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Graduate School of Education and Psychology

ASSESSMENT AND DIAGNOSIS OF AUTISM SPECTRUM DISORDER IN LATINO CHILDREN

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by

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DEDICATION

This work is dedicated to my father Dr. Alfred W. Sloan and to his father, Dr. Ketchum Sloan and to my great-grandfather Dr. Bertrum Doyle and to my great-great-grandfather Dr. William Baton Ball and the countless others in my family who have gone before me and upon whose shoulders I now stand.

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ABSTRACT

There is an increase in the number of children who are diagnosed with autism spectrum disorder. However, significant racial and ethnic disparities exist in the diagnosis and treatment of the disorder. Based on the literature, Latino children appear to be under diagnosed or misdiagnosed with other psychological disorders rather than autism spectrum disorder. In addition, Latino children are typically diagnosed at a later age than their White peers. There is almost no research devoted to the assessment of autism spectrum disorder with young Latino children and there is insufficient research related to cultural perceptions of symptoms which can influence parental report. There is an increasing need to provide culturally appropriate Spanish language assessment to Latino children and their families. Therefore, this dissertation provides a critical review of those tests that are frequently cited in the literature or available in Spanish for use in the neuropsychological assessment of young Latino children suspected of having autism spectrum disorder within the following domains: Social Communication and Social Interaction; Speech, Language and Communication; Restricted, Repetitive Behaviors, Interests or Activities; Sensory Processing/Sensory Integration and; Developmental and Adaptive Functioning. Tests used to aid in the differential diagnosis of autism spectrum disorder and other emotional and behavioral disorders in Latino children are also included. A few select tools are recommended for use with this population to be used as a resource for those clinicians serving this population.

Chapter I. Introduction

Although the American Psychological Association (APA) and other professional organizations (American Psychological Association, 2002, 2003, 2008; Wetherby & Diehl, 2006) fully recognizes the professional and ethical responsibility to engage in culturally competent practices, the field of psychology continues to use standardized psychological tests that are often predicated on Eurocentric assumptions (Dana, 2000b) and cannot be indiscriminately used with young children who differ from the normative population (Padilla, 2001). Psychological assessment of children includes a clinical interview and psychological tests that are often administered to assess for cognitive, academic, personality, and emotional functioning. Although these tests are considered essential tools to some in the field of psychology, there is significant controversy as to the clinical value of psychological testing with children from ethnic populations.

Culture and socioeconomic status can complicate the assessment process and lead to an inaccurate diagnosis, discrepancies or delays in diagnosis (Mandell, Listerud, Levy, & Pinto-Martin, 2002; Mandell, Ittenbach, Levy, & Pinto-Martin, 2007). Children from varying backgrounds interpret test items differently, bring to the test situation differing expectations and knowledge, and usually do not score as high as members of the mainstream culture on standardized tests. This creates test bias that gives an unfair advantage to one group of children over another (Padilla, 2001; Roysircar, 2005). Lower socioeconomic class and ethnocultural status have long been associated with lower levels of performance on all types of assessment measures (Padilla, 2001). Although the numbers vary across states and school districts, Latino children are frequently overrepresented in special education classes (Guiberson, 2009). In addition, most culturally diverse children of preschool age have not interacted extensively in structured group situations such as a preschool program. These children have experienced learning through the family, primarily at home, which may be isolated from the mainstream culture (Padilla, 2001). This variation in educational opportunity, parent's educational achievement, family language spoken in the home, and socialization experiences, can ultimately influence the child's test performance (Crais & Roberts, 2004) and lead to inaccurate assessment results (M. Williams, Atkins, & Soles, 2009). Furthermore, reliability and validity of a test used with a child of a different cultural and linguistic group who were not included in the standardization group is problematic (Padilla, 2001).

Outdated testing methodologies may not fairly assess the psychological needs of diverse cultural groups. Traditional assessment practices, such as paper and pencil tests often minimize the uniqueness of groups, since the purpose of these objective measures is to simply compare how one contrasts to established norms. In addition, the methodologies often used to develop tests and establish the normative data do not often adequately address how cultural differences may influence how clients respond, the selection of the normative sample used to derive the standardization data, and the interpretation of the test findings (Padilla, 2001). Not taking into account cultural issues in test development limits the applicability of these tests to a select group of clients (Dana, 1998a, 1998b, 2000a). Cultural variables connected to the group of origin can include the type of acculturating group, socio-economic status, and family and community structure (Takushi & Uomoto, 2001). An essential cultural variable that is often overlooked when assessing Latino children is the issue of language.

Variation in Spanish and English language fluency in Latino populations can further complicate the testing experience, unfortunately this may not always be adequately considered by clinicians. There are both cultural and linguistic factors that can influence the interpretation of assessment data for those children for whom English is not a first language (Overton, Fielding, & de Alba, 2007). Rosselli, Ardila, Bateman, and Guzman (2001) note that there are few neuropsychological tests available for Spanish speaking children even though Spanish is the third most spoken language in the world and the second most spoken language in the United States. In addition to the shortage of Spanish language tests, there is also a scarcity of bilingual psychologists who are able to administer the translated tests. Latino patients, especially immigrants, maintain the need for providers who speak Spanish. However, Latino physicians and clinicians continue to be few in number, especially in the states where the most Latinos reside (Hayes-Bautista, 2002). The model frequently used to assess language performance and competence in children is based on a monolingual view of language acquisition and functioning; however, there is a large population of children for whom English is not their first language and English may not be the only language they are exposed to (Padilla, 2001). In addition, current U.S. norms can be inappropriate and invalid when used with Spanish speaking children (Rosselli et al., 2001). Simply translating a test into the Spanish language remains problematic since test directions are oftentimes difficult to translate, psychological constructs are sometimes not universal across cultures and due to the great cost in translating an instrument and adapting a test, tests are seldom back translated to ensure equivalent meanings across languages and to assure validity (Padilla, 2001). This is especially important since meanings and idioms of expression often differ greatly across languages (Ton & Lim, 2006). Although adequately translated tests can assist in enhancing the accuracy of test results, it is also important to consider the child's cultural and individual differences such as English language proficiency, years of formal education, length of residence in the United States, immigration and acculturation status and socioeconomic status which all have an impact on the child's performance (Halgunseth, Ispa, & Rudy, 2006; Padilla, 2001). These considerations ensure culturally competent psychological assessment.

Psychological assessment is made culturally competent through a continuing process of substantive and methodological insertions and adaptations throughout the assessment and evaluation process, from the development or adaptation of an instrument, the administration of the measure, the scoring, analysis and interpretation of the scores. These insertions and adaptations are meant to connect the assessment and evaluation with the cultural characteristics of the child being studied (Padilla, 2001). Cultural competency in assessment is a complex process and requires that the clinician be proactive even before testing begins by receiving formal training in multicultural competent assessment practices (Fernandez, Boccaccini, & Noland, 2007). It is also important that the diagnostician be conscious of culturally specific behaviors or areas of development that have often not been considered in test theory or development (Padilla, 2001) and incorporate culturally appropriate explanations when interpreting and reporting the results (Acevedo-Polakovich et al., 2007).

Unfortunately, there is a lack of consensus on what constitutes cultural fairness (Padilla, 2001). There is also a lack of standard of practice to direct psychologists who assess ethnocultural children. Many clinicians are unaware of the complexity associated when assessing children from diverse cultural backgrounds. This is even more apparent as psychologists assess more and more Latino children and families; the largest ethnocultural population in the U.S. (Population Division, U.S. Census Bureau, 2009). Health and medical research continues to be primarily normed on the White population. However, when these theoretical models of illness are applied to the Latino population, the results are confusing and often not applicable when creating assessment, intervention or programs aimed at the Latino population (Hayes-Bautista, 2002). With the demographic shifts that are taking place in our society, the challenge to provide culturally appropriate testing to Latino children and their families is more relevant than ever.

Latino Population

It has been estimated that approximately one third of young children in the United States today are from culturally or linguistically diverse backgrounds (C. Zhang & Bennett, 2003). Hispanics (as described by the Census Bureau) are the largest ethnocultural group. In 2012 the Census Bureau reported that as of July 2011, there were 52 million Latinos living in the United States, which is 16.7 % of the U.S. population (U.S. Census Bureau, 2012b). Latinos are the fastest growing ethnic group and the Census projects that the Hispanic population is projected to triple to 132.8 million during the 2008 to 2050 period, and that Hispanics will constitute 30 % of the nation's population by that date (U.S. Census Bureau, 2012b). The Latino population is expected to experience continued sustained growth because of the higher birth rate and continued immigration from Mexico (Suarez-Orozco & Paez, 2002). In 2010, almost half of all the foreign born people living in the United States were Hispanic (U.S. Census Bureau, 2012b). Latinos have a higher fertility and birth rate than other ethnic groups. In fact, in 2011 Hispanics accounted for more than a quarter (26.3 %) of the nation's population under one year of age (U.S. Census Bureau, 2012a). In addition, Latina adolescents have a higher pregnancy rate than all other groups in the country (Hamilton, Martin, & Ventura, 2010). Although immigration is a significant contributor to the growth of the Latino population in the United States, growth from 2000 to 2010 was primarily due to births, not immigration (U.S. Census Bureau, 2012a). Statistically, Latinos are mostly young and urban, and are heavily represented in the Southern and Western United States with 46.7 % of New Mexico's residents being of Hispanic origin. In

2010, Los Angeles County, California had the largest Hispanic population of any county in the United States- 4.7 million (U.S. Census Bureau, 2012b). The educational attainment of Latinos is low. The U.S. Census Bureau reported that in 2010, of those 25 years and older, 62 % of Latinos possessed a high school diploma, compared to 87 % of Whites. Only 13 % of Latinos had a bachelor's degree or higher, compared to 30 % of Whites (U.S. Census Bureau, 2012c). In 2010, the median household income of Hispanics was $37,759 compared to $51,846 for White households (U.S. Census Bureau, 2012b). The poverty rate among Hispanic families continues to rise, with 26.6 % of Hispanics living at or below the poverty rate in 2010 (U.S. Census Bureau, 2012b). In addition, the U.S. Census Bureau reported that in 2011 the poverty rate for Hispanic children was 34.1 %, compared to 12.5 % of White children (ASPE Human Services Policy Staff, 2012). Latinos also continue to have double the unemployment rate of Whites (U.S. Census Bureau, 2012b).

Different nationalities compromise the Latino population and while sharing common cultural values, there is significant heterogeneity among its nationalities. Latinos encompass multiple races, ethnicities, cultures, traditions, social classes, have different reasons for immigrating and are bound together by historical ties to Latin American countries (Santiago-Rivera & Altarriba, 2002). Latinos represent a diverse group of individuals who have come to the United States from many different countries including Mexico, Cuba, Nicaragua, El Salvador, Panama, Puerto Rico, The Dominican Republic, Guatemala, Costa Rica, Ecuador, Peru and other Central, South American and Caribbean origins. An understanding of issues related to the assessment of Latinos requires an awareness of the commonalities and differences among individuals in this group.

There are many terms used to refer to the Latino population in the United States. The term *Hispanic* was created by the United States Census Bureau in the 1970s, and it is considered the official term for Latin American and Spanish speaking people in the United States (Comas-Díaz, 2001; Oboler, 1995; Stavans, 1995). The researcher will use the term *Latino* throughout the dissertation, while recognizing the diversity within this group. The term Latino acknowledges this identity from all Latin American countries (Comas-Díaz, 2001). Although many Latinos share similar values and beliefs, there are remarkable differences within this population and it is important to avoid drawing incorrect assumptions or stereotypes. There are however many unifying factors used by researchers to discuss Latinos in the aggregate including: the Spanish language, familismo, religion and spirituality, as well as interdependence of family and extended family (Brice, 2002). When studies do make references to specific cultural groups, the researcher will, in fact, recognize those ethnicities.

Service utilization and access to healthcare. Significant ethnic and racial disparities have been noted in medical health and mental health access to care and use of services including high uninsurance rates among Latino families (Alegría et al., 2002; Flores & Tomany-Korman, 2008; Kataoka & Zhang, 2002; F. J. Zimmerman, 2005). In addition, the Census Bureau reported that in 2011, one-third of Latinos (30.7%) did not have health insurance coverage, compared to only 15.4 % of Whites (U.S. Census Bureau, 2012b). Many Latino families and their young children experience significant barriers when accessing healthcare (Brousseau, Hoffmann, Yauck, Nattinger, & Flores, 2005; Flores et al., 2002), therefore delaying critical and necessary early assessment and intervention. In addition to a lack of health coverage, many Latino families do not have a family physician or regular place to follow-up (Flores & Tomany-Korman, 2008; Weinick & Krauss, 2000) and are unaware where to go for help. Studies also suggest language can be a significant barrier to accessing health care since Latinos who speak Spanish are less likely to have a regular source of medical care and have been noted to have lower health status (Flores, Abreu, & Tomany-Korman, 2005; Kirkman-Liff & Mondragón, 1991; Weinick & Krauss, 2000). Limited English proficiency may influence access to care and communication with a health care professional, since health care providers may not order diagnostic tests due to a lack of understanding about the person's description of symptoms (Bureau of Primary Healthcare, Health Resources and Services Administration, 2010). This can impact the healthcare for the young child of a Spanish speaking parent (Brice, 2002). Many Latinos will not attempt to acquire healthcare due to a distrust of the professional service system, perceived institutionalized discrimination by agencies or service providers, or fear due to immigration status (Croen, Grether, & Selvin, 2002; Schnittker, 2003). Although there is great variability among Latinos in the use of folk healers or folk remedies, some studies show that Latinos are more likely to use home remedies and utilize prayer or "spiritual healers" known as "espiritistas" (Brice, 2002; Overton et al., 2007; Romero, 2000). Many Mexican American families make frequent border crossings and seek assistance from a "curandero", before contacting a typical American health care provider which can also delay the diagnostic process (Mandell et al., 2002; Mandell et al., 2007; Overton et al., 2007; Romero, 2000). Latinos are also more likely to use public health facilities and emergency rooms (Chun-Chung Chow, Jaffee, & Snowden, 2003; Durden & Hummer, 2006), therefore, reducing the opportunity for continuity of care (Brice, 2002). A Latino infant is subsequently less likely to come into contact with a family physician or pediatrician who is more likely to utilize preventative screening and recognize symptoms commonly seen in infants later diagnosed with developmental disorders (Mandell et al., 2002; Mandell, Novak, & Zubritsky, 2005).

