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Philadelphia College of Osteopathic Medicine

Department of Psychology

ASSESSING OUTCOMES: EVALUATION OF A SOCIAL COMPETENCY
PROGRAM FOR CHILDREN AND ADOLESCENTS WITH AUTISM SPECTRUM
DISORDER

Jessie L. Kessler

Submitted in Partial Fulfillment of the Requirements for
the Degree of Doctor of Psychology.

June 2017

COLLEGE OF
OSTEOPATHIC
DEPARTMENT OF PSYCHOLOGY

DISSERTATION APPROVAL

This is to certify that the thesis presented to us by Jessie L. Kessler

on the 15th day of May, 2017, in partial

fulfillment of the requirements for the degree of Doctor of Psychology,

has been examined and is acceptable in both scholarship and literary quality.

COMMITTEE MEMBERS' SIGNATURES

Chairperson

D

Chair, Department of Psychology

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Abstract

The current study examines the effectiveness of a Social Competency Program, implemented by a local agency specializing in autism diagnosis and treatment, with regard to the development of social skills among children and adolescents with autism spectrum disorder. This study, conducted using archival data from a local community agency, used a within-subjects, repeated measures research design to determine if the Social Competency Program enhanced the overall social performance of enrolled participants, as measured by clinician-completed rating scales. The study also examined the relationship between program effectiveness and variables including age and gender. The results did not support the program's ability to improve social functioning or any variation in effectiveness based on age. Limitations in program evaluation procedures may, however, have affected these outcomes. In addition, analyses exploring the impact of gender could not be conducted because of a limited number of female participants. Overall, this study can be conceptualized as a preliminary measure, as well as a useful tool in guiding future program evaluation, development, and modification.

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Chapter 1: Introduction

Statement of the Problem

Autism Spectrum Disorder

Autism spectrum disorder (ASD) is a neurodevelopmental disorder whose significant increase in prevalence rates over the previous three decades has required the attention and intervention of a diverse collection of professionals (Hansen, Schendel, & Parner, 2015; Rosanoff, Daniels, & Shih, 2015). Numerous theories exist regarding the etiology of the increase in ASD prevalence rates (Hansen et al., 2015; Rosanoff et al., 2015). These theories attribute the increased rates to multiple variables, including biological factors, diagnostic changes, and patterns of reporting (Hansen et al., 2015). The release of the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed; *DSM-5*; American Psychiatric Association [APA], 2013) and the corresponding changes to the conceptualization and diagnostic guidelines pertaining to ASD are also likely salient factors (Hansen et al., 2015).

In order to understand the impact of the increase in prevalence rates, one must be knowledgeable of the diagnostic features of ASD as outlined in the *DSM-5*(2013). The previous diagnoses of Asperger's disorder and pervasive developmental disorder are now included under the unitary ASD label, which is currently conceptualized as a spectrum disorder with a leveled system of severity specifiers to describe presenting symptomatology (APA, 2013; Hansen et al., 2015; Schipper et al., 2015). A diagnosis of ASD now requires impairments across two domains of functioning (i.e., social communication/interaction and restricted, repetitive patterns of behavior, interests, or

activities), as well as initial presentation during early development and clinically significant impairment (APA, 2013; Schipper et al., 2015). Moreover, children, adolescents, and adults with ASD also frequently display comorbid deficits in adaptive behavior resulting in significant impacts on daily functioning (Friedman, Warfield, & Parish, 2013; Kanne et al., 2011; Lee & Carter, 2012).

Adaptive Functioning

Initially conceptualized as part of the definition for mental retardation in 1959, adaptive behavior is defined as a broad set of skills that encompasses conceptual, social, and practical domains (American Association on Mental Retardation [AAMR], 2002; Kanne et al., 2011). Adaptive behavior is further defined as a person's ability to be self-sufficient in everyday life through the use of communication, socialization, and independent-living skills (Kanne et al., 2011; Sparrow, Cicchetti, & Balla, 2005). In addition to intellectual disability (formerly mental retardation), impairments in adaptive behavior are also observed in individuals with ASD; however, the profile and severity of adaptive behavior functioning vary significantly between the two populations (Bolte & Poustka, 2002; Kanne et al., 2011). A hallmark of the unique adaptive-behavior profile observed in adolescents and young adults with ASD is the presence of markedly more severe impairments in the social domain, compared to the other domains of adaptive behavior (Kanne et al., 2011; Sparrow et al., 2005). These deficits in socialization are marked by weaknesses in the areas of social awareness, social cognition, social communication, and social motivation and impact a multitude of activities of daily living,

such as interpersonal relationships, play and leisure, and coping skills (Constantino & Gruber, 2012; Perry, Flanagan, Dunn-Geier, & Freeman, 2009; Sparrow et al., 2005).

The adaptive profile observed in the ASD population is distinct from the adaptive behavior profiles observed across other mental-health populations (Bolte & Poustka, 2002; Kanne et al., 2011). Children and adolescents with ASD have difficulty learning social skills at a rate that is consistent with typical development and intellectual growth (Kanne et al., 2011). As a result, children, adolescents, and adults with ASD are frequently unable to keep up with the increasing social demands associated with normal development, despite having average cognitive skills (Flanagan et al., 2009; Kanne et al., 2011; Perry et al.).

Treatment

Evidence-based practice is the gold standard of intervention and is used to describe interventions that have been comprehensively evaluated using explicit guidelines to rigorously assess the research design, evidence base, and outcomes of specific interventions (McCoy, Holloway, Healy, Rispoli, & Neely, 2016). Despite a multitude of intervention strategies and therapeutic approaches, the majority of interventions focused on improving social-adaptive behavior (i.e., social skills) in children, adolescents, and young adults with ASD have been found to have low to questionable levels of effectiveness and generalization (Fonagy et al., 2015; McCoy et al., 2016). Nevertheless, a collection of interventions, including applied behavior analysis (ABA) behavioral programs (e.g., antecedent and consequence strategies), computer-based instruction, and video interventions (e.g., modeling, scheduling, and prompting),

have been classified, although not always consistently, as evidence-based interventions (i.e., practices) for enhancing social-adaptive behavior in children, adolescents, and young adults with ASD (Fonagy et al., 2015; Matson, Hattier, & Belva, 2012; McCoy et al., 2016; Otero, Schatz, Merrill, & Bellini, 2015).

As a result of a number of biological, medical, and environmental factors, a growing number of individuals with ASD are experiencing some degree of independence in adulthood (Kanne et al., 2011; Matson et al., 2012). Despite an increase in longevity, their outcomes and quality of life are frequently constrained by impairments in adaptive behavior (Kanne et al., 2011; Matson et al., 2012). The personal and societal implications resulting from the increase in ASD prevalence rates combined with the lack of evidence-based interventions require the prioritization of the development of evidence-based interventions to target the specific adaptive-behavior profiles observed in the ASD population (Friedman et al., 2013; Tobin, Drager, & Richardson, 2014).

Social Competency Program

In 2005, a nonprofit organization focused on improving the quality of lives of those affected by ASD opened an after-school Social Competency Program in an urban community in the Northeast. The goal of the program was, and continues to be, the development of social skills through targeted skill instruction that correlates with the core social weaknesses observed in the ASD population. The treatment model incorporates curricula for skills instruction, program activities, structure for practice and application, and a relationship-based focus to help clients build bonding relationships in order to experience the benefit of social relationships in terms of enriching their quality of life.

Multiple research-based, therapeutic perspectives were integrated to develop the program, including ABA, cognitive-behavioral therapy, and developmental relationship-based therapy, to develop a comprehensive treatment model. In addition to program-wide instruction, individualized treatment plans and goals are created through collaboration with families and professionals; treatment teams are often composed of the child, family members, psychiatrists, psychologists, mental-health clinicians, and outside service providers. In the same way, the program places a strong emphasis on developing a partnership with parents and guardians by encouraging them to take an active role in their children's treatment through education, treatment, and advocacy initiatives.

Purpose of the Study

The purpose of the present study was to examine the effectiveness of a Social Competency Program, implemented by a local agency specializing in autism diagnosis and treatment, with regard to the development of social-adaptive skills among children and adolescents with ASD. Specific after-school programs have been found to have positive effects on different areas of functioning, such as increasing self-perceptions, improving social behavior, and enhancing school performance (Durlak, Weissberg, & Pachan, 2010). The Social Competency Program targets the development of social competency through a collection of interventions derived from a variety of theoretical frameworks (e.g., cognitive-behavioral therapy [CBT], ABA, and developmental relationship-based therapy). The Social Competency Program deconstructs complex, abstract social skills into more comprehensible, concrete concepts in order to enhance the weaknesses in social-adaptive functioning that correspond with an ASD diagnosis. The

present study examined the impact of the Social Competency Program by analyzing pre- and postmeasures of the participants' social-adaptive skills as measured by clinician-completed rating scales. It was hypothesized that the research-based program would enhance the overall social performance (e.g., social cognition, social communication, and social interaction) in children and adolescents with ASD. The relationship between program effectiveness and variables, including gender and age, was also explored.

Chapter 2: Review of the Literature

Autism Spectrum Disorder

Etiology

Autism spectrum disorder (ASD) is a group of childhood neurodevelopmental conditions characterized by restricted or repetitive behaviors along with impairments in social interaction and communication (Hansen et al., 2015; Inglese & Elder, 2009; Rosanoff et al., 2015). The causal mechanism behind ASD remains unknown; however, the disorder is likely the result of an interaction between environmental and biological factors resulting in abnormal brain development and functional connectivity (Belmonte et al., 2004; Inglese & Elder, 2009; Pelphrey, Adolphs, & Morris, 2004). For instance, twin studies using both monozygotic and dizygotic twins support a strong genetic component in ASD (Inglese & Elder, 2009). Equally important, research also suggests a range of influential environmental factors with regard to phenotypic presentation and severity level (Inglese & Elder, 2009). As such, etiology remains a popular topic in ASD research and continues to yield new and evolving hypotheses (Inglese & Elder, 2009).

Prevalence

As a result of the unknown etiology and recent changes in diagnostic criteria, some variability also exists with regard to ASD prevalence rates (Hansen et al., 2015; Inglese & Elder, 2009; Rosanoff et al., 2015). Autism is the fastest growing developmental disorder, marked by a 78% increase between 2002 and 2010, according to rates of diagnosis (Luther, Canham, & Cureton, 2005; Otero et al., 2015). Current estimates suggest ASD affects approximately 1% of the global population or one in every

68 children; however, diagnostic changes, along with variations in patterns of reporting and research methodology, have yielded estimates as high as 2.6% (Hansen et al., 2015; Inglese & Elder, 2009; Muhle, Trentacosta & Rapin, 2004; Otero et al., 2015; Rosanoff et al., 2015). Furthermore, ASD is more prevalent in males compared to females, with approximate rates of one in every 42 males and one in every 189 females (Otero et al., 2015). One must also acknowledge that the conceptualization of ASD has evolved in conjunction with the release of the *DSM-5* (2013), which has imposed considerable changes to the diagnostic criteria associated with ASD (APA, 2013; Hansen et al., 2015).

