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Development and Validation of the Children's Social Competence Scale

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Development and Validation of the Children’s Social Competence Scale

A Dissertation
Presented to
The Faculty of Morgridge College of Education
University of Denver

In Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

by
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August 2011
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ABSTRACT

Few scales exist that assess social competence in children with Asperger’s and high functioning autism (AS/HFA). Due to the nature of the disorder, the current social competence measures that do exist are not designed to assess the social difficulties that many children with AS/HFA encounter. To meet this challenge a scale was developed to better understand social competence in children with AS/HFA, the Children’s Social Competence Scale (CSCS). Two studies that report the development and initial validation of the scale were conducted with children between the ages of 3 and 8 with and without a diagnosis of AS/HFA. First, an exploratory factor analysis of an initial item pool yielded three factors assessing subscales of social skills, self-esteem, and social-emotional regulation. Second, a confirmatory factor analysis supported the CSCS three-factor structure. Third, test-retest reliability, internal consistency, and validity coefficients supported the viability, use, and potential for continued development of this new instrument. Finally, significant differences were found for sex and for diagnosis
in the social skills, self-esteem, and social-emotional regulation subscales. Implications for theory and research on social competence in children are discussed.
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CHAPTER 1

INTRODUCTION AND LITERATURE REVIEW

Autism is the most common of the pervasive developmental disorders, affecting an estimated 1 in 100 births (Autism Society of America, 2010). Children with autism typically show difficulties with verbal and non-verbal communication, social interactions, and leisure or play activities. Autism is complex because there is no single cause and no cure. One thing that is agreed upon by professionals is that early intervention helps decrease the severity of these deficits. To date, there are many assessment tools useful in measuring cognitive and communicative functioning levels. However, there is no assessment tool that accurately measures social deficits. This is problematic because one of the core deficits of children with autism is the inability to socially interact with others in play. A measure that accurately assesses social deficits is needed in order for children with autism to be provided appropriate intervention.

Play is essential to social skill development. When children come together and play, they form a peer culture that is uniquely their own (Wolfberg, 2003). Children create a social and imaginary world that is not directed by adults. Stagnitti and Unsworth (2000) suggested that children who self-initiate pretend play with peers facilitate the development of their social understanding. Through
play, children are forced to navigate their social world independently and develop their interpersonal skills and social knowledge. Over time children will begin to form friendships by identifying themselves with the peers they interact with (Wolfberg). Play is instrumental in helping children understand their social world and thus necessary for attaining social competence and forming meaningful friendships. However, play skills for children with autism are vastly different from those of their typically developing peers. Individuals with autism experience challenges and impairments in the areas of communication, social interactions, and imagination (American Psychiatric Association, 2000). Children with autism exhibit repetitive and stereotyped patterns of behavior. They also have restricted interests and show little interest in a variety of activities (Wolfberg). This affects their ability to engage in spontaneous pretend play, thus ultimately affecting their ability to develop friendships with peers.

Atkins-Burnett (2001) acknowledged that children who are socially competent acquire the social skills needed to form friendships with peers. However, social competence is a puzzling concept, because the skills required for social development vary by the age of a child and with the demands of particular situations and diagnoses. Children on the autism spectrum lack the necessary social skills that are needed to spontaneously interact with others to form
meaningful relationships (Wolfberg, 2003). Ineffective social skills are a central characteristic of autism, defined in the DSM-IV-TR (APA, 2000) as: “severe and pervasive impairment in several areas of development: reciprocal social interaction skills, communication skills, or the presence of stereotyped behavior, interests, and activities.” (p. 67). While typically developing children can instinctively communicate with others and engage in reciprocal interactions, children with autism cannot. Children with autism lack the ability to infer the mental states of others, such as reading others’ intentions, beliefs, and desires (Ozonoff et al., 1991). The capability to interpret and predict social behavior is known as “theory of mind” (Ozonoff et al.). As a result, children with autism are poor at predicting how another person might respond to them and what the other person is likely to do next in a given situation (McAfee, 2002). The inability to read social cues makes it difficult for children with autism to develop the appropriate social skills needed to become socially competent.

At this time, there are few assessment tools that identify and measure specific social skills in children with autism (Bellini & Hopf, 2007). The Autism Social Skills Profile (ASSP) was developed to address the need for a social skills measure for children with autism. The ASSP consists of 49 items and contains three subscales that measure social reciprocity, social participation/avoidance, and
detrimental social behaviors of children and adolescents with autism spectrum disorders (ASD). Items are rated on a 4-point response scale ranging from never to very often and can be completed by a parent, teacher, professional, or any adult that knows the child in a social situation. The ASSP was designed to assess children and adolescents between the ages of 6 and 17. Bellini and Hopf found that the measure had excellent psychometric properties with respect to internal consistency ($\alpha = .93$) and test-retest reliability (.90). However, there are a few problems with the ASSP.

First, autism is known as a “spectrum disorder,” meaning that there is wide variability among individuals in their ability to adapt and function in daily life (Wolfberg, 2003). Within the spectrum, children may range from high functioning to low functioning. The social skills of a high functioning child who is verbal would be different than a low functioning child lacking verbal skills. The ASSP does not account for the differences in functioning levels. Another limitation is that the ASSP measures social skills of children and adolescents ranging from 6 to 17 years of age. Social development is different for children than for adolescents. When developing a social skills assessment for children on the autism spectrum it is imperative to take into account the functioning level and the developmental age of the child being assessed.
Children with autism not only have difficulties with social development, but they also have cognitive impairments. The child’s cognitive and verbal capabilities determine the severity of the disorder. The autistic spectrum is comprised of four subgroups: Asperger’s syndrome and high, medium, and low functioning autism (Baron-Cohen, 1998). Individuals with Asperger’s syndrome have normal or above IQs and no language delay. Individuals that fall within the other three subgroups have some degree of language delay and the level of functioning is correlated with their IQ (Baron-Cohen).

The cognitive distinctions between Asperger’s and high functioning autism are debatable. Some argue that individuals with high functioning autism have an IQ that is less than 70, while others do not. Several studies have been conducted to differentiate the cognitive differences between Asperger’s and high functioning autism, but many of them have resulted in inconclusive findings (Koyayma et al., 2007). Koyayma et al. found that people with Asperger’s scored higher in verbal IQ; however, differences in cognitive characteristics remain uncertain. The distinction between high functioning autism and low functioning autism is more concrete. Mayes et al. (2009) considered children with low functioning autism to have an IQ of 80 and below with little verbal capabilities, and children with high functioning autism to have an IQ above 80 with language
capability. Generally speaking, the IQ of children with low functioning autism usually falls within the mentally retarded range, while IQs of children with high functioning autism do not.

In addition to cognitive differences, children with low or high functioning autism differ in adaptive functioning. Adaptive functioning is comprised of communication skills, socialization, and daily living skills (Liss et al., 2001). Although cognitive ability is important, adaptive functioning allows one to determine how individuals function in their environment (Liss et al.). Adaptive functioning is important to individuals with autism because it involves skills responsible for coping with the demands of the everyday environment. It is one of the determining factors as to whether a person with autism can live independently or needs constant supervision. Many researchers believe that IQ is correlated with adaptive functioning. Liss et al. concluded that IQ is a strong predictor of adaptive functioning in lower functioning children with autism; however, it is not a good predictor in children with higher functioning autism. They found that higher functioning children with autism were more impaired in their socialization and daily living skills than lower functioning children. Unlike the lower functioning children, the higher functioning children’s IQs did not correlate with their adaptive functioning. As the level of cognitive functioning
increases, one would predict that the level of adaptive functioning would increase. However, children who had higher levels of cognitive functioning did not display higher levels of adaptive functioning. The adaptive functioning level remained the same when compared to children who had lower levels of cognitive functioning (Liss et al.). Since autism is a spectrum disorder and the differences in IQ and adaptive functioning vary between children with high and low functioning autism, it is essential to take these differences into account when assessing social skill development in children with autism.

Another important factor to consider when developing a social assessment is stage in social development. There are a number of theories that define the developmental milestones that children and adolescents experience. Early childhood is from birth to 5 years of age and includes infants, toddlers, and preschool children (Brems, 1993). During this time children are beginning to form a sense of self. They are becoming less egocentric and are distinguishing themselves from the world around them (Dacey & Travers, 1996). Children also begin to develop self-esteem in which they begin to recognize how they feel about themselves and how they value themselves (Dacey & Travers). In addition, during the preschool years children begin to socialize with others aside from their parents and siblings (i.e., teachers and peers). Playing with peers is crucial for
social development (Dacey & Travers). Play becomes more social in which interactions with other children become more important. For example, children begin to engage in pretend play in which they depend on their peers to help them reenact their fantasies.

Middle childhood is between 6 and 10 years of age (Brems, 1993). Children begin to form close friendships during this stage. They can reach logical conclusions about their friends and search for friends that are psychologically compatible with them (Dacey & Travers, 1996). Children will become closer to children that share similar interests.

Late childhood is between 11-12 years of age and is followed by adolescence (Brems, 1993). Children and adolescents become more independent and need less adult supervision. Peer groups are very important during this stage. Adolescents begin to spend less time with their parents and more time with peers. Peer groups provide social support, encourage independence, improve social skills, develop reasoning abilities, strengthen moral values, and improve self-esteem (Dacey & Travers, 1996). Although the stages of social development differ amongst the age groups, the one common underlying theme is forming relationships with peers.
Children with autism have a difficult time forming relationships with others. This is due not only to a lack of social skills, but also to a lack of social competence. Atkins-Burnett (2001) characterized socially competent children as having the ability to perceive the boundaries of specific social situations, ascertain social behavior, and act on those behaviors. Although social deficits are one of the core characteristics of autism, children on the spectrum can acquire the skills needed to be socially competent in order to form relationships with others (Bauminger et al., 2009). The assessment procedures for measuring children’s social competence is still in its infancy and has not kept pace with advances in social skills interventions (Swindells & Stagnitti, 2006). Although many social competence measures exist—some of which are reviewed below—there is no measure that can accurately assess social competence in children with autism. As a result, deficits in social competence cannot be identified, thus making it difficult to create interventions that will help children on the spectrum to develop the skills needed to be socially competent.

The Perceived Social Competence Scale (PSCS) is a four-item measure on which children and adolescents between the ages of 6 and 16 are asked to rate their perceptions of how socially competent they consider themselves to be. The scale originally consisted of six items which were the following: (1) I am good at
making friends, (2) I help other people, (3) I share what I have with others, (4) I ask others if I can be of help, (5) I get along with others, and (6) I do nice things for people (Anderson-Butcher, Iachini, & Amorose, 2008). Participants were asked to rate themselves on these items using a 5-point scale ranging from Not at all to Very Much. The results revealed that Items 3 and 5 were problematic based on data fit to a unidimensional model \[ \chi^2 = 44.76, df = 9, p = .00, RMSEA = .09 \] (90% Confidence Interval [CI] = .06-.12), NNFI = .97, CFI = .98, GFI = .97]. The high \( \chi^2: df \) ratio and RMSEA value indicated that the model did not fit the data well. Items 3 and 5 were deleted and a confirmatory factor analysis was conducted with the remaining four items. The fit for the four-item version was considerably better \[ \chi^2 = .30 \] \( df = 2, p = .86, RMSEA = .00 \] (90% Confidence Interval \[ CI \] = .00 - .05), NNFI = 1.00, CFI = 1.00, GFI = 1.00]. Anderson-Butcher, Iachini, and Amorose (2008) concluded that this scale had acceptable internal consistency and factorial validity. Although this measure may be considered useful, it has several limitations. To begin with, participants between the ages of 6 and 16 were asked to rate themselves based on their own perceptions. As discussed earlier, the stages in social development between these ages differ immensely. 6 year-old may perceive and rate the item on the scale differently than a 16 year-old. Another limitation is lack of consistency in the
definition of social competence. To base a multifaceted definition of social competence on four items could be misleading and very limiting.

Harter (1982) created the Perceived Competence Scale for Children. This scale encompasses a broader range of items. The Perceived Competence Scale for Children consisted of four subscales: cognitive, social, physical, and general self-worth. The original version of this scale consisted of 40 items (10 items per subscale). Although factor analysis indicated that a four-factor solution was most appropriate for this measure, many of the items within the subscales did not fit. The final version of the measure contained four subscales with 28-items which were rated on a 1-4 scale: 1 being low perceived competence and 4 being high perceived competence. Third through ninth graders were asked to rate themselves based on their perception of their competence. Unlike the validation study of the Perceived Social Competence Scale, a parallel teacher rating scale was constructed to determine the relationship between the pupils’ perceived competence and their teachers’ ratings of their actual competence. There was a discrepancy between the child’s perceived competence and the actual competence rated by the teachers. The relationship between perceived and actual competence was consistent through the elementary years then dropped significantly in seventh grade, then became consistent again in eighth and ninth grades. Harter concluded
that the change in school structure, the addition of several different teachers, and the adjustment to a new social hierarchy led seventh graders to make unrealistic judgments about their competence. When this scale was used to assess the competence of children with developmental delays, no relationship was found between the perceived competence and the actual competence rated by teachers. One argument posited that children with developmental delays have lower IQ’s, thus making it difficult for them to develop realistic bases for evaluating their competence (Harter). It was recommended that children with developmental delays use an easier version of this scale, one that would match the developmental needs of this population.

Based on these findings, a less complicated version of this scale was created. The Pictorial Scale of Perceived Competence and Social Acceptance for Young Children is a 24-item instrument comprising four subscales: cognitive competence, physical competence, peer acceptance, and maternal acceptance (Harter & Pike, 1984). Separate versions were developed for two age groups: Preschool-Kindergarten (Form PK) and First-Second Grade. Since the scale was administered to young children, the item response scale was pictorial. Each item is rated on a 4-point scale. The alpha coefficients for the subscales ranged from .53 to .83, thus producing some low estimates of internal consistency reliability.
The correlations between teacher and self-ratings were moderate or weak with the highest agreement in the cognitive domain ($r = .37, p < .001$), next highest in the physical domain ($r = .30, p < .005$), and negligible agreement in the social acceptance domain ($r = .06$) (Harter & Pike, 1984). Harter and Pike concluded that the instrument was not developmentally appropriate for preschool children and children with developmental delays.

A scale that was found to be appropriate for this age group was the Social Competence Scale and Symptom Checklist for the Preschool Child. The Social Competence Scale was designed to measure the child’s mastery of their preschool environment and the Symptom Checklist was designed for professionals to assess the behaviors that could be observed in the preschool setting (Kohn & Rosman, 1972). The Social Competence Scale was based on the idea of high- and low-competent functioning (Kohn & Rosman). The theory behind the scale is that there are four categories of behavior that define competence: positive-active (high-competent functioning), negative-active, negative-passive, positive-passive (these three represent low-competent functioning). In addition to these three low-competent categories there are three low-competent functioning sub-categories: (a) bossy, hostile, domineering behavior, (b) passive-defiant, withdrawn behavior, and (c) passive-dependent behavior. These categories are measured within two
factors. Factor I measures Apathy-Withdrawal (low competence) and Interest-Participation (high competence) and is used to determine the child’s interest towards peers and his or her participation in activities with peers. Factor II measures Anger-Defiance (low competence) and Cooperation-Compliance (high competence) and assesses the child’s cooperation and adherence to rules and regulations in order to ensure normal functioning within a classroom. High-competent children are considered “healthy” and low-competent children are considered “unhealthy” (Kohn & Rosman). The scale originally consisted of 200 items and the final version contained 90 items that were rated on a 7-point frequency scale.