Acculturation and enculturation. Traditional beliefs, values and culture also affect the preventative health care behaviors of many Latino families. The differing degrees of identification and integration with native and mainstream cultural patterns, is often referred to as acculturation (Paniagua, 2010; B. L. Rodriguez & Olswang, 2003; Takushi & Uomoto, 2001). Acculturation can provide information about the extent to which the client engages in behaviors of their culture of origin or the U.S. culture. For example, as immigrants increase their amount of time as residents of the U.S., they also tend to increase their knowledge, access and use of the formal health care systems (Abraído-Lanza, Armbrister, Flórez, & Aguirre, 2006; Durden & Hummer, 2006). Assessing the family's acculturation level and views of traditional illness (Cuéllar, 2000; Halgunseth et al., 2006; Paniagua, 2010) and use of more traditional herbal treatments can also facilitate an accurate assessment and should be included in the assessment process (M. T. Stein, Flores, Graham, Willies-Jacobo, & Magana, 2004).

For example, in the Puerto Rican and Mexican culture (cultures with well-established religious or spiritual belief systems) mothers are sometimes held responsible and deemed guilty for a child with a severe disability. Furthermore, the child is believed to be punishment, a consequence of the parent's sins (Groce & Zola, 1993; Juarbe, 1996; McCallion, Janicki, & Grant-Griffin, 1997) or related to a curse or a spell (Kayser, 1998; Rogers-Adkinson, Ochoa, & Delgado, 2003; Varela, 1996). These cultural beliefs may result in the family seeking spiritual assistance and although religious faith may help the parents cope with their child with a developmental delay (Domingue, Cutler, & McTarnaghan, 2000), it can slow the help seeking process. Since there is sometimes a stigma attached to the birth of a child with a disability, some Latino parents may keep the child at home or hide him or her from others due to embarrassment or to protect the child from the criticisms of others (Groce & Zola, 1993; McCallion et al., 1997).

In contrast, some Latina mothers of children with severe disabilities believe in their spiritual role as a “sacrificing mother” with God having chosen them by giving them a special gift (Brice, 2002; McCallion et al., 1997). These Latino families often do not consider caring for their child as a burden and do not believe the child’s deficits need to be fixed; therefore intervening in order to ameliorate certain behaviors related to a developmental delay may be viewed as inappropriate (McCord & Soto, 2000). This cannot only reduce the child’s opportunities for socialization experiences, but may also lead to a delay in diagnosis and treatment. Since the obligation to care for an individual with a disability is considered a cultural preference in the Latino culture (Magilvy, Congdon, Martiniz, Davis, & Averill, 2000), Latino families are more likely to care for the child with a disability in the home, even through adulthood (Magaña & Smith, 2006b). The mothers receive strong support from their extended family and they may consequently take the responsibility of raising their child rather than using health services or behavioral support (D. B. J. Bailey, Skinner, Rodriguez, & Correa, 1999; Skinner, Bailey, Correa, & Rodriguez, 1999). The idea of strong family support, dedication, solidarity and cohesion is characterized by “familismo” (Brice, 2002; Magilvy et al., 2000; Shurgot & Knight, 2004). They may also be consulted and may actively participate in child rearing, family decision making, school activities, and health concerns or may act as referents in the care of a child with developmental delays (Brice, 2002). Some Latino families place extended value on family members and look at formal service providers as “strangers” and believe their use will result in failure (McCallion et al., 1997). This familial cohesion means some Latino families may prefer to “keep problems within the family” or may circumvent the use of professional services for the child, especially if the family’s values contradict the standards of the majority culture (Blancher, Lopez, Shapiro, & Fusco, 1997; Skinner, Correa, Skinner, & Bailey, 2001).

When working with Latino families and their children that have recently immigrated to the United States, it is also important to understand the concept of enculturation. Enculturation is a process by which a person learns what is required by the culture that encircles them. Immigrant families may experience difficulty during the enculturation process when attempting to balance their traditional cultural values with the values frequently modeled during the assessment process, in American schools and medical institutions, and in early intervention programs. This is often evident when parents feel they must reject their own traditions in order to implement interventions, assessment or other services with their child. For example, in one study of Latina mother-infant dyads, the mothers tended to be nonverbal and were non-directive when interacting with their infant, contradictory to methods often utilized in early intervention approaches. And although the mothers in the study were uncomfortable playing with their child on the floor they complied with requests by a professional during the early intervention play based program (Madding, 1999). Techniques such as token economies or psychopharmacological treatment (Gupta, 2004b), often used with children with autism but rarely used in non-Western cultures, may not "fit" with the expectations of parents and may also produce this sort of conflict (Liptak et al., 2008; Rogers-Adkinson et al., 2003). In fact, Levy and colleagues (Levy, Mandell, Merhar, Pinto-Martin, & Ittenbach, 2003) found that the families of Latino children with autism spectrum disorder were more likely to utilize complementary or alternative medicine (Gupta, 2004a) as part of the treatment. However, virtually nothing is known about how a "curandero" or other spiritual healer in the Latino community conceptualizes or treats the numerous symptoms often seen in individuals with the disorder. Unfortunately, some families conceal the use of traditional practices in their homes due to concern and fear that this may be misinterpreted and reported to police or social welfare services (Werner, Knobeloch, Erbach, & Anderson, 2001). This further emphasizes the difficulty many Latino immigrant families face when navigating the process of enculturation, as well as the importance of examining enculturation during the assessment process.

It is important to recognize that acculturation and ethnic identity are fluid, multiple and changing, and are dynamic processes that do not simply occur at one specific point in time. In addition, acculturation and enculturation can occur at the same time (Kim & Omizo, 2006). Understanding the family's level of acculturation and their cultural identity helps provide information related to the family's level of psychological mindedness and attitude towards the assessment (Lim, 2006; Takushi & Uomoto, 2001). While consideration of enculturation in the assessment process will assist in making conclusions that accurately describe the needs of the family and interventions that will fit within the context of the child's environment. Cultural differences will impact the family's understanding of the diagnosis, subsequent recommendations and treatment and the education of their children. One area in which this is most notable is in the appropriate and accurate assessment of autistic spectrum disorder.

Autism Spectrum Disorder

In the DSM-IV-TR (American Psychiatric Association, 2000), the diagnosis of Autistic disorder was one of three disorders categorized within the five pervasive developmental disorders including Asperger's disorder and Pervasive Developmental Disorder- Not Otherwise Specified. The two remaining pervasive developmental disorders were Rett's Disorder and Childhood Disintegrative Disorder. Autistic disorder was differentiated from other the other disorders by its' early onset and the combination of both social and communication impairment (American Psychiatric Association, 2000). The diagnosis of Autistic Disorder was updated in the most recent revision of the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition

(DSM-5; American Psychiatric Association, 2013). Under the DSM-5 criteria, the separate disorders are now included under one single umbrella of autism spectrum disorder. The current diagnosis of autism spectrum disorder encompasses disorders previously referred to as "early infantile autism, childhood autism, Kanner's autism, high functioning autism, atypical autism, pervasive developmental disorder not otherwise specified, childhood disintegrative disorder, and Asperger's disorder" (American Psychiatric Association, 2013). Individuals with autism spectrum disorder exhibit persistent deficits in social communication and social interaction and restricted, repetitive interests, behavior or activities. These symptoms must be present during early development and can be specified "with or without accompanying intellectual impairment"; "with or without accompanying language impairment"; "associated with a known medical or genetic condition or environmental factor"; "associated with another neurodevelopmental, mental or behavioral disorder"; or "with catatonia" (American Psychiatric Association, 2013). The new diagnosis includes symptoms that fall on a continuum from mild to severe to account for the variation in symptoms and due to the fact that severity can fluctuate over time. Studies suggest that most children diagnosed with a DSM-IV pervasive developmental disorder diagnosis, will retain their diagnosis of autism spectrum disorder, when using the new criteria (Huerta, Bishop, Duncan, Hus, & Lord, 2012). Since the DSM-5 was released in May of 2013, the majority of published studies have utilized the DSM-IV. Therefore, this dissertation will include those studies which employ the DSM-IV criteria while considering the implications when using the DSM-5.

Symptoms are evidenced in the second year of life- 12-24 months of age (American Psychiatric Association, 2013) and autism spectrum disorder is a lifelong disorder. Autism spectrum disorder has been conceptualized as a biologically determined set of behaviors that can occur with differing presentation and severity (American Psychiatric Association, 2000), most likely as a result of varying causes (S. Goldstein & Ozonoff, 2009). No two children with autism spectrum disorder have the same symptom set. Autism is four times more common among males than females (American Psychiatric Association, 2013; Autism and Developmental Disabilities Monitoring Network Surveillance Year 2006 Principal Investigators, 2009; Fombonne, 2003; Yeargin-Allsopp et al., 2003), however; when females have autism spectrum disorder they tend to exhibit accompanying intellectual disability (American Psychiatric Association, 2013; Autism and Developmental Disabilities Monitoring Network Surveillance Year 2006 Principal Investigators, 2009; Billstedt, Gillberg, & Gillberg, 2007; Fombonne, 2003; Shattuck et al., 2009).

Although once thought to be relatively rare, neurodevelopmental disorders are diagnosed more frequently today than was the case 60 years ago (Chakrabarti & Fombonne, 2005; Wing & Potter, 2009). The reported frequency for autism spectrum disorder in the United States and even in non-U.S. countries was recently noted to be 1% of the populations (American Psychiatric Association, 2013). There has also been a dramatic increase in the number of individuals receiving services from educational and developmental disabilities services agencies under the previous classification of autistic disorder in recent years (Newschaffer, Falb, & Gurney, 2005; Shattuck, 2006). In the state of California, autistic disorder was reported to be the fastest growing disability served by the Department of Developmental Services, which reported a 97 %increase from 1998 to 2002, in the number of individuals in need of services (California Department of Developmental Services, 2003; Mestel, 2003, May 13). Autism spectrum disorder is now considered to be the most common developmental disability, second only to intellectual disability (previously known as "mental retardation" Yeargin-Allsopp et al., 2003). Due to the difficulty in defining onset, only a few studies have been dedicated to the annual incidence of the disorder. Those studies that have, focused on autistic disorder, and include descriptive epidemiologic studies of birth cohorts (Dales, Hammer, & Smith, 2001; Honda, Shimizu, Imai, & Nitto, 2005; Kaye, del, & Jick, 2001; Powell et al., 2000). These studies, which included birth cohorts in the 1980s and 1990s all show a steady rise in the annual incidence of the previously known "autism spectrum disorders". However; recent sources indicate that it is unclear whether the upward trend in rates is due to an increase in the awareness and recognition of autism spectrum disorder among both parents and professionals; differences in study methodology; or to changes in the concept and definitions of autism and modifications in the diagnostic criteria (American Psychiatric Association, 2013; Autism and Developmental Disabilities Monitoring Network Surveillance Year 2006 Principal Investigators, 2009; Chakrabarti & Fombonne, 2005; C. P. Johnson, Myers, & The Council on Children With Disabilities, 2007; Newschaffer et al., 2007). Before the Individuals with Disabilities Act (IDEA) was enacted (1990) children were simply labeled mentally retarded, learning disabled, speech or language delayed, emotionally disturbed, or simply did not qualify for services (Eagle, 2004). For the mainstream population, improvements in diagnostic tools have also led to accurately documented diagnosis of the disorder (Croen, Grether, Hoogstrate, & Selvin, 2002; Fombonne, 2007; Wing & Potter, 2009).

Etiology of autism spectrum disorder. The wide spectrum nature of autism spectrum disorder suggests that there may not be a single etiology, but rather multiple etiologies with overlapping impairment profiles (Newschaffer et al., 2007). Although the etiology of autism spectrum disorder is uncertain, current research and data from twin studies and family studies support the theory that both physiological and genetic factors contribute to the disorder (Akshoomoff, 2000; American Psychiatric Association, 2013; S. Goldstein & Ozonoff, 2009;

Karapurkar, lee, & Yeargin-Allsopp, 2004; Rodier, 2000; Rutter, 2000; Sigman, Spence, & Wang, 2006). Today autism spectrum disorder is considered by many to be one the most heritable of all psychiatric conditions (Chawarska & Volkmar, 2005; Muhle, Trentacoste, & Rapin, 2004; Rutter, 2005; Sigman et al., 2006; Szatmari & Jones, 2007; Veenstra-Vanderweele, Christian, & Cook, 2004) with heritability estimates based on twin concordance rates ranging from 37 % to higher than 90 % (American Psychiatric Association, 2013). In addition, while 15 % of cases of autism spectrum disorder are associated with a known genetic mutation, the remainder of cases appear polygenic with conceivably hundreds of genetic loci influencing the disorder and creating great phenotypic variation (American Psychiatric Association, 2013; Bacchelli & Maestrini, 2006; Lauritsen, Pedersen, & Mortensen, 2005).