Diagnosis

The previous diagnoses of Asperger's disorder and pervasive developmental disorder are now included under the unitary label of *autism spectrum disorder*, which is currently conceptualized as a spectrum disorder with a leveled system of severity specifiers to describe the presenting symptomatology (APA, 2013; Hansen et al., 2015; Schipper et al., 2015). To receive an ASD diagnosis as outlined in the *DSM-5* (2013), the child must exhibit deficits across two domains of functioning: social communication/interaction and restricted, repetitive patterns of behavior, interests, or activities (APA, 2013; Schipper et al., 2015). In addition, symptoms must initially present during the early developmental stages, result in clinically significant impairment in daily functioning, and not be the result of an intellectual disability or global developmental delay (APA, 2013; Schipper et al., 2015). After a child has been determined to exhibit impairments in both domains of functioning, one of three severity specifiers (i.e., Level 1- Requiring support [high functioning], Level 2- Requiring substantial support, and

Level 3- Requiring very substantial support [low functioning]) is assigned to each domain of impairment in order to provide a more comprehensive conceptualization of the child's individual presentation to guide intervention development (APA, 2013).

Symptomatology

ASD is characterized by two defining features: impairments in social communication/interaction and restricted, repetitive patterns of behavior, interests, or activities (APA, 2013; Schipper et al., 2015). Impairments in social communication and interaction are exemplified by weaknesses in social-emotional reciprocity, nonverbal communication, and interpersonal relationships (APA, 2013; Brock & Hart, 2013; Frazier et al., 2014; Inglese & Elder, 2009; Koning, Magill-Evans, Volden, & Dick, 2013; Pelphrey et al., 2004). The separation of social communication/interaction into subcategories is a common practice adopted by ASD measurement and assessment tools to help guide treatment planning and promote the implementation of behaviorally oriented goals, interventions, and data collection procedures (Constantino & Gruber, 2012). As such, weaknesses in social communication and interaction can be subdivided into four subcategories: social cognition, social communication, social awareness, and social motivation (Constantino & Gruber, 2012; Frazier et al., 2014).

Social cognition refers to the cognitive and interpretative aspects of social impairment and is operationally defined as the cognitive processes used to process, store, and apply information about other people and social situations (Constantino & Gruber, 2012). Deficits in social cognition are marked by lack of social reciprocity and engagement, inappropriate emotional responses to others (e.g., appear inconsiderate of

others, display limited empathy), poor or underdeveloped emotional regulation, difficulty understanding other people's perspectives (i.e., theory of mind), and difficulty with emotion recognition (Constantino & Gruber, 2012; Inglese & Elder, 2009; Pelphrey et al., 2004). In comparison, social communication refers to the expressive language aspects of social impairment and is used to describe the use of language to interact with others through verbal and nonverbal strategies (Constantino & Gruber, 2012; Inglese & Elder, 2009; Pelphrey et al., 2004). Social communication includes such skill deficits as poor eye contact, difficulty using and understanding nonverbal language (e.g., gestures, joint attention, and body language), atypical facial and body movements, irregular speech patterns (e.g., prosody and intonation), and difficulty understanding sarcasm and figurative language (Constantino & Gruber, 2012; Inglese & Elder, 2009; Pelphrey et al., 2004). Additional areas of weakness within the social communication/interaction domain include social awareness and social motivation (APA, 2013; Constantino & Gruber, 2012). Social awareness encompasses the ability to detect social cues, as well as the sensory components of social impairment, and includes such deficits as inattention to social information (APA, 2013; Constantino & Gruber, 2012). Finally, social motivation describes one's willingness to seek and maintain social-interpersonal behavior and includes such behaviors as limited desire to seek social interaction, social avoidance, and social anxiety (APA, 2013; Constantino & Gruber, 2012).

The second domain of impairment is restricted, repetitive patterns of behavior, interests, or activities. This domain is also heterogeneous in nature and includes cognitive, as well as physical, symptomatology (Esbensen, Seltzer, Lam, & Bodfish,

2009). This area is marked by a preference for structure and routine, abnormally strong interests or fixations, repetitive play, stereotypic movements and self-stimulatory behaviors, and difficulty with change that often induces elevated levels of stress (Esbensen et al., 2009; Inglese & Elder, 2009). Similar to deficits in social communication and interaction, impairments in restricted, repetitive patterns of behavior, interests, or activities can differ significantly among children and require varying levels of support (Esbensen et al., 2009).

The combination of skill deficits associated with ASD typically results in pervasive and enduring impairments that affect many aspects of the individual's life from childhood through adulthood (Billstedt, Gillberg, & Gillberg, 2005; DePape & Lindsay, 2016; Eaves & Ho, 2008; Howlin, Goode, Hutton, & Rutter, 2004). Another area of impairment commonly observed in the ASD population is self-regulation (Jahromi, Bryce, & Swanson, 2013). Self-regulation is defined as the processes that allow a child to integrate his or her thoughts, feelings, and actions to manage, modify, and assess his or her own behavior (Reid, Schartz, & Trout, 2005). In neurotypical children, self-regulation skills are often learned implicitly through interactions with the environment; however, children with ASD tend to lack self-awareness and metacognition, thus impeding their ability to self-regulate (Jahromi et al., 2013).

ASD symptomatology can vary with age, gender, developmental period, and intellectual level and therefore requires ongoing progress monitoring across social, educational, behavioral, and occupational domains (Esbensen et al., 2009). For example, female individuals tend to exhibit more severe presentations, likely related to their

tendency to exhibit more significant impairments in emotion recognition (Dworzynski, Ronald, Bolton, & Happe, 2012; Frazier et al., 2014). Additionally, such characteristics as social avoidance and interpersonal relatedness appear more frequently during adolescence (Frazier et al., 2014; Kanne et al., 2011). Cognitive functioning is also negatively correlated with social functioning; higher functioning children and adults with ASD (i.e., full-scale intelligence quotient of 70 or higher) exhibit a significant discrepancy, approximately one standard deviation, between global cognitive functioning and social-adaptive behavior (Bolte & Poustka, 2002; Fenton et al., 2003; Kanne et al., 2011; Volkmar et al., 1987). In general, children, adolescents, and adults with ASD are frequently unable to keep up with the increasing social demands associated with normal development, even when they possess average cognitive skills (Bolte & Poustka, 2002; Fenton et al., 2003; Kanne et al., 2011; Perry et al., 2009; Volkmar et al., 1987).

Adaptive Behavior

Adaptive behavior is a multidimensional construct that permits a person to function independently in everyday life with regard to communication, socialization, and daily living skills (Kanne et al., 2011; Sparrow et al., 2005). Initially conceptualized in conjunction with the definition for mental retardation in 1959, adaptive behavior includes a diverse collection of skills encompassing conceptual, social, and practical domains and denotes a person's ability to apply or generalize cognition to everyday skills (AAMR, 2002; Harrison & Oakland, 2003; Kanne et al., 2011; Klin et al., 2007). The conceptual domain is comprised of communication and academic skills and includes such elements as expressive language, reading, writing, money concepts, and self-direction (AAMR,

2002; Harrison & Oakland, 2003; Sparrow et al., 2005). In comparison, the practical domain consists of independent living and daily living skills, such as dressing, mobility, health and safety, and community use (AAMR, 2002; Harrison & Oakland, 2003; Sparrow et al., 2005). Finally, the social domain typically encompasses interpersonal and social-competence skills, including self-esteem, following rules, participation in leisure activities, and socialization (AAMR, 2002; Harrison & Oakland, 2003; Sparrow et al., 2005). In addition to intellectual disability (formerly mental retardation), impairments in adaptive behavior are also observed in individuals with ASD; however, the profile and severity of adaptive- behavior functioning vary significantly between the two populations (Bolte & Poustka, 2002; Kanne et al., 2011). In comparison to the adaptive profile observed in participants with an intellectual disability, participants with ASD display significant discrepancies between cognitive functioning and adaptive behavior (Bolte & Poustka, 2002; Fenton et al., 2003; Kanne et al., 2011; Volkmar et al., 1987).

Adaptive-Behavior Profiles in ASD

Despite the inclusion of “social incompetence” as an element in the definition of an intellectual disability, a hallmark of the unique adaptive-behavior profile observed in the ASD population is the presence of markedly more severe impairments in the social domain, compared to the other domains of adaptive behavior (Kanne et al., 2011; Smith, 2000; Sparrow et al., 2005; Volkmar et al., 1987). The irregular adaptive profile observed in the ASD population is distinct compared to the adaptive-behavior profiles observed across other mental-health populations (Bolte & Poustka, 2002; Kanne et al., 2011; Liss et al., 2001; Volkmar et al., 1987). As stated previously, the social domain of adaptive

behavior is used to describe interpersonal and social-competence skills (AAMR, 2002; Harrison & Oakland, 2003; Sparrow et al., 2005). For the purposes of this document, social-adaptive behavior and social skills can be used interchangeably; in accordance with popular terminology, the term *social skills* will be used in place of social-adaptive behavior from this point forward.

Impact of Social Skills on Daily Independent Functioning

Navigating the world requires social and emotional dexterity; therefore, effective social skills, in combination with other adaptive behaviors, enhance an individual's ability to actively engage with his or her social environment (Kanne et al., 2011; Klin et al., 2007; Liss et al., 2001). Strongly developed social skills allow people to adapt to their environments and to derive a sense of predictability by reading social cues and understanding social norms in order to predict the behavior of others (AAMR, 2002; Parmenter, Harman, Yazbeck, & Riches, 2007). When discussing the implications of social-skill deficits, one must recognize that social behavior, and adaptive behavior in general, is highly dependent on the context in which the person is functioning. Therefore, adaptive behavior is culturally dependent and includes social norms that vary both within and across cultures. For example, a person is expected to behave differently in school than at home. Likewise, a person is expected to interact differently with friends than with family members.

Social skills are important because they, along with other areas of adaptive behavior, are highly correlated with the life outcomes of individuals with ASD (Kanne et al., 2011; Klin et al., 2007; Liss et al., 2001). Impairments in adaptive behavior constrain

one's ability to function independently within one's environment; therefore, the ASD population experiences the world in a manner that differs from the experiences of the neurotypical population (Klin et al., 2007). In conjunction, the impairments associated with ASD undermine that population's ability to actively engage with the environment (Kanne et al., 2011; Klin et al., 2007; Liss et al., 2001). Weaknesses in social awareness, social cognition, social communication, and social motivation inhibit the adaptability of individuals with ASD by restricting their ability to process social cues and norms (Kanne et al., 2011; Klin et al., 2007; Liss et al., 2001).

