verbal expression, use of gestures, and facial expressions indicative of the affective states of happiness and anger, (b) the maintenance of these behaviors 4 weeks, 6 weeks and 7 months after acquisition, and (c) the generalization of this skill to different people, different settings and different social contexts created using different materials? (2) What are the views of the parents and teachers of the children who participated in the study (social validity)?

Method

Participants

Subjects. The study was conducted with the participation of three male subjects diagnosed with autism by the child psychiatry clinic of a public hospital. All of the subjects attend group sessions from 09.00 a.m. to 12.30 p.m. in the Developmental Support Unit of Anadolu University’s Research Institute for Individuals with Disabilities, and a preschool attended by children with normal development. Prior to the study, the Gilliam Autism Rating Scale-2: Turkish Version (GARS-2-TV), developed in 1995 by Gilliam and adapted for use in Turkey and standardized by Diken, Ardic, and Diken (2012), was administered to all the subjects.

Prerequisite skills for teaching the target skills to the subjects are explained in the following. As a prerequisite, subjects were required to have the ability to (a) understand and perform verbal and visual instructions that involve at least two actions, (b) follow visual, verbal and auditory instructions, (c) direct attention to the images on the smartboard screen and watch the images for at least 2 minutes, (d) imitate verbal skills that involve at least two words, (e) direct attention to an event or situation for at least 5–6 minutes, (f) make eye contact, and (g) imitate facial expressions. To decide whether the subjects had these skills, first, meetings were held with their teachers and the subjects were observed in class. Then, the researcher tested the subjects for each skill.

Efe is 3 years and 9 months old. On the Stanford Binet Intelligence Test administered by an expert, Efe received an intelligence quotient score of 114. Moreover, he received an autistic disorder score of 77 on the GARS-2-TV administered. This score indicates that Efe is likely to have autistic disorder.

Uzay is 4 years and 3 months old. On the Stanford Binet Intelligence Test administered by an expert, Uzay received an intelligence quotient score of 130. Moreover, he received an autistic disorder score of 103 on the GARS-
2-TV administered. This score indicates that Uzay is highly likely to have autistic disorder.

Eren is 5 years and 3 months old. On the Stanford Binet Intelligence Test administered by an expert, Efe received an intelligence quotient score of 98. Moreover, he received an autistic disorder score of 86 on the GARS-2-TV administered. This score indicates that Efe is highly likely to have autistic disorder.

All subjects in the study were able to follow instructions that involve two or three actions, and speak in sentences that consist of a minimum of three or four words. The subjects have deficits in initiating communication, and are unable to use verbal language appropriate for the context. The subjects are comparable to their peers in terms of gross motor skills and fine motor skills.

Models. One female and two male adult models have participated in the study. Adult models took part in the study to demonstrate the social response behaviors (facial expressions, gestures and verbal expressions) that were necessary for creating the social context in the instructional videos to be watched by the subjects. Care was taken to ensure that models in the videos have as much diversity as possible in terms of age, gender and physical characteristics (weight, height, hair color and hair type). This is because the more diverse stimulus and response examples in the instruction process are, the more likely the subjects are to generalize the newly acquired skills without further instruction (Alberto & Troutman, 2013; Sulzer-Azaroff & Mayer, 1991).

Models in the study participated in a 2-hour information session about the research process and expectations from them in this process. This information session proceeded as follows: (a) explaining the aims of the study, (b) presenting discriminative stimuli that are appropriate for the context and that elicit social response behaviors, and explaining and demonstrating the proper social response behavior elicited by the discriminative stimulus, (c) explaining and demonstrating what the models need to pay attention to when shooting the videos, and (d) the researcher acting as a model and allowing the models to practice.

To establish the validity of the instructional videos, an Instructional Video Validity Form was prepared. Two experts who have worked on autism spectrum disorder and video modeling were shown the videos, and their opinions were obtained about the appropriateness of the videos. Experts were asked to evaluate the videos in terms of whether the videos contained social contexts related to affective states of happiness and anger, whether facial expressions were appropriate, and whether the images and audio were clear. Both experts were of the opinion that the videos were fit for the aims of the study.

Settings

Video modeling and probe sessions were conducted in one of the individual education rooms of the Developmental Support Unit of Anadolu University’s Research Institute for Individuals with Disabilities. The rooms are equipped with observation mirrors, a rectangular table, two chairs, a closet for storing class materials, shelves and a smartboard.

Generalization probe sessions were held in group training rooms, a different setting from the rooms where instruction took place.

Materials

Materials used during the study were as follows: (a) a digital video camera, (b) a laptop computer for editing the videos, (c) video recordings with instructional content, (d) a smartboard, (e) objects and toys used to elicit the expected social response behavior from the subjects, and (f) data collection forms.

Studies show that preparing individual videos for each child is important in video modeling (Charlop et al., 2010; Murray & Noland, 2013). Therefore, individual videos were prepared using the favorite toys and activities of each child, and taking their individual characteristics into account. To identify the favorite activities and toys of the children, the researcher had meetings with the parents and teachers of the subjects, and observed them in class. The researcher also held preference evaluation sessions for the subjects to identify their preferences. Table 1 reports materials and activities identified for each subject based on information received from teachers and families and from preference evaluation sessions informed by observations.
The trainer of the study was the first author of the manuscript. The trainer is currently working toward a PhD in special education. The trainer also has experience providing one-on-one and group training to children with autism.

Experimental Design

This study uses multiple probe design across participants, which is a single-subject design. In multiple probe design across participants, experimental control is achieved when the subject instructed starts giving more correct responses, no significant change is observed in the responses of the subjects not yet instructed, and this effect is consecutively repeated in the other subjects (Kennedy, 2005). To achieve experimental control, certain measures were taken to control factors that might affect internal validity. To control external factors prior to the study, the researcher informed the families and the teachers at the institution attended by the subjects about the study, and asked them not to provide training concerning the target behavior. In addition, the study was completed in a reasonable amount of time to control for maturity effect, and reliability data were collected in at least 20% of all sessions throughout the study to control measurement effects.

Dependent variable. The dependent variable of the study was defined as the performance of the appropriate social response behavior by the subject within 5 seconds of the emergence of a discriminative stimulus that elicits social response behaviors in the form of verbal expressions, gestures or facial expressions indicative of the affective states of happiness and anger. A literature review conducted to identify the dependent variable of the study showed that social response behavior was defined as facial expressions, gestures, verbal expressions and intonations that are used in the presence of a discriminative stimulus that elicits appropriate social response behavior (Charlop et al., 2010).

Six basic universal emotions (happiness, anger, sadness, fear, surprise, pain) are known to play a role in the comprehension and expression of emotions appropriate for the context (Ekman, 1999). This study, however, focuses on the emotions of happiness and anger. These emotions were selected because it is considered that preschool children with normal development, particularly in their interaction with peers in daily life, frequently use expressions of happiness and anger. The selection of the independent variable to be taught to the subjects was also informed by meetings held with the families and teachers of the children, the researcher’s in-class observations, and preference evaluation conducted by the researcher.

Target responses and discriminative stimuli. Discriminative stimuli were identified on the basis of the objects, toys and activities most preferred by the subjects according to preference evaluation. Table 1 reports the discriminative stimuli selected for each subject. After identifying the discriminative stimuli, the researcher also prepared scenarios concerning social response behaviors that correspond to the affective states of happiness and anger elicited in the presence of each discriminative stimulus. Scenarios involving the discriminative stimuli and the target social response behaviors are presented in Table 2.

Independent variable. The independent variable in this study is video modeling presented via smartboard. Video modeling was provided on a one on one basis in two training sessions a day, 5 days a week.

Experimental Procedures

Experimental procedure of the study consisted of probe (baseline and daily probe sessions), instruction, maintenance and generalization sessions.

Probe sessions. There were two types of probe sessions in the study: baseline probe sessions and daily probe sessions.

Baseline probe sessions. Prior to initiating the teaching of the social response behavior to be studied, a minimum of three baseline probe sessions were held with each subject until stable data were obtained. With the first subject, stable data were obtained for three sessions in a row prior to initiating the instruction. With the other subjects who had not started receiving instruction, baseline data continued to be collected on an intermittent basis (once every 4 days). After the first subject
achieved a 100% correct response rate for the behavior taught in three consecutive sessions, baseline data were collected from the second subject until stable data were obtained in three consecutive sessions. After the second subject achieved a 100% correct response rate in three consecutive sessions, the same procedure was repeated for the third subject. In baseline sessions, a total of six trials were made for each subject, consisting of three discriminative stimuli for each of the affective states of happiness and anger, to give the subjects the opportunity to display the target behavior. The intertrials intervals were five seconds. In all probe sessions, trials were presented in an unpredictable order. In probe sessions, correct responses were reinforced using verbal reinforcements (e.g. Great!), following a continuous reinforcement schedule. Incorrect responses, on the other hand, were ignored. Focused and cooperative participation of the subject in the session was reinforced at the end of each session using verbal and social reinforcers (e.g. you worked great today, you were amazing. High five!).

When collecting data for the probes, scenarios (Table 2) developed for evaluating the behaviors to be taught were acted out. The trainer initiated the interaction with the subject by presenting one of the discriminative stimuli to the subject (e.g. giving an iPad for the subject to play with for a while, and then taking it back). When the subject displayed the appropriate social response behavior within 5 seconds (e.g. frowning with an angry facial expression, shaking his finger at the researcher and saying, Don't take!), the response was verbally reinforced, and incorrect responses were ignored.

Daily probe sessions. Daily probe sessions were held to measure the performance of the subjects concerning all the skills being taught during the instruction process and data from these sessions are reported on the graph, marked as instruction phase data. Training sessions continued until the subjects achieved a correct response rate of 100% in three consecutive daily probe sessions. Daily probe sessions were held following every two training sessions, and once prior to training sessions held every day. In daily probe sessions, correct responses by the subjects were reinforced every day. In daily probe sessions, correct responses by the subjects were reinforced every day. The following table lists the discriminative stimuli selected for each subject.

Table 1: Discriminative Stimuli Selected for Each Subject

<table>
<thead>
<tr>
<th>Subject</th>
<th>Happiness</th>
<th>Anger</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efe</td>
<td>Knocking down pins with a bowling ball</td>
<td>Taking the his iPad away when he was playing with it</td>
</tr>
<tr>
<td></td>
<td>Catching fish with a fishing rod</td>
<td>Taking his story book away when he was looking at it</td>
</tr>
<tr>
<td></td>
<td>Attaching parts of the potato head to appropriate places</td>
<td>Taking his iPad away when he was playing with it</td>
</tr>
<tr>
<td></td>
<td>Taking the his iPad away when he was playing with it</td>
<td>Taking his car away when he was playing with it</td>
</tr>
<tr>
<td></td>
<td>Taking his car away when he was playing with it</td>
<td>Taking his story book away when he was looking at it</td>
</tr>
<tr>
<td>Uzay</td>
<td>Knocking down pins with a bowling ball</td>
<td>Taking his iPad away when he was playing with it</td>
</tr>
<tr>
<td></td>
<td>Playing darts</td>
<td>Taking his iPad away when he was playing with it</td>
</tr>
<tr>
<td></td>
<td>Catching fish with a fishing rod</td>
<td>Taking his iPad away when he was playing with it</td>
</tr>
<tr>
<td></td>
<td>Taking his iPad away when he was playing with it</td>
<td>Taking his car away when he was playing with it</td>
</tr>
<tr>
<td></td>
<td>Taking his iPad away when he was playing with it</td>
<td>Taking his story book away when he was looking at it</td>
</tr>
<tr>
<td>Eren</td>
<td>Knocking down pins with a bowling ball</td>
<td>Taking his iPad away when he was playing with it</td>
</tr>
<tr>
<td></td>
<td>Playing darts</td>
<td>Taking his iPad away when he was playing with it</td>
</tr>
<tr>
<td></td>
<td>Catching fish with a fishing rod</td>
<td>Taking his iPad away when he was playing with it</td>
</tr>
<tr>
<td></td>
<td>Taking his iPad away when he was playing with it</td>
<td>Taking his car away when he was playing with it</td>
</tr>
</tbody>
</table>

In baseline sessions, a total of six trials were made for each subject, consisting of three discriminative stimuli for each of the affective states of happiness and anger, to give the subjects the opportunity to display the target behavior. The intertrials intervals were five seconds. In all probe sessions, trials were presented in an unpredictable order. In probe sessions, correct responses were reinforced using verbal reinforcements (e.g. Great!), following a continuous reinforcement schedule. Incorrect responses, on the other hand, were ignored. Focused and cooperative participation of the subject in the session was reinforced at the end of each session using verbal and social reinforcers (e.g. you worked great today, you were amazing. High five!).
<table>
<thead>
<tr>
<th>Training Scenarios</th>
<th>Generalization Scenarios</th>
<th>Verbal Expression</th>
<th>Facial Expression</th>
<th>Gesture</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The trainer places an iPad on the table, and says “Let’s sit on this chair and play with the iPad,” addressing the subject. The subject sits, the trainer hands the iPad to the subject and then takes the iPad away after the subject plays games for a few minutes.</td>
<td>1. The trainer places a (chocolate) cake on the table, and says “Let’s sit on this chair. Would you like some cake?”, addressing the subject. The subject sits, the trainer hands the cake to the subject and then takes the cake away as the subject tries to unwrap the cake.</td>
<td>“Give it back”</td>
<td>Frowning, scowling, pursing lips.</td>
<td>Extending hands to the person who took the object away, with palms facing upwards or inwards.</td>
</tr>
<tr>
<td>2. The trainer places the toy car (a remote-controlled car or one with lights and sounds) on the table, and says “Let’s sit on the chair and play with car. Let’s drive the car,” addressing the subject. After the subject plays with the toy car for a couple of minutes, the trainer takes the remote or the toy car away.</td>
<td>2. The trainer places an empty piece of paper and crayon on the table, and says “Let’s sit on the chair and draw a picture,” addressing the subject. The subject sits, the trainer hands the crayon to the subject and then takes the crayon away as the subject draws a picture.</td>
<td>“Don’t take it”</td>
<td>“Don’t take, give it to me”</td>
<td>Extending hands to the person who took the object away, with palms facing downwards, and pulling at their arms.</td>
</tr>
<tr>
<td>3. The trainer places two story books on the table, says “Let’s sit on the chair and read some books,” addressing the subject, and asks “Which one would you like to read?”, pointing to the books. The subject chooses a book, and the trainer gives the book to the subject. After the subject spends a couple of minutes with the book, the trainer takes the book away.</td>
<td>3. The trainer places two toys (sliced apple and cash register) on the table, says “Let’s sit on the chair and play,” addressing the subject, and asks “Which one would you like to play with?”, pointing to the toys. The subject chooses a toy, and the trainer gives the toy to the subject. After the subject spends a couple of minutes with the toy, the trainer takes the toy away.</td>
<td>“No, don’t take”</td>
<td>“No, give it back”</td>
<td>Extending one hand to the person who took the object away, pointing with the index finger to the object.</td>
</tr>
<tr>
<td>Training Scenarios</td>
<td>Generalization Scenarios</td>
<td>Verbal Expression</td>
<td>Facial Expression</td>
<td>Gesture</td>
</tr>
<tr>
<td>-------------------</td>
<td>--------------------------</td>
<td>------------------</td>
<td>------------------</td>
<td>---------</td>
</tr>
<tr>
<td>1. The trainer and the subject enter the room. The trainer says “Let’s play bowling, but first we need to set up the pins,” addressing the subject. The trainer and the subject together set up the pins, the trainer hands the bowling ball to the subject, and throw the ball to the pins. Let’s go, you throw first.” The subject takes the ball and knocks down the pins.</td>
<td>1. The trainer and the subject enter the room. The trainer says “Let’s play football, but first we need to set up a goal post,” addressing the subject. The trainer and the subject together set up the goal post, the trainer hands the ball to the subject, and says “We will stand by this line, and send the ball to the goal post. Let’s go, you kick first.” The subject takes the ball and sends it to the goal post.</td>
<td>“Yay, I did it.” “I made it.” “I won.” “Wow, I made it.”</td>
<td>Raising the eyebrows, crinkling the eyes, baring the teeth</td>
<td>Making one hand into a fist, raising the fist, and moving the fist upwards and downwards</td>
</tr>
<tr>
<td>2. The trainer and the subject enter the room. The trainer says “Let’s play darts,” addressing the subject. The trainer hands the darts to the subject, places the dartboard on the table, and says “We will throw darts to the dartboard, and try to score 100. You go first, let’s see if you can score a 100.” The subject takes the darts, and throws them at the 100-point section.</td>
<td>2. The trainer and the subject enter the room. The trainer says “Let’s play ring toss,” addressing the subject. The trainer hands the rings to the subject, and says, “We will stand by this line and try to throw the rings onto the stake. You go first, let’s see how many rings you can land on the stake,” pointing to the line. The subject takes the rings and tosses them at the stake.</td>
<td>“Wow, I won.” “Yes, I made it.” “Yes, I won.”</td>
<td>Making both hands into fists, raising the fists, and moving the fists upwards and downwards</td>
<td></td>
</tr>
<tr>
<td>3. The trainer and the subject enter the room. Once in the room, the trainer says “Let’s sit on the chair, we will play fishing. Let’s see if you can catch any fish.”, addressing the subject. The subject sits at the table and fishes.</td>
<td>3. The trainer and the subject enter the room. The trainer places two bingo cards on the table, says “Let’s sit on the chair and play bingo,” addressing the subject, and asks “Which card would you like?”, pointing to the cards. The subject sits at the table and chooses a card, and the trainer says “Let’s see if you can place all the pictures in the right places.” The subject places all the pictures in the bingo game in the right places.</td>
<td></td>
<td>Opening hands and arms so that palms face one another, and clapping</td>
<td></td>
</tr>
</tbody>
</table>
ing verbal reinforcers (e.g. “Well done.”), following a continuous reinforcement schedule. The procedure followed in baseline probe sessions was followed in daily probe sessions as well.

**Training sessions.** Training sessions were held twice a day, for 5 days a week. At least 45 min. had been interrupted between the two training sessions. Training sessions were held on a one-on-one basis. There were a total of six training videos, three for each of the affective states of happiness and anger. A total of six trials were made in each training session. Once the subjects met 50% of the criteria in training, trials in videos started to be presented in an unpredictable order in each training session. The intertrials intervals were 5 seconds.

In training sessions, the trainer and the subject sat side by side in front of the smartboard. Then, the trainer made a brief comment about the video in order to attract the attention of the subject to the video (e.g. “Now, we will watch a video with you. Look, there are two people. Let’s see what they are going to do.”). Then, the trainer played the video, and presented the target stimulus (e.g. “Uzay, please watch the video.”). The trainer had the subject watch all six trials in the video without any intervals. If the subject got distracted when watching the video, the researcher directed the attention of the subject to the images on the smartboard by giving an instruction (e.g. “Uzay, please watch the video carefully.”). When the subject watched the video carefully and made the correct responses, he was verbally reinforced.

Immediately after watching the video, the trainer created a setting in which the subject would have a chance to implement what the saw on the video. To attract the attention of the subject to the practice, the trainer presented discriminative stimuli (e.g. “Now we are going to play the game you have watched on the video, alright?”). The trainer initiated the interaction with the subject by presenting one of the discriminative stimuli to the subject (e.g. giving an iPad for the subject to play with for a while, and then taking it back) to elicit the appropriate social response behavior (facial expression, gesture and verbal expression). When the subject displayed the appropriate social response behavior within 5 seconds (e.g. frowning with an angry facial expression, shaking his hand at the researcher and saying “Don’t take.”), he was reinforced using verbal reinforcers (e.g. “Well done, you are great!”), following a continuous reinforcement schedule. In addition, because all of the discriminative stimuli used in training sessions were selected from among the favorite activities, games or toys of the subject, these discriminative stimuli also served as natural reinforcers for the subjects. Incorrect responses, on the other hand, were ignored. Focused and cooperative participation of the subject in the session was reinforced using verbal and social reinforcers at the end of the training session.

**Maintenance and generalization sessions.** Maintenance sessions were held 4 weeks, 6 weeks and 7 months after the criteria for target behavior were met. Pretest and posttest measures were used to evaluate whether the subjects generalized the skills that they have acquired. Generalization was evaluated with different people, settings, and contexts that were created using materials not included in the training sessions for teaching the target behavior. The procedure followed in probe sessions was also followed in maintenance and generalization sessions. Differently from probe sessions, reinforcement was faded, and focused participation by the subject was reinforced using verbal and social reinforcers at the end of the session only.

**Social validity.** A “Social Validity Questionnaire” was developed to examine the appropriateness of the methods used to teach the target behavior, and the significance of the results for the teachers and mothers of the subjects. Social validity data were collected using the subjective evaluation approach. The questionnaire for families contained a total of 10 questions. Of those, eight were closed ended and two were open ended questions. The questionnaire for teachers contained a total of nine questions, of which seven were closed-ended questions and two were open ended questions. The questionnaire for teachers contained a total of nine questions, of which seven were closed-ended questions and two were open ended questions. These forms were distributed to families and teachers in closed envelopes, and collected without asking the participants to identify themselves. Data from the questionnaires were examined using descriptive analysis (Schwartz & Baer, 1991).

**Reliability.** Inter-observer reliability and treatment integrity data were collected in at
least 20% of the sessions held during the experimental stage the study. Reliability data were collected by the trainer and by an independent observer, a PhD student in special education. Inter-observer reliability data were analyzed using the following formula: \((\text{Agreement/Agreement + Disagreement}) \times 100\) (Alberto & Troutman, 2013). Inter-observer agreement was 99.3%.

Treatment integrity data were analyzed using treatment integrity percentage, calculated using the following formula: “Observed trainer behavior / Planned trainer behavior \times 100” (Billingsley, White, & Munson, 1980). Treatment integrity data for the training sessions were collected on the basis of the following behaviors: (a) preparing the video to be played on the smartboard, (b) preparing the materials and arranging the room, (c) presenting the attention prompt for watching the video, (d) presenting the target stimulus (e.g., “Please watch the video.”), (e) having the subject watch the video, (f) reinforcing the watching of the video by the subject, (g) inviting the subject to the play area, (h) attracting attention by initiating interaction in an appropriate manner, (i) presenting the discriminative stimulus (toy or activity), (j) waiting for the response period (5 seconds), (k) reacting in an appropriate manner to the subject’s response, (l) having an interval between trials, and (m) reinforcing the subject’s participation. Treatment integrity was 98.6%.