The symptom checklist was intended to identify the most severely disturbed children (Kohn & Rosman, 1972). Items assess the clinical symptoms that a child might display in a preschool setting. The original checklist’s 90 items was narrowed down to 58. Professionals rated the items either sometimes or frequently. The difference between the Social Competence Scale and the Symptom Checklist is that the checklist measures the degrees of disturbance within a child not his/her functionality within a preschool environment. Kohn (1977) conducted a longitudinal study to test the psychometric properties of these measures. It was found that both measures were correlated with one another (-
.75, Factor I; -.79, Factor II). Begin (1983) reassessed this scale and found correlations of .40 ($n = 98, p < .001$) for teachers’ ratings and .39 ($n = 98, p < .001$) for assistants’ ratings. Although the correlations were close to the ones in the original study, it was concluded that the factors were not independent of each other, but were related (Begin). Regardless of the results, the Social Competence Scale and the Symptom Checklist are beneficial because unlike other social assessments, professionals are able to assess children in their natural environment. In addition, professionals complete the measure thus making it not only practical, but also economical.

Another economical measure is the Assessment of Social Competence (ASC), which was designed to assess 11 aspects of social competence. The 11 separate scales include behavioral examples for each scale. Unlike the previous scales, the ASC consists of hierarchically organized levels of competence from childhood to adult levels. In order to move to the next level, one behavior in the set must be exhibited. Items are scored on a scale from 0-2 for each item level, where 0 means there is no evidence of the behavior, 1 means the behavior has been reported by others, and 2 means that the behavior has been directly observed. A teacher or another adult who is familiar with the child can complete the assessment. The ASC had high internal consistency, the test-retest reliability
was .90, and the inter-rater reliability was .70 (Meyer et al., 1985). This assessment has been used with a wide array of children ranging from “typical” to children with severe developmental disabilities (Fisher & Meyer, 2002). Although this assessment can be beneficial to “typically” developing children, it may not be as beneficial when measuring social competence in children with autism. Since the assessment is hierarchically organized, one must exhibit certain social behaviors in order to move up the scale. Children on the spectrum sometimes have splinter skills and behaviors may not be displayed in a neat hierarchical pattern. That is, a four-year old child with autism may have a vocabulary like a ten-year old, however their vocabulary may be based on memorized facts and in actuality the words are meaningless to them. Therefore the child’s language is disproportional to how that child functions in other areas of his/her life. Based on this, children with autism may appear to be socially competent when they really are not.

After reviewing the social competence scales that currently exist, there are many aspects to consider when developing an assessment. First, it is imperative to develop an assessment that is user-friendly which professionals, teachers, and aides can employ. It is also important to develop a scale that will allow individuals to assess children in their natural environment. A simple, cost-
effective social competence scale that would be easily implemented would be beneficial to the autism community.

Problem

A major problem with many of the social competence scales is that social competence is conceptually vaguely defined and also there is no clear operational definition of what is being measured. It is especially problematic when assessing social competence in children with autism, because the deficits are very concrete and none of the scales that exist assess these deficits accurately. Autism is a spectrum disorder marked by impairments in reciprocal interactions and communication. Children on the spectrum do not have the social skills, social-emotional regulation, or self-esteem to become socially competent. When developing an assessment for children on the spectrum it is important to determine the functioning level and the developmental age that one wants to assess. Additionally, many of the assessments do not assess children in their natural environment. Play is essential for forming relationships and developing social competence. It would be beneficial to create a scale in which professionals could observe and assess children on the playground where social interactions naturally occur.
In order to create a scale, the term social competence must be defined. Competence is generally used as an evaluative term referring to the quality or adequacy of a child’s overall performance in a particular task (McFall, 1982). To be considered competent, a child needs to be adequate, not expert or exceptional (Waksman, 1985). Therefore, a socially competent child is able to utilize environmental and personal resources in order to achieve an adequate developmental outcome (Glass et al., 2000). However, many argue that social competence isn’t based on adequacy, but a child’s ability to effectively and appropriately interact with others to form relationships (Han & Kemple, 2006).

When defining social competence, the works of Piaget’s Social Theory are reviewed. According to Piaget (1932), peer interactions are crucial to the child’s construction of social and moral feelings, values, and intellectual and social competence. Socially competent children are able to achieve personal goals in social situations while simultaneously maintaining positive friendships (Hawley, 2002). In order to achieve social goals a person must have appropriate social skills. Social skills are the specific abilities that a person needs in order to perform competently at social tasks (McFall). In addition, the ability to regulate feelings and impulses strengthens social competence in young children (Han & Kemple). Piaget’s (1932) description of sociomoral development was expressed
by the change of others regulating the child to self-regulation. Piaget also theorized that affect aided in the development of social relationships. He stated that affectivity is both intrapersonal (need, interest, effort, etc.) and interpersonal (attractions, etc.) Piaget argued that children construct schemes of social reaction just as they construct schemes relating to the world of objects. Interest in others leads to voluntary (autonomous) social efforts. The child gradually constructs more and more consistently organized patterns of social actions. As the child acts and reacts in more or less consistent ways in similar situations with a variety of people, personality becomes more consolidated and can be observed in stable patterns. Thus, the child may be viewed as "shy," "friendly," "easily upset," "aggressive," and so forth. Behind these behavior patterns lie the child's interpretations and organizations or schemes of social orientation. Thus, peer interaction provides raw material out of which the child fashions his or her personality. Not only does regulation enhance social competence, it helps with the development of self-esteem (Greenspan et al., 2001).
Building from the early works of Piaget’s Social Theory, social competence is the ability to meet personal and social goals in one’s environment, through the utilization of adequate social skills, the ability to socially-emotionally regulate, and the ability to develop positive self-esteem in order to form meaningful relationships.

Social skills can be defined as the verbal and non-verbal behaviors needed for effective interpersonal communication that results in positive social interactions with others (Rao, Beidel, & Murray, 2008). Social skills problems that have been identified in children with autism include lack of orientation towards a social stimulus, inadequate eye contact, problems initiating social interactions, difficulty interpreting both verbal and non-verbal cues, inappropriate emotional responses, and lack of empathy to others’ distress (Rao, Beidel, & Murray). There are two types of social skills to consider: overt and subtle skills (Bildt et al., 2005). Examples of overt social skills include: smiling, making eye contact, asking and responding to questions, and giving and acknowledging compliments during a social exchange (Rao, Beidel, & Murray). The ability to understand one’s feelings, articulate one’s own ideas and needs, solving problems in a social situation, cooperating and negotiating, expressing emotion, understanding jokes, and the ability to read social cues accurately and adjust
behavior to meet the demands of different social situations are examples of subtle social skills (Bildt et al.). These subtle skills are crucial for children to be able to engage in more complex social situations, thus affecting their ability to maintain friendships. Acquiring social skills is a difficult task for typical children, but for children with autism it is much more complicated. Once children learn new social skills, they need to know where and when to use them and how to choose among them (Han & Kemple, 2006). For children on the spectrum, this ability to generalize information is quite difficult and in many cases affects their interactions with family, peers, and other adults. In turn, limited social abilities can affect normal developmental milestones needed to establish satisfying peer and familial relationships (Rao, Beidel, & Murray). Accurate assessment of social skills can lead to appropriate and effective interventions that would help children acquire these skills.

Social-emotional regulation is the ability to regulate emotions in order to form pleasurable relationships and use emotional signals for communication (Han & Kemple, 2006). This includes the capability to control impulses, delay gratification, resist temptation and peer pressure, reflect on one’s feelings, and monitor one’s emotions (Han & Kemple). Much of the ability to regulate emotions develops from the interactions a newborn has with his/her primary
caregivers. It is an interactive process whereby the infant uses the caregiver’s physical and emotional state to help organize him/herself (Greenspan et al., 2002). The caregiver’s ability to match the infant’s temperament allows for synchronization of emotional states between the two, which helps the infant establish basic rhythms, perceive and process information, explore and respond to the social world, and establish secure and trusting relationships (Greenspan et al.). As children enter the peer setting, they continue to explore their social world in which they deal with various emotions such as frustration, joy, fear, anxiety, and anger (Han & Kemple). However, children with autism have trouble identifying, quantifying, expressing, and controlling their emotions (McAfee, 2002). They have a difficult time labeling their own emotions effectively and do not understand the varying degrees within an emotion. At times they appear to be overly emotional because they express their feelings in an all-or-nothing fashion (McAfee). At other times they may misread the emotions of themselves or others around them because they do not understand the complexity of emotions. For example, a child with autism may be excited about getting a present, however, within a minute he/she may begin to cry because feelings of excitement may be too overwhelming and frightening (McAfee). The lack of emotional regulation makes it hard for children on the spectrum to make lasting friendships. By
accurately assessing social-emotional regulation, teachers’ and professionals can strengthen social competence by helping children on the spectrum constructively channel and manage their feelings and impulses.

Self-esteem is a sense of competence, personal power, sense of self-worth, and sense of purpose (Kostelnik et al., 2002). Positive self-esteem is an interpersonal category of social competence (Han & Kempe, 2006). Children who feel good about themselves in these capacities are more likely to have positive interpersonal relationships, and anticipate success in their encounters with other people. As a result of their social acceptance and success, it is likely that their positive sense of self-worth and competence is enhanced (Han & Kempe). On the other hand, children with low self-esteem do not experience these positive interactions and successful encounters with others as often. Their peers can trap these children in a cycle of feeling failure and rejection thus affecting their self-worth (Han & Kempe). Children with Asperger’s Syndrome (AS) and high functioning autism (HFA) face a battle with their self-esteem. Since children with AS/HFA have a high level of intelligence, they are often painfully aware of their social skills deficits, thus affecting their self-esteem (Rao, Beidel, & Murray, 2008). Due to deficits in social skills and struggling with social interactions,
children with autism may begin to feel like social outcasts and less socially competent with their peers.

When developing a social competence scale for children with autism, it is important to determine the functioning level and the age range one wants to assess. One also wants to consider creating a scale that is practical and cost effective. Play is instrumental in helping children understand their social world and thus necessary for attaining social competence (Wolfberg, 2003). An efficient and cost effective way to assess the social competence in children is to develop a scale that allows one to observe children on the playground where play naturally occurs. In addition, many of the current social competence scales assess a wide age range of children (i.e., 3-17). Since social development is different for children than adolescents it would be beneficial to design a scale that would assess a specific age range. It has been found that social competence is evident as early as the preschool years (Hawley, 2002). Social development takes a dramatic shift during middle childhood, which begins at age 9 (Brem, 1993). Based on this, a social competence scale was designed to assess children between the ages of 3 and 8.
None of the social competence scales that currently exist are specifically intended to assess children with autism. Since the core deficit of autism is social impairment, it would be beneficial to create a scale directed to children with autism. Researchers have found that children with Asperger’s (AS) and high functioning autism (HFA) have intelligence and language within the normal range of functioning (Rao, Beidel, & Murray, 2008). The majority of these children are fully included in the regular classroom and exposed to social pressures and demands. Children with AS/HFA have the intellectual and verbal abilities to engage in more complex social interactions than a child who is lower functioning. Taking all of this into consideration, the Children’s Social Competence Scale was designed to assess all children between the ages of 3 and 8 including those with AS and HFA.

Purpose

The purpose of this research study was to develop a scale to assess the social competence of children (between the ages of 3 and 8) including those with Asperger’s and high functioning autism and to provide initial reliability and validity estimates for the measure.
In the fields of psychology and education, many variables of interest cannot be observed directly. Latent variables are measured from a sample of behaviors via questionnaires, rating scales, observation measures, and responses to simulated problems to test questions. All of these measures share the problem of yielding ordinal data, thus limiting the types of analyses that can be done. For many years classical test theory was applied to these types of measures in order to classify individuals meaningfully and to understand and improve reliability of psychological testing (Atkins-Burnett, 2001). However, this approach did not take into account the problem of the ordinality of the metric (Atkins-Burnett). More recent theories of measurement utilize latent trait or item response models. In this section I briefly review classical test theory and item response models, as the measure proposed was developed with item response theory in mind.

Classical test theory (CTT) served as the major measurement assessment model throughout most of the 20th century. CTT assumes a true score, observed score, and error score to determine item difficulty (p-values), item discrimination indices (r values), split-half reliabilities, and coefficient alphas (Embretson, 1999). The true score is the score that respondent would obtain if they were tested on the universal (infinite) set of items that measure a particular latent trait. The
observed score is the score actually obtained by the respondent, and equals the true score plus the error score (Embretson).

In CTT there are two levels of assumptions, the individual person level and the population of persons’ level. Under the individual person level there are four core assumptions. First, the observed and error score are random variables, and the true score is constant (Embretson, 1999). Second, the subsets of items used in a measure are randomly sampled from a universal set of items (Smith, 1999). Third, observed error reflects failure of the administrator to accurately sample items from the universe of all possible items, and does not depend on things such as judge bias, occasion of testing, varying item difficulty, or bias in responses (Smith). Fourth, the observed score is expected to equal the true score, since the error score is expected to average to zero (Embretson). Under the population of person’s level, there are two core assumptions. First, it is assumed that participants are randomly sampled from the population in which the true score becomes a random variable (Embretson, 1999). Therefore the random variable $X$ (the observed score) is assumed to equal the random variables which is $T + E$ (true score plus error score).
CTT is limited when it comes to assessing person ability because it is dependent upon the difficulty of the sample of items (Downing, 2003). Persons’ ability is based on the portion of items answered correctly. If the test items are easy, the person will appear to score high on that trait. For most measures of social skills, data are usually factor analyzed and scale scores are constructed based on the sum (or mean) of the ratings given to each individual item (Atkins-Burnett, 2001). Factor analysis in CTT assumes normally distributed interval or ratio variables (Atkins-Burnett). These assumptions are not met in the measurement of social and emotional traits (Reise, 1999). In CTT, the standard error of measurement varies across populations and is usually much higher for individuals at the extremes than for those scoring at the mean (Atkins-Burnett). Many programs designed to increase social skills are targeted toward children who are at the extreme scores on social and behavioral measures. Inability to measure change accurately among these children inhibits our ability to track the development of skills. The observations or ratings on these measures are usually ordinal, thus violating the assumptions of linearity and normality (Atkins-Burnett). Due to these violations in the assumptions, CTT may not be the best method to apply to data to accurately measure social traits.
Another measurement model useful in assessing the quality of a measure is item response theory (IRT). In recent years, IRT has been applied to measures of personality, affect, and behavior (Atkins-Burnett, 2010). IRT typically uses maximum likelihood estimation to estimate the probability of a correct response on an item based on ability or trait level of a particular item. IRT deals with the problem of sample dependency found in CTT. The persons’ ability is estimated independently from the difficulty of sample items on a test and item distribution characteristics (Downing, 2003). In other words, item difficulty can be estimated independently of the specific group or sample of people taking the test. As with CTT, IRT assumes the true score is based on a single latent trait (Downing). IRT also assumes local independence. This assumption is robust with respect to minor violations as long as there is a dominant first factor in the data (Downing). IRT models determine what is measurable on a linear scale, which data are useful in describing the latent trait, how the people used the item characteristics of the measure, and whether different groups of people utilized the item characteristics of the measure in different ways (Smith, 1992). Tests that measure more than one construct, multidimensional measures, will not fit the data under the classical IRT model, and cannot be used to estimate persons’ ability and item characteristics. Multidimensional IRT models have been developed for multifaceted measures.
There are three types of IRT models: one-parameter models (Rasch model as a special case), two-parameter models, and three-parameter models. The Rasch model yields estimates of the ability level of the person and the level of item difficulty (Downing, 2003). In the two-parameter model, the ability of the person is estimated along with two characteristics. These characteristics are the item difficulty and the item discrimination. The three-parameter model is like the two parameter model, however, an additional characteristic of an item is also estimated. This is known as a guessing parameter, which represents the probability that a person with low ability will answer the item correctly based on chance (Atkins-Burnett, 2001). The Rasch model is considered to be the simplest of the IRT models, since all discrimination parameters are assumed to be equal (Atkins-Burnett, 2001). Rasch models also require a smaller sample size ($n \approx 200$) than two and three parameter models (Downing, 2003).