These impairments frequently manifest themselves during everyday situations, such as within interpersonal relationships, during leisure activities, and while facing experiences that require emotional regulation (Perry et al., 2009; Sparrow et al., 2005). For example, research involving adults with ASD found approximately one quarter of participants did not participate in any daily activities (Renty & Roeyers, 2006; Tobin et al., 2014). Furthermore, adults with ASD experience limited independence in the areas of employment (i.e., 25% – 75% of adults were unemployed) and living arrangements (i.e., 29% – 94% of adults with ASD reside with immediate family members; Tobin et al., 2014). A study of adults with ASD found half of the participants had never dated, and the majority of the participants' time was spent engaging in solitary leisure activities, such as watching television and using the Internet (Kamio, Inada, & Koyama, 2013). Adults with ASD also report difficulty communicating with others in unstructured settings, limited relationships with people outside of family members, more awareness of social difficulties with age, and unpleasant feelings associated with elevated levels of loneliness

compared to the general population (Müller, Schuler, & Yates, 2008). As a result of their impairments, the ASD population frequently experiences elevated levels of bullying and social rejection (Otero et al., 2015). The lack of environmental predictability in conjunction with negative social experiences reinforces socially isolative behaviors in individuals with ASD and have been found to lead to comorbid psychiatric conditions in as many as 70.8% of children with ASD (Dworzynski et al., 2012; Frazier et al., 2014; Otero et al., 2015; Simonoff et al., 2008).

Anxiety disorders are one of the most prevalent comorbid psychiatric conditions observed within the ASD population, with prevalence rates ranging from 31.5% to 55% (Bellini, 2006; Kuusikko et al., 2008; Simonoff et al., 2008; Van Steensel, Bögels, & Perrin, 2011; White & Roberson-Nay, 2009). Within the *DSM-5* (2013) cluster of anxiety disorders, social anxiety disorder is the most frequently observed, affecting between 29.2% and 35% of children with ASD (Simonoff et al., 2008; White & Roberson-Nay, 2009). In comparison to typically developing children and adolescents, who report reductions in social anxiety with age, the ASD population reports increases in social anxiety at rates as high as 57.1% in adolescents with ASD (Kuusikko et al., 2008). When assessing the presence of comorbid social anxiety in the ASD population, evaluators must be cognizant of the diagnostic overlap between anxiety subtypes and the criteria for ASD (Simonoff et al., 2008; Van Steensel et al., 2011). The conceptualization of anxiety as inherent to ASD is made apparent in the *DSM-5* (2013) under the requirement that additional psychiatric diagnoses not be better accounted for by the ASD itself (APA, 2013; Van Steensel et al., 2011). However, despite the removal of overlapping items

(e.g., social avoidance), significant differences in social anxiety symptoms between ASD and nonclinical control groups remain apparent (Kuusikko et al., 2008).

When compared to children and adolescents with ASD who do not experience comorbid social anxiety, children and adolescents with clinically significant levels of social anxiety experience greater levels of functional impairment (Van Steensel et al., 2011). Children and adolescents with comorbid ASD and social anxiety also display elevated levels of physiological arousal leading to a predisposition for developing social fears and worries following negative peer interactions (Bellini, 2006). This increase in physiological arousal, combined with magnified social impairments, results in implications for treatment planning that require targeted efforts to reduce levels of anxiety (Bellini, 2006; Van Steensel et al., 2011). Therefore, this population requires treatment that goes above and beyond traditional social skill programs to integrate interventions that improve self-awareness and arousal regulation (Bellini, 2006; Kuusikko et al., 2008).

The ASD population presents with a broad spectrum of behavior problems that result from the social and behavioral impairments associated with ASD diagnostic criteria (Hus, Bishop, Gotham, Huerta, & Lord, 2013; Tobin et al., 2014). As a result of their pervasive and enduring impairments, the ASD population often requires life-long support from family members and professional service providers, thus impacting the quality of life of a variety of people beyond the individual diagnosed with ASD (Russa, Matthews, & Owen-DeSchryver, 2014; Tobin et al., 2014). Typically, the parents or immediate family members first recognize a child's atypical development, sending them on a path

that forces them to fill many roles, such as advocate, caregiver, educator, nurse, doctor, lawyer, and therapist (DePape & Lindsay, 2016; Tobin et al., 2014). Unfortunately, these services are correlated with an abundance of barriers, including time, finances, and availability (Research and Training Center on Community Living, 2011). Despite the increase in ASD prevalence rates, a significant gap between supply and demand still remains, limiting family's access to information, services, training, community involvement, and long-term planning (Research and Training Center on Community Living, 2011; Russa et al., 2014).

Treatment

The development and daily use of social skills directly impact the future outcomes and quality of life experienced by the ASD population (Kanne et al., 2011; Klin et al., 2007; Liss et al., 2001; Radley, McHugh, Taber, Battaglia, & Ford, 2015). Social skills serve not only as the foundation for building meaningful interpersonal relationships but also as protective factors when confronted with the normal challenges and traumatic risk factors experienced by many people throughout their lifetimes (Kanne et al., 2011; Klin et al., 2007; Liss et al., 2001). Conversely, the social impairments exemplified in ASD have pervasive and enduring effects on the development of appropriate interpersonal relationships (Radley et al., 2015). One should remember that ASD symptoms can occur in a multitude of combinations and with varying degrees of severity (APA, 2013; Inglese & Elder, 2009; Rosanoff & Shih, 2015). As such, each child presents with a unique collection of strengths and weaknesses that requires individualized intervention planning

and implementation to ensure service delivery meets the specific needs of the child and leads to improvement (Inglese & Elder, 2009).

As a result of the broad range of social and behavioral impairments, the ASD population commonly receives an integration of home, school, and community-based services across their life span (Research and Training Center on Community Living, 2011). These services are delivered by a variety of professionals and may include such amenities as daycare, after-school programs, individual and group counseling, social skill instruction, speech and language therapy, occupational therapy, vocational training, and neuropsychological assessment and evaluation (Howlin et al., 2004). The increase in ASD prevalence rates, combined with research on the importance of social skills, has led to social skill interventions becoming common practices across home, school, and community environments (Wong et al., 2015). However, knowing ASD is a spectrum disorder that impacts individuals throughout their lifetimes, one can conclude that different approaches are used depending on the developmental and chronological ages of the recipients. (Please note that psychopharmacological interventions are beyond the scope of this paper.)

Theoretical Perspectives

Diverse professional interests, in conjunction with varying clinical presentations, have resulted in the development and establishment of a multitude of theoretical perspectives with respect to the treatment and intervention for social skill enhancement.

Applied behavior analysis (ABA). ABA is the development, implementation, and evaluation of environmental modifications to produce adaptive and positive changes in social behavior (Matson et al., 2012; Sulzer-Azaroff & Mayer, 1991). ABA involves the application of interventions based on the principles of learning theory and operant conditioning to modify the environment to increase the occurrence of adaptive and desirable behaviors and decrease the presence of maladaptive and undesirable behaviors (Matson et al., 2012). ABA involves a variety of strategies including, but not limited to, direct observation, functional behavior assessment (e.g., the identification and modification of antecedents and consequences), reinforcement schedules, extinction procedures, discrete trial training, verbal behavior therapy, and video modeling (Matson et al., 2012). The goal of ABA is to teach replacement (i.e., appropriate or desirable) behaviors while manipulating the environment to encourage the child to use the replacement behavior rather than the maladaptive or problem behavior he or she was previously exhibiting (Sulzer-Azaroff & Mayer, 1991). ABA was developed on the assumption that a child's behavior is determined by past and current environmental events, as well as by biological factors (e.g., genetics). Therefore, the therapy is primarily focused on observable or overt behavior rather than on internal constructs (Sulzer-Azaroff & Mayer, 1991).

Cognitive-behavioral therapy (CBT). CBT employs some of the same strategies as ABA; however, an additional layer is added to integrate cognition (Beck, 2011; Koning et al., 2013). CBT goes beyond the observable behavior and focuses on how a child interprets events occurring in his or her environment by looking at core beliefs,

schemas, and automatic thoughts (Beck, 2011). CBT is defined as brief, structured intervention targeting environment-driven problem solving through connections between thoughts, feelings, and behaviors (Friedburg & McClure, 2002). The term *cognitive-behavioral* reflects an emphasis on principles of learning, as well as on structured strategies for changing thoughts, feelings, and behavior. The cognition aspect of CBT focuses on changing the way a child thinks about or perceives his or her environment in an effort to change his or her thought process, as well as observable behavior; therefore, a child's cognitions and perceptions become a primary focus in understanding the way he or she behaves (Beck, 2011; Koning et al., 2013). CBT is composed of various techniques, including cognitive restructuring, role playing, modeling, goal setting, strategies to improve emotional regulation, psychoeducation, and thought monitoring (Beck, 2011).

Developmental/relationship-based therapy. Developmental/relationship approaches are based on a model of early parent-child interactions and rely on the establishment of a trusting relationship as the dominant factor in influencing the development of new skills and replacement behaviors (Prizant, Wetherby, & Rydell, 2000; Walton & Ingersoll, 2013). Developmental/relationship-based therapy incorporates several different models, including -developmental, individual differences, relationship-based approach/floortime (DIR/Floortime); social communication/emotional regulation/transactional supports model (SCERTS), and the relationship development model (RDI; Gutstein, Burgess, & Montfort, 2007; Prizant et al., 2000; Prizant, Wetherby, Rubin, Laurent, & Rydell, 2006). This theoretical approach attempts to

maximize therapist responsiveness and emphasizes following the lead of the child and respecting his or her preferences to allow trust and motivation to develop before learning can occur (Prizant et al., 2000; Walton & Ingersoll, 2013). Additional features of developmental relationship-based therapy include viewing the child as an active learner, creating motivation routines in environments that are natural to the child, incorporating the child's interests in treatment, individualizing treatment goals, and viewing learning as a transactional process (i.e., interaction between the child and his or her environment; Prizant et al., 2000).