Results

Effectiveness Results

An examination of the data on social response behaviors concerning the affective states of happiness and anger, target behaviors for Efe, Uzay and Eren to learn, showed that they did not display any correct responses in the initial stages. In the training stage, when video modeling was presented via smartboard, Efe, Uzay and Eren were observed to have a correct response rate of 100%. Data from maintenance sessions 4 weeks, 6 weeks and 7 months after the training showed that Efe and Uzay maintained the social response behaviors they learned with a 100% correct response rate, and Eren with an 83% correct response rate (see Figure 1).

Generalization Results

Generalization data were collected with different people, settings, and contexts that were created using materials not included in the training sessions for teaching the target behavior. Generalization data showed that Efe, Uzay and Eren were unable to display correct response behaviors in pretest generalization sessions. Data from the posttest session, on the other hand showed that Efe and Uzay were able to generalize their skills with a correct response rate of 100%, and Eren with a correct response rate of 83% (see Figure 1).

Instructional Data

Data from the training sessions showed that Efe and Eren learned the social response behaviors concerning the affective states of happiness and anger after 18 sessions, and Uzay learned them after 14 sessions. A total of 108 trials were made in training sessions with Efe and Eren until the criteria were met, and 84 trials in the case of Uzay. Training sessions with Efe lasted 3 hours, 57 minutes and 3 seconds in total, 2 hours, 31 minutes and 7 seconds with Uzay, and 3 hours, 49 minutes and 55 seconds with Eren. Efe and Eren acquired the target social response behavior after nine daily probe sessions, and Uzay after seven daily probe sessions. A total of 54 trials were made in daily probe sessions with Efe and Eren, and 42 trials with Uzay. Training sessions with Efe lasted 1 hour, 15 minutes and 1 second in total, 40 minutes and 41 seconds with Uzay, and 1 hour, 9 minutes and 51 seconds with Eren. Before reaching the criteria for the target behavior in training sessions, Efe gave 55 (49.07%) incorrect responses, Uzay gave 40 (44.61%) incorrect responses, and Eren gave 58 (53.70%) incorrect responses. In daily probe sessions, on the other hand, Efe gave 15 (27.7%) incorrect responses, Uzay gave 18 (42.85%) incorrect responses, and Eren gave 22 (40.74%) incorrect responses (see Table 3).

Social Validity Results

Parents’ opinions about the social validity of the study. Results of the study showed that all families were of the opinion that teaching
social response behaviors in the form of verbal expressions, gestures and facial expressions was very important for their children, and video modeling presented via smartboard in the teaching of these behaviors was effective. When talking about the aspects of the study that they liked, parents said that their children repeat what they learn at school in non-school contexts as well. Families talked about the changes they observed in their children after the training as follows: “He talks about his feelings in our activities, for example when we go to a park or mall.” “He started saying ‘I did it!’ after visiting the bathroom.” “He used to remain silent when his toy was taken away, now he started saying ‘No, don’t take!’”

Teachers’ opinions about the social validity of the study. All of the teachers said that teaching social response behaviors to their students and the use of video modeling presented via

![Figure 1. Percentage of correct responses in baseline, training, maintenance and generalization sessions.](image)

### TABLE 3

<table>
<thead>
<tr>
<th>Subjects</th>
<th>No. of Training Sessions/Trials</th>
<th>No. and % of Training Errors</th>
<th>Training Time h:m:s</th>
<th>No. of Daily Probe Sessions/Trials</th>
<th>No. and % of Daily Probe Errors</th>
<th>Daily Probe h:m:s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efe</td>
<td>18/108</td>
<td>53–49, 07%</td>
<td>03:57:03</td>
<td>9/54</td>
<td>15–27, 7%</td>
<td>01:15:01</td>
</tr>
<tr>
<td>Uzay</td>
<td>14/84</td>
<td>40–47, 61%</td>
<td>02:31:07</td>
<td>7/42</td>
<td>18–42, 85%</td>
<td>00:40:41</td>
</tr>
<tr>
<td>Eren</td>
<td>18/108</td>
<td>58–53, 70%</td>
<td>03:49:55</td>
<td>9/54</td>
<td>22–40, 74%</td>
<td>01:09:51</td>
</tr>
</tbody>
</table>
smartboard to this end were important for the education of their students. When talking about the aspects of the study that they liked, teachers said that they observed the children repeat what they learned in the classroom.

Discussion

This study examined the effectiveness of video modeling presented via smartboard for teaching children with autism about social response behaviors concerning the affective states of happiness and anger. In addition, social validity data in the form of subjective evaluations were collected from the parents and teachers of the subjects who participated in the study. In the following sections, various aspects of the study are discussed in light of study results, and recommendations are made for future studies.

In the relevant literature, a limited number of studies were found on the teaching of social response behaviors concerning the affective states of happiness and anger (Akmanoğlu, 2015; Axe & Evans, 2012; Charlop-Christy & Daneshvar, 2003; Gena et al., 2005), and a single study that aimed to teach all social response behaviors in the form of gesture, intonation, verbal and facial expression (Charlop et al., 2010). Results of the present study are consistent with the results of other studies on the teaching of social response behaviors. However, the previous study aiming to teach all social response behaviors (Charlop et al., 2010), social response behaviors were planned and taught without associating these responses with affective states or contexts related to these affective states. In the present study, on the other hand, differently from the previous study, different affective states and different people associated with the social responses, identified as important variables in the emergence of social responses, were examined. One of the strengths of the present study is that it teaches all of the behaviors related to the main deficits of children with autism in a holistic manner and in relation to different contexts. In addition, the results of this study contribute to the limited literature on the teaching of this skill (Charlop et al., 2010).

Seven months after the instruction of the subjects who participated in the study was completed, data were collected to see whether the social response behaviors concerning the affective states of happiness and anger were maintained. Results of the study showed that, 7 months after the instruction, all of the subjects maintained the behaviors they have learned. Results of the present study concerning maintenance are consistent with those of previous studies on the teaching of various social response behaviors to children with autism (Gena et al., 1996; Gena et al., 2005). However, the one study on the teaching of social response behavior in the form of both verbal and non-verbal behaviors does not report maintenance data (Charlop et al., 2010). Therefore, results of the present study on maintenance makes a contribution to this limited literature.

Results of the study show that social response behaviors concerning the affective states of happiness and anger, taught using video modeling, is generalized to different people, settings and contexts that are created using different materials. Results of the study are thus consistent with those of other studies in the literature (Charlop et al., 2010). However, an examination of the data on generalization in other studies shows that these studies did not evaluate the target behaviors by creating different social contexts. The present study, on the other hand, has evaluated generalization with different people, settings and social contexts created using materials not included in training; and by taking into account probable scenarios that the subjects may encounter in daily life. Given the problems experienced by children with autism concerning generalization (Neisworth & Wolfe, 2005), generalization sessions constitute another strength of the present study. In addition, results of the present study concerning generalization expand the existing results reported in the literature.

In terms of social validity, results of the present study showed that mothers and teachers of the children who participated in the study had positive opinions of the study. Charlop et al. (2010) collected social validity data from undergraduate students. In the present study, on the other hand, social validity data are collected from parents and teachers. In other words, the two studies collected social validity data from different sources. Neverthe-
less, both studies report similar social validity results. Collecting social validity data exclusively from the subjects that are the direct participants in the study is an important limitation, and collecting social validity data from parents and teachers of the subjects removes this limitation (Schwartz & Baer, 1991). Moreover, very few studies on the exclusive use of video modeling to teach social skills report social validity data (Acar & Diken, 2012). Thus, another contribution of the present study to the literature is that it collects social validity data from both parents and teachers.

Results of the present study on effectiveness, generalization, maintenance and social validity are positive, but there are a number of additional points that need to be considered. First, subjects who participated in the study were observed to display gesture and verbal expression behaviors in a more natural manner, but their facial expressions were more mechanic and it took longer to acquire this skill compared to the other skills. It is thought that subjects with higher degrees of autism, indicated by their GARS-2-TV scores, had more unnatural facial expressions, in the form of simple imitation and displaying a more mechanic expression. Diagnosis criteria in the literature show that children with higher degrees of autism need more support, particularly in the fields of social communication and interaction (APA, 2013; Kırcaali-İftar, 2013). Results of the study are thus consistent with other results in the literature. Second, results from the training sessions showed that Uzay reached the target criteria in a shorter amount of time compared to the other subjects. Even though Uzay’s GARS-2-TV score was higher than those of the other subjects, he also received a higher score on the Stanford Binet Intelligence, which might explain why he reached the target criteria faster. Deficiencies in the social affective development of children with autism are insufficient to explain affective deficits in autism; deficiencies in terms of cognitive development also hinder the social and affective development of children with autism (Baron-Cohen, 1988, 1989). Third, given that preparing individual videos is important in video modeling (Charlop et al., 2010; Murray & Noland, 2013), all of the discriminative stimuli used in training sessions were selected from among the favorite activities, games and toys of each subject. These discriminative stimuli, selected from among the favorite activities, games and toys of each subject, also served as natural reinforcers, which is among the strengths of the present study.

Limitations and Future Research

Results of the study in terms of reliability, effectiveness and social validity were positive, but the study had some limitations as well. First, of the social response behaviors, facial expression, gesture and verbal expression were studied, but intonation was not included in the study. Second, social response behaviors concerning only two affective states, those of happiness and anger, were studied. Third, an effort was made to create diverse and natural social contexts to elicit social response behaviors, but these contexts were not naturally occurring situations in daily life. A final limitation that training was not provided concerning cases where the trainer refuses to give back the object demanded by the child, even though he displays the social response behavior concerning the affective state of anger when his toy is taken away.

Future studies are recommended to hold training sessions to teach social response behaviors to autism with children in more natural settings. This study examined social response behaviors in the form of facial expressions, gestures and verbal expressions. Thus, future studies are recommended to include intonation among the social response behaviors taught. In addition, future studies can aim to teach social response behaviors concerning other emotions besides happiness and anger taught in the present study. Future studies could also provide training concerning cases where the trainer refuses to give back the object demanded by the child, even though he displays the social response behavior concerning the affective state of anger when his toy is taken away.

In conclusion, video modeling presented via smartboard was found to be an effective method for teaching children with autism about social responses in the form of gestures, verbal and facial expressions indicative of the affective state of happiness and anger. Researchers and practitioners working with individuals with autism are recommended to use
video modeling to teach social response behaviors and different affective states.

References


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Comparison of Individualized and Non-Specific Video-Prompts to Teach Daily Living Skills to Students with Autism Spectrum Disorders

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Abstract: Three elementary students with autism spectrum disorders (ASD) participated in this study, which compared video self-prompting using individualized videos and video self-prompting using non-specific videos. Video self-prompting involves students controlling video-prompts, which show shortened video clips of someone performing steps of a target skill. The student then performs individual steps of the skill before proceeding to the next video clip. An adapted alternating treatments design was used to compare individualized and non-specific video-prompts in teaching six daily living skills. Improvements were noted for both the individualized and the non-specific video-prompts for all three students and all six skills. All three students required a slightly higher number of sessions to meet 100% correct using the non-specific video-prompts than the individualized video-prompts. One student was able to maintain the target skills 2 and 4 weeks post-intervention without the use of video-prompts. Limitations of the study, suggestions for future research, and implications for educators are discussed.

Video modeling has been identified as an established, evidence-based intervention to teach personal responsibility skills to individuals with autism spectrum disorders (ASD) by the National Autism Center (Wilczynski et al., 2009). This intervention uses videos of a performer (e.g. teacher, peer, etc.) completing a target skill. Students are shown the entire video of the task performance and then asked to complete the skill independently. Video-prompting is a form of video modeling. Unlike traditional video modeling, video-prompting breaks the target skill into discrete steps for the student. Students watch clips of the video depicting the task sequence that is typically less than 30 seconds in length, and are asked to perform a step before the next step is viewed (Cannella-Malone et al., 2006).

Video-prompting is a promising instructional technique for individuals with ASD, particularly due to their deficits in short-term working memory (Poirier, Martin, Gaigg & Bowler, 2011; Williams, Goldstein, Carpenter, & Minshew, 2005). These deficits become more apparent as tasks become more complex (Minshew & Goldstein, 2001). When information is presented to students in small segments, it can be processed more effectively and efficiently (Minshew & Williams, 2008). Video-prompting allows students to gradually attain the steps required to perform the desired skill while demonstrating proficiency.

A recent review of the literature identified 12 studies that examined video prompting and daily living skills (Domire & Wolfe, 2014). Findings of the review showed that, although video-prompting is a promising intervention for teaching daily living skills to students with ASD, there are components of the intervention that still require more research. Some areas for needed research include: level of individualization, video self-prompting with error correction procedures, maintenance of target skills, and social validity.

Level of Individualization

Tailoring the level of individualization of video-prompts involves using similar stimulus components in the video as the natural envi-
environment for the student. These components include the setting where the target skill is performed, the materials used, and the model or participant. Incorporating these components into the video could improve student performance of the target skill. Bandura (1977) postulates the model of the video is an important factor in imitation, stating that the most effective models are similar to the students in terms of gender, age, and ability-level. Thus, according to Bandura’s theory, students will be more likely to attend to a video where the model was similar to themselves or if the student themselves modeled the behavior.

In addition to using a similar model, using similar materials and settings in video-prompts could have an effect on student performance. Individualizing these components in the video-prompts is a way of programming common stimuli. This technique could be essential for students with ASD, who have difficulty generalizing newly learned skills to settings, materials, and contexts that differ from training (Maurice, Green, & Luce, 1996). Traditionally, video-prompting relies on a “train and hope” technique; students are delivered instruction via videos that use different settings and materials and students are expected to transfer this knowledge to a different context.

Limited research exists on the effects of the level of individualization of video-prompts on student outcomes. The case for individualization with this intervention is of significant importance, due to the efficiency of creating video-prompts. Creating individualized videos could be time-consuming, and teachers have voiced concern about the time required to make video-prompts (Mechling, Ayres, Foster, & Bryant, 2013). This could affect the usability of the intervention. Individualization also brings up concerns regarding commercial video-prompts that are available as applications or computer software. If video-prompts must be individualized for each student, these commercial video-prompts may not be as effective. Research is needed to compare the effects of individualized video-prompts to traditional or non-specific video-prompts.

Mechling and colleagues (2013) addressed this need to compare individualized and non-specific videos by comparing the effects of commercially available and custom-made video prompts. Four high school males with autism participated in the study related to cooking skills. Results showed that although gains were made with both commercial and custom-made video-prompts, larger gains were noted with the custom-made (individualized) videos.

**Video Self-Prompting with Error Correction Procedures**

Allowing students to control video-prompts (referred to as video self-prompting), allows students to gain independence and reduce the need for external prompting from others. The majority of the studies centered on teaching daily living skills have focused on video-prompts controlled by a researcher or teacher, rather than the student controlling the prompts independently (Domire & Wolfe, 2014). Specifically, three studies (Bereznak, Ayres, Mechling & Alexander, 2012; Mechling, Gast, & Seid, 2009; Payne, Cannella-Malone, Tullis, & Sabelny, 2012) have looked at video self-prompting. Bereznak and colleagues (2012) found that three students with ASD between the ages of 15 and 18 performed an increased number of steps independently using video-prompting. Results showed that two of the three participants were able to self-prompt. Mechling and colleagues (2009) also found that students between the ages of 16 and 17 were able to self-prompt to complete cooking tasks. Payne, Cannella-Malone, Tullis, and Sabelny (2012) taught one 18-year-old student to video self-prompt.

Questions remain over real time error correction procedures for video self-prompting and video-prompting. Providing error correction ensures that the student learns to perform the skill correctly and does not practice the error itself. Two studies that formally compared error correction procedures (Cannella-Malone et al., 2011; Goodson, Sigafoos, O’Reilly, Cannella, & Lancioni, 2007) noted that error correction improved skill acquisition.

**Maintenance and Social Validity**

The literature on video-prompting offers mixed results on the maintenance of target skills after video-prompts are removed. Some studies have shown participants were able to retain the skills demonstrated in the video for up to...
10 weeks after the prompts were removed (Van Laarhoven, Kraus, Karpman, Nizzi, & Valentino, 2010; Van Laarhoven & Van Laarhoven-Myers, 2010). Other researchers have noted difficulty maintaining target skills during maintenance sessions (Bereznak et al., 2012; Sigafoos et al., 2007). The conflicting results of these studies raise questions about whether different components of video-prompts affect maintenance of target skills.

Social validity has been identified as a quality performance indicator for research studies using single-case design (Horner, Carr, Halle, & McGee, 2005). Domire and Wolfe (2014) found that social validity was consistently overlooked in the video-prompting literature. Only three studies formally looked at social validity measures (Mechling et al., 2009; Rayner, 2011; Van Laarhoven et al., 2010). This study aimed to examine areas of limited research in existing video-prompting literature including level of individualization, video self-prompting with error correction procedures, maintenance, and social validity. To address the level of individualization, the study compared non-specific video-prompts to individualized video prompts. Video self-prompting with error correction procedures was used to broaden the research in these areas. Maintenance data were collected to determine if students could maintain target skills and if the level of individualization of the video-prompts affected performance. Finally, social validity was formally addressed to offer insight into teachers’ perceptions of the intervention. The following questions guided the study:

1) What are the effects of individualized video-prompts and non-specific video-prompts on student performance when teaching daily living skills to elementary-age students with ASD?
2) What are the effects of video self-prompting with live error correction procedures on daily living skill acquisition?
3) What are the effects of the interventions on the maintenance of the target skill?
4) Do teachers view individualized and non-specific video-prompts as a socially valid and feasible intervention for their classrooms?

Method

Participants

This study focused on elementary-age students, a population previously underrepresented in the video-prompting literature (Domire & Wolfe, 2014). Three students with ASD participated in the study. An elementary classroom teacher who taught students with ASD in a suburban district nominated students that a) were unable to perform the target skill, b) had normal vision, c) had the motor skills required to navigate the video prompts using the touch screen of the iPad, d) would benefit from learning the target skill and improved independence, and e) hadn’t formally been taught the target skill.

Chris. Chris was an 11-year-old African-American male. Chris received speech and language therapy. The classroom teacher reported that Chris’s strengths included gross and fine motor skills, desire to participate, and complete activities independently. Areas for growth included increasing vocabulary and making requests, basic addition and subtraction skills, peer interaction, and word decoding. Chris’s preferred reinforcers were edibles, gross motor activities, and drawing.

Nolan. Nolan was a 12-year-old Caucasian male. Nolan received speech and language therapy and occupational therapy services. The classroom teacher noted that Nolan’s strengths included rote memory, peer interaction, and imitation skills. Areas for growth reported included improving expressive language skills, word decoding, verbal requesting, and independent daily living skills. Reinforcers that were commonly used with Nolan in the classroom were edibles, gross motor activities, and sensory activities.

Zack. Zack was a 10-year-old Caucasian male. Zack received speech and language therapy, as well as occupational therapy services. The classroom teacher reported that Zack’s strengths included memorization skills, sight word recognition, and appropriate behaviors. Areas for growth included verbal requesting, expressive language, word decoding, and independent living skills. Reinforcers commonly used with Zack were edibles, computer time, and time on a bike.
Setting
Baseline, intervention, and maintenance sessions were conducted in the students’ classroom in a suburban school. The classroom consisted of several different stations around the room, with six student desks in rows in the middle of the classroom. Sessions were conducted at a table in the back, left corner of the classroom. Sessions were conducted with each participant individually (i.e., one at a time).

Materials and Video-Prompts
An assessment was conducted prior to selection of the intervention skills. After the assessment, in which no instruction for completion of the task was given, six daily living skills were targeted for the intervention: folding a shirt, wiping the table, hanging a shirt, sweeping the floor, getting a drink of water, and setting the table. These skills were selected after the assessment showed that the participants were not able to complete the skills independently. They were also chosen because the topography, or form of the behaviors, were comparable; they all primarily involve basic arm and hand movements, grasping, and releasing. A task analysis revealed a similar level of difficulty and number of steps required to complete the six tasks chosen for the intervention. Each skill required a total of five steps. The steps for each skill are detailed in Figure 1. Materials needed to complete these skills were: a t-shirt, plastic bin, plate, cup, fork, knife, button-down shirt, hanger, broom, paper, dustpan, paper towels, cleaning spray, large bottle of water, and paper cup. Students used an Apple iPad to view the video-prompts using the Keynote application. Each video-prompt was presented on a single slide. An Apple iPhone and iMovie was used to create and edit both sets (individualized and non-specific) of video-prompts. Both sets of video-prompts were filmed using a spectator-based point of view. This point of view is filmed so that the viewer watches someone else performing the skill with their entire body as a model, rather than a performer-based point of view that uses hands and arms as the model being shown. Audio voiceover was used to state the directions for each step, and these steps were displayed in text along the bottom of each video. At the end of each clip, an icon representing “turn” was displayed, with the voiceover prompt of “your turn.” The two sets of video-prompts differed in terms of the model, “turn” icon, materials used, and setting.

**Individualized video-prompts.** The individualized video-prompts were customized for each student. Peers were used as models in the videos, so that each student watched a model that was similar in terms of age and race.
When the “turn” slide appeared on the individualized video-prompts, a picture of the student was shown on the slide with the student’s name included in the audio prompt (e.g. Nolan’s turn). The materials used in the individualized video-prompts were the same as the intervention setting. The setting for the individualized video-prompts also was the same setting where the students were asked to perform the target skill.

Non-specific video-prompts. The non-specific video-prompts used an unknown adult as the model. The model differed from the students in terms of age, sex, and appearance. At the end of each clip, the “turn” slide displayed a line drawing representation of the concept “turn,” with an audio prompt of “your turn.” The materials used for the non-specific video-prompts differed from the materials used in the intervention wherever possible (e.g. dishes used were different in terms of size and color, different brands of items were used, different clothes). The setting used for this set of video-prompts was a home environment unknown to the students.