There are also several alternative theories of autism spectrum disorder suggesting potential causes including diet (Brudnak, 2001; Garvey, 2002; Knivsber, Reichelt, & Noland, 2001), gastrointestinal pathology (Wakefield et al., 2002), chemical imbalance (Levy & Hyman, 2002) and increased autoimmune dysfunction (Ashwood & Van de Water, 2004; Croen, Grether, Yoshida, Odouli, & Van de Water, 2005; Licinio, Alvarado, & Wong, 2002; Molloy et al., 2006; Stern et al., 2005), however further investigation is required into the specific mechanisms. Studies have also examined the etiologic possibility of early exposure to antibiotic treatments (Fallon, 2005) and vaccines, specifically the measles-mumps-rubella (MMR) vaccines, and most have concluded that there is no casual association (Blaxill, Redwood, & Bernard, 2004; D'Souza, Fombonne, & Ward, 2006; Dales et al., 2001; DeStefano, Bhasin, Thompson, Yeargin-Allsopp, & Boyle, 2004; Fombonne, Zakarian, Bennett, Meng, & McLean-Heywood, 2006; Institute of Medicine, 2004; Katz, 2006; Richler et al., 2006; Rutter, 2005). The etiology of autism spectrum disorder is complex; however in a minority of cases it is believed that environmental factors could combine with, influence and alter existing genetic factors responsible for the disorder (Croen, Grether, & Selvin, 2002; Lawler, Croen, Grether, & Van de Water, 2004; Muhle et al., 2004; Veenstra-Vanderweele et al., 2004). More recently others have studied the effects of pesticides, heavy metals, and other toxins on the neurodevelopment of infants and the association with autism spectrum disorder (Eskenazi et al., 2007; Eskenazi et al., 2010; Sigman et al., 2006). This is especially significant for Latino farm-workers and their families who are frequently exposed to pesticides in agricultural work (Marks et al., 2010). Unfortunately, Latino children are frequently overlooked in studies of autism spectrum disorder, the incidence and prevalence of the disorder among Latinos is rarely documented, and studies show contradictory results.

Etiology and race. The majority of research related to autism spectrum disorder has focused primarily on White populations, ignoring other cultural groups (Brown & Rogers, 2003; Dyches, Wilder, Sudweeks, Obiakor, & Algozzine, 2004; Fombonne, 2003; Levy & Hyman, 2002). Early research that disputed the claims of universality among the races cited a low incidence of autism in many Latin American countries such as Peru, Argentina, Brazil and Venezuela, and in several third world countries such as Kenya, India, and Hungary (Sanua, 1981a, 1981b, 1984). Sanua (1984) theorized that autism was more prevalent in Western, highly industrial countries, where the nuclear and not the extended family was predominant. He suggested psychopathological etiologies of autism spectrum disorder based primarily on anecdotal evidence; however, this has largely been discredited.

Although the exact cause of autism spectrum disorder has not been decided, current research continues to point to a biological etiology and autism appears to be liable to genetics. However, the possible association between autism spectrum disorder and race, another heritable trait, has not been fully investigated. Collins et al. (2006) reported some invariance across a group of White children and a small group of African-American children, in their study of the involvement of GABA receptor subunit genes in autism. The authors note that different single nucleotide polymorphisms were related in each ethnic group and much further research is necessary to establish whether ethnic genotypic differences are in fact present, and whether they are associated with different clinical presentation. Cuccaro et al. (2007) also examined and compared clinical and phenotype findings in individuals with autism from African-American families and White families. Although the authors found greater language delays in the African American group, they suggest that any differences suggesting a more severe phenotype is most likely due to an ascertainment bias. Chaidez, Hansen and Hertz-Picciotto (2012) found similar autistic phenotypes in Hispanic and non-Hispanic children with autism and noted that the autism spectrum profiles were comparable between the two groups. Contradictory and limited research makes declaring autism spectrum disorder an "absolute disorder" problematic. Daley (2002) suggests a more "accurate view of autism as a biological condition that is culturally shaped in symptoms and course" (p. 543). Although research is limited, the role that genetics plays in autism spectrum disorder among certain races and ethnic groups is not known and needs to be examined (Dyches, Wilder, & Obiakor, 2001).

Cross cultural research and immigrant studies. Autism spectrum disorder has been studied in other countries and cultures (see Appendix A for a list of the study of autism spectrum disorder in countries outside of the U.S.) and the number of children identified as having autism has increased worldwide (American Psychiatric Association, 2013; Trembath, Balandin, & Rossi, 2005). In addition, the epidemiology of autism spectrum disorder in countries around the world is being studied by organizations such as the Autism Epidemiology Network. Wing and Potter (2009) reported 39 studies dating from 1966 to 2001, documenting rates of autism spectrum disorder in countries all over the world; however it is important to note that Japan was the only country included in the study outside of Europe. Although it is believed autism spectrum disorder is a worldwide disorder, the dearth of research in non-Western countries makes documenting prevalence difficult. While autism spectrum disorder may in fact be a neurobiological condition, it may still be susceptible to cultural influences in demonstration and course (American Psychiatric Association, 2013), because culture provides the basis for the intrinsic meaning ascribed to symptoms and symptoms complexes. For example, some countries do not even recognize the phenomenon of autism spectrum disorder and there is a stigma attached to it (Cho, Singer, & Brenner, 2003; Magiati, Dockrell, & Logotheti, 2002). Differing parameters, for normative development, as well as varying beliefs regarding appropriate child behaviors can also affect the rate of identification of autism spectrum disorder in children from other countries. Daley (2002) noted parent organizations dedicated to the disorder in over 80 different countries. However, it is important to consider the diagnostic criteria used in various countries and cultures when interpreting prevalence rates. Although universally recognized diagnostic criteria have been established, the degree to which researchers and clinicians follow the criteria may vary across cultures. In addition, use of the DSM-5 and the International Statistical Classification of Diseases and Related Health Problems (ICD-10) requires knowledge that the observed symptoms are related to autism spectrum disorder, but also a belief by the family and the clinician that the symptoms are problematic (Daley, 2002).

The international field of autism spectrum disorder has examined various assessment tools in other countries and cultures; however, there is little discussion of how cultural factors or folk concepts can influence behavioral manifestations when using a cultural sample. In addition, these instruments have primarily been constructed in the U.S. and may not be adequate when utilized with individuals outside of the Western frame of reference. Clinicians all over the world struggle to identify and diagnosis this complex disorder, most likely due to the heterogeneous symptom presentation (Sigman et al., 2006).

Autism spectrum disorder has been studied in Latin America; however, it is still considered a relatively new "entity" and has few institutional resources to provide care for individuals with the disorder (Volkmar, 2005). This not only limits research in these countries but also restricts the use and study of appropriate assessment measures. In addition, the diagnostic systems for neurodevelopmental disorders are rapidly changing all over the world; however they appear to be changing more slowly in most Latin American countries (Mathews et al., 2001). Although most Latin American countries do utilize the DSM or ICD criteria to diagnose autism spectrum disorder; authors from Latin American countries have been noted to attribute psychoanalytic theories and pathological basis to the etiology and treatment of individuals with the disorder (Volkmar, 2005). This will undoubtedly influence the type of measures used to assess autism spectrum disorder within these countries as well as the beliefs about autism spectrum disorder from families living in those countries. It is also interesting to note that in Costa Rica and other Latin American countries, disorders that are thought to be psychogenic in nature carry less stigma than those thought to be neuropsychiatric, because they are more likely to be considered transient and treatable (Mathews et al., 2001). These beliefs may contribute to the idea that autism spectrum disorder is not a neurodevelopmental disorder among Latin American immigrants in the United States, and can influence the relatively lower reported prevalence. Expression of particular behaviors or symptom patterns is also culturally influenced, which may lead to differences in the expression of autism spectrum disorder in Latin American countries. This is especially problematic since the diagnosis of autism spectrum disorder requires the presence of clinically significant impairment (American Psychiatric Association, 2013); a concept that can vary significantly across cultures (Mathews et al., 2001). For example, a child in a Latin American country may be kept at home or may not attend school due to disruptive behaviors frequently seen in children with the disorder. This may not necessarily be reported as causing significant impairment due to different cultural expectations and needs seen in that country.

There is also conflicting information regarding the prevalence rates of autism spectrum disorder among immigrants over the last 30 years. Some studies suggested that the rate of autism spectrum disorder might be higher among immigrant families compared with the non-immigrant population (C. Gillberg, Steffenburg, & Schaumann, 1991; I. C. Gillberg & Gillberg, 1996; Mágnússon & Sæmundsen, 2001). These differences may be due to genetic disorders in the parent homeland, higher rates of brain damage (C. Gillberg et al., 1991; Goodman & Richards, 1995) and increased prenatal exposure to viral agents such as rubella (Larsson et al., 2005; Libbey, Sweeten, McMahon, & Fujinami, 2005) among migrant mothers with no viral antibodies to fight the infections. Fombonne (1998, 2005, 2007) reviewed several surveys that provided data regarding the proportion of “immigrants” in the study. Fombonne subsequently suggested that the data be interpreted with caution and concluded that the correlation between immigrant status or race and autism, was mostly uncorroborated by the empirical results due to the small sample size of the studies and the broadly defined autism spectrum disorder. Fombonne (2005) noted that large studies did not detect an association and the immigrant parent group was very heterogeneous, with several different nationalities included. Several studies have found no significant differences to support the hypothesis of a higher prevalence in children of immigrant parents (Bertrand et al., 2001; Mágnússon & Sæmundsen, 2001; Powell et al., 2000; E. Webb, Lobo, Hervas, & Scourfield, 1997). In fact, a recent California study found decreased risk of autism in children whose mothers were born in Mexico. The authors also noted that children whose mothers were born outside of the United States have the same risk for autism as children whose mothers were born in the state of California (Croen, Grether, & Selvin, 2002). Differing cultural and ethnic values may be responsible for the variability in the findings.

Prevalence of autism spectrum disorder. Overall, prevalence rates and the rate of identification of autism spectrum disorder vary in the literature. In a meta-analysis of 28 epidemiological surveys conducted since 1987, Fombonne (2007) showed prevalence rates ranging from 2.5 to 72.6 per 10,000 with a median rate of 11.3 per 10,000. Fombonne (2007) reported a conservative estimate for the current prevalence of autistic disorder with values lying somewhere between 10 per 10,000 and 16 per 10,000. Data from two nationally representative surveys completed between 2003 and 2004, was analyzed by the CDC. The CDC indicated that the prevalence of parent reported diagnosis of autistic disorder was 5.7 per 1,000 and 5.5 per 1,000 (Schieve, Rice, & Boyle, 2006).

It is believed that autism spectrum disorder occurs equitably across all races and demographic groups (Fombonne, 2007; Larsson et al., 2005; Powell et al., 2000). A large scale prevalence investigation in the United States revealed that autism was equally prevalent among African American and White 3 to 10 year olds, when ethnic background was analyzed in eligibility determination (Yeargin-Allsopp et al., 2003). A separate study examining the pattern of increase in the prevalence of autism in the state of California was the same for White, Hispanics, African-American and Asians, at each stratum of maternal age and maternal education (Croen, Grether, Hoogstrate et al., 2002). Although it is believed that there are no differences between Latino and White children in the epidemiology or phenotype, prevalence or incidence, of autism spectrum disorder (Bertrand et al., 2001), differences have been found in the identification of autism spectrum disorder among different races and varying socio-economic groups, as well as among different regions of the United States fueling questions related to this disparity.

Differences found across races and SES. Discrepancies have been found in the rate of identification of autism across racial categories (Croen, Grether, & Selvin, 2002; Hillman, Kanafani, Takahashi, & Miles, 2000; Mandell et al., 2009). Dyches et al. (2004) analyzed data from a report of all children who are served under the Individuals with Disabilities Education Act of 1997 Act ([IDEA 97'] United States Department of Education, 2001; United States Department of Education, 2002). They found that Black and Asian/Pacific Islander children were more likely than White children to be served with the label of autism. The lowest rates of identification were found among American Indian/Alaskan or Hispanic children. In addition, from 1998 to 2002, Hispanics in the study represented between 11 % and 14 % of the population; however, the percentage of children classified under the diagnosis of autism who were Hispanic stayed relatively the same, at 10 %, throughout this time period. More recently, a study of autism eligibility reporting to the U.S. Department of Education found that 80 % of states reported underrepresentation across ethnicities and Latino children were underrepresented in 95% of states (Morrier & Hess, 2012).

Racial and ethnic differences in the prevalence of autism spectrum disorder may also be attributed to variability in the use of healthcare services by Latino families. Several studies have found consistently low rates of mental health service use by Latino children even when controlling for factors such as access to services and socioeconomic status (Alegría et al., 2004; Mandell et al., 2002). One study investigating the healthcare use of Mexican-American mothers found that these families used fewer infant health services, even though they were enrolled in Medicaid and had a regular source of care (Moore & Hepworth, 1994). The first provider contact for some Latino families can be a folk healer, which not only delays diagnosis, but certain folk remedies can be harmful or fatal (Flores, 2000). In addition, Latino parents who are undocumented may be reluctant to obtain services provided by a formal agency for their children because they fear deportation if they become too "visible" (Croen, Grether, & Selvin, 2002; McCallion et al., 1997).