Evidence-based Interventions

Following the adoption of the No Child Left Behind Act in 2001 and the reauthorization of Individuals with Disabilities Education Act (IDEA) in 2004, the United States government has encouraged educators and researchers to use evidence-based interventions (Wang & Spillane, 2009). Evidence-based intervention, synonymous with evidence-based practice, is the term used to describe interventions that are derived from scientific research and have met rigorous peer reviews and standards affirming their effectiveness (Wang & Spillane, 2009; Wong et al., 2015). In 2003, the Council for Exceptional Children (CEC) Division for Research was tasked with coordinating a group of professionals to operationally define evidence-based practice (i.e., intervention; Wang & Spillane, 2009). The task force released an issue of *Exceptional Children* in 2005 that included specific guidelines regarding the process for establishing an intervention as evidence based (Wang & Spillane, 2009). In addition, other organizations, such as the

National Professional Development Center of Autism Spectrum Disorders (NPDC) and the National Standards Project (NSP), have also adopted initiatives to identify and further evaluate evidence-based interventions (National Autism Center, 2009; Otero et al., 2015; Wong et al., 2015). The guidelines used by these organizations to qualify an intervention as evidence based cover a spectrum of elements (e.g., participant selection and assignment, background information, fidelity measures, outcome measures, and data analysis) and encompass a variety of experimental designs (e.g., group, single subject, and quasiexperimental; Wang & Spillane, 2009; Wong et al., 2015).

Evidence-based interventions can be separated into two groups: comprehensive treatment models and focused interventions (Wong et al., 2015). Comprehensive treatment models are comprised of a collection of interventions and strategies based on a conceptual framework geared toward a broad learning goal that targets the core impairments of ASD (Wong et al., 2015). Examples of evidence-based comprehensive treatment models include UCLA Young Autism Program, the TEACCH program, Early Intensive Behavioral Intervention, Early Start Denver Model, and LEAP (Wong et al., 2015). In comparison, focused interventions are intended to target a specific skill or treatment goal and are typically delivered over a shorter period of time (Wong et al., 2015). However, focused interventions are often combined and incorporated into comprehensive treatment models. Some examples of focused interventions include discrete trial teaching, pivotal response training, prompting, and video modeling (Wong et al., 2015).

In addition to comprehensive treatment models and focused interventions, research also presents a current trend of combining multiple evidence-based interventions in order to address more severe problem behaviors and treatment goals (Wong et al., 2015). These combinations frequently fall into one of two categories: multicomponent interventions or individualized (i.e., idiosyncratic) packages (Wong et al., 2015). Multicomponent strategies use identical methods in the same manner across multiple studies, thus allowing them to be evaluated and recognized as evidence-based interventions (Wong et al., 2015). In comparison, individualized packages employ variations of methodology and implementation across studies, making an evaluation of them as evidence-based interventions extremely difficult (Wong et al., 2015).

A review of recent systematic, comprehensive intervention research literature has established multiple evidence-based interventions for improving social skills in the ASD population (National Autism Center, 2011; Wong et al., 2015). Social narratives or story-based interventions are effective methods of improving duration of appropriate engagement; improving frequency and appropriateness of seeking attention, initiating conversation and contingent responses; and improving appropriateness of social interaction in educational settings for children between the ages of 6 and 13 years (Delano & Snell, 2006; Sansoti & Powell-Smith, 2006; Scattone, Tingstrom, & Wilczynski, 2006). Similarly, video modeling effectively improves social skills, such as appropriate play and social initiation in educational settings for elementary-aged children (Nikopoulos & Keenan, 2004; Paterson & Arco, 2007). The Picture Exchange Communication System (PECS) has also been found to effectively improve social

communication and play while reducing problem behaviors in preschool and elementary-aged children (Charlop-Christy, Carpenter, Le, LeBlanc, & Kellet, 2002). Self-management training involves teaching children how to identify, record, assess, and manage their behavior and effectively improves self-regulation in a wide range of children and adults across a variety of settings (Otero et al., 2015). Cognitive-behavioral intervention targets thought processes to change behavior and has shown positive effects on improving overall communication and social skills in children, adolescents, and adults (Otero et al., 2015).

Additional interventions, such as modeling (i.e., demonstration of a skill with the expectation for imitation), technology-aided instruction (i.e., technology used as the primary means of intervention), scripting (i.e., detailed, explicit information to be read and memorized), visual supports (i.e., pictorial cues to prompt behavior), exercise (i.e., physical movement), and schedules (i.e., outline of sequenced tasks), are often used in conjunction with other interventions to effectively improve a wide range of social skills in children and adolescents across settings (McCoy et al., 2016; National Autism Center, 2011; Otero et al., 2015; Wang & Spillane, 2009; Wong et al., 2015). In comparison to the previously mentioned interventions, which are typically delivered by an educated professional, peer-mediated instruction and intervention is a different approach to social-skill instruction and uses typically developing peers to help youth and young adults with ASD to learn new behavior (Wong et al., 2015). Parent-implemented intervention is another form of social-skill intervention that is not delivered directly by an educated professional, but instead involves the training of parents to deliver effective,

individualized instruction to children through the age of 14 years in a wide array of social skills across home and community settings (Wong et al., 2015).

Interventions designed using ABA principles (e.g., naturalistic intervention) remain the most effective evidence-based interventions for increasing the social skills of children and adolescents with ASD in their natural environment (Turygin & Matson, 2014; Walton & Ingersoll, 2013; Wong et al., 2015). These interventions include such techniques as antecedent-based intervention; differential reinforcement of alternative, incompatible, or other behavior; discrete trial teaching; extinction; functional behavior assessment; functional communication training; pivotal response training; prompting; reinforcement; response interruption and redirection; and task analysis and are effective ways to improve a vast array of social skills across a variety of settings with participants of all ages (Matson et al., 2012; Turygin & Matson, 2014; Walton & Ingersoll, 2013; Wong et al., 2015). One should recognize that some inconsistencies exist in the literature surrounding several interventions (e.g., social narratives, peer-mediated instruction and intervention, and video modeling); however, the inconsistencies could be the result of numerous factors (e.g., study selection) and will hopefully be resolved through future research endeavors (McCoy et al., 2016; Otero et al., 2015; Wang & Spillane, 2009; Wong et al., 2015).

Contrary to advancements in the process for identifying evidence-based interventions, school-based social-skill interventions continue to remain largely ineffective (Radley et al., 2015; Walton & Ingersoll, 2013). These treatment deficits impact all populations; however, populations with comorbid psychiatric diagnoses are the

most susceptible, as few studies have explored intervention effectiveness within these low-incidence populations (Walton & Ingersoll, 2013). Despite stringent guidelines, many programs and professionals continue to implement social-skill interventions that have not met the criteria to be designated as evidence based (Radley et al., 2015; Wang & Spillane, 2009). This may be a result of the lack of attention to whether or not specific social-skill interventions have met criteria for being evidence based, as well as of a limited number of systematic, comprehensive reviews of intervention research literature (McCoy et al., 2016; Radley et al., 2015; Wang & Spillane, 2009; Wong et al., 2015). Equally important, many interventions cannot be classified as evidence based despite having strong evidence in their favor (Wong et al., 2015). Such variables as insufficient study replication, small sample size, and poor methodology prevent interventions from meeting the outlined rigorous criteria required by professional organizations to be classified as an evidence-based intervention (Wang & Spillane, 2009; Wong et al., 2015).

Regardless of the type of evidence-based intervention, one must remember that ASD is a spectrum disorder and therefore yields a highly diverse population with a wide range of strengths and weaknesses that need to be considered during the treatment-planning phase. Evidence-based social-skill interventions are designed to deconstruct complex, abstract social behaviors into more explicit and manageable tasks (McCoy et al., 2016; Winner 2005). The complex behaviors can be deconstructed in a variety of arrangements according to such factors as culture, developmental period, chronological age, and cognitive functioning (McCoy et al., 2016). As such, potential evidence-based interventions must be evaluated in conjunction with a child's specific needs.

Furthermore, treatment outcomes should be maximized by emphasizing early intervention (Boyd, Odom, Humphreys, & Sam, 2010). Research continuously supports an inverse relationship between the age that treatment is initiated and treatment effectiveness; therefore, the younger a child starts receiving treatment, the greater the improvement that is demonstrated (Boyd et al., 2010; National Autism Center, 2009, 2011).

Specific Treatment Options

As ASD prevalence rates continue to increase, the diagnosis continues to gain attention from professionals who are motivated to improve the functioning of the ASD population. As a result of the variety of ASD presentations and growing professional interest, an abundance of social-skill and self-regulation programs is available. The specific programs used by the Social Competency Program are reviewed as follows.

Think Social. The *Think Social* curriculum is based on Michelle Garcia Winner's developmental, behavioral model of social thinking that focuses on teaching the "why" as it relates to socialization (Crooke, Hendrix, & Rachman, 2008; Winner, 2000; Winner, 2008). The curriculum relies on multiple frameworks, including ILAUGH, Four Steps of Communication, and Four Steps of Perspective Taking, to improve social cognition in children with ASD (Winner, 2008). In the *Think Social* curriculum, an integration of social-thinking vocabulary and aspects of meta- and social cognition is used to improve children's social functioning (Winner, 2008).

Model. The social thinking model uses cognitive-behavioral techniques to integrate elements of metacognition and therefore requires children to possess a

sufficiently high level of language and cognition to allow them to understand the “why” as it relates to socialization (Crooke et al., 2008; Winner, 2000; Winner, 2008). Also, a child must demonstrate a basic awareness that people may have unique thoughts and opinions that are different from those he or she holds (Winner, 2008). Social thinking encompasses a variety of abilities, including the ability to predict, infer, conceptualize, identify intentions of others, organize, actively listen, and speak coherently (Winner, 2000; Winner, 2008). Social thinking’s emphasis on teaching the “why” distinguishes it from the more popular behavior-based, social-skill instruction that focuses on the development of discrete skills (Crooke et al., 2008; Matson et al., 2012; Sulzer-Azaroff & Mayer, 1991; Winner, 2008). The goal of the social thinking model is to teach children social cognitive processes to provide them insight for navigating the social world and a foundation for social growth (Crooke et al., 2008; Winner, 2008).

The social thinking model uses a wide range of materials, including curricula (e.g., *Think Social*), abbreviated lessons (e.g., *Thinksheets*), story books (e.g., *Thinking about YOU Thinking about ME*), and theoretical frameworks (e.g., Four Steps of Communication, Four Steps of Perspective Taking, and ILAUGH) to teach children how to adapt to and interact with their social environments (Winner, 2000, 2005, 2008). Despite the strong research basis and emphasis on cognitive-behavioral intervention strategies, social thinking is not currently identified as an evidence-based comprehensive treatment model (National Autism Center, 2009; Wong et al., 2015). A review of research studies revealed interventions using the social-thinking model led to significant improvements in social perception, peer interaction, and social knowledge in children

between the ages of 9 and 15 years in community- and school-based treatment settings (Crooke et al., 2008; Koning et al., 2013; Lee et al., 2015). Despite these positive results, a number of variables, including limited number of studies, duration of treatment phases, small sample sizes, lack of a control group, and individualized or idiosyncratic packages (i.e., elements of social thinking combined with other interventions), continue to prevent social thinking from meeting the requirements associated with an evidence-based intervention (Crooke et al., 2008, Koning et al., 2013; Lee et al., 2015). However, the recent establishment of cognitive-behavioral techniques as evidence-based interventions, combined with the research initiatives surrounding social thinking, may well lead to the social-thinking model's meeting evidence-based criteria in the future (National Autism Center, 2009; Wong et al., 2015).