Research Design

An adapted alternating treatments design (AATD) was used to compare the effects of the individualized video-prompts and the non-specific video-prompts. In this design, after the baseline phase is complete, the interventions are administered, and the effects on behavior are observed (Barlow & Hayes, 1979). The two interventions (individualized and non-specific) were counterbalanced across tasks and participants in order to minimize the risk of sequencing effects. The AATD is a comparison design that looks at the efficiency of interventions. Wolery, Gast, and Hammond (2009) define efficiency as having two dimensions: 1) the strategy reliably produces learning and 2) the strategy is superior to another strategy on an important dimension.

Procedure

When selecting participants, the classroom teacher was asked to nominate students that were familiar with the touch screen interface of the iPad. Prior to the baseline session, students were introduced to the iPad and Keynote application. Participants were not asked to locate this application on the iPad; Keynote was already open to the video-prompts during this session and all phases of the study. Students were shown how to move through the slides by sliding the screen and play the movie by pressing the arrow in the center. Participants were assessed on this skill by the researcher asking, “Show me the next slide” and “Play the movie.” During this session, the researcher also instructed the participant to perform each step after watching the video. Target skills were counterbalanced within and across participants for all phases of the study. Sessions were recorded using a laptop computer.

Baseline. No video-prompts were used during the baseline sessions. Participants were provided with the necessary materials to complete the task (e.g., plate, cup, knife, fork) and verbally prompted to complete the task (e.g., “Can you fold the shirt?”). If the student did not initiate the step within 10 seconds, the researcher provided the verbal prompt to complete the task again. If the student completed some of the steps but not all, the researcher asked, “Are you finished?” If the student responded “yes,” the session was ended. Data were collected on how many steps the students could complete independently, without any external prompting. Baseline data were collected for a minimum of five consecutive sessions or until the data was stable. Stability was defined as variability of less than 50% from the mean of the baseline (Alberto & Troutman, 1982). Students showed slightly higher than 50% variability with 2 of the 18 tasks across participants (i.e., Nolan’s task of wiping table, Zack’s task of getting a drink of water). Despite this higher variability, effects were still consistent across participants and across tasks.

Comparison. During the comparison phase, students were given the same verbal prompt as in the baseline phase. Each participant student was then presented with the iPad open to the video-prompts for that particular skill. The student clicked on the arrow in the center of each slide, watched the video, completed the step, and progressed to the next slide to watch the video of the next step. If the student played and watched the video, but did not initiate any of the steps after 10 seconds, the
researcher modeled the step. If the student played and watched the video, and began to perform the step incorrectly, the researcher interrupted the error and modeled the step. If the student played the video but didn’t look at the screen, the researcher prompted the student to watch the video again. If the student began to perform the step but didn’t complete the step within 30 seconds, the researcher modeled the step. Data were collected daily for 10 sessions and the number of sessions to reach 100% correct was compared across interventions.

**Maintenance.** Maintenance sessions were conducted two and four weeks after the intervention phases in the students’ classroom. The procedures for the maintenance sessions were the same as in baseline, with no video-prompts being available to the student. If the student did not meet the criteria of 100% accuracy on a target skill, they were reintroduced to the video-prompt set for that target skill.

**Dependent Variables and Data Analysis**

The main dependent variable in the study was the percentage of steps performed by the participant that were independently correct. Data were collected and analyzed across all conditions for this variable. Upon completion of all phases, the data were visually analyzed to compare changes of level and trend between the two sets of video-prompts. The average number of sessions to meet 100% correct also was calculated and compared across students and interventions. Finally, Nonoverlap of All Pairs (NAP) was calculated. NAP measures the nonoverlap or “dominance” between phases (Parker & Vannest, 2009). Another way to define NAP is “the percentage of data which improve across phases” (Parker, Vannest, & Davis, 2011, p. 312). NAP is calculated by comparing each baseline data point to each intervention data point. Each comparison is scored based on the level of overlap between the data points.

**Inter-Observer Agreement and Procedural Integrity**

*Inter-observer agreement.* Inter-observer agreement (IOA) was calculated for the percentage of steps completed independently. IOA was calculated by dividing the number of agreements by the number of agreements and disagreements and multiplying by 100 (Caro, Roper, Young, & Dank, 1979). A trained graduate student observed and scored 30% of randomly selected videos of across all phases. After completing the scoring, the researcher and graduate student compared scores to determine if and where any discrepancies existed. The average IOA across all participants was 97% (range: 90%–100%). There were slight variations in IOA between participants. Chris’s average IOA was 98% (range: 93%–100%), Nolan’s was 97% (range: 93%–100%), and Zack’s was 96% (range: 90%–100%).

*Procedural integrity.* The same graduate student also scored 30% of the videos for procedural integrity. A checklist was developed to ensure that the researcher followed all of the administration procedures across the baseline, intervention, and maintenance phases. Procedural integrity was calculated by dividing the number of procedural steps completed correctly by the total number of procedural steps and multiplying by 100 (Billingsley, White, & Munson, 1980). The average procedural integrity across all participants was 96% (range: 88%–100%). Chris’s average procedural integrity was 100%, Nolan’s was 94% (range: 88%–100%), and Zack’s was also 94% (range: 89%–100%). Variation between participants can be attributed to the increased number of opportunities to correct errors for Nolan and Zack.

**Social Validity**

Following the intervention, the classroom teacher was asked to complete a survey asking about her opinions and attitudes on the acceptability of the intervention, the outcomes, and the goals of the intervention. These three components have been identified as a necessary framework for assessing social validity (Wolf, 1978). The survey consisted of the following questions:

1) Would you use video self-prompting in your classroom? Why or why not?

2) Do you feel that your students benefited from their exposure to video-prompts? Why or why not?
3) Do you feel the goals (sweeping the floor, wiping the table, etc.) are social significant?
4) Do you feel the video-prompting intervention is accepted by society/families/peers as being an appropriate method for teaching?
5) Would you choose to use individualized or commercial/non-specific video-prompts in your classroom? Why?

Results

Results showed that students improved in the percentage of steps performed correctly across all six target skills using both individualized and non-specific video-prompts. Differences were noted amongst participants in terms of the degree of the percentage of increase in performance, and the maintenance of the target skills. All students required a fewer number of sessions to meet 100% correct using individualized video-prompts. Table 1 shows the students’ average performance across all phases and number of sessions to reach 100% correct for individualized and non-specific video-prompts. Table 2 shows the students’ average Nonoverlap of All Pairs for individualized and non-specific video-prompts between baseline and intervention phases.

### Table 1

<table>
<thead>
<tr>
<th>Student</th>
<th>Baseline (%)</th>
<th>Intervention (%)</th>
<th>Maintenance (%)</th>
<th>Sessions (#)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chris</td>
<td>42.7</td>
<td>94.7</td>
<td>97.7</td>
<td>1.3</td>
</tr>
<tr>
<td>Nolan</td>
<td>4.0</td>
<td>70.7</td>
<td>56.7</td>
<td>5.3</td>
</tr>
<tr>
<td>Zack</td>
<td>30.7</td>
<td>74.7</td>
<td>61.7</td>
<td>4.7</td>
</tr>
<tr>
<td>Average</td>
<td>25.8</td>
<td>80.0</td>
<td>72.0</td>
<td>3.8</td>
</tr>
</tbody>
</table>

#### Individualized Video-Prompts

<table>
<thead>
<tr>
<th>Student</th>
<th>Baseline (%)</th>
<th>Intervention (%)</th>
<th>Maintenance (%)</th>
<th>Sessions (#)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chris</td>
<td>17.3</td>
<td>90</td>
<td>93.3</td>
<td>3</td>
</tr>
<tr>
<td>Nolan</td>
<td>26.7</td>
<td>68.7</td>
<td>65</td>
<td>7.3</td>
</tr>
<tr>
<td>Zack</td>
<td>0</td>
<td>62</td>
<td>62.3</td>
<td>7</td>
</tr>
<tr>
<td>Average</td>
<td>14.7</td>
<td>73.6</td>
<td>73.5</td>
<td>5.7</td>
</tr>
</tbody>
</table>

#### Non-Specific Video-Prompts

**Chris**

**Individualized video-prompts.** Chris’s results can be seen in Figure 2. The target skills that Chris viewed using individualized video prompts were folding a shirt, hanging a shirt, and getting a drink of water. Using individualized video-prompts, the average number of sessions for Chris to reach 100% correct for the three target skills was 1.33 sessions. Chris’s average NAP from baseline to intervention phase for all three target skills using individualized video-prompts was 100%.

**Non-specific video-prompts.** The target skills that Chris watched non-specific video-prompts for included wiping a table, sweeping the floor, and setting the table. Using non-specific

### Table 2

<table>
<thead>
<tr>
<th></th>
<th>Individualized Video-Prompts</th>
<th>Non-Specific Video-Prompts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chris</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Nolan</td>
<td>100</td>
<td>93</td>
</tr>
<tr>
<td>Zack</td>
<td>96</td>
<td>96</td>
</tr>
<tr>
<td>Average</td>
<td>99</td>
<td>96</td>
</tr>
</tbody>
</table>
video-prompts, the average number of sessions for Chris to reach 100% correct for the three target skills was three sessions. Chris’s average NAP for skills taught using non-specific video-prompts was also 100%.

**Maintenance.** Two weeks after the intervention, Chris was able to maintain 100% accuracy for four of the six target skills without the use of video-prompts. When the video-prompts were reintroduced for the setting the table and getting a drink of water tasks, Chris’s performance increased. Four weeks after the intervention, Chris was able to perform all six target skills without the use of the video-prompts.

**Nolan**

*Individualized video-prompts.* Nolan’s results can be seen in Figure 3. The target skills that Nolan viewed using individualized video-
prompts were wiping the table, sweeping the floor, and setting the table. The average number of sessions for Nolan to reach 100% accuracy with individualized video-prompts was 5.33 sessions. Nolan’s average NAP for skills taught using individualized video-prompts was 100%.

Non-specific video-prompts. Nolan watched non-specific video-prompts for folding a shirt, hanging a shirt, and getting a drink of water. Using non-specific videos, the average number of sessions to meet criterion for Nolan was 7.33 sessions. Nolan’s average NAP for non-specific video-prompts was 93% (folding a shirt: 95%, hanging a shirt: 85%, getting a drink of water: 100%).

Maintenance. During the 2-week maintenance session, Nolan’s performance dropped sharply to baseline levels without the use of video-prompts. When the video-prompts were reintroduced, Nolan’s performance increased to 100% for wiping the table, hanging a shirt, and getting a drink of water. He reached 80% using the video-prompts for folding a shirt.

Figure 3. Percentage of steps performed correctly by Nolan across baseline, intervention, and maintenance phases for the individualized video-prompts (triangles) and non-specific video-prompts (circles). Target skills were counter-balanced in all sessions.
and sweeping the floor, and 60% for setting the table. At the 4-week maintenance session, Nolan again displayed a decrease in performance without the video-prompts, but upon reintroduction of the video-prompts, achieved 100% accuracy for all six target skills.

Zack

Individualized video-prompts. Zack’s results can be seen in Figure 4. The target skills that Zack viewed using individualized video prompts were folding a shirt, hanging a shirt, and getting a drink of water. The average number of sessions required for Zack to reach 100% correct using individualized video-prompts was 4.66 sessions. The average NAP for Zack using individualized prompts was 96% (folding a shirt: 100%, hanging a shirt: 88%, getting a drink of water: 100%).

Non-specific video-prompts. The target skills that Zack watched non-specific video-prompts

Figure 4. Percentage of steps performed correctly by Zack across baseline, intervention, and maintenance phases for the individualized video prompts (triangles) and non-specific video-prompts (circles). Target skills were counter-balanced in all sessions.
for included wiping a table, sweeping the floor, and setting the table. Using non-specific video-prompts, the average number of sessions for Zack to reach 100% correct for the three target skills was seven sessions. Zack’s average NAP for skills taught using non-specific video-prompts was also 96% (wipe table: 100%, sweep floor: 94%, set table: 94%).

Maintenance. Zack’s performance at the two-week maintenance session varied greatly. When asked to perform the skills without the use of the video-prompts, Zack’s performance dropped for all target skills, with some returning to baseline levels (hanging a shirt, sweeping the floor, setting the table). When the video-prompts were reintroduced, performance levels increased for all skills, with Zack reaching 100% correct for hanging a shirt, sweeping the floor, and getting a drink of water. During the 4-week maintenance session, Zack’s performance improved on most tasks. He completed one task without the use of video-prompts (setting the table) and met 100% correct with the reintroduction of the video-prompts for all tasks except for hanging a shirt (80% correct).

Social Validity

The classroom teacher stated that she would use video self-promoting in her classroom, noting that her students seemed very interested in the intervention and that in general they are sometimes more successful with video-based instruction than face-to-face instruction. She shared that she would choose to use individualized prompts rather than non-specific prompts, because she thought it would help her students become more successful. The teacher noted, however, that it would be more difficult and time-consuming to create the individualized video-prompts. When asked about the acceptability of the outcomes, she responded that she felt as though her students benefited and she could see their level of independence increase. The teacher shared that she also felt the goals and intervention were acceptable and appropriate, stating that the goals would help her students “be a more active participant in the community and become more independent at school and home.”

Discussion

The study aimed to expand the current literature on video-prompting by comparing the effects of the level of individualization on student outcomes, effects of video self-prompting with error correction procedures, maintenance of target skills, and social validity.

Level of Individualization

Adjusting the level of individualization of video-prompts can be viewed as a way of programming common stimuli, which may improve student performance (Stokes & Baer, 1977). Individualizing features of the model so that he or she more closely mirrors the student in terms of gender, age, and ability-level, may also help the student to imitate the skill (Bandura, 1977). This study compared the effects of individualized and non-specific video-prompts to determine if the level of individualization of the video-prompts affected student outcomes.

Using the components of efficiency defined by Wolery, Gast, and Hammond (2009), both interventions were shown to be efficient in terms of reliably producing learning. All students showed gains in performance with both individualized and non-specific video-prompts for all target skills. One student was able to reach 100% correct for all six skills. The other two students were able to reach 100% correct for five of the six target skills. All three students had high levels of NAP for both conditions (range: 93–100%), demonstrating little overlap between the baseline and intervention data.

Individualized video-prompts were more efficient than non-specific video-prompts when looking at the rapidity of learning; the mean number of sessions to reach 100% accuracy was higher for all six skills. The other two students were able to reach 100% correct for five of the six target skills. All three students had high levels of NAP for both conditions (range: 93–100%), demonstrating little overlap between the baseline and intervention data.
the current study did display individual differences in performance.

Chris. Chris's performance using the individualized and non-specific video-prompts was very similar. Chris did display a slightly higher increase in his mean level of performance from baseline to intervention using non-specific video-prompts (individualized: 52%, non-specific: 72.7%). This difference could be attributed to the fact that Chris displayed lower baseline averages for the skills taught using non-specific video-prompts, allowing him to show steeper gains in his performance level. The skill that Chris had the most variability with was setting the table, which was taught using non-specific video-prompts. The researcher noted that Chris (and others) struggled with this particular task due to steps 3 and 4, that required the student to either know directional terms (left and right) or imitate the video model. Imitating the video model in this scenario was challenging, due to the reversed image.

Nolan. Unlike Chris, Nolan had a slightly higher increase in mean level of performance from baseline to intervention using the individualized video-prompts (individualized: 66.7%, non-specific: 42%). This could again be attributed to lower baseline averages for the individualized skill set. One skill that Nolan did not reach 100% correct was sweeping the floor. This skill was taught to Nolan using non-specific video-prompts. Nolan struggled with two steps on this task, placing the shirt on the table with the buttons facing up and buttoning the buttons. Although the teacher reported that Nolan had above average fine motor skills, he often asked for help with this step. The inability to meet criterion on this task was likely due to skills deficits (fine motor), rather than the type of video-prompts being used. As Nolan watched the video for this step, he understood what was being modeled in the video, but didn’t have the skill set to complete the step. The level of difficulty for this task could have been too advanced for Nolan.

Zack. Zack’s mean level of performance from baseline to intervention was almost the same for individualized and non-specific video-prompts (individualized: 61.7%, non-specific: 62.3%). Like Chris, the skill that Zack struggled with the most was setting the table. Zack never met 100% correct for this skill, which could be due to difficulty with directional terms and concepts. Another reason Zack didn’t meet criterion could have been due to his absences; Zack was absent two of the 10 intervention sessions.

Effects of Video Self-Prompting with Error Correction Procedures

In addition to comparing individualized and non-specific video-prompts, this study sought to expand the research on video self-prompting with error correction procedures. Limited research exists on if students are able to control the video-prompts themselves, instead of a teacher or researcher navigating through the prompts. All three participants in this study were able to control the video-prompts, which mirrors results previous research (Bereznak et al., 2012; Mechling et al., 2009; Payne et al., 2009).

Although students were able to navigate the video-prompts independently, they often required external prompts to attend to the technology. The researcher noted that all three students required several external prompts (i.e., watch the video) to focus on the videos during the intervention phase. Van Laarhoven and Van Laarhoven-Myers (2006) also found that participants required external prompts to attend to the intervention package that included video-prompting. One explanation for the need for external prompts to use the technology could be the setting of the intervention. Sessions were conducted in the students’ classroom to mimic daily instruction, and classroom activities, peers, and objects in the room often distracted students. Future studies should consider using a setting free from distractions such as these until students become more proficient at self-prompting. Receiving external prompts, although not directed at the target skills themselves, decreases the level of independence for the students.

Error correction procedures were used to ensure that students learned to perform the skill correctly and did not practice the error itself. Error corrections procedures have been shown to improve skill acquisition (Cannella-Malone et al., 2011; Goodson et al., 2007). In this study, errors were interrupted and mod-
eled correctly throughout the intervention. Participants displayed a number of errors using both the individualized and non-specific video-prompts. Some students struggled with certain tasks (setting the table and sweeping the floor), indicating that the level of difficulty may not have been equal.

One of the most challenging aspects of using an adapted alternating treatments design (AATD) is the determination of skills of equal difficulty (Wolery et al., 2009). Skills in this study were selected due to the similar level of difficulty and number of steps required, but error patterns indicate that some skills may have been too advanced. Future studies can use one of the methods outlined by Wolery and colleagues (2009) to ensure behavior sets are equal in difficulty. These methods include: experimental evaluation of the difficulty, select behaviors from pools of responses where norms exist, conduct a logical analysis of the difficulty of the responses and discriminations required, ask experts to rate the difficulty, and evaluate participants’ performance on related behaviors. Adopting one of these methods may reduce the number of errors shown by participants.

**Maintenance**

Another dimension of superiority when comparing interventions is the extent of maintenance and generalization (Wolery et al., 2009). Only one student was able to perform the majority of target skills (five) at 2 and 4-week post-intervention sessions without the use of video-prompts. The other students were only able to reach 100% correct during these sessions with the use of the video-prompts. The level of individualization of the video-prompts did not affect student performance during maintenance sessions, with all students displaying similar results for target skills that were taught using individualized video-prompts as those taught using non-specific video prompts. The need for the reintroduction of the video-prompts for most students indicates that students were still prompt-dependent after the intervention phase.

Results on maintenance of target skills in the video-prompting literature offers mixed results. Some researchers have found that students were able to maintain the skills post-intervention (Sigafoos et al., 2007; Van Laarhoven & Van Laarhoven-Myers, 2010; Van Laarhoven et al., 2010). Others have found similar results to this study, wherein students were unable to maintain skills without the use of video-prompts (Bereznak et al., 2012; Mechling et al., 2009; Sigafoos et al., 2007). This could be due to the abrupt removal of prompts without systematically fading the support for students, the reinforcing nature of using the technology, or skill deficits. Future research should consider systematic fading measures for the videos or an introduction of supplementary visual supports.

Another possible barrier to maintenance of the target skills is the reinforcing nature of the technology. One student in this study (Chris) demonstrated that he was able to perform the target skills without video-prompts; however, he asked for the videos for every skill during maintenance sessions. This behavior could show that the act of watching the videos is reinforcing to the student, even after mastery of the steps has been achieved. Although informally addressed, Bereznak et al. (2012) reported that the participants demonstrated interest in the portable technology used, “boasting” about using the iPhone to teachers and family members. This interest in the technology could make fading video-supports challenging.

**Social Validity**

The classroom teacher was asked a series of questions about the acceptability of the goals, intervention, and outcomes of the study; she responded favorably to all three components. The level of individualization (individualized vs. non-specific) required for students to be successful in learning skills using video-prompting has important implications for the feasibility of the intervention. If students are able to acquire the target skill with the same or similar results for both types of videos, teachers may be more likely to use the intervention. In addition to assessing teachers’ perceptions on the intervention, future research should include the attitudes and opinions of students and peers.
Limitations

One limitation of this study is that two of the students had prior exposure to video self-prompting (Chris and Nolan). This previous experience could have affected their performance navigating through the video-prompts. It should be noted, however, that Nolan performed similarly (in terms of number of sessions to meet 100% correct) to Zack, who had no prior exposure to video-prompts.

Another threat to interval validity for this design is multi-treatment interference due to comparison of two interventions. This may be true for this study because interventions were administered on the same day. Alternating sessions by day and probing a control group may help minimize multi-treatment interference (Wolery et al., 2009).

Implications for Educators and Future Research

In an era where technological resources are accessible in seconds, it is important that educators and researchers assess their efficiency and effectiveness related to teaching needed skills. Research has shown video-prompting to be an effective method for teaching a variety of skills, including daily living skills. When interpreting the results of these studies, however, there are several considerations for both teachers and researchers.

Teachers should consider the strengths and weaknesses of their students before beginning video-prompting methods. Video self-prompting may also be best suited for students that don’t have trouble focusing on a task, as external prompting was necessary to use technology. Teachers also should consider their students’ strengths and weaknesses when selecting the target skills that will be addressed using video-prompts. Certain skill deficits such as fine motor delays may limit the results of the intervention.