Regional variability. Regional variability in the identification of autistic disorder within the U.S. has been found (Mandell et al., 2002). States with the highest percentage of Hispanic populations seem to have lower than expected rates of children identified with autism (Overton et al., 2007). The CDC's Autism and Developmental Disabilities Monitoring Network gathered data from sites throughout the United States in 2000, 2002 and 2006 (Autism and Developmental Disabilities Monitoring Network Surveillance Year 2000 Principal Investigators, Centers for Disease Control and Prevention, 2007; Autism and Developmental Disabilities Monitoring Network Surveillance Year 2002 Principal Investigators, Centers for Disease Control and Prevention, 2007; Autism and Developmental Disabilities Monitoring Network Surveillance Year 2006 Principal Investigators, 2009). Although there was a significant increase in the number of Hispanic children identified as having autism spectrum disorder from 2002 to 2006 (91 % increase in Hispanic children with 144 % in Arizona contributing to this increase), the studies all noted the prevalence for Hispanic children was still considerably lower than for non-Hispanic white and non-Hispanic Black children. Although racial differences were significant, the authors noted that the results should be interpreted with caution since the reasons for the variation require further investigation. A recent study located and examined the high incidence of autism in specific geographic clusters around California (Van Meter et al., 2010). The authors concluded that the clusters are most likely not associated with specific environmental pollutants, but rather are correlated to areas where the residents are more educated or were located near a major treatment center for autism. The study found differences in education, age and ethnicity of the parents. Again, this suggests that the children of older, White and highly educated parents are more likely to receive a diagnosis of autism spectrum disorder. Most likely because these parents tend to know more about the disorder, are more successful in getting their children treatment and are more likely to have the resources to be able to move closer to treatment centers, while other ethnicities are overlooked. Other studies also suggest that families of higher socio economic status (SES) may be more proactive in obtaining treatment for their child (Palmer, Blanchard, Jean, & Mandell, 2005). Therefore, their children are more likely to be accurately diagnosed with autism spectrum disorder and are subsequently more likely to have a documented diagnosis in their records (R. P. Goin-Kochel, Mackintosh, & Myers, 2006; Palmer, Walker, Mandell, Bayles, & Miller, 2010). Overall, it appears that children of parents of higher social class, including higher median family income and higher parental education (Mandell et al., 2009; Tek & Landa, 2012) are more likely to be educated about the symptoms of autism spectrum disorder. Access to care for autism related services is limited for those ethnocultural groups with low educational levels (Dyches et al., 2004; Flores & Tomany-Korman, 2008; Liptak et al., 2008; Newacheck, Hung, & Wright, 2002; Thomas, Ellis, McLaurin, Daniels, & Morrissey, 2007). Considering the low education attainment of Latinos in the United States, this further underscores the great importance for further education among Latino families about the signs of autism spectrum disorder and the importance of timely and accurate diagnosis.

Differences Found in School Districts. The number of children identified with autism in public schools also differs according to financial resources, with lower diagnostic rates in predominantly Hispanic school districts (Palmer et al., 2005; Palmer et al., 2010). Palmer et al. (2005) found that school district's revenue and education related spending in Texas was associated with higher proportions of children identified with autism spectrum disorder. Therefore, poorer school districts and economically disadvantaged communities may not have the economic resources available to accurately identify ethnic minorities in these areas. This impacts the ability to properly identify the number of children in a particular geographic area, if the public school system lacks resources and funding to provide assessment services, further increasing the disparity.

Although recent studies consistently maintain that ethnicity and socioeconomic status do not influence the prevalence of autism spectrum disorder (Bertrand et al., 2001; Palmer et al., 2005; Powell et al., 2000), children of lower socioeconomic status are less likely to be identified as having autistic disorder (Liptak et al., 2008). In addition, studies show that socioeconomic status also influences the age of identification of autism spectrum disorder in children (Liptak et al., 2008; Mandell et al., 2005; Ruble, Heflinger, Renfrew, & Saunders, 2005). Those Latino children who are diagnosed appear to be diagnosed at a much later age than White children (Mandell et al., 2002). One study of children on Medicaid, found that on average White children first received their diagnosis of autism at 6 years of age, compared with 7 years of age for African American children and 8 years of age for Latino children (Mandell et al., 2002). In addition, the White children entered treatment and began receiving interventions services earlier than African-American and Latino children. One study that included bilingual and Spanish speaking families in a low income region of the United States found that the average age of diagnosis with autism was 5 years old; however one child was not diagnosed until he was 16 years of age (Overton et al., 2007). Even the children who were the most socially impaired were diagnosed on average 43 months later. This can affect Latino families in poor socio-economic environments, who pursue an evaluation for their child, and do not receive a timely diagnosis (Overton et al., 2007). Mandell, Novak and Zubritsky (2005) also found that family income had a stronger association with age of diagnosis than ethnicity.

Professional bias affects identification. In addition, Latinos consistently seem under-represented in mental health organizations that focus on autism spectrum disorder (Mandell et al., 2002; Schieve et al., 2006). It has been suggested that certain discrepancies between groups are due to differential treatment and substandard interaction between clinicians and parents (Cooper-Patrick, Gallo, Gonzales et al., 1999; Cooper-Patrick, Gallo, Powe et al., 1999; Wissow et al., 2003; Wissow, Larson, Anderson, & Hadjiisky, 2005) as well as biased professional perceptions of children from ethnocultural ethnic groups (Institute of Medicine, 2002; Kreps, 2006; Mandell & Novak, 2005; van Ryn & Fu, 2003; Zwirs, Burger, Buitelaar, & Schulpen, 2006). This statistical discrimination often occurs due to a clinician's expectations about the possibility of the disorder occurring primarily in White children of higher socioeconomic status (Bhasin & Schendel, 2007; Cuccaro, Wright, Rownd, & Abramson, 1996; Heidgerken, Geffken, Modi, & Frakey, 2005; Newschaffer et al., 2007; Stone, 1987). A clinician may erroneously apply this statistic and screen Latino children for autism spectrum disorder less often than children from the majority group (Mandell et al., 2002), even when the same symptoms are evident (Mandell et al., 2009). Therefore, the disparity in the number of Latino children who are ultimately diagnosed may be influenced by the way professionals weigh socioeconomic status in the presentation of symptoms of autism spectrum disorder (Cuccaro et al., 1996).

Unfortunately, it is suspected that physicians may be more quick to discount the concerns of a Latino parent than they would when judging the concerns of a White parent related to their child's developmental delays, or they may simply not elicit concerns in the first place (Mandell et al., 2002). This is especially significant since research suggests that assessing the presence of parental concerns is sometimes as effective a tool in identifying delays in young children, than using a screening tool (Glascoe, 2000; King & Glascoe, 2003; Sices, Feundtner, McLaughlin, Drotar, & Williams, 2003) and parental reports can contribute significantly to early detection (Beauchesne & Kelley, 2004). Clinicians may also have different expectations about treatment and service needs by race and therefore may not screen for autism spectrum disorder in a Latino family as quickly as they would when interacting with a White family. This professional bias and dismissal of parent concerns interferes with accurate diagnosis and makes an appropriate diagnosis increasingly difficulty given the complexities of the disorder and the inherent difficulties in making a differential diagnosis.

Misdiagnosis of Latino children. Distinguishing autism spectrum disorder from other co-morbid psychiatric disorders can be difficult for clinicians working with young children. Misdiagnosis can occur due to similarity in features between autism spectrum disorder and other conditions that manifest in children (American Psychiatric Association, 2013; Noterdaeme, Mildenberger, Minow, & Amorosa, 2002). Unfortunately, Latino children appear to be diagnosed more frequently with inappropriate psychiatric diagnoses rather than autism spectrum disorder (Cuffe, Waller, Cuccaro, & Pumariega, 1996; Kilgus, Pumariega, & Cuffe, 1995; Wu et al., 1999). Overton, Fielding and de Alba (2007) suggest that Latino children with autism spectrum disorders are being misdiagnosed with non-spectrum disorders such as Attention Deficit Hyperactivity Disorder (ADHD). Symptoms of autism are frequently mistaken for

ADHD due to the similarities in the presentation of the disorders including: poor concentration; behavioral outbursts; low levels of frustration tolerance; short attention spans; difficulty following verbal instructions and difficulty discriminating cues in the environment that may be irrelevant or important to others (Whitman, 2004). Their review of previously completed evaluations identified parental reports which indicated that previous diagnoses were assigned using brief clinical interviews or that depended primarily on indirect measures (Overton et al., 2007). They also noted that the children were being given diagnostic labels based on partial symptoms or erroneous labels such as dissociative disorder. After completing a comprehensive evaluation, the most commonly diagnosed disorder was Autistic Disorder followed by ADHD (Overton et al., 2007). In another study, Mandell, Ittenbach, Levy, and Pinto-Martin (2007) found that African-American children ultimately diagnosed with autism were almost 3 times more likely than White children to receive another diagnosis first. When examining the children who received other diagnoses, African-American children were much more likely than White children to receive a diagnosis of conduct or adjustment disorder. This inaccurate pattern in the identification of autism spectrum disorder may be a contributing factor to the under representation of Latino children with the disorder (Mandell et al., 2009).

Studies also suggest that mothers from different Latino cultures and different levels of acculturation differentially assess specific symptoms of different disorders such as ADHD, further emphasizing the importance of careful reassessment of the validity of co-morbid disorders when making a diagnosis in Latino children (Schmitz & Velez, 2003). Although very little literature exists about the perception of autism spectrum disorder in the Latino community, cultural factors may affect Latino parents' recognition and interpretation of symptoms (Daley, 2004; Mandell & Novak, 2005; Thomas et al., 2007). For example, the Centers for Disease

Control indicated in a 2006 study that Hispanic parents tend to report lower rates of autism than parents of other groups (Liptak et al., 2008; Schieve et al., 2006). An inaccurate diagnosis can have dire consequences including delaying essential early interventions for the young child.

Accurate diagnosis of autism spectrum disorder is further complicated by linguistic variables in Latino children (Overton et al., 2007). It has also been suggested that there are ethnic differences in how parents describe symptoms which may lead to a faulty depiction or misattribution of the symptoms (Mandell et al., 2007). Even when using interpreters, key information can be lost in translation. In addition, Latino parents may have difficulty explaining or communicating symptoms in a way that allows the clinician to accurately translate and interpret parental descriptors of the child’s behaviors into the diagnostic criteria of autism spectrum disorder and the child may instead be diagnosed with a behavioral disorder. For example, Latino parents may express their child’s symptoms in ways that focuses on disruptive behavior (Mandell et al., 2007), rather than early indicators of autism spectrum disorder. One study also found that African-American children and children of other ethnicities were more likely than White children to receive a diagnosis of adjustment disorder (Mandell et al., 2007). Therefore, Latino families may explain their child’s behavior in a way that ultimately does not lead to medical intervention and may also explain the lower rate of autism spectrum disorder among Latino children. The indirect communication style of some Latinos (La Roche, 2002) may also impact the professional’s ability to accurately discern behaviors being communicated by the parents. Therefore cultural and language barriers may hinder the diagnostic process and obscure any co-morbidity making accurate diagnosis difficult. An awareness, understanding and respect of the cultural variance in communication when working with Latino families, can assist in providing culturally appropriate assessment.

The importance of early identification and intervention. It appears that Latino children are not being properly identified and classified, subsequently reducing the opportunity to benefit from essential early intervention services which provide the best chance of long-term beneficial outcome. Early identification and diagnosis of autism spectrum disorder is essential (Lord & Risi, 2000; Osterling, Dawson, & Munson, 2002). Improved outcomes have been shown to be more effective with younger children by capitalizing on the neuroplasticity of the young child's nervous system (Committee on Children with Disabilities, 2001; Farran, 2001; Sigman et al., 1999). Children who participate in comprehensive early intervention models before the age of three have significantly better outcomes when compared to children who receive these interventions after five years of age (S. L. Harris & Handleman, 2000). These improved outcomes further reinforce the support for early intervention with young Latino children (Osterling et al., 2002).

Early identification of autism spectrum disorder is so imperative that some authors have stated that "there can be no acceptable approach to late diagnosis" especially given the current state of knowledge regarding the disorder (Accardo, 2004). Most children exhibit signs of autism spectrum disorder between 12 and 24 months; however, symptoms can be recognized earlier than 12 months if developmental delays are severe (American Psychiatric Association, 2013). Therefore, clinicians should be familiar with the presentation of autism spectrum disorder before 24 months and comfortable making this diagnosis. There is currently a significant amount of research focused on identifying autism spectrum disorder in infants less than 12 months (Werner, Dawson, Munson, & Osterling, 2005; Zwaigenbaum et al., 2005; Zwaigenbaum et al., 2007). This knowledge of early developmental difficulties among children with autism spectrum disorder has increased to the point that the diagnosis can be made accurately at the age of two

(Baird et al., 2001; Bryson, Rogers, & Fombonne, 2003; Charman et al., 2005; Coonrod & Stone, 2005; Lord et al., 2006). Unfortunately, the majority of children do not receive a diagnosis until they are significantly older. Serious adverse consequences may result from delayed identification of autism spectrum disorder including lost opportunities for early intervention. In addition, the parents of the child may be unable to access services or support for themselves. Symptoms of the disorder can be disabling to the child and to the family (D. E. Gray, 2001), and early identification can help struggling families cope better. This is also important since Latina mothers of children with autism spectrum disorder are at significant risk for depression, which also underscores the importance of early identification (Blancher et al., 1997; Blancher, Shapiro, Lopez, Diaz, & Fusco, 1997; Magaña, 1999; Magaña & Smith, 2006a; Magaña & Smith, 2006b).

If there is a delay in diagnosis the parents may not receive information about effective methods of behavioral management which can further compound behavioral problems. Identification of children with autism spectrum disorder and the related parent education must occur earlier to reduce and prevent the risk of abuse (Howlin & Clements, 1995; Mandell, Walrath, Manteuffel, Sgro, & Pinto-Martin, 2005). This need is even more significant in the Latino population, considering some parents may not recognize repetitive and stereotypical behaviors associated with the disorder and instead punish their children (Mathews et al., 2001). Increasing the diagnostic accuracy of autism spectrum disorder in Latino children is especially imperative as it appears fewer Latino children are identified, and those who are accurately diagnosed are recognized at a much later age than other ethnicities (Liptak et al., 2008; Mandell et al., 2007; Mandell et al., 2009; Overton et al., 2007).