The Rasch model has been used to examine the reliability and validity of different measures in social and emotional functioning. Rasch analysis identifies the hierarchy of difficulty of items along a unidimensional structure. Clinicians can use this hierarchy and the scores obtained to determine which behaviors and/or skills are required to increase or decrease the level of trait in an individual (Atkins-Burnett, 2001). For example, Ludlow and Haley (1996) applied a Rasch
rating scale model to the Social Function subscales of the Pediatric Evaluation Disability Inventory (PEDI). This instrument assessed the functional abilities of children between the ages of six months to seven years. The six point rating scale progresses from a score of 0 (total assistance required) to a score of 6 (child performs independently). The person estimates were transformed to scaled scores with a 0-100 distribution with zero representing an absence of functional skills and 100 representing a perfect score. An identified level of assistance would be most probable for each of the subscales given a specific scale score. Thus, a child with a score of 50 would be most likely to need minimal assistance (rating category 3) on comprehension, minimal assistance (rating category 2) on peer play and expressions, and maximum assistance (rating category 1) on safety and problem solving. Ludlow and Haley further showed how age-related standard scores and the scaled scores could be used to show the child’s change over time as well as any change in status relative to same age peers. The age-related standard score was computed using normative data. Means and standard deviations for 14 age groups were calculated and used to transform the person ability and estimates to a T-scale measure with a mean of 50 and standard deviation of 10. Change in the child’s scaled score can be compared to the change in relative-age scores. These are particularly helpful in comparison for children with developmental
delays. For children with disabilities, change in age-relative scores may be negative, while change in the scale scores indicate that a child continues to progress through the change is less than that made by typically developing peers. Rasch offers a measurement model that can be used to develop linear interval scales that measure change (Rasch, 1960). Due to this, the Rasch model was used to analyze data with The Children’s Social Competence Scale.

**Research Questions:**

Does the Children’s Social Competence Scale (CSCS) reflect the three identified domains (i.e., social skills, social-emotional regulation, and self-esteem) and factor appropriately into the three domains?

Is the use of the response scale appropriate for the Children’s Social Competence Scale?

Does the Children’s Social Competence Scale evidence adequate reliability?

Does the Children’s Social Competence Scale evidence content and construct validity?
Definitions:

Social Competence: Social competence is the ability to meet personal and social goals in one’s environment, through the utilization of adequate social skills, the ability to social-emotional regulate, and having positive self-esteem in order to form meaningful relationships.

Social Skills: Social skills are the overt and subtle verbal and non-verbal behaviors needed for effective interpersonal communication that result in positive social interactions with others.

Social-Emotional Regulation: Social-emotional regulation is the ability to regulate emotions in order to form pleasurable relationships, and use the emotional signals for communication.

Self-Esteem: Self-esteem is an interpersonal sense of competence, personal power, sense of self worth, and sense of purpose.
CHAPTER 2

METHOD

Introduction

In this chapter the procedures used in the development and validation of the Children’s Social Competence Scale (CSCS) are presented. This chapter starts with an overview of the study design followed by the description of the four phases employed in development of the scale: Phase 1: Planning, Phase 2: Construction, Phase 3: Quantitative Evaluation, and Phase 4: Validation.

Study Design and Purpose

There are a number of scales that assess social competence in children. However, there is no extant scale that measures social competence in children with Asperger’s Syndrome (AS) or high functioning autism (HFA). In the current study, the Children’s Social Competence Scale (CSCS) is a comprehensive assessment aimed at incorporating all aspects of social competence that affect all children including those with AS/HFA. The CSCS is intended to assist in identifying children who have deficits in social competence. The main purpose of this study is to answer the four research questions listed below:
Does the Children’s Social Competence Scale (CSCS) reflect the three identified domains (i.e., social skills, social-emotional regulation, and self-esteem) and factor appropriately into the three domains?

Is the use of the response scale appropriate for the Children’s Social Competence Scale?

Does the Children’s Social Competence Scale evidence adequate reliability?

Does the Children’s Social Competence Scale evidence content and construct validity?

In order to answer these research questions the researcher: (1) developed a scale consisting of three domains that assess the social competence in children between the ages of 3 to 8 including those with AS and HFA and (2) tested the scale’s psychometric properties using exploratory (EFA) and confirmatory factor analysis (CFA) and Rasch analysis.

The CSCS assesses the following domains: social skills, social-emotional-regulation, and self-esteem. The CSCS pilot scale was intended to measure these three domains of social competence.
Using the scale development procedure created by DeVellis (2003), the CSCS was constructed in four phases. Table 1 provides an overview of the scale development procedure for the CSCS.

**Table 1**

*Scale Development Procedure*

<table>
<thead>
<tr>
<th>Development Phase</th>
<th>Scale Development Steps</th>
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</thead>
<tbody>
<tr>
<td><strong>Planning</strong></td>
<td>• Determine the construct being measured as Social Competence</td>
</tr>
<tr>
<td></td>
<td>• Identify the projected audience as all children ages 3-8 including AS and HFA</td>
</tr>
<tr>
<td></td>
<td>• Conduct review of literature</td>
</tr>
<tr>
<td></td>
<td>• Conduct interviews with therapists, teachers, and parents</td>
</tr>
<tr>
<td><strong>Construction</strong></td>
<td>• Generate item pool that has redundant items</td>
</tr>
<tr>
<td></td>
<td>• Write three to four times as many items as intended to use</td>
</tr>
<tr>
<td></td>
<td>• Select 4-pt. scale as item response format</td>
</tr>
<tr>
<td></td>
<td>• Have initial item pool reviewed by experts</td>
</tr>
<tr>
<td></td>
<td>• Reduce item pool to extent dictated by expert panel</td>
</tr>
<tr>
<td><strong>Quantitative Evaluation</strong></td>
<td>➢ Decide which construct-related and validity items to include</td>
</tr>
<tr>
<td></td>
<td>➢ Administer items to development sample</td>
</tr>
<tr>
<td></td>
<td>Derive subscales by means of exploratory factor analysis</td>
</tr>
<tr>
<td></td>
<td>➢ Assess concordance of subscales</td>
</tr>
</tbody>
</table>
Phase 1: Planning

Phase one focused on scale development, explicating the purpose, age range, and population for which the CSCS was intended. The following steps were taken in designing the CSCS: a literature review and interviews with professionals in the field. The literature review is provided in chapter one. Institutional Approval was obtained before any data was collected (Appendix A).

| Validation | with original measure purpose and adapt  
<table>
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<tbody>
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</tbody>
</table>
| • Evaluate subscale items by means of item analysis  
| • Assess internal consistency reliability of subscales  
| • Confirm factor structure with field administration sample  
| • Assess research participant use of response scale  
| • Optimize subscale length  
|  
|  
| • Assess construct validity by correlating scores with an external measure in pilot and field administrations and correlating scores with intake information in field administration  
| • Compare known group differences (differences on scale scores for typically developing and AS/HFA groups)  
|
Participants

There were a total of four people that were interviewed (two therapists, one teacher, and one parent who had a child with HFA). Both therapists were female private practitioners who assess and provide therapeutic interventions to children and adolescents with autism. One of the therapists had been working in the field for over 20 years and the other therapist had been working in the field for 15 years. The teacher was a male special education teacher who had taught special education at public elementary school for eight years. The parent was a mother who had an eight-year old son with high functioning autism.

Instruments

During the interview the participants were given a pen and a piece of paper to write down their answers to the following four questions:

What is social competence?

How do social skills relate to social competence?

How does self-esteem relate to social competence?

How does social-emotional regulation relate to social competence?
A tape recorder was used to record any answers that were given verbally by the participants.

Procedure

The participants were interviewed about their thoughts on social competence in children. The four interviewees were asked to come to a local non-profit agency’s office. All four participants sat around a conference table, while the researcher explained that they were each going to be interviewed separately and that during their interview they were going to be asked four questions related to social competence. Every interview began with the same question: “What is social competence?” During each interview the interviewee was asked to write down his/her definition of social competence on a piece of paper. Each interview then proceeded by asking the other three questions listed above. The interviewee was asked to write down their answers to those questions during their interview. After all the interviews were completed, the researcher asked the participants’ to wait. While the participants waited, the researcher reviewed all the written answers from those that were interviewed and looked for themes. The themes that came out of the participants’ answers were related to
social skills and self-esteem. Once these themes were identified, the researcher then asked each of the participants’ to sit around the table and to discuss how social skills, self-esteem were related to social competence. Since, social-emotional regulation was not a theme, the researcher then asked each interviewee if they felt social-emotional regulation was related to social competence. This discussion was tape-recorded.

Phase 2: Construction

Phase two consisted of the construction of the CSCS. This section describes the process for determining the domains and the items generated for each domain. It also explains the process of item elimination based on expert review. The four subsections of this phase include: item pool creation, expert review, item selection, and cognitive interviews.

Item Pool Creation

According to DeVellis (2003), the first step in item pool creation is defining the overall construct and the domains that comprise it. The objective of the CSCS and the definitions of the three domains follow.
**Objective:** The CSCS was designed to identify deficits in social competence in all children between the ages of 3 and 8 including those with Asperger’s and high functioning autism.

**Domain Definitions**

**Social Skills:** Social skills are the overt and subtle verbal and non-verbal behaviors needed for effective interpersonal communication that result in positive social interactions with others.

**Social-Emotional Regulation:** Social-emotional regulation is the ability to regulate emotions in order to form pleasurable relationships, and use the emotional signals for communication

**Self-Esteem:** Self-esteem is an interpersonal sense of competence, personal power, sense of self worth, and sense of purpose.

Once the objective was identified and the three domains were defined, the researcher began the process of writing items for each of the domains. When the CSCS item pool was fully constructed it consisted of over three times as many items as were thought to be necessary as recommended by DeVellis (2003). The CSCS consisted of 90 items--30 items per factor. Appendix B contains an
example of the items in each domain. The researcher then created a response form for expert review. Once the results from the expert reviews were analyzed, the researcher determined the item pool for the pilot test and the response format. As soon as the item pool was developed the researcher submitted it for piloting, field administration, and validation. The projected item pool for the CSCS is shown in Table 2 with the anticipated reduction in numbers of items.

<table>
<thead>
<tr>
<th>Domain</th>
<th>Item Pool</th>
<th>Pilot</th>
<th>Field Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Skills</td>
<td>30</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>Social-Emotional</td>
<td>30</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>Regulation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>30</td>
<td>20</td>
<td>15</td>
</tr>
</tbody>
</table>

Participants

According to DeVellis (2003) the expert panel should consist of 6 to 10 experts. There were 9 experts that participated in this study. The panel consisted of six therapists, two teachers, and one parent. All of the six therapists were
female private practitioners between the ages of 30 and 40 who assessed and provided therapeutic interventions to children and adolescents with autism. Three of the therapists were licensed psychotherapists and facilitated social skills groups with children on the spectrum. One of the therapists had been in practice for fourteen years, the other five years, and the other for three years. The other three therapists were behavioral therapists that provided in-home behavioral therapy to children on the spectrum. One therapist had worked in the field for four years, while the other two had worked in the field for three years. Of the two teachers, one was a 40-year old male and the other was a 34-year old female. Both teachers were special education teachers. The male teacher had been teaching special education for 15 years and taught at a public elementary school, while the female teacher had been teaching special education for eight years at a private elementary school. The parent was 45 years old and had an eight-year old son with HFA and was the Executive Director of Connect Us, a non-profit organization that offers playgroups to children on the autism spectrum.
Instrument

Experts were asked to evaluate the items on the Children’s Social Competence Scale (CSCS). Five criteria were used to evaluate the scale: (1) representativeness of the item for its intended domain; (2) clarity of that item; (3) item difficulty; (4) comprehensiveness of the scale; and (5) suggested addition or deletion of items. Each item was rated on a scale from 1 to 4 for representation, clarity, and item difficulty. Representation was demonstrated by an item’s ability to represent the content domain (i.e., social skills, social-emotional regulation, and self-esteem). The clarity of an item was evaluated on the basis of how clearly an item was worded. A value of one indicated that the item had poor representation and clarity; a value of four indicated that the item had excellent representation and clarity. Item difficulty was assessed by how easy or hard the item was perceived to be. A one indicated the item was perceived as easy and a four indicated that the item was perceived to be hard to agree with. The experts were asked to evaluate the comprehensiveness of scale by checking yes or no.
In addition, they were asked to write down the addition or deletion any item. An example of the response form is provided as Appendix C.

Procedure

Each member of the expert panel was personally called and asked to participate in this study. In order to ensure a 100% response rate, the researcher asked the participants to attend a meeting at the office of a non-profit organization. All the participants sat in a conference room and were given an expert reviewer packet. Each packet included a letter of invitation to participate in the study (Appendix D); a consent form (Appendix E); and a response form (Appendix C). Once each participant signed and turned in the consent form they were asked by the researcher to complete the response form. The response form took about 2 hours to complete. The goal was to determine which items were to be included in the item pool of the CSCS that would be used for the pilot study and field administration. Upon completion, the response form was given back to the researcher.
Item Selection

Once the results of the expert review were obtained, the researcher began the process of item clarification and deletion. All items were rated using an ordinal scale, and the results were analyzed to determine items that would best fit the CSCS. The results of representation, clarity, and item deletion were analyzed. First the means of representation were analyzed, then the means of clarity. The overall comprehensiveness and any suggestions regarding the addition and deletion of items on the scale was the final analysis in determining which items were going to be selected in the CSCS. The means of perceived item difficulty determined the order in which the items would be presented in the pilot study.

Cognitive Interviews

The researcher conducted two cognitive interviews once the scale items were in near-final form for the pilot. Cognitive interviews were held with two female teachers who taught first and second grade at a private school in Denver, Colorado. The first grade teacher was 35 years old and had been teaching first grade for 9 years. The second grade teacher was 28 years old and had been teaching second grade for two years.
Instruments

The teachers were given a copy of the CSCS, which consisted of three domains (social skills, social-emotional regulation, and self-esteem) and 15 items for each domain. Both teachers were asked to think aloud as they read through each item on the scale. This allowed the researcher to hear how the items were being interpreted and response decisions made so further clarification of the items could be made.

Procedure

The cognitive interviews were conducted at the office of a non-profit agency. Two teachers were interviewed. The cognitive interviews were conducted separately and each of them lasted approximately one hour. The only persons present were the researcher and the interviewee.

Scale Development

Once the results of the expert review and the cognitive interviews were analyzed, a revised, shorter scale was developed to use for the pilot study. The new CSCS consisted of 45 items, 15 items within each of the three subscales.
Response Format

The last element of phase two was determining the response format for the CSCS. To ensure that raters provided decisive responses, a four-point scale ranging from 1 = Never, 2 = Rarely, 3 = Occasionally, and 4 = Frequently was used. No neutral response was offered. Neutral responses can indicate indifference, lack of understanding, ambivalence, or refusal to answer an item (Gable & Wolfe, 1993), whereas eliminating the option may lead to more thoughtful responses (Doyle, 1975). In addition to adequately reflecting raters’ agreement with the items, a 4-point response format can create more variability in scores than a response scale with fewer options. This helps detect gradations in the construct, thus eliminating the issue of neutral responding (DeVellis, 1991). Items on each subscale were scored so that higher total agreement indicated greater social competence in children.
Phase 3: Quantitative Evaluation

Purpose

In this phase the following research questions were addressed:

Does the Children’s Social Competence Scale (CSCS) reflect the three identified domains (i.e., social skills, social-emotional regulation, and self-esteem) and factor appropriately into the three domains?

Is the use of the response scale appropriate for the Children’s Social Competence Scale?

Evaluation of the CSCS took place in two stages: a pilot and a field administration. The pilot was used to determine how well items reflected their domains. In the pilot study, items that cross-loaded on more than one subscale were eliminated and items that demonstrated poor factor loadings were deleted before the field administration. In addition, domains that were not uniquely identified and items that were not distinguishable in factor structure were either eliminated or domains were combined, thus narrowing the construct before the field administration took place. Scales were then analyzed using internal
consistency reliabilities for each of the three domains and the CSCS was re-administered in a field administration.

Item bias was assessed using FACETS (Many-Facet Rasch Analysis) in the pilot administration. Scale structure in the pilot administration was assessed using principal components extraction with varimax rotation and parallel analysis in SPSS. Scale structure in the field administration was assessed using Confirmatory Factor Analysis (CFA) in AMOS. Item fit to scales and use of the response scale was assessed in the field administration with WINSTEPS. The structure of the CSCS was initially tested using EFA in SPSS and ultimately tested using CFA in AMOS. Items with high correlations were deleted in order to determine the final factor structure of the CSCS. Reliability estimates of the CSCS subscales were run to determine the internal consistency of the subscales. Item fit within the subscales were reassessed using WINSTEPS.

