


# Review of Experimental Social Behavioral Interventions for Preschool Children: An Evidenced-Based Synthesis

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## Abstract

Preschool students are expelled from educational settings at higher rates than any other students, and this may serve to be problematic across their lifespan. One of the primary reasons reported is due to their display of social behavioral problems within the preschool classroom. A historical review of social behavioral interventions for preschool children in classroom settings was provided. Moreover, a meta-analysis of recent evidenced-based social behavioral interventions for children with and without disabilities in preschool classrooms was conducted. In addition, 10 research questions were addressed that included the identification of studies using the most rigorous designs. Results from 14 studies in 12 peer-reviewed journals (2007–2017) were provided that indicated variations in range and scientific rigor with two studies meeting the highest standards of rigor. Suggestions for future research were offered.

## Keywords

special education, education, social sciences, early childhood, educational psychology and counseling, educational research, education theory and practice, social sciences, experimental psychology, psychology

Preschools have the potential to affect all aspects of children's lives across their lifespan by teaching them the skills required to thrive:

High quality prekindergarten improves school readiness. It provides children with cognitive, academic, social, and emotional skills they require to be successful in elementary school. The benefits of quality prekindergarten for children three- to four-years-old go beyond the first years of school. (Gilliam, 2005, p. 2)

However, preschool students are expelled at more than 3 times higher rates than students in any other grade and have been for years without resolve (Gilliam, 2005; Gilliam & Shahar, 2006; Malik, 2017; U.S. Department of Education Office for Civil Rights, 2016). According to the 2016 National Survey of Children's Health, at least 50,000 preschool children in the United States of America were suspended at least once and 17,000 were expelled from school during the year of review (Mader, 2019). Approximately, 250 preschool children are estimated to be suspended or expelled each day (Malik, 2017; Strauss, 2017). In addition, most preschool children expelled are male, Black, (Mader, 2019), and/or taller than their peers (Gilliam & Shahar, 2006), which is a "fact experts attribute in part to implicit racial bias among educators (Mader, 2019, p. 4)."

Furthermore, preschool students are expelled at these rates for various reasons. One reason is because of their social behavior problems exhibited within the classroom (e.g., tantrums, aggression, noncompliance). Researchers have reported that preschool children from low socioeconomic status (SES) environments and lower quality schools tended to have higher rates of social behavior problems compared to their peers from middle and high SES backgrounds and higher quality schools (Qi & Kaiser, 2003; Vandell et al., 1988). These problems may serve to hinder an environment conducive to learning and socializing and promote one that may be unsafe.

In addition, these social behavior problems may serve as obstacles for preschool children for years. These problems may prevent these young children from being exposed to social engagement opportunities, receiving essential early childhood general or special education, and/or early childhood interventions, which may ultimately interfere with their ability to matriculate through elementary, secondary, and

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postsecondary programs. Preschool children exhibiting social behavior problems within the classroom such as deficiencies with on-task behaviors may not even be ready for kindergarten (De Haas-Warner, 1991).

Research has posited that the unaddressed social behavior problems of preschool children are predictive of poor literacy development and academic achievement (Hinshaw, 1992). This may lead to poor performance in kindergarten and ultimately school failure (Snyder, 2001; Tremblay et al., 1996). Consequently, the inability to obtain a preschool education may place these children at risk of being left behind their peers and impede upon their abilities to become productive citizens as adults.

Furthermore, the social behavior problems of preschool children with and without disabilities when left unmodified may place them on a positive trajectory for more serious social difficulties later in life. These may include social maladjustment problems (Morrison et al., 2002; Odom et al., 1990), aggression and antisocial behavior (Farrington, 1991), poor psychosocial adjustments (Mathur & Rutherford, 1991), conduct problems, juvenile delinquency (Zigler et al., 1992), and being infused with the “revolving door” of the criminal justice system including incarceration and recidivism as well as other behavioral, emotional, and mental health problems (Knight & Hughes, 1995). Moreover, these problems may make these children more susceptible to risk factors including but not limited to their experiencing early death, psychiatric illness, divorce, substance abuse, fatal accidents, and unemployment within their lifetime (Carter & Van Norman, 2010; Zero to Three, 2018).

On the contrary, children who receive preschool education and intervention services in schools with teachers who have high levels of job satisfaction experience lower rates of expulsion (Gilliam & Shahar, 2006). To best place young children with and without disabilities with social behavior problems on a trajectory for academic success, lifelong achievements, and positive contributions to society, it is optimal for teachers to be prepared to equip their students with positive social behavioral support, as needed, within the natural preschool classroom. However, a prodigious number of preschools are not prepared to meet the needs of these students possibly, in part, due to teachers’ unawareness of evidenced-based positive social behavioral interventions that may be implemented within the classroom environment (Stormont et al., 2011).