Further research is needed on video self-prompting in a number of areas. Replication studies should be conducted to better understand the effects of individualized and non-specific video-prompts. In addition, more research is needed that examines maintenance techniques and prompt-fading procedures. While this study and Mechling and colleagues (2013) both showed individualized video-prompts to be slightly more effective, neither study can identify which components of the individualized study affected performance. Research should be conducted that isolates components of the individualized video-prompts (e.g., setting, materials, model) to determine if certain components affect results more than others.

References


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Improvements in Proxy Individualized Education Program
Meeting Participation among Latino Parents

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Abstract: Although expected to be equal partners in the special education process, parents of children with disabilities often struggle to participate in individualized education program (IEP) meetings. Specifically, Latino parents of children with autism spectrum disorder (ASD) face systemic barriers occluding their participation and advocacy in IEP meetings. In this study, 22 Latino parents of children with ASD participated in an advocacy training. Before and after the advocacy training, participants read and responded to a proxy IEP transcript designed to gauge their participation and advocacy in IEP meetings. After completing the advocacy training, participants demonstrated significant increases in the number of words used, turns taken, and appropriate, advocacy comments. Implications for research and practice are discussed.

1. Introduction

The Individuals with Disabilities Education Act (IDEA, 2004) encourages all families to actively participate in Individualized Education Program (IEP) meetings. Unfortunately, it seems that parents rarely participate in IEP meetings. For example, in an examination of the participation of IEP team members, Martin and colleagues (2006) used momentary time sampling to determine the intervals in which parents spoke during IEP meetings. They reported that parents of children with disabilities spoke in only 15% of the recorded intervals of the meetings. Although this study did not disaggregate by race, other research indicates that Latino families are less likely to participate in IEP meetings due to systemic barriers. In a review of the literature about culturally and linguistically diverse (CLD) families including Latino families, Jung (2011) identified several barriers to CLD parent participation in IEP meetings, including lack of effort by the school to engage the family, negative school attitudes toward CLD families, and disparate communication styles between the school and the family. Notably, the lack of parent participation does not mean that CLD families are not interested in the education of their children. Instead, it seems that, compared to White families, CLD families are more involved in planning for their children with disabilities with the exception of school-based planning (e.g., transition planning; Geenen et al., 2001).

Advocacy programs tailored for Latino families may enable families to participate in IEP meetings and advocate for their children with disabilities to receive appropriate services. Given the needs of parents of children with disabilities, special education advocacy programs are becoming increasingly common across the United States (Burke, 2013). However, to date, there are few advocacy programs available in Spanish for Latino families (Cohen, 2013). Specifically, few advocacy programs exist for Latino parents of children with autism spectrum disorder (ASD) even though Latino families of children with ASD (versus other types of disabilities) may encounter greater difficulties in participating in IEP meetings and Latino (versus White) families are more likely to lack information about ASD.
and relevant services (Mercadante, Evans-Lacko, & Paula, 2009). The purpose of this pilot study was to examine responses to a proxy for participation and advocacy in IEP meetings among Latino parents of children with ASD who participated in an advocacy program. Specifically, we created an IEP transcript (i.e., a proxy) that parents completed before and after participating in an advocacy program. In the transcript, we asked parents to indicate where (if it all) they would comment during IEP meetings and what their comments or questions would be. Participation was defined broadly as any type of communication in the IEP transcript (Goldman & Burke, 2017); advocacy was defined as communication intended to act on behalf of the best interest of the child (Alper, Schloss, & Schloss, 1996).

Latino families face many barriers in the special education process. Hughes and colleagues (2002) conducted a mixed methods study with 44 Latino families to examine how they perceived special education and their involvement in the school. Families reported that they did not have sufficient support during IEP meetings and lacked accessible information to understand their rights. In a similar study, Shapiro and colleagues (2004) conducted an interview study of 19 low-income Latina mothers about their relationships with the educational and service delivery systems. Parents reported negative experiences with the school because of limited availability of resources to understand the IEP process and language barriers. Reasons for little parent involvement could also relate to school perceptions. Indeed, parent participation may be minimal because schools report that Latino families are not credible sources of information (Spann, Kohler, & Soenksen, 2003). Due to such barriers and biases, Latino families may be cautious about sharing their child’s personal information with educators (Cartledge et al, 2002).

Further barriers may relate to language. For example, most special education documents are only available in English making it difficult for Spanish-speaking parents to participate in IEP meetings and to advocate for their children (Shapiro, Monzo, Rueda, Gomez, & Blacher, 2004). Having an interpreter at an IEP meeting may help increase parent participation and advocacy by overcoming the language barrier. However, an interpreter may also introduce challenges. Latino families may view the interpreter as an “alliance with the school” (Harry, 1992, p. 182). As hired school personnel, the interpreter may have a vested interest in siding with the school making Latino families feel distrustful about expressing their concerns. Perhaps because of such barriers, Latino families are often relegated to listening roles (Hughes, Valle-Riestra, & Arguelles, 2002).

Increasing Latino parent participation in IEP meetings is insufficient; it is also necessary to increase parent advocacy during these meetings. IDEA has an expectation for parents to advocate (Harry, 2008). However, the expectation of advocacy may conflict with a family’s beliefs. Further, the expectation for advocacy may not be met because of systemic barriers. Latino parents may not be passive but rather deliberative as they are trying to navigate an unfamiliar system without being confrontational (Hatton & Correa, 2005). As such, some Latino parents may appear less assertive and more reliant on the school to make educational decisions (Olivos, 2009). Further, economic and cultural conditions may also contribute to less advocacy among Latino families (Kummerer & Lopez-Reyna, 2009). For example, Latino parents may lack needed transportation to attend IEP meetings (Leiter & Krauss, 2004).

Given the low rates of parent participation in IEP meetings and systemic barriers to advocacy among Latino families, it is important to have advocacy trainings to empower and educate parents. In this pilot study, we examined the Latino Parent Leadership Support Project (LPLSP), a 36-hour advocacy training for Latino families of children with ASD (Burke, Magaña, Garcia & Mello, 2016). We examined parent participation and advocacy in IEP meetings via a proxy measure for an IEP meeting transcript using a single-arm design (i.e., group design without a control group); participants completed the proxy before and after participating in the LPLSP. Our research questions were two-pronged: (1) Using a proxy measure for parent participation, does the LPLSP increase the number of words used and turns taken in IEP meetings of Latino, Spanish-speaking families of children with ASD?; and (2) Using a proxy measure for parent advocacy, does the LPLSP increase the appropriate responses in IEP meetings of
Latino, Spanish-speaking families of children with ASD?

Method

Participants

There were 22 participants in this study. On average, participants were 37.71 years of age (SD = 5.56, ranging from 28 to 49 years of age). Children of the participants were, on average, 8.32 years of age (SD = 4.15, ranging from 3 to 17 years of age). Inclusionary criteria required that the participants be: (1) Latino, Spanish-speaking (but can also speak English); (2) older than 18 years of age; (3) willing to participate in the 36-hour LPLSP; and (4) a family member of an individual with ASD. The ASD diagnosis was confirmed by the Social Communication Questionnaire (SCQ; Berument, Rutter, Lord, Pickles, & Bailey, 1999). The SCQ is a 40 item, binary-scaled screening instrument for ASD. The sensitivity and specificity of the SCQ have been proven to accurately identify children with ASD (Chandler et al., 2007; Corsello et al., 2007). As indicated by the SCQ, all participants had children who met the cutoff for an ASD diagnosis. See Table 1 for descriptive information about the participants.

Recruitment

To recruit participants, we collaborated with several community-based organizations (CBOs) with reputations of serving Latino families of children with ASD. By collaborating with CBOs, we ensured that the LPLSP and associated research was relevant to the participants (Magaña, 2000). For example, we collaborated with a support group which provided training, education, and support for 450 Latino parents of children with ASD in the Chicagoland area. We also collaborated with a Parent Training and Information Center. CBOs distributed flyers and e-blasts about the LPLSP. In addition, we distributed flyers and recruitment e-mails to every church and clinic in the Chicagoland area. Information about the LPLSP and associated study was also disseminated via Spanish media outlets (i.e., newspapers, radio stations). Notably, the research coordinator (who was Latina and a native Spanish speaker) was the primary person who conducted recruitment efforts and interacted with participants.

To encourage interested individuals to participate in the LPLSP, several incentives were offered. For example, food was available at each session. In addition, a small travel stipend ($24) was offered to each individual participant. The stipend was intended to help cover travel and childcare fees. During the

<table>
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*Proficiency was rated on a four point Likert scale ranging from 1 (poor) to 4 (excellent).
LPLSP, prizes (i.e., premios) were offered to participants as incentives to attend and participate in the LPLSP. At the end of the LPLSP, the participants received a certificate and a graduation party was held.

**LPLSP**

The LPLSP (Puente & Castillo, 2015) is a 36-hour training across nine sessions (i.e., 4 hours per weekly session). The purpose of the LPLSP is to enable family members of individuals with ASD to become advocates for their own children as well as other families of children with disabilities. The LPLSP was developed and facilitated by two Latina parents of children with disabilities; both parents worked at the Parent Training and Information Center. The LPLSP had an interactive format which included small group activities, games, and role-playing. For example, the facilitators developed and used games (e.g., bingo) to teach special education policy and advocacy to the participants. The LPLSP also had a strong emphasis on empowerment. For example, participants provided short presentations describing the present levels of performance and goals for their children. At the conclusion of the LPLSP, participants gathered in small groups to report what they learned from the training. The LPLSP occurred on weekday mornings in Chicago.

The content of the LPLSP included: special education jargon, the roles and responsibilities of IEP team members, the needs and disability of the child, ways to communicate the child’s needs to the school, strategies to participate in IEP meetings, timelines for evaluations, and questions to ask school personnel. For example, regarding communication, participants were instructed that they could request an interpreter and all materials in writing (i.e., documentation) from the school. In relation to roles and responsibilities, the participants were taught that schools cannot demand that children take medication. Further, the participants learned how to access more services for their children with ASD. The emphasis on accessing more services was based on the premise that Latino (versus White) children with ASD receive significantly less services and have higher unmet service needs (Magaña, Lopez, Aguinaña, & Morton, 2013). The LPLSP also highlighted ABA services as the literature indicates that families, including Latino families, of children with ASD struggled to receive ABA services from the school (Decker, 2012; Mueller & Carranza, 2011).

**Treatment Fidelity**

At each session, the research coordinator completed a treatment fidelity checklist developed for this project. Prior to the LPLSP, the first author trained the research coordinator to collect fidelity data. If a treatment component was given, the research coordinator checked “yes” on the checklist. The research coordinator collected treatment fidelity data for each session. For inter-rater reliability, the first author also conducted treatment fidelity for 77.78% (n = 7) of the sessions. Inter-rater agreement was 95.45%. Fidelity to the curriculum was 90.91%.

**Measure**

For this study, we created a proxy for an IEP meeting transcript (hereafter referred to as “transcript”). The transcript was a case example of an IEP meeting. The transcript included a general education teacher, special education teacher, case manager, and speech and language therapist. For families of children with ASD, most of the struggles with the school relate to the receipt of applied behavior analysis (ABA) services (Cohen, 2012; Decker, 2012), and previous studies have indicated that Latino families of children with ASD also want ABA services for their children (Burke & Sandman, 2015; Magaña, Parish, & Son, 2015). Thus, the transcript focused on the receipt of ABA services with the school refusing to provide ABA to the child. The first author developed the transcript based on the literature (e.g., Decker, 2012; Magaña et al., 2015) as well as her personal experiences as the relative of someone with a disability and her professional experiences as a special education teacher and ABA therapist. Two attorneys, six advocates, and six Latino parents of children with ASD then reviewed the IEP transcript. The first author incorporated their suggested changes. The transcript was piloted with two Latino parents of children with ASD; minor revisions were made.

Along with the transcript, the authors cre-
ated an answer key with expected advocacy responses. These responses reflected advocacy actions to be taken during the IEP meeting. In total, there were 10 expected responses throughout the transcript. The expected responses included: introducing one’s self as the parent; asking for the interpreter to be present; asking for summer services; requesting additional services; stating that medication is not a school decision; requesting a behavioral plan; requesting compensatory services; requesting data from the school; requesting ABA services, and requesting decisions in writing. For example, one way to qualify for extended school year services is by regression and recoupment. When a student has the potential to regress over an extended period of time and to take a long time to recoup the skills that were lost, the student may qualify for extended school year services. Thus, in the IEP transcript, when the teacher remarks that the child may regress over the break, the parent should request extended school year services. After creating the answer key, Latino parents of children with ASD, advocates, and attorneys reviewed the answer key and made small corrections.

Procedure

This study was approved by the Institutional Review Board. It was important to ensure that all of the materials and measures were accurately translated. Thus, all materials, including the IEP transcript, were translated in Spanish using the translation/back translation method (Brislin, 1970). Three research assistants, all native Spanish-speakers, translated the curricular materials and measures that were not already available in Spanish. All of the materials and measures were then back translated by native Spanish-speakers to ensure their accuracy.

Participants completed a demographic questionnaire. After completing the demographic questionnaire, participants were given the transcript. In the transcript, participants were able to add comments, questions, or other text indicating where they would participate or advocate in an IEP meeting. Participants completed the transcript before the first LPLSP session (i.e., the pre-transcript) and again after completing the last LPLSP session (i.e., the post-transcript). Notably, the pre- and post-transcript was identical so that we could gauge change using the same measure.

The participants were asked to write their responses in the transcript. Participants were also told that, if they would not typically respond to the dialogue in the transcript, they can leave the transcript blank (i.e., leave blank space). Participants had ample space to write their responses throughout the transcript. See the Tables 2 and 3 for a copy of the transcript in English and Spanish respectively.

Analyses

For the first research question, the first and third authors independently counted the number of responses and words written for the pre and post IEP transcript of each participant. The authors had the same counts of responses and words. Then, the first author conducted t-tests to determine whether the pre/post IEP transcript had significant differences. Effect sizes were calculated using Cohen’s d. Consistent with this study, in a meta-analysis of parent involvement studies, Goldman and Burke (2017) found that previous studies similarly defined parent participation by the frequency of comments made by parents.

For the second research question, the second and third author independently read the responses and compared them to the answer sheet. Individually, they recorded the correct responses for each pre and post transcript. Then, the first author reviewed their responses, conducted kappas for reliability, and noted any discrepancies. For the pre IEP transcript, the kappa was .56. For the post IEP transcript, the kappa was .67. Thus, the kappas were in the moderate to substantial range (McHugh, 2012) indicating a high degree of agreement. For discrepant responses, the authors met to discuss the responses and came to an agreement.

Validity

To determine whether the IEP meeting transcript would accurately reflect responses during an IEP meeting, we held a mock IEP meeting during the LPLSP. In this meeting, each participant held a different role (i.e., special education teacher, general education teacher, case manager). The mock IEP meeting was held toward the beginning of the LPLSP so as to accurately reflect the responses of the par-
Results

Words Used and Turns Taken

With large effect sizes, participants increased their number of words in the IEP transcript from 24.81 to 76.50 ($p < .001$). Specifically, 18 participants increased their number of words, two participants had the same number of words, and two participants had fewer words. Also, participants increased the number of times they would speak in an IEP meeting (i.e., responses or turns taken) from 1.86 to 5.18 ($p < .001$). Specifically, 15 participants increased their turns taken, three participants had no change, and four participants had fewer turns taken. See Table 4.

Appropriate, Advocacy Responses

Participants demonstrated significant increases in the number of appropriate responses with a
medium effect size ($ES = .42$). Out of 22 participants, 15 participants increased their number of appropriate responses and seven participants demonstrated no change in their responses. Participants demonstrated the greatest increases of appropriate responses for: requesting ABA services and requesting more services in general. Specifically, 12 participants made increases in requesting ABA services and 11 participants made increases in receiving services in general.

For two responses, there were no increases in correct answers; these responses included asking for an interpreter and requesting the school’s decision in writing.

Regarding requesting ABA services, in the post-transcript, participants justified their requests by writing that ABA services would enable their children to forge educational progress. For example, Leticia, the mother of a 4-year-old son, Jeison, requested ABA services. She wrote:
Como ustedes deben saber, el sistema de terapia ABA es una terapia estructurada y constante. Creo que mi hijo Jeison se vería muy beneficiado de esta terapia. Por lo que insisto en que Jeison debería recibir esta terapia.

As you probably already know, the system of therapy, ABA is a very structured and constant form of therapy. I think my son, Jeison, would benefit from this kind of therapy. For this reason, I insist Jeison should receive this therapy.

Similarly, Francisco requested ABA services for his 8-year-old son. In English and in response to the school denying his son ABA services, Francisco wrote:

I do not agree with this decision and I do not think I will sign any paper until you reevaluate my child. I think that you are not taking my opinion into account with respect to my child. You have not properly evaluated my child.

Eva, the mother of an 11-year-old daughter with ASD, justified her request for services due the lack of progress of her daughter. Eva wrote:

Yo creo que mi hija sí necesita ABA terapia dado que no está haciendo progreso.

I think my daughter needs ABA therapy since she is not making progress.

Regarding receiving more services in general, in the post-transcript, participants requested that the school provide other services to enable their children to make educational progress. For example, Brenda, the parent of a 7-year-old son with ASD, wrote the following in English:

I do not agree that ABA services and speech therapy should be taken from my child. Can you do a re-evaluation? I believe that my child cannot be left without speech therapy since he could lose what he already learned. I do not agree that my child can stay without speech therapy.

To a lesser extent, participants also increased their number of correct responses with respect to stating their children should receive compensatory services ($n = 8$), stating that services should be provided by the school instead of encouraging medication ($n = 6$), and stating that the child needs a behavioral plan or services to address behavior ($n = 5$). Regarding compensatory services, in the post-transcript, eight participants wrote that their children were entitled to compensatory services in response to not receiving the IEP-required number of speech therapy minutes. For example, Leticia, in addition to requesting ABA, also requested that the school provide the needed speech services to her son, Jeison:

Entiendo que la carga de trabajo del personal es mucha; sin embargo, lo que está escrito en el IEP de Jeison refleja sus necesidades, y no solo lo que nos gustaría que el recibiera. Si mi hijo necesita este servicio dos veces por semana, es ese tiempo el que debe de recibir. Por favor tenga la confianza de decirme en qué puedo ayudar para que esto sea posible.

I understand that the workload of the school personnel is heavy; however, what is written in Jeison’s IEP reflects his needs, and not what we would like for him to receive. If my son needs these services twice a week that is the amount of time my child should be receiving them. Please, have the confidence to tell me what I can help you with in order to make this possible.

Regarding medication, parents reported that the school should provide services rather than

<table>
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<tr>
<th>Pre</th>
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<th>$t$</th>
<th>$p$</th>
<th>Effect Size (ES)</th>
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<td>Number of Words</td>
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<td>76.50 (54.09)</td>
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<td>.001</td>
</tr>
<tr>
<td>Number of Responses</td>
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<td>5.18 (3.44)</td>
<td>-5.08</td>
<td>.001</td>
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<td>Correct Responses</td>
<td>.95 (1.43)</td>
<td>2.59 (2.03)</td>
<td>-3.96</td>
<td>.001</td>
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</table>
suggest medication. Notably, none of the parents stated that the school was not entitled to recommend medication. Gabriela, the parent of a 7-year-old daughter with ASD, wrote (in English):

I disagree with that assumption. Again, she doesn’t behave this way at home. Medication is not an option I am going to look into. Medication is like putting a band-aid on the issue. Therapy can help better than any med.

Also in the post-transcript, five participants requested that their children receive services or a plan to address problem behaviors. For example, Teresa, the parent of a 3-year-old son, in English, wrote: “You mentioned problems with my child’s behavior here at school. Then, what do you suggest to do to help him?”.

Finally, in the post-transcript, five participants introduced themselves at the beginning of the meeting, three participants requested extended school year services, and three parents informally requested seeing school data. Regarding introductions, participants wrote their name and role at the beginning of the IEP meeting (e.g., “I am Teresa. The parent of Adrian.”). Three parents requested educational services over the summer. Rosa, the parent of a 4-year-old son, wrote:

Si cree que mi hijo tuvo una recaída por no estar en la escuela. ¿Sugieren que vaya a escuela de verano?

I believe that my son relapsed because the school is not giving services. Should he go to school in the summer?

Notably, participants did not use the term “extended school year services”; however, participants did often reference regression and, subsequently, requesting summer school services. Three parents also, informally, requested the data of the speech language therapist. For example, Silvia—the parent of a 3-year-old—in English, wrote “Could you show me a chart of what level the child is on?”. Similarly, Francisco wrote “On what can you base to say that my child has progressed?”. Ana Maria, the parent of a 10-year-old son, wrote, “I want to know what advances my child has made during therapy.”

Discussion

In summary, we examined parents’ participation and advocacy responses to an IEP meeting transcript before and after participating in an advocacy training. There were two main findings. First, the majority of parents demonstrated greater IEP participation and more frequent advocacy at the end of the advocacy training. Other research has similarly documented positive effects of advocacy training including increased knowledge and comfort with advocacy skills (Burke et al., 2016) and empowerment (Magaña et al., 2015).

The second finding was that while participants made comments about advocacy actions, their comments were more informal and less assertive than may be typical in advocacy (Burke & Goldman, 2017). For example, regarding medication, participants encouraged the school to consider other options than medication. However, a stronger advocacy response would be to state that IDEA 2004 prohibits schools from mandating medication and, as such, medication should not be suggested by the school in an IEP meeting. The less assertive response about medication may be due to cultural differences about treatment. Compared to other cultural groups, Latino families of children with ASD are six times more likely to use non-traditional treatments (Levy, Mandell, Merhar, Ittenbach & Pinto-Martin, 2003); thus, it could also be that the reaction about medication is related to cultural beliefs about treatment.

The more informal and less assertive responses of the participants may be due to several, other reasons. For example, even though the participants attended an advocacy training, there are still ongoing systemic issues including a lack of cultural responsiveness in the school (Klingner et al., 2005), inaccurate interpreters (Hughes et al., 2002), absence of documents in Spanish (Shapiro et al., 2004), and limited accessibility of resources about parent rights (Mercadente et al., 2009; Shapiro et al., 2004). The lack of accessible resources may restrict the ability to use more formal or precise language in IEP meetings. Further, the lack of participants requesting interpreters and documentation from the school may be due to believing interpreters
align with school (Harry, 1992) and being unable to access documents written in English (Shapiro et al., 2004), respectively. Regarding the latter, the participants reported that they had “poor” ability to read in English; without being able to access the information in their language, the participants may have decided it was not worthwhile to request documentation.