Pilot Study

Participants

Two hundred children between the ages of three and eight participated in the pilot study. There were a total of 13 three-year olds (11 males, 2 females), 17
four-year olds (12 males, 5 females), 46 five-year olds (37 males, 9 females), 67 six-year olds (58 males, 9 females), 20 seven-year olds (15 males, 5 females), and 37 eight-year olds (31 males, 6 females). Of the 200 children, 95 had a diagnosis of Asperger’s (AS) or high functioning autism (HFA). There were a total of 6 three-year olds (5 males, 1 female), 8 four-year olds (6 males, 2 females), 21 five-year olds (18 males, 3 females), 32 six-year olds (29 males, 3 females), 10 seven-year olds (8 males, 2 females), and 18 eight-year olds (15 males, 3 females) that were diagnosed with AS or HFA. All participants were enrolled in Connect Us program, a non-profit organization that offers after school playgroups to all children. The children with AS and HFA had a diagnosis prior to entering the program. Table 3 displays the breakdown of participants that participated in the pilot study.
Table 3

Pilot Study Participants

<table>
<thead>
<tr>
<th>Ages</th>
<th>Males without AS/HFA</th>
<th>Females without AS/HFA</th>
<th>Males with AS/HFA</th>
<th>Females with AS/HFA</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 years</td>
<td>6</td>
<td>1</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>4 years</td>
<td>6</td>
<td>3</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>5 years</td>
<td>19</td>
<td>6</td>
<td>18</td>
<td>3</td>
</tr>
<tr>
<td>6 years</td>
<td>29</td>
<td>6</td>
<td>29</td>
<td>3</td>
</tr>
<tr>
<td>7 years</td>
<td>7</td>
<td>3</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>8 years</td>
<td>16</td>
<td>3</td>
<td>15</td>
<td>3</td>
</tr>
</tbody>
</table>

Four play facilitators (4 female therapists) who worked at Connect Us assessed the children who attended the program. All therapists were in private practice working with children with autism. In addition, all four therapists had been facilitating playgroups for over 4 years.

Instruments

The instruments that were administered in the pilot study were the Social Competence Scale–Teacher Version and the Children’s Social Competence Scale. The CSCS consisted of 45 items that were rated on a four-point rating scale. Each
of the three factors (social skills, social-emotional regulation, and self-esteem) contained 15 items each. The CSCS assessed social competence in children between the ages of 3-8 including those with Asperger’s and high functioning autism.

The Social Competence Scale-Teacher Version (SCS-TV) is a 25-item measure that assesses a child’s prosocial behaviors, emotional self-regulation, and academic skills (refer to Appendix F). This scale was created for the Fast Track project at Duke University (Fast-Track, 2010). The scale contains three subscales: Prosocial/Communication Skills, Emotional-Regulation Skills, and Academic Skills. Each item represents a behavior that a child may display at school. The teacher assesses how well each statement describes the child. Responses are coded on a five-point scale ranging from, “Not at all” to “Very Well.” This measure was chosen because the three subscales of the SCS-TV were similar to those of the CSCS. The items measuring prosocial/communication skills were similar to the items measuring social skills. The items measuring emotional-regulation skills were similar to the items measuring social-emotional regulation. The items measuring academic skills were similar to the items measuring self-esteem. The researcher anticipated that each of the subscales of
the two measures would correlate significantly with one another, thus signifying that both measures were assessing a similar underlying construct.

Procedure

Before the facilitators observed children, they were asked to attend a training session on how to use the CSCS and the Social Competence Scale-Teacher Version. They were shown video footage of five different children playing outside at recess. The video footage of each child was 30-minutes long. After reviewing one 30-minute video the facilitators were asked to rate the child in the video using the CSCS and the Social Competence Scale-Teacher Version. They were asked to do this after every video that was viewed. Once the training session was completed, an analysis was run in FACETS to check for rater bias.

Upon completion of the training session, the facilitators were asked to observe children who attended Connect Us. Connect Us is a non-profit organization that offers playgroups to children between the ages of 3-8. Playgroups were offered five days a week with morning and mid-afternoon playgroups offered to preschoolers and kindergarteners and after school playgroups offered to first, second, and third graders. Each playgroup was one hour and a half long. Each facilitator was asked to observe one child for 30
minutes while they played in their natural environments. This meant that the children played freely with no adult facilitation. Play environments included playing on the playground and free play in the classroom. Each facilitator filled out the CSCS and the Social Competence Scale-Teacher Version after they observed the child. Data collection took a week to complete.

**Analysis**

Pilot data were analyzed using principal components extraction (PCA) with varimax rotation and parallel analysis in SPSS. Rater bias was assessed using FACETS (Many-Facet Rasch Analysis: Linacre, 2011). Factor structure and item contribution within each factor were assessed using PCA. Items that cross-loaded across the three factors and items that demonstrated poor fit were removed. Once the items were removed the PCA was re-run with the deleted items and a parallel analysis was used for guidance for determining how many factors to retain. PCA and parallel analysis further guided the researcher in ordering the items for the final administration of the CSCS. Once the new factor structure of the CSCS was determined, reliability estimates were computed for each of the subscales.
Field Administration

Participants

Four hundred and five children between the ages of three and eight participated in the field administration study. There were a total of 32 three-year olds (25 males, 7 females), 57 four-year olds (42 males and 15 females), 119 five-year olds (72 males, 47 females), 59 six-year olds (43 males, 16 females), 62 seven-year olds (39 males, 23 females), and 76 eight-year olds (42 males, 34 females). Of the 405 children, 229 had a diagnosis of Asperger’s (AS) or high functioning autism (HFA). There were a total of 14 three-year olds (11 males, 3 females), 26 four-year olds (19 males, 7 females), 44 five-year olds (34 males, 10 females), 23 six-year olds (21 males, 2 females), 19 seven-year olds (17 males, 2 females), and 31 eight-year olds (20 males, 11 females) that were diagnosed with AS or HFA. All participants were enrolled in Connect Us program, a non-profit organization that offers after school playgroups to all children. The children with AS and HFA had a diagnosis prior to entering the program. Table 4 displays the breakdown of participants that participated in the pilot study.
Table 4

Field Administration Participants

<table>
<thead>
<tr>
<th>Ages</th>
<th>Males without AS/HFA</th>
<th>Females without AS/HFA</th>
<th>Males with AS/HFA</th>
<th>Females with AS/HFA</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 years</td>
<td>14</td>
<td>4</td>
<td>11</td>
<td>3</td>
</tr>
<tr>
<td>4 years</td>
<td>23</td>
<td>8</td>
<td>19</td>
<td>7</td>
</tr>
<tr>
<td>5 years</td>
<td>38</td>
<td>37</td>
<td>34</td>
<td>10</td>
</tr>
<tr>
<td>6 years</td>
<td>22</td>
<td>14</td>
<td>21</td>
<td>2</td>
</tr>
<tr>
<td>7 years</td>
<td>22</td>
<td>21</td>
<td>17</td>
<td>2</td>
</tr>
<tr>
<td>8 years</td>
<td>22</td>
<td>23</td>
<td>20</td>
<td>11</td>
</tr>
</tbody>
</table>

Four play facilitators (4 female therapists) who worked at Connect Us assessed the children who attended the program. All therapists were in private practice working with children with autism. In addition, all four therapists had been facilitating playgroups for over 4 years.

*Instruments*

The instruments that were administered in the field administration study were the Social Competence Scale–Teacher Version and the Children’s Social Competence Scale. After analyzing the results of the pilot study, the CSCS was
revised and the final scale consisted of 34 items that were rated on a four-point rating scale. Each of two domains (social skills and self-esteem) contained 13 items each. The social-emotional-regulation domain contained 8 items. The CSCS assessed social competence in children between the ages of 3-8 including those with Asperger’s and high functioning autism.

Procedure

The four facilitators were asked to observe children who participated in the Connect Us playgroups in their natural playing environments. The program is a five day a week program offering one hour and a half long playgroups all day. Each facilitator was asked to observe one child for 30 minutes while they played in their natural environments. This meant that the children played freely with no adult facilitation. Play environments included playing on the playground and free play in the classroom. Each facilitator filled out CSCS and the Social Competence Scale-Teacher Version after they observed the child. Data collection continued for 11 days.
Analysis

Analysis of the field administration was conducted to primarily assess the structural validity of the measure. The theorized model of the CSCS was tested using confirmatory factor analysis (CFA) in AMOS. The application of the CFA was based on the following steps: (a) model specification, (b) identification, (c) estimation, (d) testing fit, and (e) respecification. Reliability estimates on the subscales of the final version of the CSCS were assessed to determine the internal consistency. Item fit and scale use within each subscales were reassessed using WINSTEPS.

Internal consistency based on Cronbach’s alpha was used to determine the underlying constructs of social competence. According to Gable and Wolf (1993), good cognitive measures have alpha reliability ranging from the high .80s to the low .90s, but go on to say that good affective instruments frequently report reliabilities ranging in the 70s. Therefore, a coefficient alpha of .80 was used as the acceptable minimum value for each subscale in order to demonstrate adequate internal consistency.
Phase 4: Validation

In this phase the following research questions were addressed:

Does the Children’s Social Competence Scale evidence content and construct validity?

*Content and Construct Validity*

Evaluation by the expert panel was used to infer content validity. Social competence was measured by social skills, social-emotional regulation, and self-esteem in which factor structure as determined through factor analysis. This was used to infer structural validity. Construct validity refers to whether a scale measures a theorized psychological construct that it purports to measure. Construct validity was assessed through correlation with several measures. The researcher expected the subscales of the Children’s Social Competence Scale (social skills, social-emotional regulation, and self-esteem) to correlate highly with the subscales of the Social Competence Scale-Teacher Version (prosocial/communication skills, emotional-regulation skills, and academic skills) in both the pilot and field administration studies. Expected correlations for the pilot and field administration are provided in Table 5.
Table 5

*Expected Correlations between the CSCS Domains and the SCS-TV in Pilot and Field Administration Studies*

<table>
<thead>
<tr>
<th>Pilot Domains</th>
<th>CSCS and SCS-TV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Skills</td>
<td>High</td>
</tr>
<tr>
<td>Social-Emotional Regulation</td>
<td>High</td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>High</td>
</tr>
<tr>
<td>Academic Skills</td>
<td>High</td>
</tr>
</tbody>
</table>

The researcher also reviewed the intake information that was provided by Connect Us. The participant’s parents completed an intake form prior to entering the program. The intake form contained 4 open-ended questions and 2 sections on which the parents were asked to rate their child. One section contained a series of 24 words. The parents were asked to rate each word as it related to their child’s social interactions with his/her peers. The parents rated each word on a four-point rating scale ranging from 1 = does not describe my child, 2 = rarely describes my child, 3 = describes my child sometimes, and 4 = describes my child most of the time. The researcher examined the set of 24 words and chose three words that represented social skills (friendly, introvert, and extrovert) three words that represented social-emotional regulation (sensitive, impulsive, and rigid) and three words that represented self-esteem (leader, confident, and self-motivated). The researcher anticipated that the scores on the words that represented social skills,
social-emotional regulation, and self-esteem would highly correlate with the three subscales of the CSCS, respectively.

*Known Groups Differences.* When the final factor structure of the CSCS was determined, descriptive statistics were run. Means and standard deviations were compared by gender between children with Asperger’s (AS)/high function autism (HFA) and typically developing children. It was anticipated that children with AS/HFA would score lower on all three subscales of the CSCS than typically developing children. In addition, the means and standard deviations of children in different age groups were analyzed.
CHAPTER 3

RESULTS

In this chapter, the research questions listed in Chapter 1 and the results of scale development phases described in Chapter 2 are addressed. Since the results of phase one, the planning phase, were already discussed at length in Chapter 2, this chapter begins by discussing the results from phase two: scale construction.

Phase 2: Construction

In phase two, the researcher created an item pool, carried out an expert review of the CSCS item pool, selected pilot items based on results of the expert review, and finally conducted two cognitive interviews for item clarification.

Item Pool Creation

The researcher identified three domains of Social Competence (social skills, social-emotional regulation, and self-esteem) based on the literature review and the Social Competence Scales that currently exist. The researcher ultimately generated an item pool of 90 items based on findings from the literature as discussed in Chapter 1.
*Expert Review*

The researcher conducted nine expert reviews of all 90 items. Items were evaluated on five criteria: (1) representativeness of the item for its intended domain; (2) clarity of that item; (3) difficulty of that item; (4) comprehensiveness of the scale; and (5) suggestions for addition or deletions of items. These nine people included six therapists, two teachers, and one parent.

Each of the nine expert reviewers attended a meeting at a non-profit organization. During this meeting they were handed a copy of the items of the 90-item Children’s Social Competence Scale (CSCS) to be reviewed. The expert reviewers were asked to rate each item on the five criteria listed above.

*Item Selection*

Nine reviews were completed and returned. The means of each of three criteria: (1) representativeness of the item for its intended domain; (2) clarity of that item; and (3) difficulty of that item were calculated for each of the 90 items. The researcher sorted item means within each of the three criteria by representativeness (descending order), then by clarity (descending order), and lastly difficulty of that item (ascending order). The researcher pooled items from those with the greatest means for representativeness and clarity. The means for item difficulty were used to order items on the pilot version of the CSCS. The
last two criteria: (1) comprehensiveness of the scale; and (2) suggestions for addition or deletion of items were reviewed and analyzed by the researcher and used as supplemental support for item selection that would be used in the pilot study.

The means of representativeness of the item for its intended domain were assessed first. The means for the items that represented social skills and social-emotional regulation (which will be referred to as emotional regulation in this chapter) ranged from 3.56 to 2.44 and the means for the items that represented self-esteem ranged from 3.67 to 2.22. Second, the means for the clarity of each item were assessed. The means for the clarity of social skills and emotional regulation ranged from 3.56 to 2.44 and the means for self-esteem ranged from 3.56 to 3.11. Social skill items with a mean below 3.11 for both representativeness and clarity were dropped. Emotional regulation items with means below 3.11 on both representativeness and clarity were dropped. Self-esteem items with means below 3.22 were dropped in the area of representativeness and means below 3.11 in the area of clarity were dropped. The researcher then looked at the results of the qualitative data on comprehensiveness of the scale and suggestions for addition or deletion of items to determine any additional items that could be deleted. After all items were assessed and deleted,
the remaining items were ordered by the difficulty means ranging from easiest to hardest. Items with the lowest means indicated that those items were easy and those items were placed first on the scale. Items with the highest means were considered harder and those items were placed last on the scale. This process resulted with a total of 45 items with each of the three domains (social skills, emotional regulation, and self-esteem) containing 15 items each.