At this point in time, there are considerable inconsistencies in the research related to differences in the prevalence of autism spectrum disorder according to race, ethnicity and culture. Understanding the reasons underlying the disparity in the prevalence of the disorder between the different races and ethnicities is critical. Just as there may be multiple etiologies of autism spectrum disorder resulting in common symptom characteristics, it appears there are also several contributing factors to the disparity of Latino children who are diagnose. Latino families of children with autism spectrum disorder are not being diagnosed due to: (1) lack of knowledge about the disorder, therefore Latino parents may not recognize early signs; (2) limited access to or lower use of healthcare services; (3) families of lower socioeconomic status live in communities with little resources to diagnosis the disorder; (4) difficulty communicating symptoms or concerns due to a Spanish language barrier; (5) lack of knowledge about autism spectrum disorder by healthcare professionals and professional bias which can neglect parental concern and increase misdiagnosis of other disorders (i.e. ADHD and intellectual disability); (5) Latino families sometimes have differing expectations about normal child development and appropriate child behaviors; and (6) varying perceptions of the concepts of illness and disability. Unfortunately, the majority of research has been conducted with predominantly White populations, and because most research has neglected to identify children with autism spectrum disorder according to ethnicity or culture, there is inadequate information available for practitioners to make certain that these children are properly assessed and diagnosed and that appropriate services are provided. This may be due to a lack of awareness of how these issues affect children with the disorder and their families (Wilder, Dyches, Obiakor, & Algozzine, 2004); however, this lack of information limits the quality of work undertaken in the field by professionals who work with Latino children with autism spectrum disorder. This is especially important as earlier recognition leads to earlier treatment and improved outcomes (American

Academy of Pediatrics, 2001; Committee on Children with Disabilities, 2001; Mandell et al., 2002).

There is a significant disparity in the number of Latino children diagnosed with autism spectrum disorder (Kilbourne, Switzer, Hyman, Crowley-Matoka, & Fine, 2006). Future research necessitates a focus on discovering the variable causes that are involved in the unequal health outcomes for Latino children with autism spectrum disorder. It is imperative for clinicians, physicians and researchers to develop strategies for reducing these disparities, including improving the assessment methods utilized with this population. To ensure that professionals do not continue to overlook or neglect the appropriate diagnosis of autism in underserved groups, including Latino children, it is critical that assessments be designed to provide better screening, symptom detection and identification as well as accurate diagnosis, when working with Latino families (Mandell et al., 2009).

Assessment and Diagnosis of Autism Spectrum Disorder

Careful and culturally relevant assessment of autism spectrum disorder is imperative as the number of Latino families with young children increases in the United States. This need is even more crucial, so that appropriate early intervention can begin as soon as possible (National Research Council, 2001; Osterling et al., 2002). Although the documented increase in the prevalence of autism spectrum disorder has raised awareness of the needs of children with the disorder and their families (Diggle, McConachie, & Randle, 2003), little is known about the impact of cultural and linguistic diversity on the evaluation and assessment methods used with Latino children with autism spectrum disorder. The following sections will be a review of the relevant research regarding “best practice” in the assessment of autism spectrum disorder as well as best practices in the culturally competent assessment of autism spectrum disorder with Latinos families and their children.

Standardized measures and best practice. The diagnosis of autism spectrum disorder is not derived through biological tests but is based on observable behavioral criteria (Volkmar, Paul, Klin, & Cohen, 2005). Until recently, all diagnostic interviews for individuals on the autism spectrum disorder were without widespread use of standardized tools. Historically, the diagnosis was based on clinical judgment, and although clinicians utilized a set of criteria based on the DSM, there was considerable room for error. This was made even more difficult since the criteria used to identify autism spectrum disorder have not been consistent over the years and the impairments presented can vary from individual to individual. There has since been the development of highly effective tools to guide the interview process; however the use of current standardized measures to measure the symptoms of autism spectrum disorder may not be recognized nor accepted by professionals (M. Williams et al., 2009). Unfortunately, it is not clear if differences in diagnostic practice, such as significant variation when determining assessment measures, may lead to dissimilar diagnoses of individual children. In a 2009 study, Williams, Atkins, and Soles reported a significantly low agreement rate of the diagnosis of autism spectrum disorder among professionals in schools and community settings (M. Williams et al., 2009). Akshoomoff, Corsello, and Schmidt (2006) as well as Luiselli et al. (2001) note survey data documenting what procedures clinicians report using; however, at the time of this writing, there is no published data available about the actual use of different assessment practices with Latino children and the subsequent impact on the diagnosis of this population. Unfortunately, most health care professionals who are often the first to come in contact with young children do not use a diagnostic instrument when assigning the diagnosis of autism spectrum disorder (Dosreis, Weiner, Johnson, & Newschaffer, 2006). It is now essential to use standardized diagnostic tools and established interview and observation methods for assessment (Delmolino, LaRue, Fiske, Martins, & Harris, 2007). Recent research has shown that standardized measures improve accuracy and reliability and strongly improve the quality of diagnostic assessment over time and across clinicians (American Psychiatric Association, 2013; Le Couteur, Haden, Hammal, & McConachie, 2007; Ozonoff, Goodlin-Jones, & Solomon, 2005; Risi et al., 2006). Numerous best practice assessment guidelines and reviews of evidence based assessment for autism spectrum disorder have been distributed in an attempt to improve diagnostic consistency (Department of Developmental Services, 2002; C. P. Johnson et al., 2007; Ozonoff et al., 2005). Comprehensive assessment of autism spectrum disorder is more than the application of a set of diagnostic criteria to a child. Most guidelines include a review of the child's records and history. It is important to obtain history related to early development, life course and socialization, as well an indication about the environment the child lives and functions in. A parent interview is usually the primary means of gathering this information. An exhaustive history is an essential part of the diagnostic process and is one of the most useful assessment tools since it provides clues that are useful to the clinician when attempting to make a differential diagnosis (Lord & Risi, 2000; Mansell & Morris, 2004). A thorough history is often supported by checklists and standardized instruments. In addition, no one instrument should be used to diagnosis autism spectrum disorder in a child (Accardo, 2004). The assessment should also include direct observation of the child in both structured and unstructured settings (Department of Developmental Services, 2002; Overton et al., 2007). A brief office visit may not be sufficient time for an examiner to assess and identify the presence of any unusual or stereotyped behaviors if the behaviors do not occur with extremely high frequency or are not evoked within the assessment environment (Delmolino et al., 2007; Volkmar & Lord, 2007). Therefore it is important to interview parents, teachers, and significant others to explore history and scope of behavioral symptoms and social problems. Some guidelines also include the assessment of medical issues, speech and language communication, sensory processing, academic skills, family functioning and neuropsychological testing in their best practices parameters (M. Williams et al., 2009). Thus, a comprehensive assessment includes a review of relevant background information and history; a thorough interview of the caregiver; observation of the child; a comprehensive medical evaluation; and evaluation of the child's speech, language and communication, social behavior, cognitive/intellectual ability and adaptive functioning. The assessment can also be supplemented with information related to the child's neuropsychological functioning and sensory processing (Department of Developmental Services, 2002; Prelock, Beatson, Bitner, Broder, & Ducker, 2003).

Several guidelines recommend a multidisciplinary approach (Department of Developmental Services, 2002; Prelock et al., 2003; M. Williams et al., 2009) which is especially important considering that in very young children neurodevelopmental disorders are often difficult to differentiate due to shared symptoms across the various disorders (McConachie, Le Couteur, & Honey, 2005; Trillingsgaard, Sørensen, Němec, & Jørgensen, 2005). The assessment process can include specialists with expertise in neurodevelopmental disorders from a variety of disciplines such as psychiatry, psychology, neurology, pediatrics, occupational therapy, physical therapy, speech pathology and special education.

Best practice and culturally competent assessment with Latinos. Although best practice recommendations and practice parameters help direct the clinician assessing children with autism spectrum disorder, little research has been dedicated to guide those conducting evaluations of

Latino children suspected of having the disorder. Best practice models for the assessment of autism begin with culturally competent assessment. This requires culturally sensitive approaches and applications that take into account the individuals ethnic/cultural background (Christensen, Emde, & Fleming, 2004; Pumariega, Rogers, & Rothe, 2005). For example, less acculturated Latino parents are more likely to face mismatched beliefs with healthcare providers (Denney, Itkonen, & Okamoto, 2007) such as differences in the recognition of a problem or the needs of the child. Families with pervasive religious beliefs may be more accommodating of their child's deficits, and may also be more accepting of their child's low level of functioning (Rogers-Adkinson et al., 2003). This is sometimes seen as resisting or being noncompliant, however it is important to consider how the family's view of disability impacts the assessment process. Rather that becoming frustrated and assuming the family is "in denial"; it is helpful to attempt to understand an alternate view of a developmental disorder or a disability that is held by the family (Rogers-Adkinson et al., 2003). Furthermore, clinicians should also have an awareness of their own cultural history and identity (Paniagua, 2010; Ponterotto, Gretchen, & Chauhan, 2001). Without this understanding of themselves and their own cultural identity, counter-transference issues can occur that may influence how the clinician interacts or chooses to interpret the behavior of the family or the young child during the assessment (Rogers-Adkinson et al., 2003).

Adequate training is fundamental when conducting assessments with Latino children with autism. It is critical that psychologists acknowledge the limitations of their training and experience, and obtain additional training, supervision and consultation when working with diverse groups of children. As both the number of children with autism spectrum disorder and the diverse language needs of the Spanish speaking population continue to grow in the United

States, more professionals will need to learn new skills to be able to provide culturally relevant and appropriate services.

Building rapport. Building rapport is essential during the interview and assessment. This will lead to a more thorough assessment and more effective and relevant intervention plans. Unfortunately, many families from non-dominant cultures do not feel respected or understood by professionals from the dominant culture, therefore creating a barrier to developing effective interventions (Zionts, Zionts, Harrison, & Bellinger, 2003). Certain practices during the initial client contact can enhance rapport building with families from linguistically and culturally diverse backgrounds. During the early contact with the family, it may be important to spend some time engaged in small talk or casual conversation to help the family feel increasingly comfortable approaching the psychologist and accessing services and assistance for their children (Rogers-Adkinson et al., 2003). This also helps personalize the interaction between the professional and the family. Prelock, Beatson, Bitner and Broder (2003) recommend that the first face-to-face intake with the family take place in the family's home or another location of the family's choice.

Language of the family and culturally competent assessment. Language and language fluency is oftentimes the primary consideration in the assessment of autism spectrum disorder with Latino children; however the family language of the child with the disorder is frequently underestimated (Nehring, 2007). Although Spanish is not the official language, the United States has the fifth largest Spanish-speaking population in the world (Laria & Lewis-Fernández, 2006). In 2011, the U.S. Census Bureau reported that 12.9 % of U.S. residents 5 years of age and older "hablan español en casa" (U.S. Census Bureau, 2012b). Spanish remains the dominant language spoken in most Latino homes, and immigrants who migrate from Spanish speaking countries live in predominantly Spanish speaking communities (Santiago-Rivera & Altarriba, 2002). Latino children are often socialized in a multigenerational home with grandparents speaking Spanish, parents communication is a combination of English and Spanish, while school aged children speak in English but respond to questions of adults in Spanish and the television is tuned to English cartoons or Spanish novellas (Brice, 2002). The increasing population diversity and number of Latino families in the United States means that psychologists will find themselves working with Latino children and their families who either speak English as a second language or not at all. Gamst et al. (2002) found that less acculturated Mexican clients preferred treatment in bilingual Spanish, yet most psychologists use English exclusively when conducting psychological assessments with this population (M. Williams et al., 2009).

Use of interpreters. Language can become a communication barrier during the assessment process (Krauss, Gulley, Sciegaj, & Wells, 2003). Not understanding the language and the cultural nuances of the child's verbal and non-verbal behaviors may contribute to miscommunication of illness and symptoms and subsequently lead to an inaccurate assessment. If the family's primary language is not English, it is important to refer the family to a bilingual diagnostic professional, since it is certainly difficult to assess problems with language or social skills in a language with which the child is not familiar (Flores, 2000; Wilder et al., 2004). A Spanish speaking child is more likely to engage in spontaneous language, providing necessary data during the assessment, when able to freely engage in conversation in Spanish (Brice, 2002). In addition, when evaluating the types of subtle social interactions and communications critical to the diagnosis of autism spectrum disorder, it is imperative that the clinician is able to understand the child's verbalizations and expressions as well as be able to converse with the family in their native language (M. Williams et al., 2009).

If a bilingual diagnostician is not available, a bilingual-bicultural interpreter can narrow this language barrier and facilitate identification of cultural nuances. It may also be important to assess language goals for the family and assessments must then be conducted in both languages to determine levels of need when an interpreter is needed. Some professionals have recommended discussing the family's preferences about the interpreter as well as when the interpreter will be used. Some family members may find the use of a translator difficult due to the personal information that is shared (McCallion et al., 1997). Although not recommended, some families may prefer it if the interpreter be another family member to protect confidentiality, while others may prefer an unrelated individual (López, 2002; Rogers-Adkinson et al., 2003). Utilizing a family member, such as an older sibling to interpret during the assessment process has been criticized in the literature and can interfere with obtaining needed information (Brice, 2002).

Although it is beyond the scope of this dissertation, the interpreter must first be trained in a set of competencies, since many problems, such as concerns of confidentiality and confusing roles and responsibilities arise when using an untrained interpreter or family member (Brice, 2002). An interpreter, especially a cultural informant (Brice, 2002) can also help convey the meaning of questions and responses, the cultural context of the client to more accurately reflect the family's experience, and can also inform the clinician of the values and norms of the client's ethnic or cultural group (Ton & Lim, 2006). It is the clinicians responsibility to train the interpreter with the necessary information related to the field of the assessment of autism spectrum disorder, best practice in the assessment with Latino children who come from a dual language background, and provide the interpreter with information related to his or her specific responsibilities during the assessment (Madding, 2000). It is especially important for the interpreter to have clinical training of the jargon and terminology related to autism spectrum disorder to avoid mistranslation of psychological and developmental terms. An interpreter can assist with administration of specific testing procedures such as obtaining a language sample in Spanish, as well as translating specific information. It is critical to keep the language of the interview and the entire assessment process simple and to avoid using highly technical language that may be difficult to translate (Sheridan, 2000).