Future Directions for Research

A next step for research is to confirm the findings of this study. Specifically, it is necessary for researchers to actually observe and record IEP meetings to have an empirical understanding of the participation and advocacy of Latino parents. Observational data of IEP meetings would help document the participation rates and advocacy actions of parents before and after completing an advocacy training. Also, by observing and recording IEP meetings, future research can better assess other aspects of parent participation such as volume, inflection, and type of responses (e.g., questions or statements). With observations, researchers could also qualitatively analyze the dialogue of IEP meetings to identify themes. Along with the observations, it would also be helpful to have social validity measures to determine participant perspectives about the LPLSP including the mode of the LPLSP and measures to gauge their participation and advocacy in IEP meetings. By conducting observations of IEP meetings, the type and frequency of parent participation and advocacy can be better understood.

Additionally, if future studies do use a proxy for parent participation and advocacy in IEP meetings, it is important to determine generalization and maintenance of effects. Specifically, it is important to discern whether the increases made in participation and advocacy by the participants generalize to actual IEP meetings with the school. It is also important to determine whether these effects maintain over time. Since this study had participants immediately conduct a proxy for parent participation and advocacy, it is unclear whether the effect on parent participation and advocacy would be sustained after time passed from the training.

Implications for Practice

Given that many parents want to be involved in IEP meetings, practitioners may consider ways to increase parent participation. Specifically, teachers may be able to educate and empower families to increase their participation in IEP meetings. Instead of placing the onus on parents to attend trainings, teachers may be able to incorporate strategies to facilitate parent participation. For example, Holdren and colleagues (2016) conducted a study wherein they trained pre-service special education teachers to facilitate parent participation in IEP meetings by using actors and conducting simulated meetings. If teachers used family-friendly strategies, parent participation may increase.

In addition to school practitioners, coordinators of advocacy programs may consider identifying and improving advocacy trainings. Although most participants demonstrated significant increases in the number of appropriate, advocacy responses, with respect to some comments, participants did not make significant gains. For example, many participants failed to request to see the school’s data which could support whether a child needs additional services. Advocacy trainings may need to include more content related to the importance and potential use of data to make informed decisions. Using the LPLSP as an example, coordinators may consider trying to identify and add different components to the LPLSP to make it more effective.

Limitations

This study has a few limitations that may have impacted the results. First, there was a small sample size of 22 Latino parents of children with ASD who volunteered to participate in a 36-hr advocacy training. A larger sample size may provide greater power; also, this sample (given its nature of relying on volunteer participants who had the time to complete the LPLSP) may not represent all Latino families. An additional limitation relates to the transcript proxy itself. We were not able to compare the proxy to actual participation in IEP meetings. Observational methods would improve the rigor of a study about parent participation in IEP meetings. Also, although 10
potential correct responses could have been given in the transcript, at the post-transcript, participants averaged between two and three correct responses. Thus, additional training or support may be necessary to have a greater increase in the number of appropriate responses. Finally, the proficiency (i.e., reading and writing ability) of participants may have limit the accuracy of the IEP transcript measure and the effectiveness of the LPLSP: future research should consider the issue of language proficiency both in terms of measurement and the intervention.

In conclusion, this study has significant results in increasing parent participation and advocacy for parents of students with ASD and also has important implications for research and practice. Parent participation is important for student achievement; parent advocacy is important to enable children with ASD to obtain needed services. Researchers need to find more ways to increase parent participation and advocacy during IEP meetings for families who are culturally and linguistically diverse.

References


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Effects of a Self-Management Intervention to Improve Behaviors of a Child with Fetal Alcohol Spectrum Disorder

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Abstract: Fetal alcohol spectrum disorder (FASD) is one of the most prevalent causes of developmental disability, impacting up to 2–5% of children in the United States. Yet, evidence-based treatments for individuals with FASD are notably limited, and individuals with this diagnosis have been very underrepresented in the empirical behavior analytic literature. The current study investigated the effects of an intervention package consisting of self-monitoring and contingent reinforcement on the behavior of an 11-year-old Hispanic male with FASD. The intervention had therapeutic effects on the participant’s independent task completion and arguing behavior. These results suggest the promise of behavior analytic interventions for individuals with FASD, and document the positive effects of this self-management intervention in particular. Implications for behavior analytic research and practice among individuals with FASD are discussed.

According to the Centers for Disease Control and Prevention (n.d.), 2–5% of children in the United States have fetal alcohol spectrum disorder (FASD), a group of developmental disabilities causing a range of problems related to physical, cognitive, and behavioral development. Many individuals with FASD are undiagnosed or misdiagnosed (Chasnoff, Wells, & King, 2015), making them a particularly underserved population of students in today’s school systems. Individuals with FASD often have difficulty completing tasks, inhibiting “impulsive” actions, and other adaptive behaviors (Rasmussen, 2005). Due to these and other issues, children with FASD are at risk for a host of poor outcomes, including disrupted school experiences, problems related to substance, and trouble with the law (Streissguth et al., 2004).

Reports in the literature note that some caregivers consider “conventional behavioural and learning approaches” to be inadequate for addressing the support needs of individuals with FASD in their care (Peadon, Rhys-Jones, Bower, & Elliott, 2009, p. 2). Reflecting this, the research literature seems to focus on developing and investigating interventions that are specific to individuals with FASD. As FASD was identified relatively recently, with fetal alcohol syndrome officially documented in the literature in the early 1970s, research on interventions specific to this group of conditions is understandably small and limited (Peadon et al., 2009).

Impairments in attention and executive functioning are hallmark characteristics of FASD (Kodituwakku & Kodituwakku, 2014); as such, interventions that help children manage their own behavior may be particularly beneficial for this population. Within the field of applied behavior analysis (ABA), self-management interventions have been empirically validated with individuals with disabilities (Cooper, Heron, & Heward, 2007). As one of the most researched self-management interventions, self-monitoring has been widely documented as a therapeutic strategy with various disabilities across a range of target behaviors, such as completing academic tasks, engaging in social behaviors, following directions, and staying on-task (Bruhn, McDaniel, & Kreigh, 2015; Sheffield & Waller, 2010).
Among school-age children, studies have been conducted with individuals eligible for special education under the labels autism spectrum disorder (e.g., Koegel, Koegel, Hurley, & Frea, 1992); emotional disturbance (e.g., Levendoski & Cartledge, 2000); intellectual disability (e.g., Martella, Leonard, Marchand-Martella, & Agran, 1993); other health impairment (e.g., Stahr, Cushing, Lane, & Fox, 2006); specific learning disability (e.g., Harris, 1986); and speech/language impairment (e.g., Stahr et al., 2006). Self-monitoring interventions have also been found to be effective with participants having various specific conditions, such as Asperger syndrome, attention deficit hyperactivity disorder, and Down syndrome (Bruhn et al., 2015; Sheffield & Waller, 2010).

Though self-monitoring has been used successfully with participants with a wide range of disabilities and across various target behaviors, research including participants with FASD is notably limited. To our knowledge, only two published studies on self-monitoring have included individuals identified with FASD (e.g., Blood, Johnson, Ridenour, Simmons, & Crouch, 2011; Lovett & Haring, 1989), with neither demonstrating a functional relationship between the intervention and the dependent variables. Thus, children with FASD have been neglected in the self-monitoring literature, although their behavioral profiles make self-management a potentially effective strategy for this population.

Self-monitoring is well established in the literature, yet no empirical studies have documented a functional relationship between this strategy and therapeutic behavior change in an individual diagnosed with FASD, despite the relative prevalence of this condition. The goal of the current study was to address this gap by documenting the effects of a self-monitoring intervention on the challenging behavior (argumentative statements) and desirable behavior (independent task completion) of a participant with FASD.

Method

Participant and Setting

David was an 11-year-old Hispanic male diagnosed with alcohol-related neurodevelopmental disorder, one of the conditions included under the broader umbrella term of FASD. In addition, David was diagnosed with attention-deficit hyperactivity disorder, oppositional defiant disorder, reactive attachment disorder, and specific learning disability. David received special education services in a self-contained classroom for students with significant behavior support needs, and received behavior supports for 2 hours a day. David was referred to the study by faculty at a university-based FASD diagnostic clinic.

The setting for this study was David’s home; sessions were conducted after school. Within this setting, David’s mother was always present. In addition to David, other children were often in the home, including David’s sisters and cousins. At times, other adult relatives were also in the home. The two areas in the home where David spent most time during sessions were his bedroom and the living room. Within the home, both English and Spanish were spoken.

Dependent Measures and Data Collection

Two dependent measures were selected because of their frequency, and because they were of great concern to David’s mother. The first target behavior was completing chores and homework tasks. David’s mother reported that these tasks occasioned problem behavior from David on a daily basis. The second target behavior was arguing with adults (primarily his mother); argumentative statements were often emitted in response to demands.

Target behavior: Task completion. Task completion was defined as David independently and accurately performing assigned cleaning and homework tasks. The researchers operationalized the tasks by interviewing David’s mother; in the interview, she identified 10 cleaning tasks and five homework tasks. Examples included tasks David completed independently and to his mother’s specification (e.g., reading aloud at an understandable pace and volume for 20 minutes). Non-examples included tasks that were not completed independently or were not completed accurately (e.g., putting the comforter on top of his unmade bed, rather than making the bed to his mother’s specification).

Task completion was measured by direct observation of the behavior, or observation of
a permanent product (e.g., correctly made bed). The researchers used a checklist to record whether tasks were completed independently and accurately. Task completion was reported as a percentage of the total tasks in a session. In the event that a task on the checklist had already been completed prior to data collection, that item was not included in the calculation of percentage of tasks completed.

**Target behavior: Argumentative statements.** Argumentative statements were defined as statements in which the participant responded to an adult by (a) refusing, delaying compliance with, or complaining about a demand; (b) directing the adult to leave him alone or to leave his belongings alone; (c) using inappropriate language; or (d) using an argumentative tone. Examples of refusing, delaying compliance with, or complaining about a demand included saying, “No” or “Later, Ma”; non-examples included saying, “I don’t know how.” Examples of directing an adult to leave him alone or his belongings alone included saying, “Ma, stay out of my room,” or “You don’t need to look at my stuff”; non-examples included saying, “I don’t need help.” Examples of using inappropriate language included saying, “Oh my God, Ma”, or expletives; non-examples included saying, “What the heck?” Finally, using an argumentative tone was operationalized as statements in which David’s tone was sharp or rude; an argumentative tone did not include statements in which his tone was neutral, whiny, or joking.

To collect data on argumentative statements, members of the research team used event recording. Observers recorded argumentative statements during each session; they also audio recorded the sessions with iPhones when practicable. A Spanish-speaking member of the research team transcribed audio files and translated Spanish portions to English. The research team reviewed the audio files and transcripts to recode sessions in order to enhance accuracy. Rate of argumentative statements per minute was calculated for each session.

**Intervention Development and Materials**

We conducted a functional behavior assessment by interviewing David’s mother using (a) a modified version of the Functional Assessment Interview (O’Neill, Albin, Storey, Horner & Sprague, 2015), and (b) the Motivation Assessment Scale (MAS; Durand & Crimmins, 1988). We then interviewed David about his behavior, as well as his likes and dislikes. Finally, two researchers collected ABC narrative recording data on David’s behavior over five days; 18 instances of argumentative statements were observed. For the majority (11 of 18), the hypothesized function of the behavior was to access attention. In several instances (7 of 18), the hypothesized function was escape from demands. Finally, David’s mother’s responses to the MAS identified access to tangibles and escape as the two top-ranked results. Thus, we hypothesized that David’s problem behavior was multiply maintained by escape, attention, and tangibles.

We developed an intervention package to address these hypothesized functions. As described earlier, we interviewed David’s mother in order to create a task analysis of the cleaning and homework tasks that she expected him to complete each day. Two laminated checklists (Cleaning and Homework) were created. Each list identified the task and included two columns: one for the participant to self-monitor task completion, and the other for an adult to indicate whether each task had been completed independently and correctly. At the bottom of both lists, the contingency for receiving reinforcement was explained. David used the laminated lists, as well as a clipboard and dry-erase marker, to self-monitor his task completion.

To address the hypothesized function of escape, David was able to earn free time after completing tasks to criteria on both checklists; additionally, after the initial training phase, he was allowed to choose which checklist to complete first, and which to complete second. To address the hypothesized function of attention, David was provided praise for task completion and accuracy, as well as for the absence of arguing. In addition, several of the tangible reinforcers were interactive games, through which he was able to access social attention.

To identify potential tangible reinforcers for David, we conducted a preference assessment (Cooper et al., 2007). Using open-ended questions, we interviewed both David and his
mother individually about his preferences. We also conducted a naturalistic free-operant observation, noting the activities and conversation topics that David focused on most during free time. Based on these assessments, we acquired a variety of items that we expected would be reinforcing to him (e.g., checkers/chess set, soccer video game, model race car). We stored these reinforcers in a small container, along with a digital timer that was used to time how long he was allowed access the items.

Experimental Design and Procedure

We used a reversal design (ABAB), in which first baseline data were collected (A). We then conducted training and intervention (B). Next, we removed the intervention during reversal (A). Finally, we implemented retraining and reintroduced the intervention (B). We used visual analysis to both determine when to change phases, and to analyze the effects of the intervention.

Baseline. During baseline, David’s mother told him to complete room-cleaning and homework tasks (e.g., “Clean your room” or “Do your homework”). Other than the presence of research team members collecting data, baseline reflected the typical conditions in the home.

Training. Using direct instruction and modeling, a researcher taught David how to (a) complete each item on the checklist; (b) check off each item when completed; and (c) complete the items on the checklist in order. We also explicitly taught him the contingencies in effect for both checklists. For the Cleaning Checklist, if he independently completed 9 of 10 steps accurately and did not argue, then he received 15 minutes of free time before starting tasks on the other checklist. For the Homework Checklist, if he independently completed 5 of 5 steps accurately and did not argue, then he was allowed to access a reinforcer from the container for 15 minutes before starting tasks on the other checklist.

During training, a researcher provided prompts to David regarding the procedures for using the self-monitoring checklists, for completing the tasks accurately, and about the contingencies in effect. He also received praise and corrective feedback as needed. After he completed the tasks, David’s mother noted on the checklists whether he had completed them accurately (circling + on the list) or not (circling – on the list). If his performance met the criteria for the contingency in place, he received the specified reinforcer. If his performance did not meet the criteria, then a member of the research team told him that he could try again next time.

Intervention. During intervention, David was allowed to choose which checklist (Cleaning or Homework) to complete first. A researcher or David’s mother gave him the checklist and reminded him of the contingency written at the bottom. After he reported that he was finished with all the tasks, David’s mother checked each item as described previously in the training section. If his performance met the criteria, he received the specified reinforcement; if not, he was directed to begin the other checklist and was reminded of the contingency in place. When finished, David’s mother checked each item as described previously. If his performance met the criteria, he accessed the specified reinforcement.

Reversal. During the reversal sessions, we followed the same procedures as described in the baseline sessions. To explain the withdrawal of the intervention to David and his mother, we stated that we wanted to observe whether David still needed the intervention in order to complete the tasks and reduce his arguing.

Retraining. During the retraining sessions, we reminded David to check off each item on the checklist when completed, and to complete the items on the checklist in order until all were completed. We provided prompts as needed during the retraining sessions. We also provided praise and corrective feedback as needed. If his performance met the criteria for the contingency in place, he received the specified reinforcer. If his performance did not meet the criteria, then a member of the research team told him that he could try again next time.

Reintroduction of intervention. Procedures during the reintroduction phase followed the same procedures as described for the intervention sessions. The only difference was that members of the research team supported David’s mother or aunt to implement the inter-
vention, rather than the researchers implementing it (as had been the case during intervention sessions).

### Procedural Fidelity

To document procedural fidelity, an independent observer recorded whether the 10 steps comprising the intervention had been completed. To calculate fidelity, the number of correctly completed components was divided by the total number of components, and multiplied by 100. Fidelity data were collected for at least 33% of sessions in all training and intervention phases. During the final intervention phase, in which the intervention was reintroduced and conducted by David’s mother or aunt, fidelity data were collected for 83% of sessions.

For sessions in which a member of the research team implemented the intervention (e.g., during training, intervention, and retraining phases), procedural fidelity was 100%. During the final intervention phase, in which the intervention was reintroduced and conducted by the participant’s mother or aunt, fidelity data ranged from 57–100%, with a mean of 76%. Across all sessions, fidelity data ranged from 57–100%, with a mean of 86%.

### Interobserver Agreement (IOA)

For both dependent variables, IOA was calculated using total agreement IOA (e.g., smaller count divided by larger count, multiplied by 100; Kennedy, 2005). We calculated IOA for at least 33% of sessions per phase, with the exception of baseline; lack of IOA data in baseline was an oversight. To address this limitation, we collected higher levels of IOA in remaining sessions (41% for argumentative statements, and 53% for task completion). Overall, we calculated IOA on task completion for 45% of sessions; IOA ranged from 93–100% (M = 98%). For argumentative statements, two research team members independently coded the audio files and transcripts for a given session. If agreement fell below 75%, the coders reviewed differences and came to consensus about a decision rule. We calculated IOA on argumentative statements for 35% of sessions; IOA ranged from 75–100% (M = 88%).

### Pre/Post-Test and Social Validity Measures

We administered the Eyberg Child Behavior Inventory (ECBI; Burns & Patterson, 1990) to David’s mother both before the study began and after its conclusion. The ECBI is a standardized 36-item parent-report measure of the number of challenging behaviors exhibited by the child, and the intensity (e.g., frequency) of each challenging behavior (rated on a Likert-type scale, 1 = the problem never occurs, 7 = the problem always occurs). A researcher interviewed David’s mother privately using the ECBI and manually recorded her answers.

At the end of the study, we conducted social validity interviews with David and his mother individually. The interviews consisted of eight questions developed for this study. Examples of questions we asked David’s mother included, “After participating in this study, have you noticed any difference in your child’s behavior? If so, what have you noticed?” Examples of questions we asked David were, “What did you like about learning some new ways to act/behave? What did you not like about learning some new ways to act/behave?”

### Results

#### Task Completion

David’s task completion data and mean phase lines are displayed in Figure 1. During baseline, the average percentage of task completion was 46.33% (range, 31% to 55%). The level of task completion increased sharply during training sessions, with David accurately completing an average of 97.67% (range, 93% to 100%). This high level continued during intervention, in which his task completion was 100% for three consecutive sessions. During the reversal phase, David’s average level of task completion fell to 50% (range, 33% to 67%), a level comparable to his baseline data. As compared to the baseline and reversal phases, there was a clear difference in level of task completion during training and intervention. No data points
overlapped between baseline/reversal and training/intervention.

During the retraining sessions, David’s task completion increased to a mean of 76% (range, 50% to 92%), showing more variability and lower levels of correct task completion than the initial training sessions. During the final phase when the intervention was reintroduced, his task completion data stabilized at 100% for four consecutive sessions. One data point (first session of reintroduction) was not included in this analysis (see Figure 1). Because the procedures implemented by David’s mother in this session differed significantly from the recommended intervention (e.g., use of an overcorrection procedure), we separated this session from the others, and did not include it in our data analysis for this phase.

Overall, David’s task completion increased immediately from baseline to training/intervention. During reversal, his task completion decreased immediately, and closely resembled the baseline data in terms of level and variability. During retraining, his task completion remained variable, but did increase from reversal (an average of 50%) to an average of 76%. His task completion stabilized at 100% for the last four sessions of the study. Though the retraining sessions showed some variability, only one data point overlapped with the baseline/reversal data. Thus, these data document one demonstration of effect, followed by two reversals.

**Argumentative Statements**

David’s rate of argumentative statements and mean phase lines are displayed in Figure 2. During baseline, the average rate was 0.17 statements per minute (range, 0.06 to 0.31);
these data showed an increasing trend. His rate of arguing decreased during training sessions to an average of 0.10 per minute (range, 0.05 to 0.20), with a decreasing trend. This trend continued during intervention, in which his rate of arguing decreased to .03 per minute on average (range, 0 to 0.17), and remained at an average of 0.06 during the final phase of the study, (range, 0 to 0.20). As noted in the prior section, we did not include the first data point in reintroduction because the procedures used by David’s mother differed significantly from the recommended intervention.

David’s rate of arguing showed more variability than the data on his task completion; typically the first data point in each phase differed from the other data in the phase, showing a slightly delayed behavioral response to the changing contingencies. Although changes were not immediate in each phase, and therefore produced overlapping data between phases, overall we observed countertherapeutic trends and higher rates of arguing during baseline and reversal (averages of 0.06 and 0.26, respectively). In contrast, we noted therapeutic trends and lower rates of arguing during the initial training/intervention phases (average of 0.07) and the retraining/reintroduction of intervention (average of 0.06). Thus, baseline and reversal sessions produced arguing at a rate over double and triple that of the mean rates observed when the intervention contingencies were in effect. As with the task completion data, the data on David’s argumentative statements document one demonstration of effect, followed by two reversals.

Pre/Post-Test and Social Validity Measures

David’s mother’s responses to the ECBI pre-test produced a score of 26 (out of 36), representing the number of behaviors she identified as a problem (Burns & Patterson, 1990). On the post-test, her responses produced a score of 24, indicating a slight decrease in the number of behavior problems. Both pre- and post-test scores were well above the clinical cutoff of 11 for this measure. David’s mother’s pre-test responses on the ECBI produced a score of 186 (out of 252 possible), representing the intensity of the behavior problems (e.g., frequency). On the post-test, her responses produced a score of 120, showing a marked decrease from pre- to post-test reports. The post-test score fell slightly below the clinical cutoff of 127 for this measure.

In the social validity interviews, David and his mother both reported that his behavior had improved after participating in the study. Both also reported that the intervention helped them to learn strategies that they will continue to use. Finally, they both reported that David’s motivation to clean his room had increased; his mother stated, “Now he is proud of keeping his room clean.” David commented, “I like having a clean room. Before it was gross and messy.”