Cognitive Interviews

Cognitive interviews were conducted with two female teachers who taught at a private school in Denver, Colorado. One teacher was 35 years old and had been teaching first grade for nine years and the other teacher was 28 years old and had been teaching second grade for two years. Both interviews were conducted at the office of a non-profit organization. The interviews were conducted separately. The researcher gave a copy of the 45-item CSCS to each of the participants and asked them to think aloud as they worked their way through the scale. They asked questions when statements were unclear to them, and the researcher responded by asking what they thought the item was saying. If the response indicated that the item was being interpreted the way it was intended to be, the researcher would ask if they had a better suggestion for phrasing that item. If the response indicated that the item was not being interpreted the way it was intended to be, the
researcher explained what she meant and asked the interviewee for suggestions as to how to restate the item so that its meaning was clear. Both interviewees commented when items appeared repetitive in relation to other items. The researcher took notes throughout both interviews and highlighted items on the scale that were unclear. The researcher used the results of the cognitive interviews to reword any of the 45 items that were vague or unclear. Based on the interviews, fifteen items were re-worded or changed. Table 6 displays all the changes that were made to the CSCS as a result of the cognitive interviews. When all the changes were made, the CSCS comprised 45 items measuring three domains (social skills, emotional regulation, and self-esteem). Each domain contained 15 items. This scale was used in the pilot study.
Table 6

*Item Changes Resulting from Cognitive Interviews*

<table>
<thead>
<tr>
<th>Original Items</th>
<th>Changed Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Able to join a conversation with peers</td>
<td>Able to join an ongoing conversation with peers</td>
</tr>
<tr>
<td>Able to sustain a conversation</td>
<td>Sustains age appropriate conversations</td>
</tr>
<tr>
<td>Has the ability to compromise with peers</td>
<td>Collaborates with peers during play</td>
</tr>
<tr>
<td>References the talker in a conversation</td>
<td>Looks at speaker during a conversation</td>
</tr>
<tr>
<td>Thinks before acting</td>
<td>Acts impulsively</td>
</tr>
<tr>
<td>Understands others point of view</td>
<td>Shares his/her point of view with others</td>
</tr>
<tr>
<td>Can read when others are annoyed</td>
<td>Reacts appropriately when others are annoyed</td>
</tr>
<tr>
<td>Interprets basic body language</td>
<td>Responds to others’ body language</td>
</tr>
<tr>
<td>Can resolve conflict</td>
<td>Resolves conflict independently</td>
</tr>
<tr>
<td>Aware of the effects of his/her behavior on others</td>
<td>Talks about own behavior as it effects others</td>
</tr>
<tr>
<td>Able to articulate own emotion to others</td>
<td>Expresses his/her emotions to others</td>
</tr>
<tr>
<td>Can accept things when they don’t go his/her way</td>
<td>Remains calm when things don’t go his/her way</td>
</tr>
<tr>
<td>Can cope when losing a game</td>
<td>Maintain composure when losing a game</td>
</tr>
<tr>
<td>Feels good about themselves</td>
<td>Makes positive statements about him/herself</td>
</tr>
</tbody>
</table>
Phase 3: Quantitative Evaluation

In this phase, the following research questions were addressed:

Does the Children’s Social Competence Scale (CSCS) reflect the three identified domains (i.e., social skills, social-emotional regulation, and self-esteem) and factor appropriately into the three domains? Is the use of the response scale appropriate for the Children’s Social Competence Scale?

To answer these questions, item loadings from an exploratory and confirmatory factor analysis and results of an item response theory analysis were assessed using a series of analyses from the pilot administration through the field administration.

Pilot Measure Structure

The primary purpose of the pilot study was to provide a preliminary empirical assessment of dimensionality of the CSCS via exploratory factor analysis (EFA). The secondary purpose was to examine the internal consistency reliability of the potential scales using Cronbach’s alpha.

Prior to conducting the EFA on the pilot study data, the researcher examined the distributions of the CSCS items. There were no violations of univariate normality, and all other assumptions were met. The factor structure of
the pilot study data was explored via EFA using principal components extraction with varimax rotation using SPSS for Windows as the statistical software package. The researcher used a sample of 200 cases to conduct an EFA on the 45 items remaining after content expert review. To determine the number of components indicated by the items, the researcher first examined a scree plot (Figure 1) of the eigenvalues. A three-component solution was suggested by the scree plot.

![Scree Plot](image)

*Figure 1. Pilot Data Scree Plot*

The researcher then looked at the total variance explained which also indicated a three-component solution. As seen in Table 7, three components were
identified with eigenvalues ranging from 29.58 to 2.00. In this analysis three components were extracted that cumulatively explained 77.2% of the total variance. Components with eigenvalues exceeding 1.0 are listed in Table 8. Following varimax rotation, the three-components explained 67.41%, 5.171%, and 4.576% of the item variance respectively.

Table 7

*Total Variance Explained by Factors in Pilot Data*

<table>
<thead>
<tr>
<th>Component</th>
<th>Total</th>
<th>% of Variance</th>
<th>Cumulative %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>29.582</td>
<td>67.410</td>
<td>67.410</td>
</tr>
<tr>
<td>2</td>
<td>2.269</td>
<td>5.171</td>
<td>72.581</td>
</tr>
<tr>
<td>3</td>
<td>2.008</td>
<td>4.576</td>
<td>77.158</td>
</tr>
<tr>
<td>4</td>
<td>1.295</td>
<td>2.952</td>
<td>80.110</td>
</tr>
<tr>
<td>5</td>
<td>.958</td>
<td>2.182</td>
<td>82.292</td>
</tr>
</tbody>
</table>

The item loadings from a principal components extraction for a three-component solution were reviewed in order to determine which items should be dropped before the analyses were rerun. The criterion for retaining items was a loading of .60 or higher. Items meeting the .60 criterion that loaded on more than one component with a loading above .40 were eliminated due to cross-loading. Item, ER1 (*Acts Impulsively*) was dropped because it was the only item that loaded above .60 on a fourth component. As seen in Table 8, bolded items in
Component 1 were selected items. The bolded items in Component 2 were kept, and the bolded items in Component 3 were selected. The italicized items were dropped. A total of 11 items were dropped (SS11, SS14, ER1, ER3, ER4, ER5, ER6, ER10, SE2, SE11, and SE13).

Table 8

Item Loadings for Children’s Social Competence Scale

<table>
<thead>
<tr>
<th>Items</th>
<th>Component 1</th>
<th>Component 2</th>
<th>Component 3</th>
<th>Component 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can enter an existing play scheme (SS)</td>
<td>.812</td>
<td>.276</td>
<td>.357</td>
<td>.061</td>
</tr>
<tr>
<td>Collaborates with peers (SS)</td>
<td>.809</td>
<td>.323</td>
<td>.296</td>
<td>.107</td>
</tr>
<tr>
<td>Sustains appropriate conversations (SS)</td>
<td>.789</td>
<td>.358</td>
<td>.374</td>
<td>.003</td>
</tr>
<tr>
<td>References peers while playing (SS)</td>
<td>.783</td>
<td>.306</td>
<td>.278</td>
<td>.105</td>
</tr>
<tr>
<td>Able to join a conversation (SS)</td>
<td>.776</td>
<td>.345</td>
<td>.420</td>
<td>-.055</td>
</tr>
<tr>
<td>Stays engaged during play (SS)</td>
<td>.766</td>
<td>.403</td>
<td>.307</td>
<td>.131</td>
</tr>
<tr>
<td>Asks questions in a conversation (SS)</td>
<td>.726</td>
<td>.292</td>
<td>.400</td>
<td>-.152</td>
</tr>
<tr>
<td>Looks at speaker during conv., (SS)</td>
<td>.755</td>
<td>.368</td>
<td>.283</td>
<td>.236</td>
</tr>
<tr>
<td>Makes eye contact with peers (SS)</td>
<td>.744</td>
<td>.365</td>
<td>.289</td>
<td>.266</td>
</tr>
<tr>
<td>Asks peer to join activity (SS)</td>
<td>.734</td>
<td>.274</td>
<td>.438</td>
<td>-.061</td>
</tr>
<tr>
<td>Initiates play with peers (SS)</td>
<td>.717</td>
<td>.305</td>
<td>.444</td>
<td>-.108</td>
</tr>
<tr>
<td>Initiates introductions (SS)</td>
<td>.716</td>
<td>.183</td>
<td>.442</td>
<td>-.086</td>
</tr>
<tr>
<td>Is inquisitive while engaged in con. (SS)</td>
<td>.709</td>
<td>.331</td>
<td>.367</td>
<td>-.182</td>
</tr>
<tr>
<td>Maintains boundaries (SS)</td>
<td>.589</td>
<td>.455</td>
<td>.243</td>
<td>.417</td>
</tr>
<tr>
<td>Say, “Please” &amp; “Thank you” (SS)</td>
<td>.556</td>
<td>.416</td>
<td>.401</td>
<td>.117</td>
</tr>
<tr>
<td>Calms down when really</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td>Value 1</td>
<td>Value 2</td>
<td>Value 3</td>
<td>Value 4</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>excited (ER)</td>
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<td>-.834</td>
<td>-.275</td>
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<td>Remains calm (ER)</td>
<td>-.265</td>
<td>-.822</td>
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<td>Calms down when upset (ER)</td>
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<td>-.805</td>
<td>-.344</td>
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<td>Controls temp. during disagree. (ER)</td>
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<td>Maintains composure when losing (ER)</td>
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<td>-.764</td>
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<td>Expresses emotional distress (ER)</td>
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<td>Approp. expreses feelings (ER)</td>
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<td>-.710</td>
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<td>Expresses his/her emotions (ER)</td>
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<td>-.442</td>
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<td>Responds to others’ body lang. (ER)</td>
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<td>-.653</td>
<td>-.311</td>
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about self (SE)   
Cooperates with others (SE)   
Is respectful (SE)   
Treats others with respect (SE)   
Accepts criticism from others (SE)   
Accepts compliments from peers (SE)   
Acts impulsively (ER)   

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Note. Factor loadings exceeding .40 are presented in boldface.

After item reduction was complete, the data were rerun. A parallel analysis was run to determine the number of factors exceeding a chance level. Parallel analysis requires the researcher to randomly generate raw data matrices of the same “rank” as the actual raw data matrix. Using SPSS a 200-by-34 raw data matrices consisting of 1s, 2s, 3s, or 4s was generated. The eigenvalues associated with the 50th percentile of the random data matrices and the real data matrices were compared. As seen in Table 9, the eigenvalues for the real data exceeded the associated eigenvalues from the random data for the first three components, thus indicating a three-component solution was appropriate.
Table 9

*Eigenvalues for Real and Random Data*

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<th>Components</th>
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<th>Eigenvalues for Random Data—50th percentile</th>
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<td>Component 4</td>
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*Internal consistency reliability estimates.* Using Cronbach’s (1951) coefficient alpha formula (as implemented in SPSS for Windows), the internal consistency reliabilities of the three subscales were calculated. The internal consistency reliability estimates of the CSCS subscales were determined to be adequate. For the social skills subscale Cronbach’s alpha was .98; for self-esteem alpha was .90; and for social-emotional regulation alpha was .96. High alpha coefficients indicated that the sample of items were adequate for measurement of the content. In fact, such high alphas suggested items may be very closely related.
The final scale for field administration consisted of three item groupings. Component 1, social skills, consisted of 13 items. Component 2, emotional regulation, contained 8 items. Component 3, self-esteem, consisted of 13 items. There were a total of 34 items in the scale used in the field administration.

*Rater bias.* In the pilot study, four raters were enlisted to assess the children. The results of the CSCS may be affected by rater differences. FACETS (Linacre, 1988), is a computer program for Rasch analysis of data with multiple facets (e.g., raters as well as items and children). This program was used to determine if there were substantial differences amongst the raters. Each of the raters assessed the same five children using the CSCS, providing linkage in the data set. Analyses using FACETS were run for each of the intended three factors (social skills, self-esteem, and emotional regulation), with each subscale analyzed separately.

*Social Skills.* The overall fit of the data was adequate, with infit and outfit mean squares of .97 and .94 respectively. The raters appeared similar in their rating of social skills, with rater 4 (R4) being the most severe rater and rater 3 (R3) being the least. Raters 1 (R1) and rater 2 (R2) seemed to be measuring similarly. Overall, the raters
demonstrated sufficient fit to the model when rating social skills (infit = .80 to 1.16; outfit = .80 to 1.40). The infit and outfit values for each of the raters are displayed in Table 10 and rater logit positions and standard errors are displayed in Table 11.

Table 10

*Rater Infit and Outfit Values by Factors*

| Rater | Social Skills | | Emotional Regulation | | Self-Esteem | |
|-------|--------------|-------|----------------------|-------|-----------|
|       | Infit | Outfit | Infit | Outfit | Infit | Outfit |
| Rater 1 | 1.02 | .89 | .95 | .91 | .87 | .71 |
| Rater 2 | 1.01 | 1.40 | 1.06 | 1.03 | 1.00 | .83 |
| Rater 3 | 1.16 | .95 | .88 | .85 | 1.12 | 1.01 |
| Rater 4 | .80 | .80 | 1.08 | 1.06 | 1.02 | .97 |

Table 11

*Rater Logit Position and Standard Error*

| Rater | Social Skills | | Emotional Regulation | | Self-Esteem | |
|-------|--------------|-------|----------------------|-------|-----------|
|       | Logit Position | Standard Error | Logit Position | Standard Error | Logit Position | Standard Error |
| Rater 1 | .00 | .23 | -.08 | .24 | .32 | .24 |
| Rater 2 | .05 | .23 | -.20 | .24 | -.09 | .24 |
| Rater 3 | -.22 | .24 | .09 | .24 | .03 | .24 |
| Rater 4 | .16 | .23 | .20 | .24 | -.26 | .24 |
Emotional Regulation. The raters appeared similar in their rating of emotional regulation, with rater 4 (R4) being the most severe rater and rater 2 (R2) being the least. As seen in Table 10, the raters demonstrated sufficient fit to the model when rating emotional regulation (infit = .88 to 1.08 outfit = .85 to 1.06). Table 11 provides rater logit positions and standard errors.

Self-Esteem. The raters ratings of self-esteem were more divergent for this scale than for the prior two, but differences were still not statistically significant. Within this factor rater 1 (R1) was the most severe rater and rater 4 (R4) was the least. Raters 2 (R2) and 3 (R3) appeared to be measuring similarly. Overall, the raters demonstrated sufficient fit to the model when rating self-esteem (infit = .87 to 1.12; outfit = .71 to 1.01). The infit and outfit values for each of the raters are displayed in Table 10 with rater logit positions and standard errors in Table 11.

Field Administration. The purpose of the field administration was to confirm the structural stability and validity of the CSCS. The raters that were enlisted for the pilot study were the same raters that participated in the field administration.
In the field administration, the scale structure was assessed using Confirmatory Factor Analysis (CFA) on the covariance matrix of the CSCS items using the maximum likelihood estimation as implemented in AMOS. The researcher used a sample of 405 cases to conduct a CFA on 34 items. As seen in Figure 2, Model 1 assumes a three-factor model for the CSCS. Social skills comprised 13 items, self-esteem contained 13 items, and emotional regulation consisted of 8 items. Model 1 had poor fit to the data, $\chi^2 (524, N = 405) = 5918.312, p < .001$; RMSEA = 0.160, $p < .001$; CFI = 0.77; GFI = 0.47; and PNFI = 0.70.
Figure 2. Model 1: Graphical representation of the three factors-34-items of the Children’s Social Competence Scale.
Since Model 1 exhibited poor fit, the researcher reviewed the modification indices. The modification indices revealed that many items within each of the factors had highly correlated measurement errors. Netemeyer et al. (2003) states that, “although the high level of intercorrelations results in high levels of internal consistency, highly disproportionate correlations among some items relative to others also can result in correlated measurement errors.” Netemeyer et al. continues to say that a common source of misfit is due to items that remain too correlated after accounting for their common factor. Based on this reasoning the researcher decided to compute the correlations between each of the items within each of the three factors.

As see in Table 12, many of the items within the social skills factor were highly correlated with one another. Table 13 displays items that highly correlated with each other within the self-esteem factor. Table 14 shows the items that were highly correlated within the emotional regulation factor.
Table 12

**Social Skills Item Correlations**

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<th>SS3</th>
<th>SS4</th>
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Table 13

**Self-Esteem Item Correlations**

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82
Netemeyer et al. (2003) states that a high level or correlation (covariation) between the items may be due to “common wording.” For example, within the social skills factor SS7 (initiates play with peers) and SS10 (asks peer to join in a social activity) have similar meanings and were highly correlated with one another ($r = .95$). Netemeyer et al. suggests that deleting items that are similar in content and highly correlated with other items may result in adequate fit of the items to the CFA structure. The researcher deleted the items that were highly correlated with two or more items and/or had a correlation of .90 or above. The bolded correlations in Tables 12 to 14 indicate the items that were deleted. In the social skills factor items SS5, SS7, SS9, SS10, SS11, and SS13 were deleted. In the self-esteem factor items SE1, SE5, SE6, SE7, SE8, SE9, SE10, and SE13 were deleted. In the emotional regulation factor items ER2, ER4, ER5, and ER8 were
deleted. Model 2 consisted of three-factors with 16 items. Figure 3 shows social skills contains 7 items, self-esteem contains 5 items, and emotional regulation contains 4 items.