### What is Positive Social Behavior?

Social behavior may be described as “the behavior of two or more people with respect to one another or in concert with respect to a common environment (Skinner, 1953, p. 297).” The social behavior of preschool children has been studied by researchers (Gesell, 1925) in preschool settings/environments (Lawrence, 2018), which are classrooms where children typically 3 to 5 years of age receive their formal education, for

nearly a century (Berne & Van, 1930; Chandler et al., 1992a; Chittenden, 1942; Choi & Ohm, 2018 ; Grady et al., 2012; Jolstead et al., 2017; Lane et al., 2017; Marshall & McCandless, 1957; Parten, 1933 ; Parten & Newhall, 1943). Positive social behavior may be observed in preschool settings when the children function appropriately with others and their environment during designated class activities particularly when presented with social occasions including but not limited to free play. As mentioned previously, research indicates that children who persistently display positive social behavior generally develop advanced language, cognitive, and social behavioral proficiencies over time, whereas those who constantly experience social behavior problems without modifications may experience deficiencies in these areas of development (McEvoy et al., 1992).

Preschool children who exhibit positive social behavior generally possess three behavioral characteristics. First, they use a wide range of *social skills* on various occasions. “Social skills are behaviors that promote positive interaction with others and the environment” (Lynch & Simpson, 2010, p. 3). Moreover, these children demonstrate their repertoire of social skills (e.g., offering and responding to compliments, smiling, asking for assistance, negotiating play roles, sharing, cooperating, taking turns, making eye contact, solving problems, staying engaged with the lessons and materials, asking and replying to questions) without extraordinary levels of prompting and/or reinforcement by their teachers, peers, or environmental supports. Research suggests that both teachers and parents concur regarding the importance of preschool children possessing social skills and that their ability to cooperate and be responsible were the most essential (Frey et al., 2014; Lane et al., 2007).

Second, preschool children with positive social behavior have *social interactions* that are appropriate and engaging with their teachers and peers. They often play well with others and aptly use preschool objects, equipment, materials, toys, and lessons as they are intended. For example, these children remain actively involved with the art lesson assigned during the designated time while adequately sharing art materials with others (Kim et al., 2003).

Third, teachers of preschool children with positive social behavior rate them as possessing generally high levels of *social competence*. These trait behaviors are rated based on the teachers’ observations over time of the children’s social behaviors during activities scheduled inside (e.g., free play) and outside (e.g., on the playground and field trips) of the preschool classroom. Moreover, social competence is the capacity of children to establish long-lasting friendships, be accepted by peers, adequately participate in interpersonal relationships, and become members of social groups (Lobo & Winsler, 2006). Although social skills and social competence are often used interchangeably in the literature, some researchers argue that these terms are best used separately to better differentiate between specific social behaviors and the outcomes of social behavioral interventions (Hops & Greenwood, 1988).

## What Are Social Behavior Problems of Preschool Children?

Research clearly indicates that demonstrating positive social behavior early in life is essential to preschool children's future accomplishments within and outside of classrooms and may lead to positive emotional and social development (i.e., positive peer friendships and relationships, called on in class regularly, popular, and acceptance) in the future. However, preschool children with social behavior problems often lack social skills as well as other skills such as language skills (Qi et al., 2019) and interpersonal problem-solving skills (Hune & Nelson, 2002). Moreover, they may experience limited or unsuccessful positive social interactions (e.g., withdrawal, isolation, few initiations, off-task behaviors, inappropriate, and negative interactions) with their peers and teachers. Also, these children may be rated by their teachers as being students with low levels of social competence. For example, in a prevention study of 60 preschool children who were at risk for developing conduct disorders, Tankersley et al. (1996) used the following behavioral definitions to describe social behavior problems: negative verbal statements, destruction, noncompliance, grabbing, out-of-seat or out-of-area, and aggression.

The preschool years may be the most advantageous period for implementing social behavioral intervention programs. Teachers may serve as key interventionists in preschool settings for young children needing additional positive social behavioral support such as those with language delays, social delays, and developmental disabilities (Bovey & Strain, 2003). However, preschool teachers report that their greatest obstacle to instruction is the social behavior problems of their students' particularly disruptive behaviors (Joseph & Strain, 2003). Moreover, Frey and his colleagues (2013) stated that this problem is increasing with teachers reporting the need to address this behavior in 10% to 15% of their students.

## What Are Rigorous Evidenced-Based Social Behavioral Interventions for Preschool Children That May Be Useful to Teachers in the Classroom?

According to Dunst et al. (2002b), evidenced-based interventions are those that "create testable, dependable, and planned changes, [in which] the most meaningful causes are those which can be deliberately manipulated (p. 1)." Moreover, evidenced-based interventions do not necessarily have a common set of criteria across fields; they are determined by underscoring the best evidence that is known for improving a problem (Marchant, 1991). Evidenced-based practices are those that are effective, research-driven, and based on empirical data (Dunst et al., 2002a).