Frameworks. The ILAUGH framework, heavily referenced in the *Think Social* curriculum, is an acronym that represents research-based concepts that undermine the social challenges experienced by the ASD population (Winner, 2000, 2008). The ILAUGH acronym stands for initiation of communication, listening with eyes and brain, abstract and inferential language/communication, understanding perspective, Gestalt processing/getting the big picture, and humor and human relatedness (Winner, 2000, 2008). The framework respectively covers the ability to use verbal and nonverbal language to initiate an interpersonal interaction that is not routine; integrate contextual visual and auditory information to accurately comprehend the intended message; understand idioms, metaphors, sarcasm, nonverbal communication, and inferences; interpret the thoughts, feelings, and beliefs of others across a variety of social contexts;

integrate different concepts and pieces of information to understand the overall meaning; and relate with others and appropriately use humor in social contexts (Winner, 2008).

In addition to the ILAUGH framework, two other frameworks are referenced in the *Think Social* curriculum: Four Steps of Communication and Four Steps of Perspective Taking. Four Steps of Communication is a framework that depicts four definable aspects of social communication: thinking about the people who will be involved in the communication (e.g., thoughts, emotions, motivations, and belief systems), establishing a physical presence (e.g., body language), using eye contact to enhance communication, and using verbal language to mediate the interaction (Winner, 2008). Similarly, the Four Steps of Perspective Taking focuses on translating abstract concepts, associated with regulating behavior while consistently thinking about other people in the immediate environment, into more concrete parts (Winner, 2008). Four Steps of Perspective Taking involves consideration of the following elements: when people share a common space, they form thoughts about each other; once people have a thought about someone else, they contemplate their intentions and consider what the other person may be thinking about them; and once involved in communication, both parties monitor each other's behavior and modify their own behavior to increase the likelihood that they will be perceived in a desirable manner (Winner, 2008).

Curriculum. The *Think Social* curriculum is organized into eight major sections (i.e., Being Part of a Group and Recognizing Expectations; Our Whole Body and Mind Help Us Be Part of the Group; Self-awareness and Self-monitoring Our Behavior in a Group; Starting the Detective Agency: Learning More about Observing Others; The

Super Detective Group: Figuring Out What People Mean by What They Say; Adjusting our Participation and Language Based on What Other People Are Thinking, Imagining, or Wondering; Our Language Makes Others Have Different Thoughts and Feelings; and There is Still so Much More to Teach) with 69 corresponding lessons, corresponding measurable goal suggestions for each chapter, and lesson summary sheets to distribute to parents and family members (Winner, 2008). The *Think Social* curriculum offers instructional material based on social-thinking frameworks (e.g., Four Steps of Communication, Four Steps of Perspective Taking, and ILAUGH) through an emphasis on acquisition, fluency, generalization, and progress monitoring. The curriculum encourages educators to use creativity, flexibility, humor, and patience while teaching children to understand others' perspectives, observe other people's behaviors, use observations to make judgments, realize other people are thinking about them, and learn that having positive interactions with others makes others want to engage with them (Winner, 2008). *Think Social* is designed to be adaptable and therefore should be modified to meet the individual needs of children and adolescents of various ages, developmental levels, and social-skill profiles (Winner, 2008). Although delivering the curriculum over the course of 1 year is not uncommon, the duration of implementation often varies according to the individual needs of the children receiving the instruction (Winner, 2008).

Zones of Regulation. *Zones of Regulation* is a curriculum developed by Leah M. Kuypers that uses cognitive-behavioral strategies to teach children self-regulation skills to improve their self-awareness, self-control, and problem-solving abilities (Kuypers,

2011). Self-regulation is defined as the processes that allow a child to integrate his or her thoughts, feelings, and actions to manage, modify, and assess his or her own behavior (Reid et al., 2005). In neurotypical children, self-regulation skills are often learned implicitly through interactions with the environment; however, children with ASD tend to lack self-awareness and metacognition, thus impeding their ability to self-regulate (Jahromi et al., 2013). Research supports the improvements in one's ability to self-regulate correlates with increases in on-task behavior, productivity, and accuracy, as well as with decreases in maladaptive or problem behavior (Reid et al., 2005). In addition, self-regulation is positively correlated with social competence (i.e., low levels of self-regulation correlate with poor social skills and vice versa; Eisenberg, Fabes, Guthrie, & Reiser, 2000). As a result, improved regulation of emotions and behaviors is likely to lead to improved social skills or, at the least, to build a strong foundation to help children enhance receptiveness to social-skill instruction (Eisenberg et al., 2000).

The curriculum is delivered through large-group, small-group, and individualized instruction and helps children to conceptualize the abstract construct of self-regulation through the use of zones and a toolbox (Kuypers, 2011). Zones refer to four different states of physiological arousal a child is likely to experience (i.e., blue zone, green zone, yellow zone, and red zone; Kuypers, 2011). The blue zone is used to describe the lowest levels of arousal, including such emotions as sadness, boredom, and sickness (Kuypers, 2011). The green zone represents a state of calmness, including happiness, focused, and content (Kuypers, 2011). The yellow zone indicates an elevated level of arousal and includes such feelings as frustration, anxiety, silliness, and excitement (Kuypers, 2011).

The red zone signifies the highest levels of arousal and is marked by intense emotions, including devastation, rage, and terror (Kuypers, 2011). In addition to the zones, the curriculum also facilitates the development of a toolbox, or collection of coping skills that coordinate with the different levels of arousal (i.e., zones; Kuypers, 2011). The toolbox is organized into three sections: sensory strategies, calming strategies, and cognitive strategies (Kuypers, 2011).

After-School Programs

After-school programs targeting social skills can have statistically significant effects on enhancing the performance of children and adolescents (Durlak et al., 2010). Some after-school programs have been found to have positive effects on different areas of functioning, such as increasing self-perceptions, improving social behavior, and enhancing school performance (Durlak et al., 2010). Conversely, not all after-school programs effectively improve the functioning of youth (Durlak, 2010; Granger, 2008). Research has found the inclusion of instruction that is highly structured, sequenced, actively engaging, targeted, and explicit is likely to result in the most effective treatment outcomes (Durlak et al., 2010; Reichow, Steiner, & Volkmar, 2013). Although after-school programs deserve recognition as integral strategies for improving the functioning of children and adolescents within a community setting, the lack of consistent outcomes continues to support the need for additional research (Durlak et al., 2010; Granger, 2008).

Chapter 3: Methods

Given the need for effective interventions to increase social skills in the ASD population, the purpose of the present study was to examine the effectiveness of a Social Competency Program, implemented by a local agency specializing in autism diagnosis and treatment, with regard to the development of social skills among children and adolescents with autism spectrum disorder (ASD). The present study examined the impact of the Social Competency Program through a within-subjects, repeated-measures research design by analyzing pre- and postmeasures of the participants' social skills as measured by clinician-completed rating scales. It was hypothesized that the research-based program would enhance the overall social performance in children and adolescents with ASD. The relationship between program effectiveness and variables, including gender and age, was also explored.

Participants

All of the participants met pre-enrollment criteria according to the admissions requirements for the program being evaluated. Admission requirements required all participants (a) had an ASD diagnosis; (b) were between the ages of 6 and 16 years; (c) did not have a comorbid diagnosis of moderate, severe, or profound intellectual disability; (d) were in relatively good physical health (i.e., did not require care beyond what could be provided by program staff in a ratio of 1 staff to 3 clients); (e) demonstrated functional verbal language (e.g., spontaneous requests and comments, ability to follow verbal directions, and some degree of motivation to engage in the program); (f) exhibited foundational social skills (e.g., basic imitation skills, ability to

attend to peers, and tolerance of groups of six to eight people); (g) displayed generally safe behavior (e.g., no physical aggression or self-injurious behaviors, basic self-regulation skills, and ability to maintain safety in 1:3 ratio); (h) exemplified minimal gross motor mastery; and (i) demonstrated independent toileting practices. In addition to program-specific criteria, participant selection was also based on the completion of two SRS-2 rating scales.

One hundred and fifty-seven children and adolescents (Mean Age = 11.2 years, range 6 – 16 years; 32 females, 125 males) were enrolled in the Social Competency Program as of December 2016 and assigned to the same group. Participants for this study were selected based on the availability of two administrations of the primary outcome measure, resulting in 47 possible participants. Three participants did not have ASD identified as their primary diagnosis and therefore were eliminated from the sample. As such, the final participant sample was comprised of the 44 school-aged children (Mean Age = 10.8 years, $SD = 3.3$ years, range 6 – 16 years; 3 females, 41 males) with the most recent program start dates. The 44 participants were enrolled in the Social Competency Program between January of 2015 and November of 2016. Participants in the study were separated into three different groups according to age (i.e., 6-8, 9-11, and 12-16 years). There were 15 participants in the 6 to 8 group, nine participants in the 9 to 11 group, and 20 participants in the 12 to 16 group. Within the sample, 68.2% of participants were identified as Black or African American, 13.6% were identified as Caucasian, and 18.2% were identified as Other or Unknown; sample demographics were representative of the Social Competency Program population demographics. Although individual

socioeconomic data were not available, the organization's 2015 annual report indicated 70% of clients involved in at least one of the programs offered through the organization fell below the poverty line. With regard to psychiatric diagnosis, all of the participants had a primary diagnosis of Autism Spectrum Disorder. Participant attendance rate varied from 43% to 100% (Mean Percentage = 87.5%, $SD = 13.9\%$) or between six to 15 treatment sessions (Mean Number of Sessions = 12.7, $SD = 2.1$). Approximately 86% of participants (i.e., 12 of 15) attended at least 80% of treatment sessions.

All participants accessed additional services from the same provider prior to or while enrolled in the Social Competency Program: 100% accessed psychological evaluation services, 95.5% accessed intake services, 47.7% accessed outpatient services (e.g., individual and small-group therapy), 13.6% accessed prekindergarten services (i.e., center-based, outpatient program to address the core deficits of autism in children aged 2-5 years), 13.6% accessed First Friends (i.e., a full-day program that targets communication and interpersonal relationship skills in children up to age 6 years), and 9.1% accessed the Saturday Program (i.e., a weekly program that targets prevocational, independent-living, and community navigation skills in adolescents and young adults). Of the 44 participants, 2.3% accessed two additional services, 38.6% accessed three additional services, 38.6% accessed four additional services, 18.2% accessed five additional services, and 2.3% accessed six additional services.