Finally, both David and his mother noted improvements in their communication. His mother reported, “Now it’s easier for me to communicate with [him]. He understands you better. He understands what you want him to do.” She also stated, “Now he is more mature. Now he is more respectful of me.” Likewise, David said, “My mom is more humble and nice. She used to be aggressive when she told me to clean my room, and now she asks more nicely.”

Discussion

The data from this study document a functional relationship between the intervention and both (a) completion of cleaning and homework tasks, and (b) argumentative statements. The intervention addressed the multiple functions that were hypothesized to maintain David’s behavior. Completion of his room-cleaning routine to the specified criteria and without arguing resulted in 15 minutes of free time (e.g., escape from demands). Completion of his homework tasks to the specified criteria and without arguing resulted in 15 minutes of access to reinforcers in the container; in every instance, he chose to play checkers, thereby accessing both the game (e.g., tangible) and attention from the other person playing.

Further, the social validity data documented via multiple measures that the participant and
his mother considered both the goals and results of the study to be important. Though not explicitly a goal of this investigation, David reported that his mother communicated with him in a more respectful way after participating in the study. They also both reported that the procedures were acceptable. This is notable because David’s mother initially expressed reluctance to give him “rewards,” and in our observation, relied more on punishment procedures (e.g., response-cost, reprimands). Despite her initial hesitance, after we explained our rationale for the intervention, David’s mother agreed to try it. After the study ended, she did not express reservations about the reinforcement procedures during the social validity interview or during other conversations with the researchers.

The reasons that David’s mother relied on punishment may relate to parenting models within her family and culture; her attributions about David’s challenging behavior; instructions she received from professionals; her history of negative reinforcement for using punishment strategies; or likely some combination of these factors. Future studies are needed to examine how these factors affect parents’ acceptance and implementation of reinforcement-based strategies, and behavior analytic interventions more broadly. Such studies could provide a basis for refining parent training in order to strengthen the social validity of behavior analytic interventions among consumers, including those from culturally and linguistically diverse backgrounds.

Though an important contribution to the literature, we must note several limitations of the current study. First, we did not collect IOA during baseline; we compensated for this by exceeding the traditional criteria of 33% of sessions for IOA for both dependent variables for the remaining sessions. Second, IOA for argumentative statements for two sessions fell slightly below the traditional standard of 80% agreement (e.g., 75% and 78%). Given the complexity of the verbal behavior being coded, and the complexity of the environment (e.g., multiple individuals speaking at a time, in English and Spanish, as well as other background noise), we considered these slightly lower levels of IOA to be acceptable (Kennedy, 2005).

Third, as in most applied studies, we were not able to control for all extraneous variables within and outside the setting. David’s mother was a caregiver for multiple children in her extended family, and the number of children in the home could vary widely from session to session. The children required varying levels of her attention, and engaged in different activities from day to day, producing a variable backdrop for the current study. Further, external events (e.g., related to the health of several family members) occurred over the course of the study and we were unable to account for these incidents and the ways they affected David and his family.

Relatedly, when David’s mother reintroduced the intervention in the last phase, she used an overcorrection procedure that was not included in our intervention package. Because this procedure deviated so greatly from the recommended intervention, we did not include it in our analysis of the data for this phase. It is notable, however, that this procedure produced high rates of argumentative statements from David, as well as a decrease in his task completion from the prior session. In some ways, then, this unanticipated event served as a natural experiment documenting the countertherapeutic effects of this type of procedure for David.

A final limitation relates to the lack of formal maintenance and generalization data. Based on feedback from David’s mother, continued data collection would have decreased the acceptability of the study. However, in the social validity interview, she reported that her intention was to continue using the intervention strategies. In an informal follow-up conversation approximately one year after the study’s completion, she reported that David was continuing to keep his room clean to her satisfaction. In the social validity interview immediately after the study, she also reported her generalization of the use of contingent reinforcement to promote untrained behaviors. For example, she described how she had asked David to do a chore not on his checklist; after completing it, he was allowed to play outside with friends in the neighborhood. Finally, during the last session David’s aunt implemented the intervention, demonstrating generalization to a degree. During this session, he completed 100% of the assigned tasks correctly and independently; he also did not
make any argumentative statements in this session.

This study has shown the promise of behavior analytic self-management strategies to improve the behavior of a child with FASD within the complex context of his home. Like families of children with other types of developmental disabilities, families of children with FASD face challenges in meeting their academic, social and behavioral needs. They also face pronounced challenges in accessing services for their children. A family seeking services for a child with FASD will likely experience limited community and social supports and encounter professionals who are not familiar with FASD (Paley & O'Connor, 2011). In our observation, they will also likely interact with professionals who do not identify behavior analytic interventions as appropriate for children with FASD, and insurance companies that do not cover behavior analytic services for their children.

This study is an important step in demonstrating the effects of behavior analytic interventions for children with FASD. More studies are needed to document behavior analysis as an evidence-based technology for this highly underserved, at-risk population. Given the extraordinarily limited literature on this population to date, more home-based investigations are warranted. Future research should also extend this work by investigating the applications of self-management strategies among children with FASD within school settings. By growing the evidence base, our field can better disseminate effective behavioral strategies to the families of children with FASD and the professionals who serve them.

References


Rasmussen, C. (2005). Executive functioning and working memory in fetal alcohol spectrum disor-


Investigating Components, Benefits, and Barriers of Implementing Community-Based Vocational Instruction for Students with Intellectual Disability in Saudi Arabia

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Abstract: Special education teachers’ perceptions towards community-based vocational instruction (CBVI) are critical for effective implementation of related activities for students with intellectual disability (ID). This paper examines special education teachers’ perceptions towards CBVI in preparing secondary students with ID for postschool employment in Saudi Arabia. A web-based survey was used for data collection. The survey was distributed to the population of special education teachers in public high schools in Riyadh city, Saudi Arabia. Based on the survey results, this study examines educators’ perceptions about the components, the benefits, and the barriers to implementing CBVI. The results indicate that teachers are generally confident about the importance of CBVI components and show positive perceptions toward the benefits of implementing CBVI. Additionally, the results reveal some barriers to implementing CBVI in Saudi Arabia. Implications and recommendations are also discussed.

The purpose of this study was to examine special education teachers’ perceptions toward the components, the benefits, and the barriers to the implementation of community-based vocational instruction (CBVI) to prepare students with intellectual disability (ID) for postschool employment. Special education in Saudi Arabia is still being developed, particularly for students with ID (Al-Ajmi, 2006). Investigating teachers’ perceptions about CBVI could increase awareness of this approach, which could increase the likelihood it would be implemented. Additionally, gathering information about CBVI could increase teachers training (pre-service and/or in-service) about developing and providing CBVI activities.

Individuals with special needs in Saudi Arabia did not receive special education before the year 1958. In that year, the first institute for blindness was established (Alhano, 2006). After that initiative, students with ID began to receive special education services when the first institute for them was opened in 1972 (Al-Hoshan, 2009). The increased services in special education in Saudi Arabia have improved the education of students with disabilities (Al-Ajmi, 2006). Regulations were established in order to provide human rights that ensure free and appropriate services for all students with disabilities. As a result, Saudi schools have incorporated inclusion for students with ID as in self-contained classrooms since 1991 (Almalky, 2008). However, although there is an improvement, it is very slow. Consequently, most of the regulations regarding students with disabilities were passed in the last two decades, and even some of these laws have yet to be applied (Al Quraini, 2011).

Postsecondary Transition

Special education services in Saudi high schools provide an Individualized Education Program (IEP) for each student with ID, which focuses on academic, social, and communication skills. However, transition planning and services are not clearly considered in students’ IEPs (Alnahdi, 2012). Teachers should educate their students with ID on job sites to facilitate an easier transition from academic life to employment (White & Weiner,
2004). Despite this, high schools in Saudi are still not including job training in students’ community environment, thereby not preparing the students for their adult life (Alhossan & Trainor, 2015; Almanea, 1997). It is essential that they have a connection with the community so that they can stay aware of the opportunities, which are not available in the classrooms (White & Weiner, 2004). After high school, the students with ID has access to only certain training that are offered in vocational centers which are usually a sheltered workshop meant for students with disabilities. However, this option is also not readily available (Elsheikh & Alqurashi, 2013).

Since Saudi schools do not include transition planning and transition services in the students’ IEPs, transition research from the US will be used in this study. In addition to that reason, the transition is still a new concept in Saudi Arabia, thus, the research on transition for students with ID is limited in Saudi Arabia. Besides, numerous Saudi scholars are trained in the US and then imported some of these ideas. The imported ideas that have been successful include, implementing IEPs, integrating students with ID in public schools, and providing related services. However, in Saudi Arabia, students with ID are not connected to the community environment, which offers a rich experience that students cannot get it in their classrooms. When compared to the US, Saudi government statistics indicate lower quality of life, higher unemployment rates, and lower wages if employed, for people with ID (Ministry of Economy and Planning, 2014).

In contrast, in the US, the transition plan needs to be included in students’ IEPs. Transition planning is used to help students with disabilities move smoothly from school to postschool life. The Individuals with Disabilities Education Act (2004) requires that transition planning and services begin when a student reaches 16 years of age or younger (Schwartz, Mactavish, & Lutfiyya, 2006). However, most research suggests starting transition planning at age 14 or earlier if appropriate. Furthermore, some states and previous versions of IDEA required transition planning by age 14 (Cameto, Levine, & Wagner, 2004).

IDEA (2004) defines a transition plan as a coordinated set of strategies and activities based on the student’s strengths, needs, interests, and preferences that help the student in achieving postsecondary objectives related to training, education, employment and independent living. IDEA requires that students take part in transition planning and decision-making about their lives, working with their parents, teachers, and community service providers to support achieving their goals. Facilitating transition services among students ensure that they have a successful transition from academic life to postsecondary education, employment, vocational training and independent living. Research also supports the fact stating that there is a positive relationship between transition planning in secondary schools and transition outcomes (Phelps & Hanley-Maxwell, 1997; Test, Mazzotti et al., 2009; Trainor, 2008; Wehman, 2006).

Vocational Education

According to The Career and Technical Education Act (2006), vocational education may be defined as the programs that are focused on providing individuals the technical and academic knowledge along with the necessary skills that make them ready for further studies or employment, which may be paid or unpaid. For vocational training to be successful, it should have these components: (a) a training and employment setting providing a real feel, (b) job analysis, (c) correct job placement, (d) proper assessment and instructions, (e) support during transition and (f) effective supervision (Inge, Wehman, & Dymond, 2005). These training programs can be in different fields such as trade and industry, agriculture, consumer sciences, family, or technology education (Scott & Sarkees-Wircenski, 2004).

Unfortunately, it is a rarity that Saudi schools implement these programs for students with ID (Alnahdi, 2013). As per the research conducted in the US, vocational education is one of the most integral components for the students with ID and should be made a part of all the special education programs run for secondary education (Harvey, 1998; Inge et al., 2005; Trainor, Carter, Owens, & Swedeen, 2008). Additionally, various studies have also indicated that it acts a strong predictor of the employment opportunities for the students with ID (Baer, Daviso, Flexer,
Queen, & Meindl, 2011; Benz, Lindstrom, & Yovanoff, 2000; Doren, & Benz, 1998; Test, Mazzotti et al., 2009). It is observed that students who have attended vocational training during high school tend to have better wage earnings, higher working hours as compared to those who do not attend (Harvey, 1998; Rabren, Dunn, & Chambers, 2002).

Based on these evidence, it is argued in the research that if the vocational training especially CBVI, is implemented, it will prepare the Saudi students with ID for the job skills which are required for job search and maintenance (Masters, Mori, & Mori, 1993; Wehman, 2006). The conceptual framework, for this study, is derived from the human capital theory, which indicates that an individual investment is expected to increase one’s ability to make improvements in one’s quality of life (Becker, 1993). As per the theory, acquiring more skills make an individual rich in human capital and therefore increases the employment opportunities, production and potential income for him (Blackorby, Hancock & Siegel, 1995).

Community-Based Vocational Instruction

CBVI includes training roles, events and integrated settings in the work of students to develop their employment skills and awareness towards the career (Kim & Dymond, 2010). Educators have realized that the skills learned in schools cannot be generalized to community workplaces that led to providing vocational instruction in community environments, which became one of the best transition practices for the students with ID (Test, Fowler et al., 2009). As the implementation of vocational training has proved to be successful, it is considered as one of the prominent CBVI strategies for job seeking and maintaining (Cimera, 2010; Wehman, 2006). According to Chan and Chadsy (2006), employment engagement and preparing students with ID is necessary, as it can encourage independent living and integration of work in a community.

Various studies indicate that to improve career awareness and skills development, students should take different jobs and narrow them to determine the final work that they want to pursue in the final years of study (Renzaglia, Hutchins, Dymond, & Sheldon, 2008; Test, Aspel, & Everson, 2006; Wehman, 2006). CBVI includes work experience, which may be paid or unpaid and may vary from volunteer to competitive employment. Paid and short-term experiences may include job shadowing and unpaid long-term experiences may include internships. Students with ID can broaden their work experiences with these opportunities either before or after their graduation (Donell & Hardman, 2010; Renzaglia et al., 2008; White & Weiner, 2004).

CBVI helps in the advancement of school, reduce the possibilities of student dropout, and improves outcomes for students with disabilities after school (Benz, Yovanoff, & Doren, 1997). The literature also indicates that CBVI help students with ID in the development of vocational competencies, social skills, and employment behaviors. Schools with CBVI have assisted students with ID in finding employment opportunities as per their strengths and achievements (Benz, Lindstrom, Unruh, & Waintrup, 2004; Langone, Langone, & McLaughlin, 2000; Wehman & Revell, 1997). These schools have also helped in connecting students with the community environments for accessing other services too which help them in getting better employment opportunities (Nuehring, 2003).

For connecting CBVI to the evidence base, the literature provided by Test, Mazzotti, et al. (2009) and Test, Fowler, et al. (2009) emphasizes the application of real work environments. The studies indicate that students who were a part of CBVI in natural environments possessed better chances of getting jobs post school. Furthermore, students had jobs during the school were likely to have paid employment after graduating as compared to volunteer work and unpaid jobs. Parmenter (2011) researched CBVI and reflected that with the help of individualized supervision in the workplace culture offered to students with ID, it contributes to their professional development. Additionally, students who participated in teamwork, built relationships with other agencies, mastered managing their time, and selected jobs that fit their strengths. The literature provides that CBVI is an effective approach as it allows students with the opportunities to develop skills, acquire knowledge, and apply them in actual settings. Different studies have identified the correlation be-
tween competitive employment outcomes and secondary school work experience (Benz et al., 2004; Collet-Klingenberg, 1998; Inge et al., 2005; Lindstrom & Benz, 2002; Rabren et al., 2002; West, Wehman, & Wehman, 2005).

Perceptions of Teachers toward CBVI

The perceptions of special education teachers regarding CBVI are important to develop effective programs. Langone et al. (2000) stated that teachers with positive perceptions regarding CBVI are in a better position to develop effective CBVI activities. In addition to this, the teachers who took a part in CBVI indicated positive attitudes as they were able to design community-based activities that had a positive impact on the self-worth, success, and feelings of the students. Agran, Snow, and Swane (1999) found that teachers consider CBVI to be essential for preparing students with ID for the life after school. The researchers concluded that teachers believe CBVI to have various benefits for the students with ID, such as to enhance social interactions, independence, promote learning skills, and generalizing the educational skills across different settings. The teachers considered administrative support to be the key factor in effective community programs.

This depicts the significance of examining the perceptions of special education teachers about CBVI and its relationship with the post-school employment outcomes. Therefore, the focus of the researcher was to find out if CBVI can be successful in Saudi Arabia, as it is successful in the US. It is crucial to determine whether the same benefits will be available for the students in Saudi Arabia which are available to students in the US. These may be in the form of better employment opportunities, higher wages, more working hours and better life. Thus, this study focuses on identifying the perceptions of special education teachers towards implementation of CBVI in Saudi Arabia to determine the extent to which the intervention can be transferred. In this respect, the following research questions are developed:

1. Given a definition of CBVI, what are the perceptions of Saudi special education teachers toward the essential components of CBVI?
2. What are the perceptions of Saudi special education teachers regarding the potential benefits of implementing CBVI at their schools?
3. What are the perceptions of Saudi special education teachers regarding the potential barriers of implementing CBVI at their schools?
4. What are the possible differences in the perceptions of female and male special education teachers towards implementing CBVI?

Method

This study used a survey to collect data regarding the perceptions of special education teachers toward the implementation of CBVI in high schools. These perceptions were gathered to help students with ID for preparing for work after high school through the implementation of CBVI programs. The rationale for using survey methodology was that the technique was effective in obtaining the attitudes and perceptions of participants and understanding it (Couper, 2008). Additionally, it was feasible to cover a wide base of respondents at a low cost, in short duration, and from a distance (Tourangeau, Rips, & Rasinski, 2000).

Instrument Development

The researcher used a survey developed in the U.S. context as it was conducted on a similar population dealt with similar issues regarding using CBVI to prepare students during high school for employment. The survey was developed by Kim and Dymond (2010) basis on the literature review conducted on the topic of CBVI. The researcher made necessary changes in the survey to make it suitable in the context of Saudi Arabia.

The survey was divided into four sections, section 1 aimed at gathering the demographic information of the participants. Section 2 measured participants’ perceptions about the importance of different components of CBVI identified in the literature. Section 3 assessed participants’ perceptions about the potential benefits of CBVI in the Saudi Arabian context.
and Section 4 gathered participants’ perceptions concerning potential barriers to implementation of CBVI in the context of Saudi Arabia. The survey used a linear and numeric 6-point Likert-type scale, which included labeled anchors as the rating mechanism for Sections 2 - 4 (e.g., 1 = not important to 6 = very important; 1 = not a benefit to 6 = extreme benefit; 1 = not a barrier to 6 = extreme barrier; Kim & Dymond, 2010).

Validity and Reliability

Validity. The final English version of the survey was reviewed by a content expert in transition for youth with disabilities. Then, the researcher translated the survey into Arabic, and a native Arabic speaker, who is also an expert in transition, reviewed the translation from English to Arabic of that version of the survey. Additionally, two faculty members at King Saud University in Riyadh reviewed the Arabic version of the survey to determine the content validity, the accuracy of the items and its relevance, and the survey design. Then the faculty members translated the survey back to English. Utilizing this back-translation technique (Khalaila, 2013), a comparison of the translation from Arabic to English was made with the original English survey, and some minor changes were made to the Arabic survey after this procedure. To find the consistency in the survey, it was then given to five special education teachers working in the middle schools in Saudi Arabia. The researcher tested this survey with these participants as they were teachers in the middle school. They also did not belong to any focal group that was a part of this study. Based on their suggestions, necessary changes were made in the survey, which were minor in nature.

Reliability. The researcher used Cronbach’s alpha coefficient to measure internal reliability of the Arabic version of the survey (Coladari, Cobb, Minium, & Clarke, 2004). After calculating the items consistency across the sections of the survey, the total score of the coefficient alpha was high (97%) indicating high reliability. The coefficient alpha for the survey’s sections—namely, the components (16 items) was .97, the benefits (13 items) was .96, and the barriers (16 items) was .93.

Sampling Procedures and Sample

The sample for this study included the special education teachers working in all the public high schools that offer programs for the students with ID in Riyadh. The schools that offered the programs amounted to 18 high schools and all these schools were included for the purpose of this study.

Data Collection

After obtaining the IRB approval, and the Education Department consent in Saudi Arabia, the web-based surveys were distributed to the targeted population of special education teachers via emails. The online survey tool Qualtrics (www.qualtrics.com) was used. A link to the survey was emailed to the participants. The first page of the survey explained the survey’s purpose, its confidentiality, potential risks associated with participation, and the duration of the survey. A voluntary consent statement was also provided. Three reminders were emailed weekly to the participants before the close of the survey.

Data Analysis

After exporting the data in the form of Excel sheets, the data were entered into a statistical software program (SPSS). Descriptive statistical calculations were made which included standard deviations (SD), frequencies, means, the coefficient of variation (CV), and percentages. The researcher used the means (M) for comparing the differences in the perceptions of participants about the components, benefits and the barriers. Additionally, the researcher calculated the coefficient of variation for measuring the consistency of the participants’ answers for each item in the survey. An independent sample t test was used to determine if there was a statistically significant influence by gender on special education teachers’ perceptions of the components, benefits of and barriers to CBVI. More information can be found in the results section below.

Results

The current study investigated teachers’ perceptions about CBVI. This section presents
the results in the following order: (a) response rate, (b) participants’ demographic characteristics, (d) components of CBVI, (e) benefits of implementing CBVI, and (f) barriers to implementing CBVI.

Response Rate

The targeted population consisted of 108 special education teachers. A total of 86 participated. Responses from five of the 86 participants were excluded because they did not complete the survey. Data from 81 completed surveys were analyzed. Participant demographics are described in Table 1.