Based on these definitions, key criteria that characterize *rigorous evidenced-based interventions* extend beyond being *experimental* (a scientific approach that manipulates one set

of variables as a constant and measures another set of variables), *applied* (of social importance to society; Baer et al., 1968), *behavioral* (physical aspects of behavior are modified; Baer et al., 1968), *analytic* (the researcher exercises control over the participant's behavior during the implementation of an experiment), and *technological* (the behavioral application was described completely; Baer et al., 1968). These interventions also are *effective* (Baer et al., 1968), measure *treatment fidelity* (Detrich, 1999; Gable et al., 2001), assess *social validity* (Wolf, 1978), and demonstrate *generality* (Baer et al., 1968; Brown & Odom, 1994; Stokes & Baer, 1977; Stokes & Osnes, 1989).

Behavioral research scientists have concurred regarding the social importance of identifying and implementing social behavioral interventions for young children in preschool classroom environments for more than 50 years. More specifically, improving the functional positive social behavior of preschool children was of particular interest to these early founding research scientists (Baer & Sherman, 1964; Buell et al., 1968; Goetz et al., 1975; Hart et al., 1968; Pinkston et al., 1973; Strain et al., 1976) whose focus was often strongly established in the teachings of B. F. Skinner (1953). They generally used single-subject and experimental-group designs with preschool children (a) diagnosed with disabilities, (b) diagnosed with developmental delays, (c) at risk for developmental delays, and (d) typically developing. Moreover, their focus was often on the use of environment-mediated strategies that included manipulations of classroom arrangements to modify behavior (Foster & Ritchey, 1979; LeLaurin & Risley, 1972; Quiltich & Risley, 1973; Risley & Cataldo, 1973; Twardosz et al., 1974; Wallace et al., 1976).

Research examining children with and without disabilities in preschool classroom environments, which was particularly prolific in the 1990s, specifically sought to enhance their positive social behavior (Chandler et al., 1992a; De Haas-Warner, 1991; Filla et al., 1999; Hall, 2006; Miller et al., 1993; Raab, 2003; Zanolli et al., 1996) including their social interactions (Garfinkle & Schwartz, 2002; Goldstein & Cisar, 1992; Goldstein et al., 1997; Gronna et al., 1999; Hendrickson et al., 1993; Hughes & Carter, 2002; Hundert & Hopkins, 1992; Hundert & Houghton, 1992; Keller & Honig, 1993; Krantz & McClannahan, 1998; Lindeman et al., 1993; McGee et al., 1992; Nordquist & McEvoy, 1983; Rettig et al., 1993; Sainato et al., 1992; Spohn et al., 1999; Strain et al., 1994, 1995), social skills (Ducharme & Holborn, 1997; Factor & Schilmoeller, 1983; Guglielmo & Tryon, 2001; LeBlanc & Matson, 1995; Storey et al., 1994), and social competency (Jenkins et al., 1989; McEvoy et al., 1992; Odom et al., 1999). Moreover, child-, teacher-, peer-, and environment-mediated social behavioral interventions were of major interests to behavioral scientists (Goldstein et al., 1992; Guralnick, 1981; Malmskog & McDonnell, 1999; Odom et al., 1992; Robertson et al., 2003; Storey et al., 1993) particularly through the manipulation of toys (e.g.,

Hendrickson et al., 1981; Kallam & Rettig, 1991; Martin et al., 1991).

Since that time these researchers have continued lines of work that address the importance of using evidenced-based interventions to examine and manipulate the social behavior of preschool students, their peers and teachers, and various aspects of the classroom environment when intervening to enhance the social behavior of these children (Barnett, 2018). In summary, this historical work of early behavioral research scientists has contributed to informing the field of useful social behavioral interventions for preschool children with and without disabilities and that those who enter kindergarten with persistent social behavior problems are generally not ready to learn but are at an elevated risk for academic and school failure (Brigman et al., 1999).

The current research serves as a meta-analysis of evidenced-based positive social behavioral interventions for children with and without disabilities in preschool classrooms. In addition, it extends the work of early behavioral research scientists as well as prior review syntheses on evidenced-based social behavioral interventions for these children (Chandler et al., 1992b; Kim et al., 2003; Knight & Hughes, 1995; Vaughn et al., 2003). Thus, it was possible to address 10 research questions across studies to determine the most highly rigorous evidenced-based social behavioral interventions for preschool children in their classrooms.