Although Latino cultures share the Spanish language, Spanish is spoken with varying degrees of proficiency by Latino immigrants throughout the United States (Villenas, 2001). In addition, different families will have varying levels of English language proficiency among family members (Rogers-Adkinson et al., 2003). These significant language and cultural differences can result in misunderstandings between the parents of the child with autism spectrum disorder and the professional providing the evaluation, which can ultimately result in poor diagnosis and intervention outcomes.

A family centered and person centered assessment process. Several authors have concluded that a family centered, strength based approach to the assessment of autism spectrum disorder is essential. It is also recommended that the assessment process include all those individuals who care for or provide treatment to the child (Department of Developmental Services, 2002; Paul & Wilson, 2009; Prelock et al., 2003). The Vermont Rural Autism Project (VT-RAP; Beatson & Prelock, 2002) model has been used to increase the knowledge and skills of the community based practitioner in the assessment of children with autism spectrum disorder. This family centered, culturally competent and strengths based assessment model is consistent with familismo and appropriate for the collective Latino culture. Throughout the assessment process the inherent strength of the family was recognized and the family was made an integral part of the assessment team. The parent's perceptions of their child's needs were prioritized in the assessment process. Families participated in all clinical meetings and their assessment agenda was prioritized. Families also assisted with parts of the assessment itself, collaborated with team members to plan the recommendations and even helped to write the report. It is recommend that the family not only suggest disciplines and family support they would like to involve in the assessment process, but also assist in determining the environments the child will be examined and the individuals to be interviewed (Prelock et al., 2003). When parents are included in the assessment process, the validity of the data is enhanced and intervention outcomes are improved (Paul & Wilson, 2009). Callicott (2003) also discusses the concept of person centered planning (PCP) which is also appropriate for Latino families of children with autism spectrum disorder because there is an emphasis on discussion, exploring issues rather than issuing commands, and the focus is on generating solutions that are agreed on by everyone. Some families view the lifelong care of the child as their job in life and may not agree with the goal of mainstreaming their child into the community to function as independently as possible; however, PCP can address these differing views and assist all involved in making decisions that are favorable for everyone.

Multidisciplinary approach with Latino families. A multidisciplinary approach throughout the assessment process is crucial when working with Latino children and families (Prelock et al., 2003; M. Williams et al., 2009). This is especially important since the symptoms of autism spectrum disorder are often difficult to distinguish from other health conditions or folk illnesses common in the Latino community. For example, the treatment of "empacho" (a folk illness common in Spanish speaking communities) with certain lead containing powders can result in lead poisoning. In addition, the use of lead oxide can disrupt the development of children and result in behavioral abnormalities, attention disorders, lower cognitive skills and school problems (M. T. Stein et al., 2004). Therefore, consultation with a pediatrician is essential when establishing a medical condition or making a differential diagnosis as part of the assessment. Latino children who have not had access to frequent hearing checkups may also have a history of untreated ear infections or hearing loss, which can impair language development and social functioning, as well as increase unusual or sensory behaviors, mimicking autism spectrum disorder (C. Gillberg & Billstedt, 2000). Cooperation with a physician as well as a speech and language pathologist can assist in differentiating whether this may have impacted the child's overall language development (Brice, 2002) or if the child in fact does have language and communication deficits inherent in the disorder. Multidisciplinary family centered assessment ensures the most accurate diagnosis is made and the most appropriate interventions are included as part of the report and recommendations.

Test selection and translated tests. Implementation of the aforementioned best practice recommendations assists in preparing the Latino family for the assessment process. The clinician will then gather a thorough history, complete an interview with the family, and observe the child as part of the assessment process. A comprehensive assessment of a young child also includes an evaluation of speech, language and communication, social behaviors, developmental level and adaptive functioning. The assessment can also include an evaluation of the child's neuropsychological functioning and sensory processing. The most apparent difficulty when diagnosing a Latino child suspected of having autism spectrum disorder, is determining the appropriate instruments to utilize during the assessment.

Inaccurate assessments can have significant behavioral, social and academic consequences for bilingual children. This can be seen in areas of the United States with large numbers of culturally and linguistically diverse students who are also disproportionately represented in special education programs (Artiles, Aguirre-Munoz, & Abedi, 1998; Oswald, Coutinho, Best, & Nguyen, 2001). Unfortunately, few assessment and diagnostic instruments have been developed specifically for children in dual language homes (Rosselli et al., 2001; Valdes, 1996), and even fewer assessment tools are available for children under the age of five from Spanish-speaking backgrounds (M. Williams et al., 2009). In a 2009 study, of primarily Spanish-speaking Latino children being evaluated for autism, Williams, Atkins, and Soles, reviewed the evaluations to determine whether the professional completing the evaluation used the native language of the parent and child. Of the 57 reports for children from non-English speaking families, only 34 reports (58%) reported using Spanish. Most assessors in these community settings did not specify in their evaluation whether they used the child's and parent's native language. Williams, Atkins, and Soles also noted the reports rarely addressed issues related to the use of tests validated on English-speaking populations, nor was this limitation indicated as a reason for caution in diagnostic decisions. This non-ethical practice is most likely impacting data related to the study of language and communication and non-English speaking children with autism spectrum disorder. It is critical that clinicians follow best practices when working with non-English-speaking families since eligibility decisions are frequently made regarding children with autism spectrum disorder.

Spanish translation of tests. A significant problem when attempting to utilize standardized tests with Latino children is language inadequacy in test translation and adaptation (Horton, Carrington, & Lewis-Jack, 2001). There are several Spanish translations of language tests available; however, there are very few studies related to ethnic or language differences among children with autism spectrum disorder and many of these tests have little or no research supporting their use with Spanish speaking clients (Fernandez et al., 2007). And although the assessment of communication and language is a central component of the assessment of autism spectrum disorder, little research has been dedicated to this area. Translations of tests are a necessary part of the assessment process for those family members who first language is not English (Padilla, 2001). Unfortunately, psychologists often utilize measures that are not well validated for the particular population, or tools are simply translated from English to Spanish without taking into account the inherent loss of psychometric properties that may have depreciated the value of the measure. In addition, many translated tests have little to no research validating their use with Spanish-speaking or bilingual children living in the United States (Fernandez et al., 2007). The cross cultural validity of an instrument is not simply indicated by an adapted version in Spain, nor does this imply that the United States norms can be applied to Latinos in America. There are also problems that can occur when using separate translations for each Latin American country and for Spain since the Spanish spoken in these countries is not identical (Dana, 2001). Care should be taken to ensure that the language of the test matches the variant spoken by the child. This becomes even more problematic in the United States where individuals from more than 20 Spanish speaking countries reside (Dana, 2001).

Translation alone is an inadequate rationalization for the use of a particular test and does not indicate sufficient validity or reliability (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 1999; Valdes, 1996). Unfortunately, most tests available in Spanish are either translations or adaptations of existing English versions. Translated tests may fail to ensure that an item has psychological as well as linguistic equivalence (Butcher, 2004; Peña, 2007), which assures the cross cultural applicability of an assessment instrument. Linguistic equivalence can be demonstrated by first translating the instrument and then using a blind back-translation method (American Educational Research Association et al., 1999; Arnold & Matus, 2000; Beck, Bernal, & Froman, 2003; Muñiz, Hambleton, & Xing, 2001). An expert review after this process identifies and addressed discrepancies and cultural barriers with the source language. Although an instrument may focus on linguistic translation, incongruity in meaning may still result, which interferes with the content validity of the measure. Therefore, consideration must be paid to the functional equivalence of the measure. Functional equivalence ensures the instructions and the instrument will elicit the same target behaviors, by concentrating on both the language and the cultural group (Erkut, Alarcón, Coll, Tropp, & García, 1999; Greenfield et al., 2006). This dual-focus develops the instrument and the instructions at the same time in the two languages, so that even though each test may include different stimuli, there is equality in clarity for each test and the behavior being tested is comparable. In addition, it is also important to consider metric equivalence and within item difficulty, when adapting an instrument from one language to another (Kim, Han, & Phillips, 2003; Muñiz et al., 2001; Peña, 2007). This psychometric adaptation sometimes results in different items being used and/or in a different order in the two different languages. Varying cultural interpretations can also impact the way a Latino parent responds to an instrument (Hendrickson, 2003; Peña, 2007). The cultural equivalence of a measure considers how individuals from different cultural groups will interpret the fundamental meaning of an item and ensures that the items are developed to tap the same cultural meaning for each group (Arnold & Matus, 2000; Van der Veer, Ommundsen, Hak, & Larsen, 2003). Overall, there are many factors beyond linguistic translation that must be considered when adapting and using translation of existing measures of autism.

It is particularly necessary to consider the degree to which the test scores of Latino children can be evaluated against the instruments normative sample, especially if Latinos are insufficiently represented in the normative sample (Kwan & Aldarondo, 2001). The percentage of Latino children represented in a sample is often relatively small and usually simply corresponds to the number of Hispanic individuals found in the latest Census data. This is insufficient because the child will be compared to the mainstream population and not to a Latino peer. In addition, due to the significant heterogeneity of the Latino population in the United States, evidence of Hispanic children in the sample does not always translate to adequate representation in an instrument (Brice, 2002).

Test bias. Test bias is a potential threat to the validity of an instrument and may be introduced unknowingly when the measure is translated into another language or adapted to a culture or context for which it was not designed. Construct bias, method bias or item bias can be introduced when using measures with a Latino family since response style and scores are influenced by issues of language proficiency and familiarity of item content (Morales, Reise, & Hays, 2000). If the Latino family member does not understand the item content, then the endorsement may not reflect the intended assessment function of the item. For example, differences in response style and item interpretation have been found to influence the response of Latino parent's responses to screening questions about their child's health (Shenkman, Vogel, Brooks, Wegener, & Naff, 2001).

For non-English-speaking children, the cultural and linguistic factors which effect the interpretation of the assessment results are not always adequately considered by professionals (Overton et al., 2007). There is often linguistic bias in the language that is used during the testing and the language expected in the child's responses. There may also be cultural bias in the activities and items that do not correspond to the child's experiential base (Brice, 2002). For example, Peña, Quinn and Iglesias (1992) studied low income Puerto-Rican preschool children's performance when required to label pictures. The majority of the children scored poorly, not because they had a true expressive language deficit, but because object labeling was not a typical language experience in the children's environment. Biased procedures as well as biased item choices may make it difficult to determine if the child failed due to a language deficit or because the expected response did not match what was expected in the child's culture (Brice, 2002). In order to reduce linguistic bias the clinician must examine the content of the norm referenced test to determine its appropriateness for the child including adequacy of the item for eliciting the desired response; how the correct response corresponds to what would be considered a typical response for the child's particular language variant; and the representativeness of the child's culture and linguistic background in the normative sample, especially with dual language learners. In order to reduce cultural bias, the clinician should obtain information from a professional in the community, related to the typical interaction between the adult and child in the community. Studying the responses of Latino children with a similar background as the child being tested, but with age appropriate skills can also give insight into potential cultural and linguistic bias present in the instrument (Brice, 2002). Sometimes developmental data are available for Spanish speaking children with limited English skills; however the clinician may need to consult with a cultural informant to determine whether the patterns observed are typical for the background and sociolinguistic experience (Brice, 2002).

Since many commonly used assessment instruments have not been evaluated for use with Latino children it is important that they be interpreted with caution (M. Williams et al., 2009). In addition, assessment instrument developers in the United States are primarily White, middle class males (Ladson-Billings, 2001). Therefore, it is recommended that the psychologist maintain an awareness of these limitations of assessment practices (American Psychological Association, 2003) and note these limitations in the later report. Both the DSM-IV-TR (American Psychiatric Association, 2000) and the DSM-5 (American Psychiatric Association, 2013) provide a cultural formation outline that assists the clinician when evaluating the child's symptoms within a multicultural context. Unfortunately, the DSM does not clarify how to modify the autism spectrum disorder diagnosis or the criteria to accommodate cultural differences. Utilizing these cultural considerations when working with young Latino children and their families can facilitate accurate and appropriate assessment and diagnosis of autism spectrum disorder in this population.

There is a dire need to identify appropriate assessment instruments to utilize with young Latino children with autism spectrum disorder and their families that includes consideration of Latino families' language and communication, socio-cultural practices and values (Lynch & Hanson, 2004a). The following sections include a review of the relevant research within the particular domains. The behaviors and symptoms frequently assessed within these domains are identified while simultaneously highlighting the cross cultural research related to Latino children and their families that may influence this process.

Assessment of social communication and social interaction. The persistent impairments in reciprocal social communication and social interaction are considered a core diagnostic feature of autism spectrum disorder and are required for a diagnosis (American Psychiatric Association, 2013; Sigman, Dijamco, Gratier, & Rozga, 2004). The social behavior of infants with autism spectrum disorder differs significantly from their typically developing peers and the impaired social functioning of these children is the most important indicator for a differential diagnosis of the disorder (Chawarska & Volkmar, 2005). Typically developing infants use nonverbal social communicative behaviors in the early stages of development such as eye contact, facial expressions and gestures. Infants are able to synchronize or attune their affect, attention and arousal states to those of their caregiver, using facial expression, vocalization and visual orientation, in a pattern of dyadic interaction that begins very early (R. Feldman, 2007; Sigman et al., 2006). However, many infants with autism spectrum disorder avoid this synchrony and do not show a preference or responsiveness for the primary caregiver's voice (Plauche-Johnson, 2004; Prior & Ozonoff, 2007). The isolation, lack of communication and failure to respond to human voices seen in infants later diagnosed with autism spectrum disorder is often misinterpreted as deafness, but is typically ruled out (American Psychiatric Association, 2013). Although many infants with autism spectrum disorder will disregard human vocalizations, they may show awareness for environmental sounds (Plauche-Johnson, 2004). Joint attention abilities are present in typically developing infants by nine to 10 months of age, when they learn to shift attention in response to others' pointing or directed gaze. However, young children with autism spectrum disorder show a reduced response to joint attention bids by others and reduced initiation of joint attention behaviors such as lack of pointing or showing objects to share with others, or failure to follow another person's pointing or eye gaze (American Psychiatric Association, 2013; Landa, Holman, & Garrett-Mayer, 2007; Plauche-Johnson, 2004; Prior & Ozonoff, 2007). This is especially significant, since these specific preverbal skills, are the most discriminating early symptoms of autism spectrum disorder and are associated with social development (American Psychiatric Association, 2013; Charman, 2003; Rogers, Hepburn, Stackhouse, & Wehner, 2003).