As a standard practice in the Social Competency Program, all participants were also assigned individualized treatment goals as a progress-monitoring tool. Of the 44 participants, 56.1% had general goals to improve peer interaction, 14.6% had goals to

improve initiation of peer interaction, 9.8% had goals to improve reciprocation of peer interaction, 7.3% had goals to increase volley verbal exchanges, 4.9% had goals to increase socially appropriate comments, 2.4% had goals to improve assertive communication, 2.4% had goals to maintain personal space, and 2.4% had goals to identify positive feelings. Goal data were not provided for three participants.

As a result of the recruitment process and research design, the participant sample reflected a volunteer sample obtained in an urban community and therefore is not representative of the general population. Informed consent was not obtained, as the Social Competency Program is a standard program offered at the center. In addition, treatment was not randomized or manipulated, and all data were deidentified for the purposes of program evaluation.

Measure

The Social Responsiveness Scale, Second Edition (SRS-2), developed by Constantino and Gruber, is a 65-item rating scale designed to objectively measure the severity of the core symptomatology associated with ASD (Constantino & Gruber, 2012). The SRS-2 includes three forms, Preschool (ages 2.6 – 4.6 years), School-Age (ages 4.0 – 18.0 years), and Adult (ages 19.0 – 89.0 years), and can be completed in approximately 15 to 20 minutes (Constantino & Gruber, 2012). The SRS-2 uses a 4-point Likert scale format of reporting (i.e., 1 = *not true*, 2 = *sometimes true*, 3 = *often true*, and 4 = *almost always true*) and can be completed by parents, teachers, and/or mental-health professionals to assess a variety of skills, including social awareness; social information processing; reciprocal social communication; social avoidance; and restricted, repetitive

patterns of behavior, interests, or activities (Constantino & Gruber, 2012; Laugeson, Frankel, Gantman, Dillon, & Mogil, 2012).

In addition to a total score, the SRS-2 yields five treatment subscales (i.e., Social Awareness, Social Cognition, Social Communication, Social Motivation, and Restricted Interests and Repetitive Behaviors; Constantino & Gruber, 2012). Although initially developed by Constantino, an expert panel of judges (e.g., counselors, social workers, psychologists, psychiatrists, and pediatricians) independently categorized a list of items into one of the five treatment subscales to evaluate interrater reliability (Buros Center for Testing, 2014; Constantino & Gruber, 2012). The results found Constantino's initial categorization to be significant, suggesting good to strong agreement among the expert panel (Buros Center for Testing, 2014; Constantino & Gruber, 2012). However, because of a high degree of item overlap, interpreting the treatment subscales as a reflection of a unique set of symptomatology is not recommended (Buros Center for Testing, 2014; Constantino & Gruber, 2012). Treatment subscale median item to subscale correlations were analyzed to determine how well each item correlates with the remaining items in its cluster compared to items from a different cluster; correlations ranged from .60 to .72 within clusters and .41 to .62 between clusters (Constantino & Gruber, 2012).

Consistent with recent findings regarding the two-factor structure of ASD, the SRS-2 can also be used to calculate two *DSM-5* compatible scale scores: Social Communication and Interaction (SCI) and Restricted Interests and Repetitive Behavior (RRB; Constantino & Gruber, 2012; Frazier et al., 2014). The *DSM-5* compatible scales are based on strong support for distinguishable, yet correlated, clusters of ASD

symptomatology across the majority of populations (Constantino & Gruber, 2012; Frazier et al., 2014). Although further research is still needed, the two compatible scales are beneficial in the evaluation of treatment outcomes when focused ASD treatment programs that target specific impairments associated with ASD are delivered (e.g., social thinking; Constantino & Gruber, 2012; Frazier et al., 2014). The SCI is based on the sum of the first four treatment subscales (i.e., Social Awareness, Social Cognition, Social Communication, and Social Motivation) and aligns with the most recent ASD diagnostic criteria (APA, 2013; Frazier et al., 2014). The *DSM-5* compatible scales are sensitive to changes in social functioning among children and adolescents with ASD and are therefore a useful tool for facilitating the assessment of behavioral treatment goals and tracking the course of severity of ASD symptoms over time or in response to an intervention (Buros Center for Testing, 2014; Constantino & Gruber, 2012; Wood et al., 2009).

For the purposes of this study, the four treatment subscales that assess the social aspects of ASD (i.e., Social Awareness, Social Cognition, Social Communication, and Social Motivation), along with the SCI *DSM-5* compatible scale from the School-Age Form, were scored and analyzed using corresponding gender norms. The School Age Form (i.e., total score, subscale scores, and compatible scale scores) was normed on a sample that included 2,025 ratings of 1,014 children and adolescents across 16 different age levels (Bruni, 2014; Constantino & Gruber, 2012). The sample used was similar to the 2009 U.S. Census with regard to race/ethnicity, geographic region, and parent educational level (Bruni, 2014; Constantino & Gruber, 2012). Research using the SRS-2

School-Age Form generally supports strong levels of reliability and validity with the exception of interrater reliability. The correlations for interrater reliability (i.e., .77) are considered adequate, considering ratings were collected from parents and teachers across environments (Bruni, 2014; Constantino & Gruber, 2012; Wood et al., 2009).

The SRS-2 uses *t* scores to produce one total score, five treatment subscales, and two *DSM-5* compatible scales (Constantino & Gruber, 2012). *T* scores of 76 and above are considered severe and denote clinically significant social functioning deficits that interfere with interpersonal relationships (Bruni, 2014; Constantino & Gruber, 2012). Scores falling between 66 and 75 are in the moderate range and indicate some level of clinically significant impairment in social functioning, while *t* scores in the 60 to 65 range designate mild deficits in social functioning (Bruni, 2014; Constantino & Gruber, 2012). Finally, *t* scores of 59 and below fall within normal limits and denote individuals who most likely do not exhibit impairments in social functioning that are indicative of ASD (Bruni, 2014; Constantino & Gruber, 2012).

Procedures

Treatment

All participants in this study received the standard Social Competency Program implemented and supervised by the personnel of the local agency. Sessions were scheduled twice weekly for 2 hours in the evening. Treatment sessions were presented through a consistently structured schedule and delivered on either Mondays and Wednesdays or Tuesdays and Thursdays starting in September and continuing throughout the year. In order to promote homogeneity with regard to developmental level,

participants were divided into small treatment groups (i.e., one staff to three children) according to age (i.e., 6-8 years, 9-11 years, 12-16 years). Treatment was delivered in small groups by Master's-level clinicians who worked closely with the participants and curricula to make modifications and ensure all of the participants' needs were being addressed. The treatment program used two primary curricula (i.e., *Zones of Regulation* and *Think Social*) to provide a structure for exposing clients to the didactic element of treatment. The curricula, described in the previous section entitled Specific Treatment Options, were typically delivered in their entirety throughout the year-round program; however, the clinician was permitted to modify and adapt the curricula as needed to meet the individual needs of the students in a specific group. Owing to developmental levels, the participants in the 6- to 8-year age group spent approximately 2 months working with the *Zones of Regulation* curriculum. After all of the lessons were completed and some degree of proficiency in emotional regulation was demonstrated, the *Think Social* curriculum was delivered for the remaining duration of the study. The two older age groups worked solely with the *Think Social* curriculum.

First, clinicians used the curricula to introduce and teach specific social skills during a 25-minute time slot. Then, clinicians created opportunities for rehearsal and generalization for the remaining 80 minutes of the treatment session. During the 80 minutes, clinicians consistently collected data to monitor participant progress toward individual treatment goals. Approximately one lesson was presented each week while the clinician informally assessed comprehension and retention of the presented skills. On some occasions, the clinician determined that a specific lesson needed to be explained

differently or repeated for some certain groups; however, the entire group progressed through the curriculum at the same pace.

Each treatment session was divided into six time slots with corresponding activities to promote uniformly structured treatment sessions. First, from 4:30 p.m. to 4:45 p.m., children were expected to put away their belongings, review the schedule, practice greetings, and review the rules. Second, from 4:45 p.m. to 5:10 p.m., children received direct instruction through modeling, role playing, feedback, and generalization techniques using research-based social-skill curricula. The third time slot, from 5:10 p.m. to 5:30 p.m., consisted of team-building and collaborative activities to provide the children with a more natural opportunity to rehearse and apply social skills. Dinner was the fourth activity, from 5:30 p.m. to 5:50 p.m., and allowed the children to practice appropriate table manners while interacting with their peers in a common social context. The fifth activity, from 5:50 p.m. to 6:10 p.m., used movement activities to engage children in peer interaction. Lastly, the sixth time slot, from 6:10 p.m. to 6:30 p.m., was used to deliver reinforcement or rewards earned during the session, as well as to give children time to pack up and prepare for the transition home by retrieving belongings and saying good-bye. The program was designed such that each activity or time slot corresponded with specific social behaviors that are underdeveloped in individuals with ASD. These behaviors varied depending on the specific activity and included some the following skills: reciprocal salutations, reciprocal conversation skills, following directions, attending to peers, active listening, transitioning between activities, turn

taking, collaboration, perspective taking, communication, social engagement and interaction, manners, sportsmanship, and generalization.

The Social Competency Program used two data sources to monitor individual skill development and overall program effectiveness. As a standard programmatic practice, a comprehensive treatment plan was developed for each child prior to enrollment in the program. Following a treatment team model, the child's treatment plan was developed through a collaborative process that included evaluation and/or input from a variety of stakeholders, including the child, family members, psychiatrists, psychologists, mental-health clinicians, and outside service providers. Each treatment plan included one or two individualized treatment goals that were focused on the development of social behaviors. Similar to an individualized education program goal, these goals were monitored during each treatment session through data collection that was dictated by the specific goal being assessed (e.g., frequency, duration, intensity). In addition to individualized treatment goals, rating scales were used. Clinicians completed the rating scales in December of 2016 and February of 2017 to monitor progress and provide a continuous measure of the child's ASD-related impairments.

In line with the treatment team model, treatment plan reviews occurred in 120-day cycles. In other words, each child's treatment team met to evaluate the child's progress every 120 days; the first treatment plan meeting was 120 days after the date on which the child's initial treatment plan was developed. Treatment plan meetings were typically attended by all involved parties (e.g., program director, clinician, psychiatrist, outside service providers, families, and the child or adolescent, if appropriate). During the

meeting, the team reviewed several sources of data, including individualized treatment goal data, SRS-2 scores, and anecdotal or observational data. The team used these data, along with input from family members and outside service providers, to determine how well the child was responding to the program. If the student was not responding, or responding only minimally, the team collected additional information to explore potential barriers (e.g., competing behaviors) and make modifications to the treatment plan.