## Method

### *Searching the Literature*

Research studies meeting the inclusionary criteria were identified in the general literature using focused searches to broadly locate and identify relevant works. Inclusionary criteria included experimental studies designed to improve the positive social behavior (viz., social skills, social interactions, and social competence) of young children in preschool classrooms. Exclusionary criteria included nonexperimental studies (e.g., correlational, observational, quasi-experimental, meta-analytic, descriptive, and review), treatment administered in settings within non-preschool classrooms (e.g., contrived preschool environments like research laboratories and rooms within the preschool school but not in the natural classroom, clinics, home settings), and studies focused on enhancing mental health, social emotions, social cognitions, or social communications of preschool children. Moreover, studies that were not primarily focused on promoting positive social or prosocial behavior but specifically on reducing aggressive or negative behavior were not selected for review in this study.

An electronic search of the PsycINFO and ERIC databases was conducted to identify recently published (2007–2017), experimental, social behavioral interventions for young children in preschool settings. The following key research topic terms were used to conduct the search: social

behavior, preschool, and intervention. Only peer-reviewed academic journals and journal articles were selected. Reports, dissertations, books, or magazines were not selected for review. This search resulted in 668 records. The author then examined these records to ensure the inclusionary criteria (experimental, social behavioral interventions, and target participants received interventions within actual preschool classrooms) were met yielding a total of 14 studies.

### *Analytic Method*

This meta-analysis served to review and underscore the results of evidenced-based, positive social behavioral interventions for children with and without disabilities in preschool classrooms from 14 studies in 12 peer-reviewed journals (2007–2017). Ten research questions were addressed from these studies with four (questions 6–9 in the following) providing the evidence of the studies applying the most rigorous designs or those that had effective treatment results, measured treatment fidelity and social validity, and generalized. To address this study's research questions, a simple cross tabulation of each of the 14 studies by 10 response categories was completed to yield the frequency and percentage of studies of interests. The research questions and respective response categories were as follows:

1. What was the range of target participants? The range across studies of target participants selected was identified.
2. What was the disability status of the target participants? Studies were assigned to one (or more) of the following four categories based on the study's selected target participants' disability status including (a) disability, (b) at-risk, (d) developmental delay, or (d) none/typically developing.
3. What was the target social behavior of the target participants? The selected target participants' social behavioral problems addressed were assigned to one of the three response categories: social skills, social interactions, and/or social competency.
4. What experimental research designs were used? The percentages of research designs commonly implemented were identified and categorized as a single-subject or group design study procedures.
5. What experimental intervention procedures were implemented? The intervention procedures were grouped into one of the five social behavior-change strategy categories. Only the social behavior and environments that were modified during the treatment phases of the studies were evaluated in this analysis. These categories included interventions that measured behavioral changes as a function of particular manipulations of (a) the behavior of target children (child-mediated), (b) the behavior of their peers (peer-mediated), (c) the behavior of their teachers or

- preschool personnel (teacher-mediated), (d) the target participants' preschool environments (environment-mediated), or (e) various combinations of these four strategies (multiple component).
6. Were the experimental treatment interventions reported to be effective? Studies were reviewed to determine whether convincing data, which demonstrated positive treatment effects, were reported. Comparative studies were considered effective if the researchers reported evidence for one type of intervention being more effective than a second one or that there were substantial differences detected between groups.
  7. Did the researchers implement treatment fidelity procedures? Studies were examined to identify those that systematically measured the extent to which the experimental treatment was implemented as planned. Also, the percentages of studies with treatment fidelity procedures across behavioral-change categories were determined.
  8. Did the researchers assess the social validity of the intervention results? Studies were examined to determine the extent to which the perspective of the target preschool children and/or others (e.g., their parents, teachers and/or peers) were systematically assessed regarding the intervention as being worthwhile, acceptable, and beneficial. Also, the percentages of studies using social validity assessments across behavior-change categories were identified.
  9. Did the interventions produce generalization of positive treatment effects? Studies were identified to determine whether positive effects of the interventions generalized to nontreatment variables (e.g., new behaviors, people, settings, times, and/or events). Moreover, the percentages of studies with generalization across behavior-change categories were identified.
  10. Which studies implemented the most rigorous evidenced-based social behavioral interventions? Each of the 14 studies was considered evidenced-based as measured by the selection criteria. Yet the most rigorous, evidenced-based studies also met four criteria including (a) effective positive treatment effects, (b) a measurement of treatment fidelity, (c) an assessment of social validity, and (d) generalization of positive treatment effects. In addition, robust studies were those that met three of these four criteria. In summary, studies were also analyzed to identify the percentage of studies across behavior-change categories that included the most rigorous research results.