Components of CBVI

The overall mean for the importance of the components of CBVI was high ($M = 4.71$) on a 6-point Likert-type scale range as depicted in Table 2. The means of the components ranged from 3.93 to 5.00, and standard deviations ranged from 1.36 to 1.61. The difference between the highest and lowest mean

### Table 1

Participants’ Demographic Characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 to 5</td>
<td>18</td>
<td>22.2</td>
</tr>
<tr>
<td>6 to 10</td>
<td>15</td>
<td>18.5</td>
</tr>
<tr>
<td>11 to 20</td>
<td>27</td>
<td>33.3</td>
</tr>
<tr>
<td>More than 20</td>
<td>21</td>
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<td>Certificate</td>
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<td></td>
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<tr>
<td>Bachelor</td>
<td>51</td>
<td>63</td>
</tr>
<tr>
<td>Master’s</td>
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</tr>
<tr>
<td>Ph.D.</td>
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<td>3.7</td>
</tr>
<tr>
<td>Major</td>
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<td></td>
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<tr>
<td>Special education</td>
<td>57</td>
<td>70.4</td>
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<tr>
<td>Other majors with Special education certificate</td>
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<td>11.1</td>
</tr>
<tr>
<td>Other majors</td>
<td>15</td>
<td>18.5</td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>Male</td>
<td>45</td>
<td>55.6</td>
</tr>
<tr>
<td>Female</td>
<td>36</td>
<td>44.4</td>
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<tr>
<td>Experience with CBVI</td>
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<td></td>
</tr>
<tr>
<td>Yes</td>
<td>33</td>
<td>40.7</td>
</tr>
<tr>
<td>No</td>
<td>48</td>
<td>59.3</td>
</tr>
</tbody>
</table>

### Table 2

Means and Standard Deviations and Coefficients of Variation for Components of CBVI

<table>
<thead>
<tr>
<th>The Importance of Components of CBVI</th>
<th>$M$</th>
<th>$SD$</th>
<th>$CV$</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop IEP goals for CBVI collaboratively with a team (e.g. parents, students, special education teachers, job-coordinator, etc)</td>
<td>5.00</td>
<td>1.36</td>
<td>0.27</td>
<td>1</td>
</tr>
<tr>
<td>Offer opportunities for students to perform a variety of job tasks</td>
<td>4.93</td>
<td>1.41</td>
<td>0.28</td>
<td>2</td>
</tr>
<tr>
<td>Choose CBVI sites that reflect local labor market needs</td>
<td>4.93</td>
<td>1.41</td>
<td>0.28</td>
<td>2</td>
</tr>
<tr>
<td>Provide students with CBVI more than 2 times a week</td>
<td>4.89</td>
<td>1.42</td>
<td>0.29</td>
<td>4</td>
</tr>
<tr>
<td>Provide experiences that reflect the specific job demands of the local business</td>
<td>4.96</td>
<td>1.44</td>
<td>0.29</td>
<td>5</td>
</tr>
<tr>
<td>Keep a portfolio documenting students’ CBVI experiences</td>
<td>4.96</td>
<td>1.49</td>
<td>0.30</td>
<td>6</td>
</tr>
<tr>
<td>Provide students with a variety of work experiences</td>
<td>4.72</td>
<td>1.50</td>
<td>0.31</td>
<td>7</td>
</tr>
<tr>
<td>Provide CBVI based on the needs of students (not the needs of the business)</td>
<td>4.55</td>
<td>1.45</td>
<td>0.31</td>
<td>8</td>
</tr>
<tr>
<td>Provide students with choices of work experiences</td>
<td>4.74</td>
<td>1.51</td>
<td>0.32</td>
<td>9</td>
</tr>
<tr>
<td>Provide students with opportunities to interact with employees without disabilities</td>
<td>4.69</td>
<td>1.56</td>
<td>0.33</td>
<td>10</td>
</tr>
<tr>
<td>Supplement CBVI with classroom-based instruction (e.g. simulation)</td>
<td>4.72</td>
<td>1.58</td>
<td>0.33</td>
<td>11</td>
</tr>
<tr>
<td>Use systematic instructional procedures (e.g. job analysis)</td>
<td>4.62</td>
<td>1.55</td>
<td>0.33</td>
<td>12</td>
</tr>
<tr>
<td>Provide classroom-based instruction (e.g. simulation) prior to community placement</td>
<td>4.78</td>
<td>1.61</td>
<td>0.33</td>
<td>13</td>
</tr>
<tr>
<td>Provide instruction and/or supervision (i.e. by the school or business) during CBVI at all times</td>
<td>4.41</td>
<td>1.49</td>
<td>0.33</td>
<td>14</td>
</tr>
<tr>
<td>Assess students’ generalization of skills across CBVI sites</td>
<td>4.44</td>
<td>1.51</td>
<td>0.34</td>
<td>15</td>
</tr>
<tr>
<td>Provide CBVI to heterogeneous groups of students at the same time</td>
<td>3.93</td>
<td>1.54</td>
<td>0.39</td>
<td>16</td>
</tr>
<tr>
<td>Overall mean and standard deviation and coefficient of variation</td>
<td>4.71</td>
<td>1.22</td>
<td>0.25</td>
<td></td>
</tr>
</tbody>
</table>

*Note. M = Mean; SD = standard deviation; CV = coefficient of variation.*
was 1.07, which is negligible because of a high mean of all components (Coladarci et al., 2004). That indicates special education teachers believed the components of CBVI were very important. The high degrees of significance of the components reveal positive perceptions regarding the CBVI in general. The rate of the standard deviation (SD) illustrates a good consistency with the sample answers. As Table 2 shows, teachers ranked “developing IEP goals for CBVI collaboratively with a team (e.g. parents, students, special education teachers, job-coordinator, etc.)” as the most important component. With a mean of 5.00 and the standard deviation of 1.36; it was the most consistent answer of the participants than the rest of other components where the coefficient variation (CV) was 0.27. The sample ranked “providing CBVI to heterogeneous groups of students at the same time” as the least important component, with a mean 3.93, and a standard deviation of 1.54. The coefficient of variation in this component was 0.39, which indicates the variation of the sample perceptions toward this component was less homogeneous than the other perceptions in the rest of components.

**TABLE 3**

Means and Standard Deviations and Coefficients of Variation for Benefits of CBVI

<table>
<thead>
<tr>
<th>The Benefits of CBVI</th>
<th>M</th>
<th>SD</th>
<th>CV</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increases the likelihood that students will maintain a job after graduation</td>
<td>5.39</td>
<td>0.99</td>
<td>0.18</td>
<td>1</td>
</tr>
<tr>
<td>Help students learn specific job skills</td>
<td>5.31</td>
<td>1.08</td>
<td>0.20</td>
<td>2</td>
</tr>
<tr>
<td>Assists students in identifying vocational goals</td>
<td>5.17</td>
<td>1.08</td>
<td>0.20</td>
<td>3</td>
</tr>
<tr>
<td>Help students learn job task skills (e.g., production rate, work product quality, etc.)</td>
<td>5.13</td>
<td>1.09</td>
<td>0.21</td>
<td>4</td>
</tr>
<tr>
<td>Increases students’ self-determination</td>
<td>5.17</td>
<td>1.16</td>
<td>0.22</td>
<td>5</td>
</tr>
<tr>
<td>Help students learn work behaviors (e.g., attendance, punctuality, hygiene etc.)</td>
<td>5.24</td>
<td>1.26</td>
<td>0.24</td>
<td>6</td>
</tr>
<tr>
<td>Increases the likelihood that students will obtain paid employment</td>
<td>5.13</td>
<td>1.26</td>
<td>0.24</td>
<td>7</td>
</tr>
<tr>
<td>Provides opportunities for interactions with co-worker without disabilities</td>
<td>5.17</td>
<td>1.27</td>
<td>0.24</td>
<td>8</td>
</tr>
<tr>
<td>Prepares students for post-school life</td>
<td>5.17</td>
<td>1.29</td>
<td>0.25</td>
<td>9</td>
</tr>
<tr>
<td>Identifies student’s employment interests</td>
<td>5.03</td>
<td>1.30</td>
<td>0.26</td>
<td>10</td>
</tr>
<tr>
<td>Promotes generalization of skills across settings</td>
<td>4.86</td>
<td>1.26</td>
<td>0.26</td>
<td>11</td>
</tr>
<tr>
<td>Increases students’ independence</td>
<td>5.13</td>
<td>1.36</td>
<td>0.26</td>
<td>12</td>
</tr>
<tr>
<td>Decreases high school drop-out rate</td>
<td>4.79</td>
<td>1.55</td>
<td>0.32</td>
<td>13</td>
</tr>
<tr>
<td>Overall mean and standard deviation and coefficient of variation</td>
<td>5.13</td>
<td>1.04</td>
<td>0.20</td>
<td></td>
</tr>
</tbody>
</table>

*Note. M = Mean; SD = standard deviation; CV = coefficient of variation.*

**Benefits of Implementing CBVI**

The overall mean of the benefits of CBVI was very high (M = 5.13) on a 6-point Likert-type scale as shown in Table 3. The means of the benefits ranged from 4.39 to 5.39, and standard deviations ranged from 0.99 to 1.55. The difference between the highest and lowest mean was 1.14, which is a small discrepancy indicating a high level of value to these benefits of CBVI according to the sample perceptions. The value of the standard deviation was 1.04, which depicts a little variance between the sample answers. The statement “increasing the likelihood that students will maintain a job after graduation” was ranked first among the benefits, with a mean of 5.39 and a standard deviation of 0.99. This item demonstrated the most homogeneous participant perception compared to the rest of the benefits where the coefficient of variation was 0.184. The statement “decreasing high school drop-out rate” was the last important benefit in rank with a mean of 4.79, and standard deviation of 1.55 indicating the variation of the sample perceptions toward the importance of this benefit was less homogeneous than the rest of the perceptions in other ben-
Barriers to Implementing CBVI

The overall mean of the third dimension, which is the barriers of implementing CBVI in Saudi Arabia, was high \((M = 4.66)\) on a 6-point Likert-type scale. The means of the barriers ranged from 4.31 to 5.07, and standard deviations ranged from 0.91 to 1.59. The disparity between the highest and lowest mean is 0.76, which is a small variation depicting a high consistency in the sample perceptions of the significance to these barriers. A good consistency with the sample answers was based on the rate of the standard deviation 0.91. As shown in Table 4, special education teachers ranked “lacking of administrative support” as the first barrier with a mean of 5.07 and the standard deviation of 0.91. This barrier was the most homogeneous compared to other barriers, and the coefficient of variation was 0.18. The barrier “not enough staff” was in the last rank with a mean of 4.44, and the standard deviation of 1.59 indicating a small variation about the significance of this barrier, and the perceptions about it were less homogeneous than the rest of the perceptions of other barriers where the coefficient of variation was 0.35.

An independent sample \(t\)-test was used to determine if the “Gender” had a statistically significant influence on special education teachers’ perceptions of the components, the benefits, and barriers regarding implementing CBVI. There were non-significant differences between perceptions of male and female teachers toward the importance of components of CBVI \((t = -0.988, p = 0.34)\), and the value of \(t\) was non-significant \((p = 0.34 > 0.05)\). Furthermore, there were also non-significant differences between perceptions of male and female teachers toward the benefits of CBVI \((t = -0.538, p = 0.596)\), and the value of \(t\) was non-significant \((p = 0.596 > 0.05)\). Finally, there were non-significant differences between perceptions of male and female teachers toward the barriers of implementing CBVI \((t = -0.035, p = 0.97)\), and the value of \(t\) was non-significant \((p = 0.97 > 0.05)\).

Discussion

The results of this study indicated that special education teachers in Riyadh recognize the
potential importance of the components and the benefits of CBVI. They also were aware of challenges and barriers of implementing CBVI for students with ID. Special education teachers think that CBVI has to incorporate various essential components to be an efficient approach for training students with ID for employment. Teachers ranked different components such as creating CBVI's goals with a team as the most important. Additionally, they state that it is vital to provide opportunities for students with ID to do a variety of tasks for different jobs. This result agrees with Test, Fowler, et al. (2009) study, which supports preparing students with ID for various jobs. It was not clear why special education teachers ranked providing instruction and/or supervision (i.e. by the school or business) during CBVI at all times as one of the least important components. Instruction and/or supervision are essential components of CBVI. The students with ID need the instruction and/or supervision to learn job skills and function effectively. Several studies recommend supervision and natural support in the integrated work environments (Luecking, Cuozzo, & Buchanan, 2006). Even though teachers ranked some components lower, those components are still important because they have a high average mean which is in line with some studies’ findings (Kim & Dymond, 2010; Lindstrom & Benz, 2002).

Teachers in high school confirm that the implementation of CBVI drives to positive postschool outcomes such as more likely that students with ID will find and maintain a job. This result is consistent with Lindstrom and Benz (2002) and Collet-Klingenberg (1998) findings, both of which revealed that work experience in high school is a vital component in assisting students with transition to work after secondary school. Special education teachers also think that CBVI supports students with ID to equip with needed employment skills, find postschool employment, and reach independent living, which agreed with Parmenter’s (2011) findings.

In this study, educators ranked major barriers to implementing CBVI, such as a lack of administrative support, lack of preparation time, and lack of cooperation between schools and other related agencies, and employers. These were consistent with Sarkees-Wircenski and Scott’s (1995) findings, but inconsistent with the findings of Kim and Dymond (2010), who investigated secondary special education teachers (N = 68) in Illinois, and found different ranking of major barriers, such as: not enough staff, requirements of the No Child Left Behind Act (NCLB), and lack of funding. This inconsistency in the results of the current study and Kim and Dymond study may refer to the different way of funding schools between the two countries. In Saudi Arabia, the government provides equal funding for all school based students while in the US, federal, state, and local revenue provide varying funding for different schools. Teachers believe that the community has been not supportive with the implementation of CBVI. Employers are still not ready to cooperate with schools. Educators have not received a sufficient level of staff development. Local universities do not offer programs that teach CBVI for current special education teachers or students training to be special education teachers. Alnahdi (2013) concluded that special education teachers felt unequipped with adequate skills to plan and provide transition services. Additionally, Althabet (2002) pointed out that there were no university courses about transition services in the special education program at King Saud University. Furthermore, the legislation in Saudi Arabia does not require the involvement of other agencies in providing employment training for students with ID during high school. This pressures special education teachers to concentrate only on teaching academic skills and do not provide CBVI for their students. Lastly, educators conclude that implementing CBVI more likely to take too much time from the academic instruction in the classroom.

The current study revealed that there was a non-significant difference in the perceptions of female and male special education teachers concerning components, benefits, and barriers of CBVI. This may indicate two things, first that the special education teachers do not consider CBVI to be an important component and second, the female and male teachers have positive perceptions about the CBVI due to its better understanding of the students with ID.
Limitations of the Study

Throughout conducting the study in Riyadh there were various challenges in carrying out this investigation. Therefore, there were various limitations. One of the limitations was involving participants from only one city. That precludes the generalization of the study results. Secondly, only public high schools were selected; thus, there was not enough representation of various institutions across Riyadh, which resulted in an unequal number of participants among special education teachers. The third problem encountered was the fact that the definition of CBVI that was provided in the survey was broad (Kim & Dymond, 2010). This may have led to a situation whereby many participants may have cited having experience in CBVI than if a narrower definition had been provided. CBVI was not implemented at all schools in Riyadh. Thus, it was not clear that teachers understood CBVI from the definition that was provided in the survey and from the items under the dimensions in the survey, which are the importance of components, the benefits, and the barriers. This study is based on a survey conducted on special education teachers in Riyadh; thus, those respondents’ perceptions were based on Saudi Arabian culture, legislation and education systems, which reflect only the challenges educators face in their social setting.

Implications for Practice

One of the significant implications of this study is for the schools, government and other related agencies to include the CBVI programs in student IEPs. It is necessary that it is effectively implemented so that the students can be prepared for the postschool employment. Southward and Kyzar (2017) emphasized that on the job experiences should be focused by the educators for the overall development of the students, which should include internships, shadowing, apprenticeships, cooperative education, and nonpaying observation. It is also required that the government should adopt certain legislative policies which require employers to provide training to the students with ID. This will ensure that while working in real life environment, they are made more job-ready and have a better quality of life. Another significant implication is for the schools to create new positions for specialists in schools for professional development such as transition and CBVI specialists (Luecking et al., 2006). These implications will help in increasing the employment opportunities for students with ID and will enhance their integration in the community thereby providing a better quality of life.

Future Research

As the present study focuses only on the Riyadh city, it is recommended that for the future studies, a similar study is conducted on a national level. Additionally, it is also recommended that unlike the current study, which is focused on determining the perceptions of special education teachers, another study should be conducted for determining administrators’ perceptions for the implementation of CBVI. Another area which needs an additional inquiry is the push for accountability, as expressed in the legislation and CBVI (Rabren et al. 2002). Future studies should also be conducted to study CBVI as an intervention study to determine the impact of CBVI on employment success after completion of high school. Lastly, the future studies should also focus on determining the role of family members and school-based staff in guiding and influencing the decisions taken by the students with ID concerning employment (Lindstrom, Doren, Metheny, Johnson, & Zane, 2007). Test, Mazzotti, et al. (2009) illustrate that students who have proper occupational guidance from family members and school staff are likely to have successful transitions to jobs and are capable of keeping their job positions for a longer time.

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West, M. D., Wehman, B. P., & Wehman, P. (2005). Competitive employment outcomes for persons with intellectual and developmental disabilities:


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Participation in Related Services and Behavioral, Social, and Adaptive Symptom Presentation in Young Children with Autism Spectrum Disorder

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University of California, Los Angeles

Abstract: Children with autism spectrum disorder (ASD) tend to receive several related services during their early school years. In this study, we followed 70 preschoolers with ASD and used parent reports to document the intensity of these services over a 4-year period, in relation to children’s outcomes in three domains. While behavioral difficulties improved, social skills and adaptive abilities in children with ASD tended to remain impaired across development. We found that very young children with ASD received behavioral services regardless of need and overall standardized measures of behavioral difficulties showed improvement over 4 years. Further, over time, behavioral services were correlated to children’s needs. Standardized measures of social skills improved significantly but scores remained impaired and services specific to this skill area were few. Adaptive abilities remained significantly impaired however, and adaptive services were very few, with little relationship to abilities over time.

In 2001, the National Research Council (NRC) published Educating Children with Autism calling for interventions prioritizing language, social skills, cognitive development, problem behaviors, and academic skills. They state, “Effective services will and should vary considerably across individual children, depending on a child’s age, cognitive and language levels, behavioral needs, and family priorities” (Lord & McGee, 2001, p. 220). They recommended a minimum of 25 hours per week, 12 months of the year with a particular emphasis on early intervention. During early school years, in addition to schooling, services may be provided through young children’s Individual Education Programs (IEPs) while others may be obtained by parents through private funds or health care coverage (Young, Ruble, & McGrew, 2009).

The NRC report summarized research on effective interventions, and subsequent research has focused on identifying ingredients of therapeutic interventions that maximize outcomes for young children with autism spectrum disorder (ASD) in such areas as autistic behaviors, cognitive skills, language skills, and social skills. Meta-analytic reviews of comprehensive intervention programs for young children with ASD, for example, suggest relatively broad gains across these areas with considerable interactions between these gains and individual child characteristics such as symptom severity, initial IQ, and age at intervention entry (Eldevik et al., 2009; Makrygianni & Reed, 2010; Virues-Ortega, 2010).

What remains concerning, however, is that adaptive behavior was not specifically included in the NRC report as a priority and yet adaptive behavior scores for children with ASD consistently seem to fall one to two standard deviations below average, even in children with average intelligence (Lee & Park, 2007). Further, adaptive behavior has not readily

Tremendous gratitude is extended to all the families who gave their valuable time to participate in the present project. We are incredibly grateful to Megan Micheletti for tireless data entry. Thank you also to Angela Nam and Yanzhen Chen for reliability and administrative help. Correspondence concerning this article should be addressed to Stephanny Freeman, University of California, Los Angeles, Department of Child Psychiatry, 78-243B Semel Institute for Neuroscience & Human Behavior, UCLA, 760 Westwood Plaza, Los Angeles, CA 90024-1759. E-mail: sfreeman@mednet.ucla.edu
been used as an intervention outcome measure at least as compared to other outcomes; and, when it has, post-intervention adaptive scores tend to remain quite low (Sainato et al., 2015). For example, Eldevik et al., (2009) reviewed eight studies and found, after treatment, a mean adaptive behavior composite score of only 61.9 or more than two standard deviations below the mean. More recent studies on young children with ASD focus on identifying the moderators and mediators of gains in adaptive behaviors. Baghdadli et al., (2012) examined trajectories in adaptive behavior from preschool into adolescence and found that “important deficits remain in adaptive abilities” (p. 1322) but that one-third of their sample with higher cognitive abilities and more hours of intervention during follow up did make significant improvements. Indeed, cognitive (IQ) and language abilities are reliable moderators of adaptive behavior outcomes (Anderson, Oti, Lord, & Welch, 2009; Hedvall et al., 2014; Szatmari et al., 2012) but type and intensity of therapeutic services remain less well established (Scahill et al., 2016).

It is not altogether clear what therapeutic services young children with ASD actually receive in community settings through the elementary grades. Some studies have attempted to collect such data but are limited to hours of intensive behavior therapy and not to a broader spectrum of therapeutic services (Estes et al., 2015; others are limited only to special education services (Wei et al., 2014). More comprehensive surveys have been conducted on child and family access to a wide range of related services and generally suggest that those most often used are speech/language therapy, behavior therapies, occupational therapy, and social skills training (Ruble & McGrew, 2007; Thomas, Ellis, McLaurin, Daniels, & Morrissey, 2007; Thomas, Morrissey, & McLaurin, 2007; Young et al., 2009). These studies also suggest that the norm is for families to use many services at once, often in clusters related to specific developmental or behavioral needs. It is important to note, however, that these studies were based on broad cross-sectional and not longitudinal data and that parents reported very little that could be considered related to daily living or adaptive skill targets.

In the present study, we therefore sought first to understand the current state of therapeutic services in a cohort of preschoolers over a 4-year period and then to examine the relationship of service provision to standardized scores in three domains of development (behavioral difficulties, social skills, and adaptive abilities). Although multiple services have been studied we chose the four most frequently used from the service literature noted above, and then added adaptive skills therapy as the fifth, since it was of particular interest. The sample of families originated in a short-term (3-month) intensive partial-day hospitalization program for young children with ASD. The families that accessed the program were pro-active, highly engaged, and, as part of the program, were given extensive training on accessing community resources. The program itself was located in a middle to upper class community in one of the largest metropolitan cities in the US where depth, breadth, and variety of programs are significantly more available than in smaller cities. Taken together, these families were such that, if the services were available, they were generally able to access them given that they presumably had the skills and the resources, as well as the potential availability of therapeutic services. In other words, in a best-case scenario, we sought to understand 1) what therapeutic services could be obtained over a 4-year period after completing a brief but intensive therapeutic intervention for young children with ASD, and 2) how these services related to functioning. This study thus investigated three predictor variables (initial abilities at program entry, intervention intensity as it varied over the 4-year period, and change over time in various services provided) on standardized outcome measures of behavioral difficulties, social skills, and adaptive abilities.