Figure 3. Model 2: Graphical representation of the three factors 16-items of the Children’s Social Competence Scale.
A CFA was run on Model 2. The results indicated that Model 2 had poor fit to the data, $\chi^2 (101, N = 405) = 808.495, p < .001$; RMSEA = 0.132, $p < .001$; CFI = 0.91; GFI = 0.79; and PNFI = 0.76. Based on the results of this model, the researcher decided to run a CFA on each of the factors individually to attempt to identify the problem.

First, the researcher ran a CFA on Model 3, the one-factor social skills model. As seen in Figure 4, the one-factor social skills model consists of 7 items. The results indicated that this model was not a good fit to the data, $\chi^2 (14, N = 405) = 231.672, p < .001$; RMSEA = 0.196, $p < .001$; CFI = 0.93; GFI = 0.85; and PNFI = 0.62. The researcher looked at the modification indices that revealed that the measurement errors of items and 3, 6, and 12 were highly correlated with more than one measurement errors of other items. Based on these modification indices, the researcher deleted items, 3, 6, and 12.
Figure 4. Model 3: Graphical representation of the one factor social skills model of the Children’s Social Competence Scale.
Model 4, the one-factor social skills model with four items was run.

Figure 5 displays that this model had adequate fit, \( \chi^2 (2, N = 405) = 8.237, p < .01; \) RMSEA = 0.088 \( p < .01; \) CFI = 0.99; GFI = 0.99; and PNFI = 0.33.

Figure 5. Model 4: Graphical representation of the one factor social skills model with 4-items of the Children’s Social Competence Scale. All parameters are significant at \( p < .01. \)
Next the researcher ran a CFA on Model 5, the one-factor self-esteem model. As seen in Figure 6, the one-factor self-esteem model consisted of 5 items. The results indicated that this model was not a good fit to the data, $\chi^2 (5, N = 405) = 33.340, p < .001$; RMSEA = 0.123, $p < .001$; CFI = 0.98; GFI = 0.96; and PNFI = 0.49. The researcher looked at the modification indices that revealed that the measurement error of item 11 was highly correlated with more than one measurement errors of other items. Based on the modification indices, the researcher deleted item 11.

Figure 6. Model 5: Graphical representation of the one factor self-esteem model of the Children’s Social Competence Scale.
Model 6, the one-factor self-esteem model with four items was run.

Figure 7 displays that this model had adequate fit, $\chi^2 (2, N = 405) = 8.237, p < .01$; RMSEA = 0.088 $p < .01$; CFI = 0.99; GFI = 0.99; and PNFI = 0.33.

\textit{Figure 7.} Model 6: Graphical representation of the one factor self-esteem model with 4-items of the Children’s Social Competence Scale. All parameters are significant at $p < .01$. 
Lastly the researcher ran a CFA on Model 7, the emotional regulation model. As seen in Figure 8, the results indicated adequate fit with $\chi^2 (2, N = 405) = 8.174, p < .01$; RMSEA = 0.087, $p < .01$; CFI = 0.99; GFI = 0.99; and PNFI = 0.33.

Figure 8. Model 7: Graphical representation of the one factor emotional regulation model of the Children’s Social Competence Scale. All parameters are significant at $p < .01$. 
Based of the results of all the one-factor models, the researcher decided to combine all three factors in order to determine if CSCS is adequately represented by a three-factor structure. Model 8, the three-factor 12-item model was run. Figure 8 displays that this model had adequate fit with $\chi^2 (51, N = 405) = 213.534, p < .001$; RMSEA = 0.089, $p < .001$; CFI = 0.97; GFI = 0.92; and PNFI = 0.74. Figure 9 displays the final diagram representing the Children’s Social Competence Scale with three-factors (social skills, self-esteem, and emotional regulation), with 12 items. In the final diagram, Social skills contained 4 items, self–esteem contained 4 items, and emotional regulation contained 4 items.
Figure 9. Model 8: Graphical representation of the three factor 12-item model of the Children’s Social Competence Scale. All parameters are significant at $p < .001$.

*Internal consistency reliability.* Reliability estimates were calculated for each of the three factors of the final version of the CSCS. For the social skills factor Cronbach’s alpha was .96; for self-esteem alpha was .93; and for emotional regulation alpha was .95. These alpha coefficients indicated that the final version of the CSCS had high internal consistency with very brief subscales.
Dimensionality, Overall Fit, Use of the Response Scale, Reliability of Person Separation, and Item-Person Map

The data were analyzed using the entire sample (\(N=405\)) for all 3 subscales (social skills, self-esteem, and emotional regulation), with each subscale analyzed separately in an item response theory analysis.

Social Skills. Dimensionality of the item set was reviewed using a principal components analysis of residuals generated with the Winsteps (Linacre, 2011) software. The percent of variance attributable to the first dimension was 77.6%, with an eigenvalue for the first contrast of 1.5, accounting for 8.5% of the variance. Linacre (2010) suggests that a measure is reasonably unidimensional if over 50% of the variance is attributable to the first dimension, with an eigenvalue of 2.0 and less than 6% of variance attributable to the first contrast (or the second dimension). The focus of these rules of thumb falls on an eigenvalue of less than or equal to 2.0. The Social Skills subscale was, then, considered unidimensional.

The overall fit of the data to the Rasch model was adequate, with infit and outfit mean squares of .97 and .94, respectively. The model expectation for mean squares is 1.0 if the data fit the model exactly. In this case, the data overfit the model, with less than expected random variation.
Rasch-Andrich thresholds were calculated to review use of the response scale. A four-point rating scale was used: 1 (Never), 2 (Rarely), 3 (Occasionally), and 4 (Frequently). The dominant proportions of responses were in categories 3 and 4 as chosen by 29% and 41% of raters respectively, while the remaining 30% chose category 1 or 2. The observed average of category structure was ordered, increasing in logit position from -7.38 to 6.88. Infit and outfit mean squares revealed acceptable values of less than 1.2 for all categories. Threshold calibrations were satisfactory, increasing in value from -6.49 to 6.02. The category probabilities plot showed use of the scale as intended (Figure 10). When scale use is as intended, there is a clear progression in scale values with discernible higher probabilities for any single response as one’s logit position on the trait increases.
Figure 10. Scale Use for Social Skills Items

Reliability of person separation for this 4-item subscale was .90, with an estimate of Cronbach’s alpha from the Rasch analysis of .95, so the item set was highly internally consistent.

Targeting of items for this sample of persons is displayed in Figure 11, where persons’ logit positions are indicated by hashmarks (#) on the left and a low category, mean, and high category response to each item indicated by an X in the figure. When items are appropriately targeted for the sample and sufficient construct coverage is provided, there will be item category responses
available to reflect all person positions. In this scale, some persons had higher logit positions than were well assessed by item response categories, indicated by a series of hashmarks at the top of the figure with no corresponding item response category response available at that position.

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Figure 11. Targeting of Items of Sample of Persons Within the Social Skills Subscale

Self-Esteem. Dimensionality of the item set was first reviewed using a principal components analysis of residuals. The percent of variance attributable to the first dimension was 83.0%, with an eigenvalue for the first contrast of 1.5, accounting for 6.3% of the variance. The self-esteem subscale was, then, considered unidimensional.

The overall fit of the data to the Rasch model was adequate, with infit and outfit mean squares of .93 and 1.01, respectively. In this case, the data overfit the model, with less than expected random variation.

Rasch-Andrich thresholds were calculated. A four-point rating scale was used: 1 (Never), 2 (Rarely), 3 (Occasionally), and 4 (Frequently). The dominant proportions of responses were in categories 2 and 3 as chosen by 25% and 34% of responders respectively, while the remaining 42% chose category 1 or 4. The observed average of category structure was ordered,
increasing in logit position from -6.59 to 6.44. Infit and outfit mean squares revealed acceptable values less than 1.6 for all categories. Threshold calibrations were satisfactory, increasing in value from -4.86 to 5.43. The category probabilities plot showed use of the scale as intended (Figure 12).

**Figure 12. Scale Use for Self-Esteem Items**

Reliability of person separation for this 4-item subscale was .90, with an estimate of Cronbach’s alpha from the Rasch analysis of .93, so the item set was highly internally consistent.

Targeting of items for this sample of persons is displayed in Figure 13, where persons’ logit positions are indicated by hashmarks (#) on the left and a
low category, mean, and high category response to each item indicated by an X in the figure. In this scale, some persons had higher logit positions than were well assessed by item response categories, indicated by a series of hashmarks at the top of the figure with no corresponding item response category at that position.

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Figure 13. Targeting of Items of Sample of Persons Within the Self-Esteem Subscale

*Emotional Regulation.* Dimensionality of the item set was reviewed using a principal components analysis of residuals generated with the Winsteps (Linacre, 2011) software. The percent of variance attributable to the first dimension was 74.9%, with an eigenvalue for the first contrast of 1.7, accounting for 10.6% of the variance. The Emotional Regulation subscale was, then, considered unidimensional.

The overall fit of the data to the Rasch model was adequate, with infit and outfit mean squares of .58 and .58, respectively. In this case, the data substantially overfit the model, with less than expected random variation.

Rasch-Andrich thresholds were calculated. A four-point rating scale was used: 1 (Never), 2 (Rarely), 3 (Occasionally), and 4 (Frequently). The dominant proportions of responses were in categories 3 and 4 as chosen by 40% and 38% of responders respectively, while the remaining 22% chose
category 1 or 2. The observed average of category structure was ordered, increasing in logit position from -5.42 to 8.05. Infit and outfit mean squares revealed acceptable values less than 1.2 for all categories. Threshold calibrations were satisfactory, increasing in value from -6.62 to 7.68. The category probabilities plot showed use of the scale as intended (Figure 14).

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**Figure 14. Scale Use for Emotional Regulation Items**

Reliability of person separation for this 4-item subscale was .75, with an estimate of Cronbach’s alpha from the Rasch analysis of .95, so the item set was highly internally consistent.
Targeting of items for this sample of persons is displayed in Figure 15, where persons’ logit positions are indicated by hashmarks (#) on the left and a low category, mean, and high category response to each item indicated by an X in the figure. In this scale, some persons had higher logit positions than were well assessed by item response categories, indicated by a series of hashmarks at the top of the figure with no corresponding item response category at that position.

<table>
<thead>
<tr>
<th>MAP OF PERSON AND ITEM</th>
<th>BOTTOM P=50%</th>
<th>MEASURE</th>
<th>TOP P=50%</th>
<th>MEASURE</th>
<th>&lt;rare&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>PERSON</td>
<td>+</td>
<td>ITEM</td>
<td>+</td>
<td>ITEM</td>
<td>+</td>
</tr>
<tr>
<td>9</td>
<td>.#############</td>
<td></td>
<td>+</td>
<td>+</td>
<td>X</td>
</tr>
<tr>
<td>8</td>
<td>.##</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>.#</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>+</td>
<td></td>
<td>+</td>
<td>+</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>+</td>
<td></td>
<td>+</td>
<td>+</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>+</td>
<td></td>
<td>+</td>
<td>+</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>+</td>
<td></td>
<td>+</td>
<td>+</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>+</td>
<td></td>
<td>+</td>
<td>+</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>+</td>
<td></td>
<td>+</td>
<td>+</td>
<td>1</td>
</tr>
<tr>
<td>0</td>
<td>.#</td>
<td></td>
<td>+</td>
<td>XX</td>
<td>+</td>
</tr>
<tr>
<td>-1</td>
<td>.#</td>
<td></td>
<td>+</td>
<td>+</td>
<td>-1</td>
</tr>
</tbody>
</table>
Figure 15. Targeting of Items of Sample of Persons Within the Emotional Regulation Subscale

Phase 4: Validity

Pearson product-moment correlation coefficients were computed between the CSCS subscales and the subscales of the Social Competence Scale-Teacher Version (SCS-TV) on the sample of 200 cases in the pilot study. The correlation among CSCS social skills subscale and SCS-TV prosocial/communication subscale was statistically significant \( r = .98, p < .01 \). In addition, the correlation between the CSCS social-emotional regulation subscale and the SCS-TV emotional-regulation subscale was statistically significant \( r = .89, p < .01 \).

The correlation between the CSCS self-esteem subscale and the SCS-TV
academic subscale was also statistically significant ($r = .97, p < .01$). The correlations between the three subscales of the CSCS and the SVS-TV indicated that there is support for convergent validity for the CSCS.

Pearson product-moment correlation coefficients were computed between the CSCS subscales and the subscales of the SCS-TV in the field administration. The correlation among the CSCS social skills subscale and SCS-TV prosocial/communication subscale was statistically significant ($r = .95, p < .01$). The correlation between the CSCS social-emotional regulation subscale and the SCS-TV emotional-regulation subscale was significant ($r = .90, p < .01$). In addition, the correlation between the CSCS self-esteem subscale and the SCS-TV academic subscale was statistically significant ($r = .93, p < .01$). The strong correlation between the subscales of the CSCS and the SVS-TV indicated that overall there is support for convergent validity for the CSCS.

In addition, Pearson product-moment correlation coefficients were computed between the CSCS subscales and the computed scores of the words chosen from the intake from the field administration. The words that were chosen to correlate with the CSCS social skills subscale were friendly, introvert, and extrovert (labeled as SS words). The words that were chosen to represent the CSCS self-esteem subscale were leader, confident, and self-motivated (labeled as
SE words). The words that were chosen to represent the CSCS emotional regulation subscale were sensitive, impulsive, and rigid (labeled as ER words). The correlation among the CSCS social skills subscale and SS words was significant \( r = .91, p < .01 \). The correlation among the CSCS self-esteem subscale and the SE words was significant \( r = .83, p < .01 \). Lastly, the correlation among the ER subscale and the ER words was significant at \( r = .80, p < .01 \). The high correlations between the CSCS subscales and the words that were rated on the intake indicated additional support for the validity of the CSCS.

**Known Groups Differences.** Descriptive statistics were run for social skills, self-esteem, and emotional regulation scales separately. The researcher wanted to compare the means and standard deviations between males and females of typically developing children and children diagnosed with autism (i.e., Aspergers and high functioning autism) for each of the three subscales (social skills, self-esteem, and emotional regulation). The researcher also wanted to examine the main effects of sex, diagnosis, and their interaction for each of the three subscales.
Social Skills. Results revealed that variances were significantly different across sex and diagnosis (Levene’s, $p < .05$). The means and standard deviations of males who are typical and diagnosed with autism and females who are typical and diagnosed with autism are reported in Table 15.

Table 15

Social Skills: Means and SD of Males and Females With and Without a Diagnosis

<table>
<thead>
<tr>
<th>Sex</th>
<th>Diagnosis</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>Typical</td>
<td>3.60</td>
<td>.49</td>
<td>141</td>
</tr>
<tr>
<td></td>
<td>Autistic</td>
<td>2.19</td>
<td>.76</td>
<td>122</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>2.95</td>
<td>.94</td>
<td>263</td>
</tr>
<tr>
<td>Female</td>
<td>Typical</td>
<td>3.55</td>
<td>.49</td>
<td>107</td>
</tr>
<tr>
<td></td>
<td>Autistic</td>
<td>1.81</td>
<td>.77</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>3.12</td>
<td>.94</td>
<td>142</td>
</tr>
<tr>
<td>Total</td>
<td>Typical</td>
<td>3.58</td>
<td>.49</td>
<td>248</td>
</tr>
</tbody>
</table>
As can be seen from Table 16, the results of the two-way ANOVA revealed statistically significant main effects for sex, $F(1, 401) = 9.36, p = .002, \eta^2 = .023$, and diagnosis, $F(1, 401) = 500.01, p < .001, \eta^2 = .555$. There was a statistically significant interaction between sex and diagnosis, $F(1, 401) = 5.54, p = .019, \eta^2 = .014$. This interaction is shown in Figure 16. Due to the statistically significant interaction, simple effects of diagnosis were computed separately for males and females. Statistically significantly differences were found between males presenting as typical and diagnosed with autism, $F(1,261) = 326.05, p < .001, \eta^2 = .555$, and also between females presenting as typical and diagnosed with autism, $F(1,140) = 245.49, p < .001, \eta^2 = .637$. The effect size for diagnosis was somewhat stronger for females than for males, with lower scores for females than males.
Table 16.