## Results

This review paper synthesized the results concerning evidenced-based social behavioral interventions for preschool

children with and without disabilities from 14 studies (2007–2017). Studies included in the meta-analysis were selected from 12 peer-reviewed journals for review most frequently from *Topics in Early Childhood Special Education* ( $n = 3$ ; see Table 1). Most of these studies were published in 2007 with a decline thereafter. Ten research questions were addressed across the studies to identify evidenced-based social behavioral intervention studies using the most rigorous designs. Results indicated variations in range and scientific rigor. Unless otherwise indicated, the following analyses are based on ( $n = 14$ ) studies.

### *What Was the Range of Target Participants Across Studies?*

The range of target preschool children included were between one and 334 across studies. The range of target preschool teachers per study included between one and six across studies. The range of target peers included were between four and 20. Fifty-seven percent of the studies involved a small number of target children between one and six children. The most rigorous studies selected two to three target participants.

### *What Was the Disability Status of Target Participants?*

Fifty percent of the social behavioral studies included children with disabilities diagnosed with autism spectrum disorders (ASD; 36%), Down syndrome (7%), or who were blind (7%). Sixty-eight percent of the studies represented different groups of target participants without disabilities. These studies included those who were at-risk for oppositional and conduct disorders (21%); with language, communication, motor, social, and cognitive developmental delays (21%); aggressive (14%); peer-rejected (7%); and/or typically developing peers (36%). Only one study (7%) intervened solely with target children who were typically developing and considered to be experiencing normal social behavioral development. The two most rigorous studies focused on children with ASD.

### *What Were the Target Social Behaviors of the Target Participants and Were the Experimental Treatment Interventions Effective?*

Overall, 93% of the experimental social behavioral intervention studies ( $n = 13$ ) provided evidence that the treatments were effective at enhancing the social behavior of preschool children (Bellini et al., 2007; Benitez et al., 2011; Celeste, 2007; Crozier & Tincani, 2007; Feil et al., 2014; Hughett et al., 2013; Kim et al., 2011; Kohler et al., 2007; Ledford & Wolery, 2013; Michael et al., 2009; Ocasio et al., 2015; Smith et al., 2009; Strain & Bovey, 2011). The target participants'

**Table 1.** Authors and Journal Titles of Peer-Reviewed Social Behavioral Intervention Studies.

First author and publication year	Peer-reviewed journal title
Bellini et al. (2007)	<i>School Psychology Review</i>
Benitez et al. (2011)	<i>School Psychology International</i>
Celeste (2007)	<i>Journal of Visual Impairment and Blindness</i>
Crozier and Tincani (2007)	<i>Journal of Autism and Developmental Disorders</i>
Feil et al. (2014)	<i>Journal of Early Intervention</i>
Hughett et al. (2013)	<i>Topics in Early Childhood Special Education</i>
Hyatt and Filler (2007)	<i>Journal of Research in Childhood Education</i>
Kim et al. (2011)	<i>Children and Youth Services Review</i>
Kohler et al. (2007)	<i>Topics in Early Childhood Special Education</i>
Ledford and Wolery (2013)	<i>Exceptional Children</i>
Michael et al. (2009)	<i>TEACHING Exceptional Children</i>
Ocasio et al. (2015)	<i>Journal of Child and Family Studies</i>
Smith et al. (2009)	<i>Journal of Applied School Psychology</i>
Strain and Bovey (2011)	<i>Topics in Early Childhood Special Education</i>

social behavioral problems addressed by researchers were categorized into one or more of three response categories including social skills, social interactions, and/or level of social competency. In addition, the effectiveness of each of the three social behavioral interventions was analyzed.

**Social skills.** Forty-three percent of the studies reviewed ( $n = 6$ ) focused on teaching preschool children social skills primarily through the implementation of a social skills training program (Celeste, 2007; Kim et al., 2011) including *Preschool First Step to Success* (Feil et al., 2014), the *Learning Experiences and Alternative Program for Preschoolers and Their Parents (LEAP)*; Strain & Bovey, 2011), the *Second Step* curriculum (Ocasio et al., 2015), and a program based on *Skillstreaming in Early Childhood* (Hyatt & Filler, 2007). Children with disabilities, developmental delays, at risk for delays, and who had social behavior problems received the interventions. Teachers and typically developing children were generally taught to facilitate and promote the use of social skills by the target participants. The target children were primarily taught social skills via coaching, modeling, script training, and teacher-mediated and peer-mediated approaches to prompt them to initiate and maintain play experiences with their peers (Celeste, 2007) such as how to join in activities already underway, share, wait your turn, and invite someone to play (Hyatt & Filler, 2007). Studies addressed entire preschool classrooms and provided social skills training to all students enrolled (Ocasio et al., 2015; Strain & Bovey, 2011). Eighty-three percent of the social behavioral intervention studies that sought to improve the social skills of the target children were reported to be effective.