Method

Participants

Participants all were within 2–6 years of age (24–81 months) at Time 1 (mean in months = 48.4, SD = 14.9) and 6–11 years of age (69–135 months) at Time 2 (mean in months = 96.4, SD = 21.1). This provided both a longitudinal and a cross-sectional view over a 10-year period. The fact that they all
participated in the intensive program was a constant in regard to baseline assessments. All children were assessed in person at Time 1 but then parent/provider questionnaires were mailed at Time 2. Report of services was thus retrospective.

Materials and Procedure

A packet of questionnaires was mailed to 328 families who had once participated in an intensive short-term treatment program between the years of 2008 and 2014. The treatment program is for children with ASD. All children, prior to entering the treatment program, had an established diagnosis by a state Regional Center psychologist or a private psychologist using the Autism Diagnostic Observation Schedule (Lord, Rutter, Dilavore, & Risi, 2008). Children are referred to the program for intensive, comprehensive, interdisciplinary treatment. Enrollment is on a first come first serve basis with only the ASD diagnosis as criteria. Four months after the initial mailing, new packets were re-mailed to nonresponders. Of the original 328 packets, 56 were returned due to incorrect addresses. Thus, 272 families potentially received the packet. Of these families, a total of 70 (25.7%) returned at least one questionnaire and the demographic form, reflecting an acceptable response rate for complex questionnaires delivered by mail in academic studies (Baruch, 1999; Sahlqvist et al., 2011). Note that family demographics indicated a relatively well-to-do profile including family income and caregiver’s highest level of education (Table 1).

Time 1 (Initial). At program admission, all children were assessed using one of two developmentally appropriate measures of cognition: the Wechsler Preschool and Primary Scales of Intelligence (WPPSI-III; Wechsler, 2002) or the Mullen Scales of Early Learning (MSEL; Mullen, 1995) both yielding a composite mental age. Parents were administered the Vineland II Adaptive Behavior Scales (VABSII; Sparrow, Cicchetti, & Balla, 2005) to identify both adaptive and social skill strengths and weaknesses using the subscale scores for these domains. We limited our analyses to these two domain scores and not the global score intentionally so as not to include language and motor skills. Parents also completed the ASEBA Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001) to examine behavioral difficulties. The University Human Subjects Protection Committee approved the data collection protocol, and parents signed informed consent to have their data used for research purposes.

Time 2 (Follow-up). A mean of approximately 48 months later, parents were mailed packets containing a brief introductory letter, a consent form, self-addressed stamped envelope, and four questionnaires/instruments. The University Human Subjects Protection Committee approved this time point questionnaire study and parents returned informed consent forms to have their data used for research purposes. No incentives were provided to complete the forms. The first was a demo-

<table>
<thead>
<tr>
<th>Responder</th>
<th>Income (in 10,000)</th>
<th>Ethnicity</th>
<th>Highest Level of Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother</td>
<td>58 (83%) 30–40</td>
<td>African Am</td>
<td>High school 1 (1%)</td>
</tr>
<tr>
<td>Father</td>
<td>9 (13%) 40–50</td>
<td>Asian Am</td>
<td>Some college 10 (14%)</td>
</tr>
<tr>
<td>Other</td>
<td>2 (3%) 50–60</td>
<td>Caucasian/White</td>
<td>Completed college 24 (34%)</td>
</tr>
<tr>
<td>NR</td>
<td>1 (1%) 60–80</td>
<td>Hispanic</td>
<td>Graduate/professional 34 (49%)</td>
</tr>
<tr>
<td></td>
<td>80–100 6 (9%)</td>
<td>Other</td>
<td>NR 1 (1%)</td>
</tr>
<tr>
<td></td>
<td>&gt;100 47 (67%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NR = no response.
graphic questionnaire that also included a log for parents to inventory year-by-year their child’s past and current services (“Service History Inventory”). Parents followed the prompt, “My child received services related to...” the following: occupational therapy, speech therapy, physical therapy, social skills development, adaptive daily living skills/self-help skills, interfering/maladaptive behaviors. Table 2 provides the language and examples used to define each category in the inventory.

The second was the Adaptive Behavior Assessment System Second Edition (ABASII, Harrison & Oakland, 2003) where again we focused on the two subscale scores of practical reasoning and social skills. The ABASII manual contains specific validation studies demonstrating concurrency between the VABSII and the ABASII. The correlation between the General Adaptive Composite (GAC) on the ABASII and the VABSII Adaptive Behavior Composite was .75 (Community-University Partnership for the Study of Children, Youth, and Families, 2011). Further, Kenworthy et al (2010) identified the ABASII as comparable and informative in relationship to the VABS in their study while Lopata (2013) found that the VABSII and the ABASII yielded scores that did not significantly differ for adaptive social skills and showed similar patterns of deficits overall across the sample. The third instrument was the CBCL (Achenbach & Rescorla, 2001) and the fourth was the Social Responsiveness Scale-2 (SRS2; Constantino & Gruber, 2007).

**Target outcome measures.** Behavioral Difficulties were assessed using the CBCL at both Time 1 and Time 2. The scores are expressed as $T$-Scores (70 and above = clinical, 65–69 = borderline, 50–64 = nonclinical). Social Skills were assessed using the Social Skills Subdomain of the VABSII (VABS-SO) at Time 1 and the ABAS Social Skills Subdomain (ABAS-SO) at Time 2. These measures are expressed as standard scores (Mean = 100, SD = 15). The SRS from Time 2 was used to validate the ABAS Social Skills subdomain at Time 2 since the SRS could not be given at Time 1 as most participants were too young for the age range. The SRS and ABAS Social Skills Subdomain were very highly correlated ($R^2 = .778$, $p < .001$) at Time 2. Adaptive Abilities were assessed using the Daily Living Skills subdomain of the VABSII (VABS-DLS) at Time 1 and the ABAS Practical Skills (ABAS-PR) score at Time 2. The measures are also expressed in this study as Standard Scores (Mean = 100, SD = 15).

**Contributing variables.** Hours of therapeutic services targeted towards improving behavioral difficulties, social skills, adaptive abilities, speech and language, and occupational therapy skills were obtained through the Service History form at each age. For behavioral

### Table 2

<table>
<thead>
<tr>
<th>Type of Service</th>
<th>Brief Definition and Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupational Therapy</td>
<td>Offered in school, clinic, or home setting. OT focuses on fine motor skills, gross motor</td>
</tr>
<tr>
<td></td>
<td>skills, sensory and neuromuscular, and strengthening.</td>
</tr>
<tr>
<td>Speech Therapy</td>
<td>Offered in school, clinic, or home setting. ST focuses on speech, language, and pragmatic</td>
</tr>
<tr>
<td></td>
<td>skills.</td>
</tr>
<tr>
<td>Physical Therapy</td>
<td>Offered in school, clinic, or home setting. PT focuses generally on mobility and functional</td>
</tr>
<tr>
<td></td>
<td>ability.</td>
</tr>
<tr>
<td>Social Skills</td>
<td>Usually offered in a clinic or through your in home behavioral services. Some skills</td>
</tr>
<tr>
<td></td>
<td>include but are not limited to turn taking, sharing, or play.</td>
</tr>
<tr>
<td>Adaptive Daily Living Skills/Self-Help</td>
<td>Offered in school or home/community setting. Examples of ADLS include toileting, dressing,</td>
</tr>
<tr>
<td></td>
<td>clearing the table, using the telephone, going to the store, etc.</td>
</tr>
<tr>
<td>Interfering/Maladaptive Behaviors</td>
<td>Behavior Therapy at Home and/or at School: Focus on home or school behavioral concerns. Can</td>
</tr>
<tr>
<td></td>
<td>include any specific teaching styles, e.g., DTT, PRT.</td>
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and adaptive therapy, the families categorized their hours per week using the following scale: 0 hours, 1–5 hours, 6–10 hours, 11–15 hours, 16–20 hours, 20 hours. For social skills, speech and language, and occupational therapy, parents specified the total number of minutes they received per week. Since speech and language therapy includes a focus on pragmatic communication, we examined those services as well as social skill services in relation to social skills. Additionally, occupational therapy often focuses on daily living skills; and thus we examined those services, as well as adaptive services, in relation to adaptive abilities.

Statistical analysis. Pearson correlations were conducted to examine the relationship between hours of service (behavioral, social, and adaptive) and standardized scores at Time 1 and Time 2. Generalized linear mixed models (GLMM) were used to examine relationships over time. GLMM with a main effect of time and subject level random intercepts and slopes were used to model the longitudinal trajectories of different services (behavioral, adaptive, social skills, speech therapy, and occupational therapy). GLMM accounts for correlations between repeated measures within subjects and utilizes all available observations from each subject. Outcome measures were collected at Time 1 and Time 2, and not at each time point. Thus, in order to study the association between change over time in the services and skills at Time 1 and Time 2, we regressed the predicted services slopes from the GLMMs on the baseline measures and then on outcome measures (behavioral, social, and adaptive).

Results

Differences in Symptomology from Initial to Follow Up

Using two-group dependent sample t-tests, the 70 responders were examined at Time 2 compared to Time 1 symptom presentation on t-scores (CBCL) and standard scores (VABSII and ABAS) for each of the corresponding target domains (behavioral, social, adaptive). In all three domains, there was a significant difference between Time 1 and 2 (Table 3). Behavioral difficulties improved from a subclinical to a non-clinical range. Social skills improved but remained at two standard deviations below the mean, and adaptive abilities worsened from slightly above two to well below two standard deviations from the mean.

Services

Figure 1 shows the average hours of service per week over time for behavioral and adaptive services. Both are presented by “category” of hours, as noted in the methods section. As can be seen, behavioral therapy peaked at around 10 hours per week between the ages of 3 and 6. Adaptive therapy remained under 5 hours per week across the age range. Figure 2 shows the average minutes per week over

### Table 3

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<th>Time 1</th>
<th>Time 2</th>
<th>T Score</th>
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<tbody>
<tr>
<td>Behavioral Difficulties&lt;sup&gt;a&lt;/sup&gt;</td>
<td>65.0 (10.2)</td>
<td>58.0 (9.62)</td>
<td>3.97***</td>
</tr>
<tr>
<td>Social Skills&lt;sup&gt;b&lt;/sup&gt;</td>
<td>70.0 (11.4)</td>
<td>76.0 (17.9)</td>
<td>3.33***</td>
</tr>
<tr>
<td>Adaptive Abilities&lt;sup&gt;b&lt;/sup&gt;</td>
<td>73.5 (13.2)</td>
<td>64.5 (18.1)</td>
<td>3.85***</td>
</tr>
</tbody>
</table>

*** p < .001.

<sup>a</sup>CBCL Child Behavior Checklist; T50-T64 = within normal limits, T65-T69 = subclinical, T70 and above = clinical.

<sup>b</sup>VABS at Time 1 Vineland Adaptive Behavior Scales, Subscales: DLS = Daily Living Skills, SO = Social Skills; (M = 100, SD=15).

<sup>b</sup>ABAS at Time 2 Adaptive Behavior Assessment System Subscales: PR = Practical Skills, SO = Social Skills; (M = 100, SD = 15).
time for social skills, occupational, and speech therapy. Speech and occupational therapy followed similar trends and, again, peaked between 3 and 6 years of age. Social skills therapy began to be prominent around age 8 and speech therapy also showed a slight increase. The sample at age 11 is \( n = 3 \), none of whom appeared to have received behavioral or occupational therapy.

**Correlations at Time 1**

We examined the relationship between service hours and symptom presentation at Time 1. The amount of services each child was receiving for behavior, social skills, adaptive abilities, speech, and language, or occupational therapy at Time 1 did not correlate significantly with the corresponding Time 1 symptom presentation in the three domains. Further, mental age at Time 1 did not significantly contribute to any of the models or correlate to the variables.

**Predictors of Service Provision**

**Behavioral difficulties.** The GLMM showed that Time 1 CBCL was not related to the slope of behavioral service provision but it was at Time 2 CBCL \( (F(1, 66) = 3.66, p = .06, R^2 = .05) \). Using the \( \beta = .004 \) and the intercept \(-.3\) we can interpret the slope. For the average child in this sample who had a Time 2 CBCL of 58, their service hours decreased by .07 categories per year or approximately 3.5 hours per week after 10 years. For a child scoring two standard deviations above the mean, their service hours increased by .01 categories per year and half an hour per week after 10 years. Finally, for a child scoring two standard deviations below the mean their service hours decreased

![Figure 1. Distribution of behavior and adaptive skills therapy by category of hours per week. The y-axis represents the hours of services reported per week using the following categories 0 = 0 hours, 1 = 1–5 hours, 2 = 5–10 hours, 3 = 10–15 hours, 4 = 15–20 hours.](image)

![Figure 2. Distribution of social skills, speech, and occupational therapy in minutes per week. The y-axis represents the minutes of services reported per week.](image)
Our longitudinal data also allowed us to examine three predictor variables (initial abilities, change over time of service provision, and intensity of hours of outcome services) on standardized outcome measures of behavioral difficulties, social skills, and adaptive abilities, as noted below.

First, taken in perspective, the group as a whole improved significantly in their behavioral presentation, and this appeared unrelated to initial mental age. More specifically however, as predicted, initial behavioral services were not correlated to initial CBCL scores. Young children with autism were receiving intensive behavioral interventions in the preschool period regardless of the severity of their behavioral difficulties. When examining the pattern of behavioral services over time by the slope of their service change, unexpectedly but not surprisingly, over the end of the preschool years through early elementary years, the group increased hours of services slightly over time. This was not related to improvements they may or may not have been making in behavioral symptoms. Cross-sectional data suggested that caregivers rated behavioral therapy as the most effective of the many services they received which also seemed to be verified by child outcome data (Ruble & McGrew, 2007). In our study, however, there was a strong trend for children with worsening symptom presentation to receive a larger increase in behavioral therapy hours, as indicated by the high correlation at follow-up in hours of service with the severity of their behavioral impairments.

Social skills showed an improvement over time but remained impaired at outcome. Social skill services seemed to be available across the age range and showed a trend towards increases in services as the children aged. Symptom presentation was more strongly related, however, to speech and language services. Parents and practitioners seem to be accessing speech and language therapy as a response to difficulties in social skills but why this should be the case is not readily apparent from our data. The possibility is that pragmatic language skills may be contributing to gains in social skills as suggested by cross-sectional findings that only about a quarter of families seemed to access social skills therapy while over 80% accessed speech and language therapy (Thomas, Morrissey et al., 2007).
A broad examination of adaptive abilities shows that overall, children with ASD are worsening in their symptom presentation. Further, consistently across the age range in this study, the service hours that target these critical skills are extremely low. Finally, there was no significant relationship between adaptive therapy services and adaptive abilities scores; but, there was a slight relationship between adaptive abilities and occupational therapy services. Occupational therapy minutes were quite low, generally less than an hour per week and tended to decline over time, consistent with cross-sectional research suggesting that nearly two-thirds of families access occupational therapy (Thomas, Morrissey et al., 2007) but this service only ranked sixth out of nine services rated for effectiveness (Ruble & McGrew, 2007).

The findings in this study, taken together, may help to provide a preliminary picture of service provision for young children with ASD in a resource-rich environment where access and availability seem to be strong and sustained behavioral interventions are being implemented. While not presuming any assumptions about quality or type of intervention package, children who are receiving 6 to 15 hours per week of behavioral intervention at an early age for a period of 3 to 4 years and who are then generally sustaining some service, if needed, show significant improvements in behavioral symptomology. For social skills, families seem to be relying somewhat more on speech therapy, and this appears to be yielding some improvements. Clearly more is needed, since their outcome standard scores remained below one standard deviation. The access of social skill therapy seems not to be enough; thus, outcomes are not strong. Finally, in the adaptive domain, there are few targeted services and virtually no improvements. Indeed, declines in this area remain consistent with prior literature, but the provision of occupational therapy services in this area deserves more study.

This study had several limitations. The sample was a convenience sample and thus, issues of sampling bias were present and acknowledged as a limitation; nonetheless, these biases contributed to our understanding. Organized, pro-active, participating, well-educated families were likely accessing all that could be available for their children. This particular sample was the target but it is acknowledged that the study then assumed that those who did not answer the follow-up questionnaires or did not participate in the treatment program at Time 1 were thus not accessing broader or more comprehensive services. A second limitation relates to the Service History form. Although the form did not name a particular service delivery style (e.g., ABA) but instead focused parents on the targets of the services (e.g., “services related to interfering/maladaptive behaviors”), it is possible that some parents did not rate social and adaptive skills because they felt they were embedded in their “ABA” services. We recognize that this could under-represent adaptive and social skill assistance but we specifically asked for services related to a particular content area rather than a specific service provider to help bring attention to those target domains. Finally, this study does rely on retrospective reports of families, which may have somewhat limited validity. Although a limitation, a number of studies have shown that parents are reliable reporters in a variety of circumstances. For example, parents of younger children show relatively accurate report of health care service (Kosa, Alpert, & Haggerty, 1967), and the more severe the health condition the more accurate the report (Daly, Lindgren, & Giebink, 1994). Parents with higher educational levels seem to provide more accurate reports than lower educational level households (Hawe et al., 1991). It should also be noted that “substantial beyond chance agreement” was found between maternal recall of medical records and actual medical records (D’Souza-Vazirani, Minkovitz, & Strobino, 2005). Further, one could argue that the study targets the absence of a critical area of need; and, even when prompted, if the parents couldn’t recall any or very little help within the social and adaptive domains over the past 4 years, it may likely be the result of these services not being readily available.

Although this study has a relatively small sample with seemingly limited generalizability, it nonetheless suggests intriguing possibilities for future research that might further our understanding of effective interventions targeting adaptive and social skill development. An examination of another subset of children
between the ages of 10 and 16 would be useful to determine if the relationship between worsening symptom presentation and increases in behavioral therapy continues into adolescence, if continued low levels of adaptive therapies correlate with adaptive scores, and if other therapies can be increased (occupational and speech) to provide additional enrichment and skill training for these under-represented areas. As for professional practice, more careful attention to adaptive skills, both as a focus for more targeted adaptive skill training as well as a focus within behavioral and occupational therapies, might be warranted, especially given the generally poor outcomes reported for adaptive skills of relatively young children with ASD.

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Friendship 101: Helping Students Build Social Competence

Juliet E. Hart Barnett and Kelly J. Whalon, Editors

2014

The eighth volume of the CEC Division on Autism and Developmental Disabilities’ Prism series, Friendship 101 focuses on building social competence, friendship making, and recreation and leisure skills among students with autism spectrum disorder and other developmental disabilities. Chapters in this evidence-based, user-friendly guide address the needs of students in different developmental periods (from pre-K through young adulthood), providing teachers, parents, faculty and teacher educators with tools and strategies for enhancing the social skill development of these children and youth. Presented through an ecological perspective, together these chapters emphasize building social competence within and across school, home, and community contexts.

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The transition from high school to adulthood is challenging for many young people, and often particularly difficult for those with disabilities. Transition To Adulthood: Work, Community, and Educational Success provides a blueprint for supporting youth with disabilities in achieving their postsecondary goals in a variety of adult settings – education and training, employment, and the community.

This publication of the Council for Exceptional Children’s Division on Autism and Developmental Disabilities is the latest in its successful Prism series (Prism 11) and covers a wide range of topics, from assessing students’ interests and abilities to fine-tuning their education plans and goals, ensuring that students with disabilities are included in a variety of settings, and building community relationships to ensure their continuing inclusion. It provides a valuable resource for transition personnel, special and general educators, and special education administrators at the school and state level, as well as adult service professionals.

With eight chapters written by 20 authors, Transition to Adulthood covers the breadth of research delineating best practices and proven instructional strategies for ensuring that students with disabilities reach their full potential and achieve their goals.

Visit the CEC online catalog at pubs.cec.sped.org to order this book. The direct link to the book listing is http://pubs.cec.sped.org/p6296/
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(Act of August 12, 1970, Section 3685 Title 39, United States Code)

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**15. Extent and nature of circulation:**

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<td>J. Percent paid and/or requested circulation</td>
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**17. This statement of ownership will be printed in the VOL. 53 #4 (12/01/2018 issue of this publication.**

**18. Signature and Title:**

| Teresa Doughty | Executive Director | September 24, 2018 |
Education and Training in Autism and Developmental Disabilities

Editorial Policy

*Education and Training in Autism and Developmental Disabilities* focuses on the education and welfare of persons with autism and developmental disabilities. *ETADD* invites research and expository manuscripts and critical review of the literature. Major emphasis is on identification and assessment, educational programming, characteristics, training of instructional personnel, habilitation, prevention, community understanding and provisions, and legislation.

Each manuscript is evaluated anonymously by three reviewers. Criteria for acceptance include the following: relevance, reader interest, quality, applicability, contribution to the field, and economy and smoothness of expression. The review process requires two to four months.

Viewpoints expressed are those of the authors and do not necessarily conform to positions of the editors or of the officers of the Division.

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1. Manuscript submission is a representation that the manuscript is the author’s own work, has not been published, and is not currently under consideration for publication elsewhere.
3. Each manuscript must have a cover sheet giving the names and affiliations of all authors and the address of the principal author.
4. Research studies, including experimental (group and single-subject methodologies), quasi-experimental, surveys, and qualitative designs should be no more than 20–30 typewritten, double-spaced pages, including references, tables, figures, and an abstract.
5. Graphs and figures should be originals or sharp, high quality photographic prints suitable, if necessary, for a 50% reduction in size.
6. Three copies of the manuscript along with a transmittal letter should be sent to the Editor: Stanley H. Zucker, Mary Lou Fulton Teachers College, Box 871811, Arizona State University, Tempe, AZ 85287-1811.
7. Upon receipt, each manuscript will be screened by the editor. Appropriate manuscripts will then be sent to consulting editors. Principal authors will receive notification of receipt of manuscript.
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10. Please describe subjects (or any other references to persons with disabilities) with a people first orientation. Also, use the term “intellectual disability” (singular) to replace any previous term used to describe the population of students with significant limitations in intellectual functioning and adaptive behavior as manifested in the developmental period.
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Council for Exceptional Children
Division on Autism and Developmental Disabilities (DADD)

Research-Informed Practice

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