Social Skills: Two-Way ANOVA of Sex, Diagnosis, and Sex and Diagnosis

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>p</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>3.48</td>
<td>1</td>
<td>3.48</td>
<td>9.36</td>
<td>.002</td>
<td>.023</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>185.72</td>
<td>1</td>
<td>185.72</td>
<td>500.01</td>
<td>.000</td>
<td>.555</td>
</tr>
<tr>
<td>sex * diagnosis</td>
<td>2.07</td>
<td>1</td>
<td>2.07</td>
<td>5.53</td>
<td>.019</td>
<td>.014</td>
</tr>
<tr>
<td>Error</td>
<td>148.95</td>
<td>401</td>
<td>.371</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>4029.75</td>
<td>405</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 16. Interaction Between Social Skills and Diagnosis
**Self-Esteem.** Results revealed that variances were reasonably homogeneous (Levene’s, \( p > .05 \)). The means and standard deviations of males who are typical and autistic and females who are typical and autistic are reported in Table 17.

Table 17

**Self-Esteem: Means and SD of Males and Females With and Without a Diagnosis**

<table>
<thead>
<tr>
<th>Sex</th>
<th>Diagnosis</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>male</td>
<td>Typical</td>
<td>3.00</td>
<td>.720</td>
<td>141</td>
</tr>
<tr>
<td></td>
<td>Autistic</td>
<td>2.00</td>
<td>.725</td>
<td>122</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>2.52</td>
<td>.880</td>
<td>263</td>
</tr>
<tr>
<td>female</td>
<td>Typical</td>
<td>3.18</td>
<td>.585</td>
<td>107</td>
</tr>
<tr>
<td></td>
<td>Autistic</td>
<td>1.66</td>
<td>.577</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>2.80</td>
<td>.877</td>
<td>142</td>
</tr>
</tbody>
</table>

| Total | Typical | 3.07 | .670 | 248 |
|       | Autistic| 1.91 | .706 | 157 |
As can be seen from Table 18, the results of the two-way ANOVA revealed no statistically significant main effect for sex, $F(1, 401) = .917, p = .339, \eta^2 = .002$. However there was a statistically significant main effect for diagnosis, $F(1, 401) = 261.96, p < .001, \eta^2 = .395$, and for the interaction between sex and diagnosis, $F(1, 401) = 10.80, p < .001, \eta^2 = .026$. This interaction is shown in Figure 17. Due to the statistically significant interactions, simple effects of diagnosis were computed separately for males and females. There were statistically significant differences found between males presenting as typical and those diagnosed with autism, $F(1,261) = 121.53, p < .001, \eta^2 = .318$, and also between females presenting as typical and those diagnosed with autism, $F(1,140) = 135.68, p < .001, \eta^2 = .492$. 
Table 18

*self-Esteem: Two-Way ANOVA of Sex, Diagnosis, and Sex and Diagnosis*

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>.420</td>
<td>1</td>
<td>.420</td>
<td>.917</td>
<td>.339</td>
<td>.002</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>120.08</td>
<td>1</td>
<td>120.08</td>
<td>261.96</td>
<td>.000</td>
<td>.395</td>
</tr>
<tr>
<td>sex * diagnosis</td>
<td>4.95</td>
<td>1</td>
<td>4.95</td>
<td>10.80</td>
<td>.001</td>
<td>.026</td>
</tr>
<tr>
<td>Error</td>
<td>183.81</td>
<td>401</td>
<td>.458</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3108.12</td>
<td>405</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Figure 17. Interaction between Self-Esteem and Diagnosis*
Emotional Regulation. Results revealed that variances were not significantly different across sex and diagnosis (Levene’s Test, \( p > .05 \)). The means and standard deviations of males who are typical and autistic and females who are typical and autistic are reported in Table 19.

Table 19.

Emotional Regulation: Means and SD of Males and Females With and Without a Diagnosis

<table>
<thead>
<tr>
<th>Sex</th>
<th>Diagnosis</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>male Typical</td>
<td>3.31</td>
<td>.716</td>
<td>141</td>
<td></td>
</tr>
<tr>
<td>Autistic</td>
<td>2.68</td>
<td>.703</td>
<td>122</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3.02</td>
<td>.775</td>
<td>263</td>
<td></td>
</tr>
</tbody>
</table>

| female Typical | 3.60 | .507 | 107 |
| Autistic | 2.34 | .630 | 35 |
| Total | 3.29 | .765 | 142 |
As see in Table 20, the results of the two-way ANOVA revealed statistically significant main effects for diagnosis, $F(1, 401) = 155.93, p < .001, \eta^2 = .28$, and for the interaction between sex and diagnosis, $F(1, 401) = 17.44 p < .001 \eta^2 = .042$. However, there was no statistically significant main effect for sex, $F(1, 401) = .068, p = .80$. This interaction is shown in Figure 18. Due to the statistically significant interaction, simple effects of diagnosis were computed separately for males and females. There were statistically significant differences found between males presenting as typical and diagnosed with autism, $F(1,261) = 51.23, p < .001, \eta^2 = .16$, and also between females presenting as typical and those diagnosed with autism, $F(1,140) = 143.82, p < .001, \eta^2 = .51$. 

<table>
<thead>
<tr>
<th></th>
<th>Typical</th>
<th>3.43</th>
<th>.650</th>
<th>248</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autistic</td>
<td>2.60</td>
<td>.700</td>
<td>157</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3.11</td>
<td>.782</td>
<td>405</td>
<td></td>
</tr>
</tbody>
</table>
Table 20.

*Emotional Regulation: Two-Way ANOVA of Sex, Diagnosis, and Sex and Diagnosis*

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>.029</td>
<td>1</td>
<td>.029</td>
<td>.068</td>
<td>.795</td>
<td>.000</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>67.02</td>
<td>1</td>
<td>67.02</td>
<td>155.93</td>
<td>.000</td>
<td>.280</td>
</tr>
<tr>
<td>sex * diagnosis</td>
<td>7.50</td>
<td>1</td>
<td>7.50</td>
<td>17.44</td>
<td>.000</td>
<td>.042</td>
</tr>
<tr>
<td>Error</td>
<td>172.36</td>
<td>401</td>
<td>.430</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>4170.25</td>
<td>405</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Figure 18. Interaction Between Emotional Regulation and Diagnosis*
Correlations were also computed between age, and the social skills, emotional regulation, and self-esteem subscales as well as between all subscales. As seen in Table 21, the social skills and self-esteem subscales had the strongest correlation ($r = .77$). None of the subscales and age were significantly correlated.

Table 21.

*Correlations Between Subscales and Age*

<table>
<thead>
<tr>
<th></th>
<th>SS</th>
<th>ER</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>age</td>
<td>.23**</td>
<td>.223*</td>
<td>.12**</td>
</tr>
<tr>
<td></td>
<td>.000</td>
<td>.000</td>
<td>.006</td>
</tr>
<tr>
<td>N</td>
<td>405</td>
<td>405</td>
<td>405</td>
</tr>
<tr>
<td>SS</td>
<td>1</td>
<td>.68**</td>
<td>.77**</td>
</tr>
<tr>
<td></td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>405</td>
<td>405</td>
<td>405</td>
</tr>
<tr>
<td>ER</td>
<td>.68**</td>
<td>1</td>
<td>.58**</td>
</tr>
<tr>
<td></td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>405</td>
<td>405</td>
<td>405</td>
</tr>
</tbody>
</table>

*Note.* *p < .05  **p < .01
CHAPTER 4
DISCUSSION

This study was conducted because currently there are very few assessments that can accurately measure social deficits among children with Asperger’s (AS) and high functioning autism (HFA). Children with AS/HFA are affected in all areas of development, especially social development. Current assessments only assess social skills, and do not measure the complexities of social interactions among peers. In order for peers to appropriately interact with one another, children need to develop a level of social competence. Although there are several scales that measure social competence in children, none of them are designed to capture the social deficits that children with AS/HFA struggle with. Thus, it was important for the researcher to develop a reliable and valid scale that could be used to assess the social competence in all children including those with AS/HFA.
The present study was conducted to answer the following research questions:

Does the Children’s Social Competence Scale (CSCS) reflect the three identified domains (i.e., social skills, social-emotional regulation, and self-esteem) and factor appropriately into the three domains?

Is the use of the response scale appropriate for the Children’s Social Competence Scale?

Does the Children’s Social Competence Scale evidence adequate reliability?

Does the Children’s Social Competence Scale evidence content validity and construct validity?

Summary of Results

The researcher began the study by following the scale development procedure created by DeVellis (2003). The CSCS was constructed in four phases: Planning, Construction, Quantitative Evaluation, and Validation. During the planning phase the researcher determined Social Competence to be comprised of three domains (i.e. social skills, self-esteem, and social-emotional regulation). Through the literature review and interviews the researcher created an item pool of 90 items (30 items per factor). DeVellis (2003) recommended that there should be at least three times as many items as needed when first developing a scale.
The 90 items were reviewed and rated by an expert panel. Then cognitive interviews were conducted in order to determine which items should be eliminated. Based on the results of the expert panel and the cognitive interviews the CSCS items were decreased by half. For the pilot study the CSCS consisted of 45 items (15 items per factor).

Pilot data were collected on 200 female and male children between the ages of 3 and 8 with and without a diagnosis of AS/HFA. All the children attended Connect Us, a non-profit organization that offers afterschool playgroups to all children. An exploratory factor analysis (EFA) was conducted and the results revealed that the structure of the CSCS was represented by four components. Within the fourth component there was one item (*Acts Impulsively*). Since that was the only item that loaded on that component it was eliminated, thus leaving three components. Items that cross-loaded were also eliminated. After all the items were eliminated the CSCS consisted three factors with 34 items (13 items represented social skills, 13 items represented self-esteem, and 8 items represented social-emotional regulation. This three factor 34-item scale was then administered in the field administration.
A field administration was conducted with 405 female and male children between the ages of 3 and 8 with and without a diagnosis of AS/HFA. Like the pilot study these children attended Connect Us. Confirmatory factor analysis (CFA) was used to determine the structural validity of the scale. The CFA results revealed that the CSCS was not represented by three factors with 34 items. Based on the modification indices, the researcher discovered that many of the items within the factors were highly correlated with one another. This was in part due to the beginning stages of scale development. When creating the items in the item pool, the researcher wanted to express a similar idea but in different ways. Many of the items in the item pool were purposely created to be redundant. For example, within the social skills factor, the items, “asks questions in conversations” and “is inquisitive while engaged in conversation,” mean the same thing--they are just expressed differently. Even though these items were similar, the researcher included both of these items in order to see the raters’ preference. DeVellis (1991) mentions that redundancy is not bad when developing a scale, however it could affect the final results if too many items are redundant on the final scale.
Redundancy between items within the factors of the CSCS led to poor discriminant validity. Discriminant validity occurs when two items are highly correlated with each other and are not distinct (Brown, 2006). Brown suggests that respecification should be conducted to improve the parsimony and interpretability of the CFA model. Rather than collapsing the correlated items, the researcher decided to delete the items that were highly correlated with one another. It was hypothesized that deleting the highly correlated items would lead to model fit. The researcher determined that items that were correlated with multiple items should be deleted. The deletion of the remaining items was based on the researchers knowledge and expertise within the field. For example, within the social skills factor SS6 (asks questions in conversations) and SS9 (able to join an ongoing conversation with peers) have similar meanings and were highly correlated with one another. Since SS9 was also correlated with SS10 and SS13, the researcher decided to delete SS9. The researcher systematically continued this process with all the items within the three factors. The researcher deleted a total of 18 items. The respecified model of the CSCS consisted of three factors with 16 items (social skills contained 7 items, self-esteem contained 5 items, and social-emotional regulation consisted of 4 items).
A CFA was run on the second model and the results demonstrated a three factor 16 item structure still did not fit the CSCS. The researcher decided to run a CFA on each of the factors individually. Aside from the social-emotional regulation factor, the other two factors (social skills and self-esteem) data did not fit a one-factor structure. The modification indices revealed that many of the items within these two factors had highly correlated error terms. Correlated error terms represent the hypothesis that the unique variances of the associated items overlap (Netemeyer et al., 2003). That is the items within these two factors are measuring something in common rather than singly social skills and self-esteem. Netemeyer et al. argues that correlations among error terms can cause serious problems with interpretation of the model and vastly reduce the likelihood of replication. Based on this, the researcher carefully evaluated each of the items with highly correlated error terms and deleted the items that made the most theoretical sense to eliminate. Three items were deleted within the social skills factor and one item was eliminated within the self-esteem factor.

Once the items with highly correlated error terms were deleted, a CFA was run on the one factor social skills and self-esteem models. The results showed that all the one factor models fit the data. The researcher then combined all three factors and ran a CFA. The final results revealed that the structure of the
CSCS was represented by three factors with 12 items (4 items represent social skills, 4 items represent self-esteem, 4 items represent social-emotional regulation). Refer to Appendix G for the final scale.

In addition to running a CFA, Rasch analysis was used to determine item fit within each of the three factors. Data for each of the three factors was reassessed using WINSTEPS. The overall fit of each of the three subscales was found to be unidimensional, concluding that the final structure of the CSCS is represented by three factors, 12 items. Reliability estimates for each of three factors were high in both the pilot study and field administrations. The internal consistency of each of the three subscales was found to be adequate. Reliability of person separation was analyzed for each of the subscales, and the item set was highly internally consistent for each of the subscales.

Due to time constraints the same raters were used for both the pilot study and the field administration. FACETS was used to assess rater bias. Results revealed that raters appeared similar in their rating of social skills and emotional regulation. However, raters within self-esteem were more divergent. There were some clear differences in scale scores. This could possibly occur because the raters knew the children and knew their diagnoses, thus causing rater contamination.
The present study found evidence supporting the validity of the CSCS. Significant positive correlations were found between the three subscales of the CSCS (social skills, self-esteem, and social-emotional regulation) and the SCS-TV (prosocial behaviors, emotional self-regulation, and academic skills). One reason is that many of the items in the academic subscale were very similar to some of the items in the self-esteem subscale. Based on these findings one concludes that self-esteem and academic skills are related to one another, at least as measured by the academic skills items on the SCS-TV. The researcher also assessed intake information. Parents were asked to rate their children on a series of words and how they related to their child socially. The researcher identified three words that would represent social skills (friendly, introvert, and extrovert), three words that would represent self-esteem (leader, confident, and self-motivated), and three words that would represent social-emotional regulation (sensitive, impulsive, and rigid). Significant correlations were found between the parent’s ratings of their children and the subscales of the CSCS. This finding not only supported additional validity of the CSCS, but also revealed that the scores of the CSCS significantly correlate to how parents view their children socially.

This scale was originally developed to assess the social competence in children with AS/HFA. However, based on the results, the assessment can be
used to assess all children between the ages of 3 and 8 with or without a
diagnosis. The results showed that within social skills, self-esteem, and social-
emotional regulation there were significant differences for sex and diagnosis.
Within all three subscales significant interactions were found between sex and
diagnosis. In both the self-esteem and social-emotional regulation there was no
significant main effect for sex, however, there was a significant main effect for
diagnosis. One would expect children with AS/HFA to score lower on these
subscales. However, there were significant main effects found for both sex and
diagnosis within the social skills subscale. When additional analyses were run it
was found that girls with AS/HFA scored lower than boys with AS/HFA. In
addition, based on the effect sizes in the follow-up there were differences between
the means of small (girls) and large groups (boys). The means for small groups
(girls) is lower than the mean for large groups (boys).