**Social interaction behaviors.** Thirty-six percent of the studies ( $n = 5$ ) reviewed were designed to facilitate the positive social interactions of target participants with and without

disabilities. All of these studies reported obtaining effective treatment results. In these studies, the social behavioral interventions were primarily geared toward increasing the social engagement of children with ASD using a video self-modeling technique (Bellini et al., 2007) using a *Social Stories (TM)* intervention to increase their positive social interactions (e.g., sitting appropriately during circle time, interacting with peers during snack time) and lowering their inappropriate social interactions (e.g., not cooperating or sharing during block time; Crozier & Tincani, 2007). Furthermore, improving the play behavior (viz., stay, play, and talk) of children with developmental delays (Hughett et al., 2013) and ASD (Kohler et al., 2007) together with their typically developing peers was the focus of intervention using a buddy skills treatment package. Moreover, the use of socio-dramatic play using *Bob Bear*, a stuffed animal, was implemented to role-play, model, and reinforce appropriate social interactions of the children (Michael et al., 2009). The two most rigorous studies aimed to improve the social interactions of children.

**Social competence.** Only 21% of the studies ( $n = 3$ ) were specifically designed to improve the social competence of the preschool children. Compared to the prior interventions that primarily used direct observational measures of behaviors and skills, these interventions focused on social competence as indicated by teacher ratings of the target children including those peer-rejected and typically developing peers. For example, researchers implemented the *Aprender a Convivir* prevention program, which focused on teaching children about following rules, cooperating and helping skills (Benitez et al., 2011). These researchers had teachers to rate child behavior change by using the *Preschool and Kindergarten Behavior Scales (PKBS)* and the *Child Behavior Checklist-Teacher Report Form (CBCL-TRF)*. Each of the social behavioral interventions that sought to improve the social

competence of the target children were reported to be effective.

### What Experimental Research Designs Were Used?

*Single-subject design studies.* The most commonly used experimental research designs of the reviewed social behavioral studies were identified. Sixty-four percent of studies ( $n = 9$ ) used single-subject research designs. Of these studies, 56% ( $n = 5$ ) used a multiple baseline design, 33% ( $n = 3$ ) utilized a multiple probe design, and 11% ( $n = 1$ ) used a single-case design. Each of the most rigorous studies used single-subject designs.

*Group design studies.* Thirty-six percent of studies ( $n = 5$ ) employed experimental group design studies. Most of these studies (60%;  $n = 3$ ) utilized experimental pre-post comparison designs. Other group design studies used randomized control trials (20%;  $n = 1$ ) and clustered randomized comparison designs (20%;  $n = 1$ ). These studies compared the effects of receiving interventions versus not receiving the intervention on groups of preschoolers. None of the most rigorous studies used a group subject design.

### What Experimental Intervention Procedures Were Implemented?

*Teacher-mediated strategies.* Twenty-nine percent of the social behavioral intervention studies ( $n = 4$ ) used teacher-mediated strategies (Crozier & Tincani, 2007; Kim et al., 2011; Ocasio et al., 2015; Strain & Bovey, 2011). The teachers' or preschool personnel's behaviors were manipulated by equipping them with supportive instructive techniques designed to facilitate the positive social behaviors of their students. One of the two most rigorous studies used a teacher-mediated strategy (Crozier & Tincani, 2007).

*Peer-mediated strategies.* The sole use of peer-mediated strategies was not employed in any of the reviewed social behavioral intervention studies reviewed. Typically, these intervention strategies are used to teach typically developing peers of preschool children who are disabled, at-risk, or developmentally delayed ways to promote their positive social behavior. More specifically, interventions using these strategies are often used by peers to trigger reciprocal responses and social interactions of these children. Social behavioral interventions implementing peer-mediated procedures also enlists typically developing preschool children to advance these children's social skills. After the social skills training, the target children are provided with opportunities to practice with their peers and are prompted and reinforced, at various degrees, by the teacher or researcher when they interact with others using positive social skills.

*Environment-mediated strategies.* The sole use of environment-mediated strategies was not employed in any of the reviewed social behavioral intervention studies. Environment-mediated strategies manipulate various physical aspects (e.g., toys) of the children's natural preschool settings to promote the positive social engagement and interactions of the target children. Children may be prompted and reinforced for using designated aspects of their physical classroom environments appropriately.