Early impairments that are commonly observed and assessed in children with autism spectrum disorder include: does not hold his or her arms up to be picked up; does not show affection or seek comfort; does not offer comfort; lack of facial expressions and inappropriate affect; impairments in social smiling; lack of interest in other children and failure to develop peer relations; failure to join in the activities of others; lack of seeking to share their own enjoyment; impaired ability to engage in simple mutual imitation and imitative games; failure to direct attention to their own activities; ignores others; lack of social play and social responsiveness; impairment in response to their own name and orientation to visual stimuli; prefers being alone; lacks gaze monitoring; and poor quality of eye contact (Baranek, 1999; Clifford, Young, & Williamson, 2007; Clifford & Dissanayake, 2008; K. M. Gray & Tonge, 2001; Maestro et al., 2002; Maestro et al., 2005; Osterling & Dawson, 1994; Osterling et al., 2002; Plauche-Johnson, 2004; Prior & Ozonoff, 2007; Werner, Dawson, Osterling, & Dinno, 2000). The diagnosis of autism spectrum disorder is often most obvious when the parents report severe problems in social interaction from early in the child's life. However, some parents note that their child did not exhibit problems socially until the second year (Lord, Shulman, & DiLavore, 2004; Luyster et al., 2005). Sometimes parents are able to provide clear descriptions of noticeable changes in the child's social behavior in the second year; however, others report a slow stagnation of social involvement. These children may continue to respond to physical contact, such as being tickled, but the child may no longer blow kisses (Volkmar & Lord, 2007). Other complex behaviors which are often apparent in children with autism spectrum disorder during the second year include ignoring others; preferring to be alone; exhibiting an empty gaze; lacking gestures and emotional expressiveness (Beauchesne & Kelley, 2004). Pretend or symbolic play, that is also a social skill, is frequently evaluated (Plauche-Johnson, 2004). Social-communicative behaviors are assessed using various standardized instruments, parental reports and observations (Gamliel & Yirmiya, 2009).

The type of impairment in social interaction may change over time depending on the developmental level of the child, and these social deficits can manifest differently throughout life (American Psychiatric Association, 2013). Interviews, self-reports or specific measures are used to test the child's perceived social relationships, while others measure interactions more directly (Gamliel & Yirmiya, 2009). Observation of the child in a naturalistic environment is often used to assess the limited, awkward or unsuccessful interactions with peers. Observation usually reveals lower social engagement and overall socially inappropriate behavior (Sally & Hill, 2006; Sigman et al., 1999).

Cultural issues in the assessment of social communication and interaction. Although autism spectrum disorder has been seen in diverse national groups (Volkmar, 2005), the core symptoms and skills of the disorder including social and communication skills, are to some extent culturally determined. Unfortunately, the impact of culture on the assessment of the social domain in children with autism spectrum disorder is also significantly lacking in the literature. In Latino immigrant children, problems in the social domain that are characteristic of autistic disorder may be interpreted as problems related to acculturation (Reijneveld, Harland, Brugman, Verloove-Vanhorick, & Verhulst, 2005). This may contribute to the apparent under-diagnosis of autism spectrum disorder in young Latino children (Kreps, 2006; Mandell et al., 2002; Mandell & Novak, 2005; van Ryn & Fu, 2003) and can interfere with accurate assessment and diagnosis.

Differing expectations of social development. The Latino family may hold various norms for development of social and communicative behaviors. For example, in their study, which included a Latino group of Puerto Rican mothers, Dworkin and Pachter (1997) found that milestones for social development varied significantly across four ethno-cultural groups. The Puerto Rican mothers expected their children to smile at a significantly later age than the mothers from other racial and ethnic groups (Dworkin & Pachter, 1997). This is significant since parents of children later diagnosed with autism spectrum disorder frequently report their infant tried less frequently to attract others attention, and was less eager to engage in early social games that involve smiling at others and vocalizing (Volkmar, Chawarska, & Klin, 2005). In addition, studies suggest that Latina mothers may view certain behaviors that are encouraged by the mainstream culture such as self-confidence, independence and curiosity as unacceptable and improper conduct (Harwood & Schoelmerich, 1996). Therefore, the atypical social reciprocity behaviors associated with autism spectrum may be perceived and interpreted differently by Latino parents. The greatest cross cultural differences have been found regarding parent's developmental expectations within the social domain (Okagaki & Frensch, 1995; Wojtkiewicz & Donato, 1995).

Latino parents may not recognize less obvious characteristics of autism spectrum disorder, such as lack of initiating joint attention and consequently delay the diagnostic evaluation (Leekam & Ramsden, 2006; Overton et al., 2007; Wetherby et al., 2004). These "under expectations" (Dworkin & Pachter, 1997) or lack of awareness of the early behavioral abnormalities associated with autism spectrum disorder may not only increase or decrease the likelihood that a child will be referred for treatment at an early age, it also complicates the diagnosis, since what a psychologist notes as atypical behavior (e.g., smiling, lack of eye contact) may be acceptable or even reinforced in the Latino family home (Delmolino et al., 2007; Rogers-Adkinson et al., 2003). Studies have also noted that some parents may be less aware of social-communicative abnormalities because they use compensatory strategies in the home in an attempt to engage their infants socially and during play (Adrien et al., 1992; Baranek, 1999). This can often be seen during the assessment of the child when a parent unknowingly stands in front of the child when calling his or her name, thus ensuring eye contact in an attempt to "maximize their child's success during social interactions" (Baranek, 1999; Department of Developmental Services, 2002). Overall, Latino children face significant challenges considering they are culturally diverse, frequently linguistically diverse and often exhibit deviating behavior patterns that may interfere with assessment of social functioning and accurate diagnosis of autism spectrum disorder (Wilder et al., 2004).

Assessment of speech, language and communication. The current DSM-5 diagnosis of autism spectrum disorder includes the specifier "with or without accompanying language impairment", which requires the assessment and description of the child's current level of verbal functioning (American Psychiatric Association, 2013). In addition, some of the first symptoms of autism spectrum disorder involve delayed language development (American Psychiatric Association, 2013). Language development and use varies significantly among children with autism spectrum disorder. Some children may develop age appropriate verbal skills, and their deficits may primarily be seen in the use of language for reciprocal social communication, while some children never develop the ability to speak beyond a few single words (Tager-Flusberg, Paul, & Lord, 2005). Some caregivers report a plateau or deterioration of previously mastered words during the first 2 years of life (American Psychiatric Association, 2013; Plauche-Johnson, 2004). Therefore determining assessment methods depends on the child's age and developmental level, verbal ability and communication skills. Assessment techniques include formal evaluation using standardized tools; informal evaluation through checklists, observation and communication samples; interviews of the parents as well as parent questionnaires.

Early abnormalities in prelinguistic communication in children with autism spectrum disorder can often be seen in the form of lack of (or abnormal) babbling; abnormal eye contact; lack of limited range of facial expressions; lack of preference for human speech and limited responsiveness to speech; failure to imitate sounds and speech; delayed development of language; lack of response to name; no use or poor use of gestures; and use of others' bodies as tools (K. M. Gray, Tonge, Sweeney, & Einfeld, 2008; Klin, 1991; Paul, 2007; Plauche-Johnson, 2004; Wetherby et al., 2004). Since infants and toddlers with autism spectrum disorder frequently exhibit a lack of pointing to express interest, "pointing milestones" are also evaluated as part of the assessment of early receptive language abilities (Accardo, 2004). Individuals with autism spectrum disorder will also use proto-declarative utterances (non-speech sounds) and atypical preverbal vocalizations in early developmental stages (Sheinkopf, Mundy, Oller, & Steffens, 2000). The frequency of communication, which is often low in children with autism spectrum disorder are observed and recorded (Chawarska & Volkmar, 2005; Mundy & Burnette, 2005). The rate, means and functions of communication are also gathered, since prelinguistic communicative behaviors in children with the disorder are usually performed for the purpose of regulating other's behavior (getting others to do or not do things), with limited use of communication for the purposes of sharing, commenting, establishing joint attention and social interaction (Mundy & Stella, 2000; Mundy & Burnette, 2005; Wetherby et al., 2004). Children with autism spectrum disorder often use unconventional communicative means, such as pulling the parents' hand towards a desired object, rather than pointing to show or ask for the object. Deficits in non-verbal communication used for social interaction and gesture use, are a core deficit in young children with autism spectrum disorder (Shumway & Wetherby, 2009), therefore the child's means of communication are assessed. Infants and toddlers later diagnosed with autism spectrum disorder exhibit reduced responsiveness to their names, words and human speech in general (Bruinsma, Koegel, & Koegel, 2004; Nadig et al., 2007; Osterling & Dawson, 1994) and the child's responsiveness to communication is also assessed. All of the above deficits in children with autism spectrum disorder frequently require structured observation, recording and evaluation of the caregiver-child play.

Individuals with autism spectrum disorder who do acquire language are often very slow to develop words and speak very little until the preschool years. In addition, when language exists it is often lacking in social reciprocity; there is continued difficulty with comprehension of speech; prosody or sustained deficits in the areas relative to nonverbal functioning (American Psychiatric Association, 2000; Paul, 2007; Plauche-Johnson, 2004; Prior & Ozonoff, 2007; Tager-Flusberg & Joseph, 2003; Wetherby et al., 2004). Those individuals with autism spectrum disorder who do attain some language commonly display more severe receptive language difficulties than children with other language disorders; therefore, expressive and receptive language skills should be assessed separately (American Psychiatric Association, 2013; Paul, Chawarska, & Volkmar, 2007). The assessment of spoken language of children with autism spectrum disorder utilizes standardized measures to assess these areas and the clinician may also obtain a communication profile by collecting spontaneous speech during interaction with the child. Social communication deficits are often assessed using informal and formal tools such as observation or a parent checklist. Structured play methods are also used to evaluate the child's conversational skills, the ability to share information and the ability to understand contextual cues (Paul & Wilson, 2009; Schneider, 2004).

Cultural issues in the assessment of speech, language and communication. An awareness of cultural differences that can significantly impact the assessment of language and communication is essential when providing culturally competent care to Latino children. For example, traditional Mexican-American parents often teach their children to be compliant, respectful and quiet when in the presence of adults (Arcia, Reyes-Blanes, & Vazquez-Montilla, 2000; Brice, 2002; Valdes, 1996). Some Mexican-American mothers place high importance on characteristics of conformity and teach their children to be polite to adults, to obey parents and teachers and to be a niño "bien educado" or "well behaved" (B. L. Rodriguez & Olswang, 2003). Therefore, if the family places a high value on courtesy and "respeto" the child may not initiate conversation with an adult examiner. This can have a significant impact on the child's communication with the clinician during the evaluation and lead to an inaccurate assessment of the child's language and communication abilities. This can also interfere with the assessment such as when obtaining data for a communication profile or language sample. Therefore Latino children may require additional communication elicitation or it may be necessary to adjust the level of prompting during the assessment of language. In addition, language and communicative problems that characterize autism spectrum disorder may also be improperly interpreted as language problems related to immigrant or ethnocultural status in general and may impede correct detection of autistic features (Reijneveld et al., 2005).

Differing expectations of language development. Although delays in language are not specific to autism spectrum disorder, the most common presenting complaint of the parents of preschool children who are later diagnosed with autism is delayed speech and language development (Coonrod & Stone, 2004; Goin & Myers, 2004; Rapin, 1996; Wetherby & Diehl, 2006). Parents will often report that their child failed to begin saying words, learned a few words and did not progress. Approximately 25% to 35% of parents of a child with autism report regression after initial speech development (Lord et al., 2004; Osterling et al., 2002; Paul, 2007;

Rogers & DiLalla, 1990). However, Overton, Fielding and de Alba (2007) found that Latino parents, in a dual language environment, often did not recognize language delay as symptomatic of a developmental delay. In one study, Latino parents reported having other family members with speech and language impairments, therefore, some parents believed their children were showing similar signs and would simply outgrow the problem (Maldonado, 2008). Parents of children with autism spectrum disorder have been found to have more frequent communication deficits than parents of typically developing children, and even lower communication abilities than parents of children with Down Syndrome (Landa et al., 1992; Piven et al., 1997; Ruser et al., 2007). This is most likely due to a broader phenotype that has been documented as well as the genetic inheritance suspected in autism spectrum disorder. Therefore, it is not surprising that these deficits can remain unnoticed in some Latino families. Although not specific to autism spectrum disorder, another study of Latina mothers' beliefs about their child's disabilities, found that deficits in speech and language abilities was not perceived as symptomatic (García, Pérez, & Ortiz, 2000). Although the children exhibited impairments including limited verbal skills, impaired use of nonverbal gestures and poor retention abilities, the mothers lack of concern was related to their belief that children were not expected to speak or comprehend language until at least 3 years old. However a more recent study of Mexican immigrant mothers found that the mothers expected early vocalization to happen within the first year of life (Kummerer & Lopez-Reyna, 2006). Although the children in this study were not diagnosed with autism, all the children exhibited communication delays and the mother's did not report concern about their child's delays in early word production or their inabilities to use word combinations, rather they were concerned about poor pronunciation and speech intelligibility. In addition, in some cultures, there is a tolerance for boys who display language delays. The child is not viewed with alarm because the parents may not be concerned about their child's lack of verbalization and believe the child will eventually speak (Roseberry-McKibbin, 2008). This is even more significant when considering male relatives of children with autism spectrum disorder frequently exhibit language deficits (Szatmari et al., 2000). Therefore, it may be challenging to evaluate the language skills of a Latino male child by parent report alone if the language and communication deficits are considered ordinary in the home.