Research has shown that boys and girls socialize differently (Holmberg et
al., 2008). Girls acquire language quicker than boys, girls develop social skills
sooner than boys, and girls are more verbal and boys are more physical
(Holmberg et al.) All of the items within the social skills subscale require a child
to have language in order to socially engage with their peers. For example on of
the items is, \textit{sustains age appropriate conversations}. Based on the above
research, boys would not have to use that much language in order to engage in an age appropriate conversation. On the other hand a girl would have to have more language. Since one of the core deficits in AS/HFA is language, girls would score lower than males within the social skills subscale, as they would be compared to their same-sex peers.

Limitations

There are several limitations to this study. To begin with, data collected for the field administration were collected under time constraints. The data for 405 children were collected within eleven days. This limited time may have affected the way in which the raters assessed each child. The child may not have been assessed as accurately due to the limited amount of time the rater was given to assess each child. In addition, due to the time constraints, the same four raters that were used for the pilot study were also used for the field administration. These raters also had previous interactions with the participants and had prior knowledge as to whether the children had a diagnosis of AS/HFA or not, thus potentially causing rater contamination.
For future studies, it would be important to vary the types of professionals that rate the children. This would include teachers, speech pathologists, and occupational therapists, etc. Using various types of raters and adding more time to collect data would help each rater look at each child objectively. It would also be important to include raters that had no previous knowledge of the child’s diagnosis and no previous interactions with the child they are assessing. Rater bias would need to be assessed in future work, along with effects of providing training on rater bias.

Another limitation to the study was that all the children that were assessed attended Connect Us. Connect Us is an afterschool program that helps children with social development. All the children being assessed were already receiving some sort of social intervention, including those with AS/HFA. This variable could have affected how the children with AS/HFA scored on the CSCS as opposed to children who have had no previous social intervention. When using the CSCS in future research it would be important to assess children in their natural play environments (i.e., recess) to see how they socially interact with their peers with no facilitated support. It would also be important to consider if the child has had previous social skills interventions of if he/she is currently receiving any type of social intervention.
Suggestions for Future Research

A scale that is sensitive to identifying the social needs of children with AS/HFA may prove to be valuable to use in an elementary school setting. This scale can be used to identify the social deficits of children with AS/HFA. Once the social deficits are identified the items on this scale can be used as a guide in writing social goals, speech goals, and social-emotional regulation goals in a child’s IEP. In addition, this scale is cost effective to implement and requires very little training for someone who has some knowledge of child development. Teacher’s, speech pathologists, occupational therapists, special education teachers, and para-professionals could use the scale immediately as long as they have had some exposure to working with children. This scale was developed so it could be used and implemented by various types of professionals. Lastly, this scale was designed not only to assess children with AS/HFA, but all types of children. This scale can be beneficial for a teacher to assess children without a diagnosis who struggle socially (e.g., shy children, aggressive children, children that are bullies, etc.) The scale would provide the teacher with information about the social needs of the child being assessed. For example, a child who is shy and does not play with other children at recess may have trouble with self-esteem. So the teacher might want to set goals around building that child’s self-esteem.
Another example is a child that is bullying other children on the playground might have trouble with social-emotional regulation. The teacher might want to focus on setting goals that would help that child with social-emotional regulation. Since the CSCS can be beneficial to use in elementary school settings there are many recommendations for future research.

Some recommendations would be to diversify the population in which this scale is used for (i.e., children with Fragile X, Down’s Syndrome, Fetal Alcohol Syndrome, etc.) to see if it would yield results similar to those of the present study. It is also recommended that this study be replicated in other settings such as various elementary school environments to determine how generalizable the results are. Another suggestion would be to replicate this study within different elementary schools within one school district, then open it up to other school districts. It would be important to assess children who are identified as having social struggles. The children being assessed should have no previous social intervention and they should be assessed in their natural play environments (i.e., recess). Multiple raters should be used (i.e., teachers, social workers, speech pathologists, aides, etc.) and they should have minimal knowledge/interactions with the child being assessed.
In addition, this scale could be used as a guide to develop appropriate social interventions that would help children with AS/HFA. Before entering a social intervention program the CSCS would be administered as a pre-test assessment. Based on the scores, social deficits would be identified and an intervention program would be implemented (e.g., 8-week program that would focus on increasing social competence). After the intervention is complete the CSCS would be used as a post-test measure in determining and understanding the effectiveness of different types of social interventions.

Lastly, it would be recommended that the CSCS be used to see if there is a difference in how parents view their child socially and how educators/professionals view their child. A correlational study could be conducted in which data would be collected from both parents and professionals. Correlations would be calculated to see if parents view their child differently from educators/professionals. Additionally, research is important to help support the reliability and validation of the CSCS. Ultimately efforts should be made in standardization of this scale since it would not only benefit children with AS/HFA, but all children who struggle socially.
Conclusion

In sum, the findings of this present study support the reliability and validity of the CSCS. The CSCS is represented by three factors: social skills, self-esteem, and social-emotional regulation and measures social competence in children between the ages of 3 and 8. This scale is also useful for assessing the social competence in children with AS/HFA. Since the CSCS only contains 12 items it is simple to use, time efficient, and a variety of people can potentially use it such as teachers, aides, speech pathologists, parents, etc. It is implemented in the child’s natural play environment, thus making it cost effective, especially for schools. The CSCS can be used in identifying social deficits in children who struggle socially and used as a guide to writing social IEP goals. Lastly, the CSCS could also be used within private practice settings as a tool for identification, setting goals, and determining the nature of social interventions that are needed. Aside from having support for measure reliability and validity this scale is also easy to administer, cost effective, and practical. Overall, the CSCS has support as a valuable tool for assessing the social competence of children between the ages 3-8 with and without a diagnosis who struggle socially.
References


Linacre, J. M. (personal communication, April 19, 2011).


APPENDIX A

IRB Approval

The following human subjects protocol application has been approved by the IRB, effective 07/13/2010.

Protocol Director: Annette Nunez
Protocol Title: The Reliability and Validity of the Children's Social Competence Scale
Protocol Number: 2010-1480
Submission include Connect Us Letter of Support, Expert Review Request Letter, Response Form for Expert Viewers

For New/Renewals

The Institutional Review Board for the Protection of Human Subjects has reviewed the above named project. The project has been approved for the procedures and subjects described in the protocol for a period of 12 months. This information must be updated on a yearly basis, upon continuation of your IRB approval for as long as the research continues. Please submit any changes, revisions and unanticipated events reports in a prompt manner. We will send you a courtesy continuation/renewal email reminder as this expiration date approaches.

For Revisions

The Institutional Review Board for the Protection of Human Subjects has reviewed revisions to the above named project. The revision has been approved for the procedures and subjects described in the protocol. The expiration date for this revision is the same as the original IRB approved application. Revisions do not extend the approval period.

The Institutional Review Board appreciates your cooperation in protecting subjects and ensuring that each subject gives a meaningful consent to participate in research projects. If you have any questions regarding your obligations under the Assurance, please do not hesitate to contact Research Compliance at du-irb@du.edu
APPENDIX B

Example Items of the Children’s Social Competence Scale

Subscale 1: Social Skills
Aks questions on various subjects
Responds to being introduced to others
Able to be inquisitive with another during a conversation
Politely excuses him/herself to others
Initiates introductions with others
Able to join a conversation with peers
Exhibits the ability to compromise with others
Responds to introductions appropriately
Asks peers to join in social activities
Maintains a conversation with two or more peers

Subscale 2: Social Emotional-Regulation
Comprehends others feelings and emotions.
My child plays well with others.
My child is able to help others with difficult tasks
Can accept things when not in his/her favor.
Ability to sympathize with others
Comprehends humor and sarcasm
Can calm down when upset
Has the ability to see “both sides” of a story
Offers assistance to others
De-escates when anxious or under stress

Subscale 3: Self-Esteem
Copes with personal failure
Encourages others
Accept compliments from peers
Is positive around others
Is respectful
Expresses positive thoughts
Happy with others actions
Is enthusiastic
Self-Initiates
Cooperates with others
Appendix C

Children’s Social Competence Scale
Response Form for Expert Review

Directions: Below is a list of three subscales (i.e., Social Skills, Social-Emotional Regulation, and Self-Esteem). There are thirty items within each of the three subscales. Please rate each item on the 4-point scale below. Items are to be rated on how well they represent the domain, how clear each item is worded, and how difficult each item is.

Subscale 1: Social Skills
Asks questions on various subjects

<table>
<thead>
<tr>
<th>REPRESENTATION:</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>Adequate</td>
<td>Good</td>
<td>Excellent</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CLARITY:</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>Adequate</td>
<td>Good</td>
<td>Excellent</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ITEM DIFFICULTY:</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy</td>
<td>Somewhat Easy</td>
<td>Somewhat Hard</td>
<td>Hard</td>
<td></td>
</tr>
</tbody>
</table>

Subscale 2: Social Emotional-Regulation
Comprehends others feelings and emotions

<table>
<thead>
<tr>
<th>REPRESENTATION:</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>Adequate</td>
<td>Good</td>
<td>Excellent</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CLARITY:</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>Adequate</td>
<td>Good</td>
<td>Excellent</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ITEM DIFFICULTY:</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy</td>
<td>Somewhat Easy</td>
<td>Somewhat Hard</td>
<td>Hard</td>
<td></td>
</tr>
</tbody>
</table>

Subscale 3: Self-Esteem
Copes with personal failure

<table>
<thead>
<tr>
<th>REPRESENTATION:</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>Adequate</td>
<td>Good</td>
<td>Excellent</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CLARITY:</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>Adequate</td>
<td>Good</td>
<td>Excellent</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ITEM DIFFICULTY:</th>
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<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy</td>
<td>Somewhat Easy</td>
<td>Somewhat Hard</td>
<td>Hard</td>
<td></td>
</tr>
</tbody>
</table>

Is this subscale comprehensive? Yes ______ No _______
Which item numbers would you delete?

Suggestions for additional items:
APPENDIX D

Expert Review Request Letter

Expert Review Letter:

Dear [insert person’s name],

Hello! My name is Annette Nunez. I am a doctoral candidate in the Morgridge College of Education's Quantitative Research Methods Program. I am validating a scale of social competence for children.

The enclosed survey asks you to evaluate how representative the items are of the content domain of social competence. That is, to what extent do you think each question on the survey measures social skills, social-emotional regulation, and self-esteem. Since social competence is comprised of several different factors, you are asked to indicate which factor the item measures. The clarity of each item is another important aspect for you to evaluate. Specifically, indicate how clear you think each item is. Then, please rate each item within its domain in terms of how difficult you think the item is to agree with. Finally, you are asked to evaluate the overall comprehensiveness of the entire scale by either adding or deleting items and providing general comments.

I intend the results of this study to help professionals identify those children who struggle socially.

If you are willing to participate in the expert review of my scale please complete the enclosed survey.

Thank you for you time and support!

Sincerely,

Annette Nunez, LMFT
APPENDIX E
Consent Form

DISSERTATION RESEARCH
Reliability and Validity of the Children’s Social Competence Scale

You are invited to participate in a study that will study the reliability and validation of the Children’s Social Competence Scale. You will be asked to evaluate items on the scale for difficulty, quality, and appropriateness. In addition, this study is being conducted to fulfill the requirements of a doctoral dissertation. The study is conducted by Annette Nunez. Results will be used to fulfill the requirements for the degree in Doctorate of Philosophy and for publication and presentation. Annette Nunez can be reached at (303) 243-4812 or anunez@du.edu. This project is supervised by my dissertation advisor, Dr. Kathy Green, Morgridge College of Education, University of Denver, Denver, CO 80208, 303-871-2490, kgreen@du.edu).

Participation in this study should take about 60 minutes of your time. Participation will involve responding to 90 questions about social competence in children. Participation in this project is strictly voluntary. The risks associated with this project are minimal. If, however, you experience discomfort you may discontinue the interview at any time. We respect your right to choose not to answer any questions that may make you feel uncomfortable. Refusal to participate or withdrawal from participation will involve no penalty or loss of benefits to which you are otherwise entitled.

Your responses will be identified by code number only and will be kept separate from information that could identify you. This is done to protect the confidentiality of your responses. Only the researcher will have access to your individual data and any reports generated as a result of this study will use only group averages and paraphrased wording. However, should any information contained in this study be the subject of a court order or lawful subpoena, the University of Denver might not be able to avoid compliance with the order or subpoena. Although no questions address it, we are required by law to tell you that if information is revealed concerning suicide, homicide, or child abuse and neglect, it is required by law that this be reported to the proper authorities.

If you have any concerns or complaints about how you were treated during the
interview, please contact Dr. Dennis Wittmer, Chair, Institutional Review Board for the Protection of Human Subjects, at 303-871-2431, or Sylk Sotto-Santiago, Office of Research and Sponsored Programs at 303-871-4052 or write to either at the University of Denver, Office of Research and Sponsored Programs, 2199 S. University Blvd., Denver, CO 80208-2121.

You may keep this page for your records. Please sign the next page if you understand and agree to the above. If you do not understand any part of the above statement, please ask the researcher any questions you have.

I have read and understood the foregoing descriptions of the study called the Reliability and Validity of The Children’s Social Competence Scale. I have asked for and received a satisfactory explanation of any language that I did not fully understand. I agree to participate in this study, and I understand that I may withdraw my consent at any time. I have received a copy of this consent form.

Signature _____________________ Date _________________

____________ I would like a summary of the results of this study to be mailed to me at the following postal or e-mail address:
## Social Competence Scale — Teacher Version

**APPENDIX F**

### Social Competence Scale — T

**INSTRUCTIONS:** Please rate each of the listed behaviors according to how well it describes this child.

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Very Well</th>
<th>Moderate Well</th>
<th>Need some Help</th>
<th>Hard At All</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Functions well even with distractions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Can accept things not going his/her way</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.Copies well with failure</td>
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<td></td>
</tr>
<tr>
<td>4. Is a self-starter</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Works well without adult support</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Accepts legitimate imposed limits</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Expresses needs and feelings appropriately</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Takes turns properly</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Resists peer pressures on his/her own</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Stays on task</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Can calm down when excited or all wound up</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Can work in team promptly when necessary</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Very good at understanding other people's feelings</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Is aware of the effect of his/her behavior on others</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Works well in a group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Plays by the rules of the game</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Pays attention</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. Dominates group when there is a disagreement</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. Shares materials with others</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. Cooperates with peers without prompting (PD/ODMC)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. Follows teacher's verbal directions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. Is helpful to others</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. Listens to others' points of view</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. Can give suggestions and opinions without being bossy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25. Acts friendly toward others</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX G

Final Version of The Children’s Social Competence Scale

**Children’s Social Competence Scale**

Directions: Please rate the child on each item below using a 1-4 scale based on how frequently the behavior is observed with

<table>
<thead>
<tr>
<th>SOCIAL SKILL</th>
<th>Never</th>
<th>Rarely</th>
<th>Occasionally</th>
<th>Frequently</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Collaborates with peers during play</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. Can enter an existing play schema</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. Sustains age appropriate conversations</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. Stays engaged during play</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

**SOCIAL-EMOTIONAL**

1. Remains calm when things don’t go his/her way  
2. Maintains composure when losing a game         
3. Controls temper during disagreements           
4. Calms down when upset                          

<table>
<thead>
<tr>
<th>SOCIAL-EMOTIONAL</th>
<th>Never</th>
<th>Rarely</th>
<th>Occasionally</th>
<th>Frequently</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Remains calm when things don’t go his/her way</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. Maintains composure when losing a game</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. Controls temper during disagreements</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. Calms down when upset</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

**SELF ESTEEM SCALE**

1. Makes positive statements about self               
2. Encourages others to do their best                 
3. Secure with oneself during play                    
4. Shares his/her point of view with others           

<table>
<thead>
<tr>
<th>SELF ESTEEM SCALE</th>
<th>Never</th>
<th>Rarely</th>
<th>Occasionally</th>
<th>Frequently</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Makes positive statements about self</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. Encourages others to do their best</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. Secure with oneself during play</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. Shares his/her point of view with others</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>