*Multiple component strategies.* Most of the studies (71%;  $n = 10$ ) utilized multiple component strategies to promote the positive social behavior of preschool children (Bellini et al., 2007; Benitez et al., 2011; Celeste, 2007; Feil et al., 2014; Hughett et al., 2013; Hyatt & Filler, 2007; Kohler et al., 2007; Ledford & Wolery, 2013; Michael et al., 2009; Smith et al., 2009). Researchers examined the effects of up to a total of three behavior-change strategies in a single study on social behavioral outcomes. The most (50%;  $n = 7$ ) widely utilized combination of strategies was teacher-mediated, peer-mediated, and environment-mediated (Bellini et al., 2007; Benitez et al., 2011; Celeste, 2007; Hughett et al., 2013; Hyatt & Filler, 2007; Kohler et al., 2007; Smith et al., 2009). Teacher-mediated plus peer-mediated (14%; Ledford & Wolery, 2013; Michael et al., 2009) and teacher-mediated plus environment-mediated strategies (7%; Feil et al., 2014) were also used in the reviewed studies. One of the two most rigorous studies used a combination of teacher-mediated, peer-mediated, and environment-mediated strategies.

### Did the Researchers Implement Treatment Fidelity Procedures, Assess Social Validity of the Intervention Results, and Did the Interventions Produce Generalization of Positive Treatment Effects?

Forty-three percent of the studies ( $n = 6$ ) systematically measured the administration of the intervention procedures (Bellini et al., 2007; Crozier & Tincani, 2007; Feil et al., 2014; Ledford & Wolery, 2013; Smith et al., 2009; Strain & Bovey, 2011). Most of these studies assessing treatment fidelity enlisted teachers or researchers to complete a checklist during the treatment phase to determine whether the intervention was implemented correctly as planned. In addition, 21% of the studies assessed ( $n = 3$ ) the social validity of the intervention results (Bellini et al., 2007; Crozier & Tincani, 2007; Feil et al., 2014). The social validity of the interventions was measured in several ways. One common measure, for example, was a questionnaire in the form of a *Likert-type* scale, which was administered to gauge consumers' beliefs regarding the appropriateness and suitability of the intervention found to be an effective treatment for improving children's social behaviors. Moreover, 29% of the studies ( $n = 4$ ; Bellini et al., 2007; Crozier & Tincani, 2007;

Ledford & Wolery, 2013; Strain & Bovey, 2011) reported treatment results that were effective and generalized to non-treatment variables. These findings support previous research that state that social behavioral interventions are effective, but the actual generalization of these positive results are elusive.

### **What Were the Most Rigorous, Evidenced-Based Social Behavioral Studies?**

For the purposes of this review, the most rigorous evidenced-based social behavioral intervention studies met all four standards that included effective treatment outcomes that enhanced the positive social behavior of target participants, the implementation of treatment fidelity measurements, social validity assessments, and treatment effects that generalized to other variables. Results indicated that 14% of the evidenced-based social behavioral studies ( $n = 2$ ; Bellini et al., 2007; Crozier & Tincani, 2007) examined met the highest standards of rigor. These studies also selected only two (Bellini et al., 2007) to three (Crozier & Tincani, 2007) target participants at a time, implemented single-subject designs, and used teacher-mediated (Crozier & Tincani, 2007) as well as a combination of teacher-mediated, peer-mediated, and environment-mediated strategies (Bellini et al., 2007).

Moreover, in these studies, the social behavioral interventions were geared toward increasing the social engagement of children with ASD. For example, Bellini and his colleagues (2007) used a video self-modeling technique where the target child was shown a video recording of the target child, peers, or teacher demonstrating the appropriate social behavior then was asked to replicate the behavior exhibited by the model. In another example, Crozier and Tincani (2007) used a *Social Stories (TM)* intervention to increase their positive social interactions (e.g., sitting appropriately during circle time, interacting with peers during snack time) and lowering their inappropriate social interactions (e.g., not cooperating or sharing during block time). This intervention includes a short story which is written for the target child to outline a particular activity the appropriate social behaviors required for that activity. Both interventions may be easily implemented within the preschool classroom. In addition, research findings also revealed that 21% of the evidenced-based social behavioral studies ( $n = 3$ ; Feil et al., 2014; Ledford & Wolery, 2013; Strain & Bovey, 2011) met robust standards that adhered to three of the four standards.

### **Discussion**

The purpose of this article was to review evidenced-based intervention studies designed to bolster the positive social behavior of preschool children with and without disabilities in preschool classroom environments, thus identifying the most rigorous of these studies. To this end, the studies were

examined to distinguish those that (a) reported positive treatment effects, (b) measured treatment fidelity, (c) assessed social validity, and (d) produced generalization of treatment effects to nontreatment variables (e.g., new teachers, peers, and classrooms). Results from this review revealed the most rigorous evidenced-based social behavioral interventions for children with disabilities in preschool settings (Bellini et al., 2007; Crozier & Tincani, 2007).