In order to evaluate treatment fidelity, status review forms were completed once a month by the program's clinical support specialists to evaluate treatment fidelity. Clinical support specialists were trained in all of the curricula and were responsible for conducting direct observations of each treatment group, auditing treatment progress notes, and monitoring data collection. The status review form collected qualitative information (i.e., clinical summary, therapist collaboration, and group management) in order to identify issues and concerns with treatment fidelity, as well as to make recommendations for improvement. The clinical support specialists recorded direct observations in the clinical summary section (e.g., the skills the group was working on that day, how the participants were reacting to the facilitators, and the strategies used to support participant treatment goals). This section also incorporated information regarding lesson delivery (e.g., sequence and quality of didactic delivery). In comparison, the therapist collaboration and group management sections included summaries of how well the facilitators worked together and managed the group during the session (e.g., Are the facilitators working collaboratively? What roles is each facilitator taking on within the group?). Once complete, the status review forms were then shared with the program

directors during supervision, and feedback was provided to the program facilitators during monthly team meetings. Issues surrounding poor treatment fidelity typically merited direct consultation with the clinical support specialist or assistant director, follow-up observations within a defined period of time, and/or retraining with the clinical support specialist or the center's training department. A comprehensive review by program facilitators of the status review forms supported the program was delivered with fidelity, as none of the clinicians required corrective action because of their performance on monthly treatment fidelity checks (i.e., status review forms). See Table 1 for a summary of the evaluation methods imbedded within the Social Competency Program discussed in this section.

Table 1

Summary of Program-Imbedded Evaluation Methods

<i>Treatment measure</i>	<i>Construct being measured</i>	<i>Frequency</i>	<i>Assessor</i>
<i>SRS-2: Initial probe</i>	Social functioning	December 2016	Clinician facilitating program delivery
<i>SRS-2: Second probe</i>	Social functioning	February 2017	Clinician facilitating program delivery
<i>Treatment plan reviews</i>	Individual treatment goals	Program start date; Every 120 days	Treatment team
<i>Status review form</i>	Treatment fidelity	Monthly	Clinical support specialist

Note. SRS-2 = Social Responsiveness Scale, Second Edition

Evaluation

All participants were required to have two SRS-2 rating scale probes completed. All of the SRS-2 rating scales were completed by the child's specific clinician to provide a continuous measure of the child's ASD-related impairments. For each participant, SRS-2 rating scales were completed in December of 2016 and February of 2017. Therefore, all participants had an initial SRS-2 completed prior to the holiday break and a second SRS-2 after receiving approximately 2 months of targeted social-skill intervention after the initial SRS-2 probe was completed.

A within-subjects, repeated measures research design was used to evaluate the effectiveness of treatment (i.e., Social Competency Program). The independent variable was the social-skill instruction delivered through the Social Competency Program, and the dependent variable was the change in social functioning measured through the two SRS-2 probes. After all participants had two SRS-2 rating scales completed, the four treatment subscales that assess the social aspects of ASD (i.e., Social Awareness, Social Cognition, Social Communication, and Social Motivation), along with the *DSM-5* compatible scale (i.e., SCI), were analyzed and used as measures of participants' social skills. (See previous section entitled Instrumentation for a more detailed description of the SRS-2.) Statistical analyses consisted of a paired samples *t* test to analyze pre- and postmeasures of the participants' social skills to evaluate program effectiveness. Owing to a high degree of item overlap between treatment subscales, separate repeated measures ANOVAs were conducted to assess differences in program effectiveness across gender

and age groups (i.e., 6-8 years, 9-11 years, 12-16 years; Buros Center for Testing, 2014;

Constantino & Gruber, 2012).

Chapter 4: Results

In order to test the first hypothesis, “Will the research-based program enhance the overall social functioning in children and adolescents with autism spectrum disorder?” improvement in the social functioning of participants in the study from pre- to posttreatment was evaluated using paired-samples *t* tests. Two participants were excluded from the analysis as a result of incomplete data (i.e., missing SRS-2 scores). On average, participation in the Social Competency Program did not have a significant effect on participants’ SRS-2 subscales or *DSM-5* compatible scores (i.e., Social Awareness, Social Cognition, Social Communication, Social Motivation, and Social Communication and Interaction). Pretest mean scores ranged from 59.36 to 61.64, with standard deviations between 9.13 and 11.01. Posttest mean scores ranged from 60.29 to 63.81, with standard deviations between 10.30 and 12.96. (See Table 2 for specific subscale and *DSM-5* compatible scale scores.)

Table 2

Paired Samples t Test

Social-skill measure	Pretest mean (SD)	Posttest mean (SD)	<i>t</i>	Significance
Social Awareness	59.88 (9.13)	62.24 (10.40)	-2.106	0.041
Social Cognition	60.69 (11.01)	62.83 (12.96)	-1.460	0.152
Social Communication	61.62 (10.21)	63.62 (11.73)	-1.810	0.078
Social Motivation	59.36 (9.35)	60.29 (10.30)	-0.894	0.376
Social Communication and Interaction	61.64 (9.53)	63.81 (11.58)	-1.979	0.055

Additional correlations were conducted in order to assess the impact of treatment session attendance on posttreatment scores obtained on the clinician-rated social-skill measure (i.e., SRS-2). Results indicated the number of treatment sessions attended was not significantly correlated with the posttreatment Social Awareness subscale scores, $r = 0.233$, $p = 0.138$; Social Cognition subscale scores, $r = 0.251$, $p = 0.108$; Social Communication subscale scores, $r = 0.123$, $p = 0.438$; Social Motivation subscale scores, $r = 0.035$, $p = 0.827$; or *DSM-5* Social Communication and Interaction subscale scores, $r = 0.160$, $p = 0.312$.

To evaluate whether the social-skill program resulted in improvement in social functioning within and across the three different age groups (i.e., 6 – 8 years, 9 – 11 years, and 12 – 16 years), repeated measures ANOVAs were performed on participants'

pre- and posttreatment scores on the clinician-rated social-skill measure (i.e., SRS-2).

Two participants were excluded from the analysis as a result of incomplete data (i.e., missing SRS-2 scores). Despite the assumption of sphericity being met (Mauchly's $W = 1.0$), the repeated measures ANOVA did not indicate a significant interaction effect between age and social-skill instruction on the Social Awareness SRS-2 subscale, $F(1, 39) = 0.122, p = 0.885$. (See Table 3 for additional statistics).

Table 3

Social Awareness Subscale Repeated Measures ANOVA

Age groups (years)	Pretest mean (SD)	Posttest mean (SD)	<i>F</i>	Significance
6-8	59.57 (9.53)	62.71 (10.99)	0.122	0.885
9-11	64.44 (7.83)	66.22 (8.90)		
12-16	57.95 (9.08)	60.00 (10.51)		
Combined	59.88 (9.13)	62.24 (10.40)		

Similarly, the repeated measures ANOVA did not indicate a significant interaction effect between age and social-skill instruction on the Social Cognition SRS-2 subscale, $F(1, 39) = 0.160, p = 0.853$. (See Table 4 for additional statistics.)

Table 4

Social Cognition Subscale Repeated Measures ANOVA

Age groups (years)	Pretest mean (SD)	Posttest mean (SD)	<i>F</i>	Significance
6-8	63.21 (10.96)	64.29 (13.10)	0.160	0.853
9-11	58.33 (8.80)	60.33 (8.70)		
12-16	59.95 (12.30)	62.95 (14.84)		
Combined	60.69 (11.01)	62.83 (12.96)		

Despite the assumption of sphericity being met (Mauchly's $W = 1.0$), the repeated measures ANOVA also failed to indicate a significant interaction effect between age and social-skill instruction on the Social Communication SRS-2 subscale, $F(1, 39) = 0.695$, $p = 0.505$. (See Table 5 for additional statistics.)

Table 5

Social Communication Subscale Repeated Measures ANOVA

Age groups (years)	Pretest mean (SD)	Posttest mean (SD)	<i>F</i>	Significance
6-8	62.57 (9.73)	66.00 (13.40)	0.695	0.505
9-11	63.56 (6.00)	66.33 (9.66)		
12-16	60.00 (12.15)	60.58 (11.15)		
Combined	61.62 (10.21)	63.62 (11.73)		

Consistent with previous results, despite the assumption of sphericity being met (Mauchly's $W = 1.0$), the repeated measures ANOVA did not indicate a significant interaction effect between age and social-skill instruction on the Social Motivation SRS-2 subscale, $F(1, 39) = 1.455$, $p = 0.246$. (See Table 6 for additional statistics.)

Table 6

Social Motivation Subscale Repeated Measures ANOVA

Age groups (years)	Pretest mean (SD)	Posttest mean (SD)	<i>F</i>	Significance
6-8	56.93 (9.81)	60.29 (11.89)	1.455	0.246
9-11	62.33 (6.06)	62.67 (8.26)		
12-16	59.74 (10.20)	59.16 (10.24)		
Combined	59.36 (9.35)	60.29 (10.30)		

Finally, despite the assumption of sphericity being met (Mauchly's $W = 1.0$), the repeated measures ANOVA once again failed to indicate a significant interaction effect between age and social-skill instruction on the Social Communication and Interaction *DSM-5* compatible SRS-2 subscale, $F(1, 39) = 0.485, p = 0.619$. (See Table 7 for additional statistics.)

Table 7

Social Communication and Interaction (DSM-5 Compatible Subscale) Repeated Measures ANOVA

Age groups (years)	Pretest mean (SD)	Posttest mean (SD)	<i>F</i>	Significance
6-8	62.00 (9.66)	65.64 (13.12)	0.485	0.619
9-11	63.33 (6.23)	65.33 (8.97)		
12-16	60.58 (10.94)	61.74 (11.70)		
Combined	61.64 (9.53)	63.81 (11.58)		

Although a hypothesis regarding the effect of participant gender on program effectiveness was originally generated, gender analyses could not be conducted owing to a limited number of female participants (i.e., three).

Chapter 5: Discussion

Summary of Findings

The purpose of this study was to evaluate the effectiveness of an after-school Social Competency Program. In order to discuss the findings of this research study, each research question and the corresponding results will be evaluated using the initial hypothesis and current literature. The findings will be followed by clinical implications, limitations, and directions for future research. Although the results did not support program effectiveness, findings should be interpreted with caution because of logistical limitations of the program evaluation.

Program Effectiveness

It was hypothesized that the research-based program would enhance the overall social functioning of children and adolescents with ASD. This hypothesis was not supported. Within-subjects analyses found that social instruction received through the Social Competency Program did not result in improved social functioning as measured by clinician-rated social-skills measures (i.e., SRS-2). Additional correlational analyses exploring the relationship between individual rates of treatment session attendance and posttreatment scores did not signify a relationship between attendance rate and program effectiveness.