### **Relevance of the Review**

This review of the literature is particularly relevant for the following reasons. First, high-quality preschool classroom environments, especially those where teachers are aware of and feel confident, equipped, and supported to implement appropriate interventions when needed, are beneficial for promoting the positive social behavior of preschool children with and without disabilities (Kohler et al., 2001). Second, teaching preschool children who may have or be at risk for social behavioral problems as well as those typically developing techniques to self-manage their social behavior is beneficial for them in the classroom as well as in other settings, which places them on a positive trajectory for life. Third, preschool teachers and typically developing peers who are adequately prepared to intervene with children experiencing social behavioral problems may add to the quality of that environment, which serves to promote the overall development, academic success, and positive social behavior of all of the children in the class. Fourth, preschool children with social behavior problems especially those with disabilities who receive evidenced-based social behavioral interventions at school, where they spend most of their day, may be more capable of reaching their optimal levels of development across their lifespan than those who do not receive help. Fifth, if this issue is trivialized and the preschool children do not receive the help that they need to modify their social behavioral problems in preschool (e.g., families joke that this is just how he is and is not he cute when he acts out, he is just bossy and likes to be a leader, she is just too smart for this classroom, or he is just bored) especially in inclusive preschools, they may be inadequately prepared to display positive social behavior in any social environment, unable to learn and behave in kindergarten and other academic settings, and at a greater risk of dropping out of school or being suspended and expelled, which may eventually lead to juvenile delinquency and subsequently incarceration as well as a host of other problems.

### **Limitations**

Seven limitations of this review are underscored, which warrants additional investigations. First, only 14 studies were found on the two selected databases and only two were considered highly rigorous studies that met the established inclusion criteria, which is inarguably a small sample size.



Moreover, the number of studies using each behavior-change strategy was variable in size and conclusions and interpretations made were on even smaller numbers of studies. Thus, conclusions should be made with caution. Additional research is needed that will identify additional evidenced-based strategies for promoting the positive social behaviors of preschool children with and without disabilities. Second, only 7% of the interventions focused solely on typically developing children. All children may benefit from social behavioral interventions in the preschool classroom. Additional studies are needed that focus on typically developing preschool children and children who do not have ASD. Interventions designed to teach these children to be more aware of their peer's disabilities and ways to serve a peer models are needed to enhance the social behavior of both groups of children particularly when interacting with one another in inclusive preschool classrooms. Third, although one of the two most rigorous studies used a multiple component intervention strategy, none of the solely child-mediated strategies were determined to possess the highest levels of rigor. Fourth, while the majority (93%) of the studies reported effective treatment results, less than half (43%) measured treatment fidelity, 21% assessed social validity, and 29% obtained generalization of the positive treatment effects. Fifth, inter-rater reliability measures were not conducted. Sixth, none of the interventions specifically and solely evaluated the effects of modifying only the preschool environmental aspects of the target participants on their social behavior. Seventh, only 14% of the interventions were the most rigorous, evidenced-based studies. Consequently, additional evidenced-based social behavioral intervention research that is conducted in preschool classrooms is needed that will address these issues and produce more rigorous, evidenced-based results.

## Conclusion

Rigorous, evidenced-based social behavioral interventions for children with and without disabilities must continue to be conducted in preschool classrooms, if more children in the population are to be prepared to learn and socialize in kindergarten and remain on a positive lifetime trajectory. Rigorous intervention studies that examine the effects of change in the preschool classroom on the positive social behavior of the children are exceedingly important especially if the cycle of American children being suspended, expelled, and placed on the pathway to negative life experiences such as the pipeline to prison is to be resolved. Nevertheless, unlike the proliferation of this type of research in the 1960s to the early 2000s, in the past few years, a limited number of researchers have not opted to conduct studies of the highest rigor as defined in this article in preschool classrooms. According to Baer and Pinkston (1997), however, "Behavior and environment go together, as do bread and butter, law and order, and peaches and cream. Mere pairing does not communicate much, however; as usual, the meaning is in the details" (pp. xiii).

Supplemental research with less stringent inclusion criteria is needed to focus on teasing out how these interventions effect the functional positive social behavior of children in preschool environments.

In conclusion, additional research is needed that will help to close the gap between research and evidenced-based social behavioral intervention practices by teachers of children with and without disabilities in preschool classrooms. Preschool teachers should be instructed to implement these practices with fidelity (U.S. Department of Education Office for Civil Rights, 2016). Albeit, empirically validated interventions are not frequently applied in preschool settings (McConnell et al., 1992). Therefore, while this review identified evidenced-based intervention studies with high rigor as well as sound designs, it is highly improbable that these strategies will be implemented, sustained, and taken to scale across preschool classrooms. The suggestion of Odom and McConnell (1992) provided nearly three decades ago holds true today, "A final direction for future research relates less to the development of methodologies and more to support for the use of these procedures by teachers, clinical psychologist, behavior therapists, and other consumers" (p. 243). Thus, it will be possible for preschool children to learn both academic and positive social behavior in the classroom, be ready to be successful in school, and subsequently be best prepared for life and not to be left behind in the shadows of their peers.

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