These findings are consistent with available research on social-skill instruction. Contrary to advancements in the process for identifying evidence-based interventions, social-skill interventions continue to remain largely ineffective (Radley et al., 2015; Walton & Ingersoll, 2013). After-school programs targeting social skills can have

statistically significant effects on enhancing the performance of children and adolescents; however, despite stringent guidelines, many programs and professionals continue to implement social-skill interventions that have not met the criteria necessary to be designated as evidence based (Durlak et al., 2010; Radley et al., 2015; Wang & Spillane, 2009). Although after-school programs deserve recognition as integral strategies for improving the functioning of children and adolescents within a community setting, the lack of consistent outcomes continues to support the need for additional research (Durlak et al., 2010; Granger, 2008).

Effect of Age

The hypothesis for the question, “Does participant age impact program effectiveness?” was nondirectional owing to the variation of treatment protocols between age groups and was therefore measuring any difference, positive or negative, between the three age groups (i.e., 6-8 years, 9-11 years, and 12-16 years). This hypothesis was also not supported. Within-subjects, repeated measures analyses did not find a relationship between age and program effectiveness. Although these results are not consistent with previous research findings that indicate an inverse relationship between age that treatment is initiated and treatment effectiveness, the results are consistent with the research findings that indicate the general ineffectiveness of social-skill programs (Boyd et al., 2010; National Autism Center, 2009, 2011; Radley et al., 2015; Walton & Ingersoll, 2013).

Effect of Gender

The hypothesis for the question, “Does participant gender impact program effectiveness?” was nondirectional and was therefore measuring any difference, positive or negative, between male and female children and adolescents. Owing to the limited number of female participants (i.e., three), this research question could not be explored.

Limitations

While these findings will be useful in future evaluative efforts by the Social Competency Program, the study was marked by several limitations regarding access to incomplete treatment data. Similar to other social-skill intervention programs, the treatment delivered was only semistructured, allowing program facilitators to use clinical judgment to guide the pace of instruction. Therefore, the individual treatment groups did not progress through the curriculum at a uniform pace, making difficult an evaluation of the program as a whole. In other words, no data were available to analyze the impact of pacing on social-skill acquisition. Moreover, the only treatment fidelity datum available was a qualitative summary, provided by a supervisor of the program, that noted none of the clinicians required corrective action as a result of their performance on monthly treatment fidelity checks (i.e., status review forms). Although additional quantitative data were collected, these data are considered part of the clinicians’ human resources employee files and were not available for review.

Subsequent limitations of the study involved limitations in the intervention period and timing of SRS-2 probes. Participants received the initial SRS-2 probe in December of 2016; however, the probe cannot be conceptualized as a true baseline measure as it was

not uniformly administered at the start of the intervention. Instead, the initial probe was completed after participants received between 1 month and more than 1 year of treatment, depending on the date the participants were initially enrolled in the Social Competency Program. The delay in, and inconsistency of, the collection of the initial SRS-2 probe may have caused this study to miss the improvement in social functioning. In other words, participants may have shown an improvement prior to the collection of the initial SRS-2 probe. With regard to baseline data collection, one must recognize that clinicians require some amount of time to become familiar with the participants in order to provide a valid assessment of social functioning (i.e., SRS-2 probe). Therefore, gathering baseline measures of social functioning as part of the diagnostic interview completed during the intake process and/or creating an opportunity for clinicians to have conducted multiple observations of the participants prior to implementing the Social Competency Program may have been beneficial. Moreover, participants in the study received only approximately 13 treatment sessions across 2 months before receiving the second SRS-2 probe in February of 2017. Although the 2-month time frame is not uncommon in mental-health interventions, the Social Competency Program is not designed to be a brief intervention; rather, participants commonly remain enrolled in the program for 1 or more years. In addition, the timing of the second SRS-2 probe occurred shortly after the program's holiday break. Knowing the ASD population is susceptible to regression and frequently requires time for recoupment, adjusting the data collection timeline to collect both SRS-2 probes before the holiday break or to allow more time to elapse after the break before a second SRS-2 probe is administered may be beneficial. Additionally, gaps

in program sessions as a result of the holiday break may have also influenced outcomes. Finally, although the curricula used to deliver the core social-skill instruction included numerous evidence-based strategies, the overall organization and presentation frameworks have not been deemed evidenced based through rigorous research.

Additionally, the sample needs to be expanded, and the breadth of demographic and program-specific data needs to be increased. The current sample included only three female participants, thereby preventing statistical analyses exploring correlations between gender and response to treatment from being conducted. Unfortunately, the ratio of female to male participants used in this sample is representative of the gender distribution of all of the children and adolescents enrolled in the Social Competency Program. Although agency-wide socioeconomic data were retrieved from the organization's 2015 annual report, the sample lacked socioeconomic data for individual participants, thus inhibiting the analysis of correlations between socioeconomic status and program effectiveness. Similarly, owing to the nature of the ASD population and high rates of comorbidity, collecting data on comorbid psychiatric conditions would have been beneficial to evaluate the impact of comorbidity on program effectiveness; however, these data were also unavailable. Also missing from the data set was a uniform method for collecting participant progress on individualized treatment plan goals. Owing to a large number of clinicians, individual treatment goals were written in a variety of formats, making correlational analyses difficult to conduct. Similarly, data describing generalization of social skills to settings outside of the treatment setting were not available for review. The data set also lacked information about clinician qualifications,

such as level of education and experience. In consideration of the negative outcomes, an assessment of the clinicians' professional qualifications would have been valuable.

Likewise, the collection of clinician-generated SRS-2 ratings in isolation inhibited the assessment of generalization of social skills across environments other than the treatment setting.

Clinical Implications

Regardless of the lack of significant findings, the current study provided some valuable implications to guide future program modifications and evaluations, as well as the broader field of ASD research. The current study reinforces the need for comprehensive planning when conducting a program evaluation. In order to conduct a thorough program evaluation, comprehensive planning should include strongly delineated data collection procedures to evaluate all potential confounding variables. Although the findings of this study were not indicative of program effectiveness, the results include valuable information with regard to the design of future internal program evaluations. Overall, this study can be conceptualized as a preliminary measure and a useful tool in guiding future program development and modification.

Despite advancements in the process for identifying evidence-based interventions, the field of psychology has been unsuccessful in developing interventions that consistently and effectively improve social skills (Radley et al., 2015; Rao, Beidel, & Murray, 2008; Walton & Ingersoll, 2013). Available social-skill interventions continue to remain largely ineffective in their ability to foster the acquisition and generalization of social skills, subsequently undermining the development of comprehensive evidence-

based social-skill remediation programs (Radley et al., 2015; Rao et al., 2008; Walton & Ingersoll, 2013). Despite stringent guidelines, many programs and professionals continue to implement social-skill interventions that have not met the criteria necessary to be designated as evidence based (Radley et al., 2015; Wang & Spillane, 2009). The fact that interventions which are not evidence based continue to be implemented may be a result of the lack of attention to whether or not specific social-skill interventions have met criteria for being evidence based, as well as of the limited number of systematic, comprehensive reviews of intervention research literature (McCoy et al., 2016; Radley et al., 2015; Wang & Spillane, 2009; Wong et al., 2015). Equally important are the many interventions not able to be classified as evidence based despite having strong evidence supporting effectiveness (Wong et al., 2015). Such variables as insufficient study replication, small sample size, and poor methodology prevent interventions from meeting the rigorous, required criteria outlined by professional organizations as necessary to be classified as an evidence-based intervention (Wang & Spillane, 2009; Wong et al., 2015). While some progress has been demonstrated with regard to social-skill instruction, research indicates the need for additional efforts to develop efficacious social-skill interventions for the ASD population (Radley et al., 2015; Rao et al., 2008; Walton & Ingersoll, 2013).

These treatment implications affect all populations; however, populations with potential comorbid psychiatric diagnoses are likely the most susceptible, as few studies have explored intervention effectiveness within these low-incidence populations (Walton & Ingersoll, 2013). The available research on ASD is in the preliminary stages and

supports the need for further investigation into the neurobiological correlates and degree of brain plasticity observed in the ASD population. The field of ASD research currently presumes high expectations that social skills can be acquired and generalized with the appropriate intervention. However, one must consider that comorbidity and different phenotypic presentations of ASD may be less responsive to social-skill intervention. Regardless of the specific outcomes, additional research has great potential to improve the quality of treatment for the ASD population.

Directions for Future Research

The results of this study suggest future directions for general ASD research, as well as for specific after-school Social Competency Program evaluations. One of the primary goals of future program evaluations should be to reduce the influence of confounding variables on measures of program effectiveness. To accomplish this goal, the results of this study should be used to develop targeted follow-up questions to investigate possible confounding variables. In order to evaluate potential confounding variables, the research design should include extensive data collection to evaluate the impact of such variables as participant socioeconomic status, comorbid psychiatric diagnoses, and clinician qualifications (e.g., education level and experience). A detailed data collection plan should also include multiple outcome measures and evaluate the impact of clinical judgment and pacing of instruction, as well as of treatment fidelity. A more thorough investigation of existing fidelity measures should be conducted to assess differences in treatment integrity among clinicians, as well as the degree of subjectivity

within the fidelity measure. Depending on the outcome, exploring a more standardized, objective format for assessing treatment fidelity may be beneficial.

Additional efforts to assess generalization, intervention duration, and curriculum selection are also warranted. In order to evaluate generalization, the incorporation of the perspective of parents and guardians through measures of social functioning using such methods as structured interviews and standardized rating scales would also be beneficial. In addition, true baseline data must be obtained immediately after a new participant is enrolled in the program. Each new participant should receive an SRS-2 probe during his or her first week in the program, with additional progress-monitoring probes administered during all subsequent treatment plan review meetings. This would allow the program to investigate participant responses over time and to assist the treatment teams in evaluating and modifying treatment programs on an ongoing basis while evaluating short-term versus long-term benefits of the program. Finally, the data collection timeline should be adjusted to account for the regression that frequently occurs in the ASD population. In order to compensate for recoupment, both SRS-2 probes should be collected before the holiday break or after the break once more time has elapsed. After all of the additional data are collected and analyzed, a reevaluation of the curricula might be beneficial.

More rigorous evaluations of social-skill interventions are also warranted. Although after-school programs deserve recognition as integral strategies for improving the functioning of children and adolescents within a community setting, the lack of consistent outcomes continues to support the need for additional research (Durlak et al., 2010; Granger, 2008). Professionals need to acquire a more comprehensive

understanding of the social impairments observed in the ASD population to enhance the development of effective social-skill intervention programs, with special attention to different phenotypic presentations and corresponding variations in treatment response.

The field of ASD research is relatively young and has significant potential to improve the quality of treatment for the ASD population.

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