Dual language learners. Although verbal language deficits are typically observed in your children with autism spectrum disorder, studies on the bilingual aspect of speech and language development in Latino children with autism spectrum disorder is lacking in the literature (Daley, 2004). For example, some children who are in the process of acquiring a second language have been noted to repeat to oneself and start and stop a sentence several times (Brice, 2002). This may be confused with atypical language patterns commonly seen in children with autism spectrum disorder. Research is also lacking to assist in differentiating the pragmatic difficulties associated with learning a second language (Brice, 2002) from the pragmatic deficits often observed in children with autism spectrum disorder. It is unknown if the pronoun reversal often seen in children with autism spectrum disorder presents differently in Spanish-speaking children. This can interfere with identification of communication impairments necessary when making an accurate diagnosis of autism spectrum disorder.

An awareness of and understanding of second language acquisition, bilingualism and sociolinguistics is necessary when assessing language and communication of Latino children who have been exposed to both English and Spanish (Brice, 2002). Although not specific to children with autism spectrum disorder the following is a brief review of the process of second language acquisition.

Second language acquisition. Simultaneous language acquisition occurs when both English and Spanish are spoken to the child simultaneously in a naturalistic environment in early infancy, and competency in both languages is comparable to that of a monolingual speaker. Sequential language acquisition, or consecutive language learners, includes children who hear Spanish in the home and are only later exposed to English in the community or when they enter school (M. T. Stein et al., 2004). These children may have had fewer opportunities to hear and use English and may demonstrate a lower level of English proficiency (Brice, 2002). Balanced bilingualism is equal proficiency in both languages. If only one language is dominant then the child is non-balanced bilingual. Subtractive bilingualism is a problem often seen in children with developmental delays. This is the process of gaining ability in one language, while losing ability in the other language. This will sometimes lead to semilingualism, or incompetence in either language (Hamayan & Damico, 1991).

It is commonly believed that learning two languages will confuse a child or slow language development (Macrory, 2006). However, typically developing infants or children who learn two languages simultaneously in an interactive and naturalistic context can generally acquire a second language quickly (Snyder, Miller, & Stein, 2008; M. T. Stein et al., 2004) and can certainly process and learn two languages without promoting speech and language delays (Petitto et al., 2001). Even studies of children with intellectual disability or Down Syndrome have found that these children are not differentially challenged in learning their first language as a result of being exposed to and learning a second language (E. K. Bird et al., 2005; Feltmate & Bird, 2008; Genesee, Paradis, & Crago, 2004). In fact, children with developmental delays are able to learn two languages successfully (Roseberry-McKibbin, 2007).

In addition, language acquisition in a bilingual child develops at a similar pace as a monolingual child. For example, when investigating the early babble of monolingual and bilingual infants, researchers found similar ages of onset for babbling, and monolingual and bilingual infants performed similarly on measures of babbling and the production of vowel-like sounds (Oller, Eiler, Coco-Lewis, & Urbana, 1997). Studies that have evaluated the early vocal behaviors of children with autism spectrum disorder, found those infants later diagnosed with autism spectrum disorder are able to produce well-formed syllables associated with the babbling stage of speech development, but these children displayed vocal impairments, such as atypical intonation (Sheinkopf et al., 2000; Wetherby et al., 2004). Unfortunately, those studies evaluating early language in infants with autism spectrum disorder (Sheinkopf et al., 2000) do not include Latino children, therefore limiting the results and their implications among Spanish-speaking or bilingual infants.

Language acquisition in a bilingual child also follows the same sequence of learning with a focus on common nouns such as that seen in a monolingual child; however bilingual children will usually combine the two languages (M. T. Stein et al., 2004). For example, by 20 months a bilingual child should have more than 20 words in the two languages combined (Fierro-Cobas & Chan, 2001). Studies suggest, bilingual children tend to have smaller vocabularies in both languages compared to monolingual children; however, when considering both languages and translation equivalents are only counted once, bilingual children typically have vocabularies that are equal or larger (Genesee et al., 2004; B. Z. Pearson, Fernandez, & Oller, 1993; B. Z. Pearson & Fernandez, 1994).

Overall, in a typically developing child, bilingualism is associated with an array of advantages. However, little is known about the process of learning a second language, in children who already have limited communication skills in a primary language, such as children with autism spectrum disorder (B. A. Goldstein, 2006; Mueller, Singer, & Carranza, 2006). A few published studies have examined the effect of the exposure of more than one language on children with autism spectrum disorder (Hambly & Fombonne, 2009; Kremer-Sadik, 2005). Some studies suggest that the social deficits in children with autism may interfere with the cognitive, linguistic and social strategies used to acquire a second language, making learning another language difficult (Toppelberg & Snow, 1999) . In fact, some bilingual families of a child with autism spectrum disorder are even encouraged to speak only one language in the home (M. E. Smith, Thordardottir, & Weismer, 1997), isolating and creating social distance between family members (Kremer-Sadik, 2005). However Petersen, Marinova-Todd, & Mirenda (2012) did not find any differences between bilingual and monolingual children with autism spectrum disorder on several measures of early language development. The authors suggest that early bilingual exposure does not add further burden on the developing language of a young child with autism spectrum disorder and they suggest interventions be provided in both languages. Further study related to the early language development in children with autism spectrum disorder who are exposed to more than one language is required to determine if bilingualism is attainable in children with the disorder (Petersen et al., 2012; Toppelberg & Snow, 1999). This is especially significant, since studies show that Hispanic families of a child with autism spectrum disorder are more likely to speak more than one language in the home (Chaidez et al., 2012).

Language loss and language shifts. Language loss and language shifts are frequently seen in typically developing children exposed to two languages, and are important phases of a child's bilingual language development and should be taken into account when identifying delayed language or communication deficits. Many children experience an increase in their English language proficiency with a concurrent loss of language skills in Spanish if there is little support or maintenance (Brice, 2002). These children sometimes appear to have slowed or arrested their Spanish language development while learning English, while other bilingual children may seem delayed in both languages (M. T. Stein et al., 2004). In addition, there is a normal nonverbal phase of second language acquisition in young children (Toppelberg, Tabors, Coggins, Lum, & Burger, 2005) sometimes called a "silent period" that can last anywhere from 3 to 6 months or even longer while the child is attempting to learn a second language (Brice, 2002). This may be mistaken as a language deficit or regression of skills during the assessment process or selective mutism (Toppelberg et al., 2005). However, studies show that children who are in the process of learning a second language do attempt to make use of various social or cognitive strategies during the "silent period" when learning a new language such as gestures, relying on routine events for deriving meaning and learning a few gestural phrases in the language (Brice, 2002). Unfortunately, studies that explore the use of these types of non-verbal strategies in dual language learners suspected of having autism spectrum disorder are limited.

It is difficult to differentiate between children with temporary limited English proficiency (LEP) and those children with a language disorder. In addition, little research has been dedicated to differentiating children with temporary LEP, from those children with autism spectrum disorder who are also exposed to two different languages. Unfortunately, if a young child is not speaking, the professional may simply attribute the observed behavior to the bilingual environment at home and tell the parents their child will "grow out of it", subsequently delaying, or overlooking an appropriate diagnosis of autism spectrum disorder (Roseberry-McKibbin, 2008). Several Latino parents of one study reported being told their child's speech and language delay was due to "language confusion" (Maldonado, 2008). Studies suggest that children with

LEP will eventually gain proficiency with adequate exposure to bilingual education. However, age appropriate academic language proficiency may take up to 7 years to develop in children who learn English after the age of 6 years old (M. T. Stein et al., 2004). This can certainly complicate the early assessment of language of Latino children suspected of having autism spectrum disorder, given the variety of communication skills and differences in exposure to preschool or early academic learning. Although delayed language is often one of the first noticeable symptoms of autism spectrum disorder in young children (American Psychiatric Association, 2013), slower language acquisition, commonly seen in children exposed to a dual language environment is not sufficient for a diagnosis of autism spectrum disorder. To determine if a child has autism spectrum disorder it is necessary to take into account important non-verbal communicative behaviors.

Assessment of restricted, repetitive behaviors, interests or activities. Repetitive behaviors and interests are an essential diagnostic feature of autism spectrum disorder and have also been found to predict the severity of autism (Bodfish, Symons, Parker, & Lewis, 2000). There is great heterogeneity in the early presentation of these repetitive behaviors in children which can also vary according to age and ability (American Psychiatric Association, 2013). Identification is difficult since many of these odd and repetitive behaviors are not evident until after the second year of life and it has been suggested that stereotyped behaviors may have a later onset than symptoms associated with the other developmental domains (American Psychiatric Association, 2013; Chawarska, Klin, Paul, & Volkmar, 2007; K. M. Gray & Tonge, 2001; Mooney, Gray, & Tonge, 2006). In addition, research shows that ritualistic and stereotyped behaviors are only reported by a small percentage of parents (Coonrod & Stone, 2004; De Giacomo & Fombonne, 1998).

Abnormalities in symbolic play are often observed during early stages of development, such as lining up or grouping toys, staring at toys out of the corner their eye or self-stimulatory behaviors such as rocking, hand flapping or finger flicking (American Psychiatric Association, 2013; Plauche-Johnson, 2004; Volkmar & Pauls, 2003). Clinical observation and history are often gathered to determine the child's manner of playing with toys or other objects in his or her environment. Children with autism spectrum disorder exhibit a limited range of interest that may be restricted to specific subject areas such as astronomy or Legos, or the interest may be as idiosyncratic as parts of the body, smooth surfaces, or corners. Young children with autism spectrum disorder have also been observed repeatedly opening and closing doors or drawers with no intentional or functional use (Huebner, 2001; Plauche-Johnson, 2004). Children with autism spectrum disorder also show little interest in usual childhood toys and can often be observed playing with everyday items such as string or dirt or exhibit an unusual attachment to objects such as a rock or pan (American Psychiatric Association, 2013). The child may play perseveratively with these items for hours in a stereotypic manner and will protest violently when the object is removed (Plauche-Johnson, 2004). When children with autism spectrum disorder do play with typical toys, they may become preoccupied with a part of the toy and play with it in an atypical manner such as spinning only the wheels of a toy car or opening and closing the door of the toy car repeatedly (Plauche-Johnson, 2004). The goal of assessing the child's play is to determine whether the child is able to use objects for imaginative play (e.g. using pretend noises) or is the child playing in a repetitive, stereotyped or unusual manner with aspects of the objects and lacking spontaneous and imitative play (Schneider, 2004) . Rigidity in response to the environment or a compulsive need for "sameness" is common including a marked preference for constancy and maintenance of routines (American Psychiatric

Association, 2013; Plauche-Johnson, 2004). In young children with autism this often manifests as an insistence on eating the same foods every day or difficulty transitioning from one activity to another. When the environment is altered, the child with autism spectrum disorder can become disorganized and distressed over trivial things and this often results in temper tantrums, screaming and crying for several hours. Other stereotyped or repetitive behaviors observed and assessed in young children with autism spectrum disorder include repetitive speech patterns or verbal rituals, echolalia or the parroting of heard words (American Psychiatric Association, 2013); whole body mannerisms (considered a "stiff or non-cuddly baby", arching or swaying the whole body); distractibility; sleep problems (Werner & Dawson, 2005); self-injurious behaviors (e.g. head banging, hand biting and head punching); unusual fears; lack of curiosity; running away from others and; indifference to animals (Accardo, 2004; K. M. Gray & Tonge, 2001; Malow, 2004; Plauche-Johnson, 2004; Stevens, Tidman, & Glasgow, 2004).

Cultural issues in the assessment of restricted, repetitive behaviors, interests or activities. One of the most difficult factors in the assessment of restricted or repetitive behaviors or interests is that these behaviors may not be observed during a brief clinical evaluation (Overton et al., 2007; Wetherby, Prizant, & Schuler, 2000). However, those instruments that focus solely on observation are problematic since some deviant behaviors, such as self-injurious behaviors, are frequently not observed because they rarely occur and have very low base rates (Klin, Saulnier, Tsatsanis, & Volkmar, 2005; Volkmar, 2007). This means the clinician must frequently rely on the parent's report of the child's behaviors, which is definitely impacted by the parent's culture.

There are few studies that focus on the impact of culture on autism spectrum disorder, however, studies suggest that Latino families may consider certain behavioral deficits or excesses usually associated with the disorder as more, or less, problematic. Research on the attribution styles of Latina mothers of children with developmental disabilities suggests that Latino families may not take into account behaviors related to autism spectrum disorder as symptomatic because of their attribution style (Chavira & Lopez, 2000). For example, Chavira and Lopez (2000) found that behavioral excesses in children such as temper tantrums were likely to elicit attributions of responsibility such as the parent holding the child responsible; however, children were held less responsible for developmental deficits such as speech and language delay. This suggests that the behavioral presentation of the child with autism spectrum disorder may not elicit parent concern and can impact parental recognition of symptoms. In addition, Latino families may have differences in what is considered aberrant behavior sometimes associated with autism spectrum disorder (Croen, Grether, & Selvin, 2002). For example, Latina mothers may be more tolerant of sleeping problems or disruptive behaviors such as crying or lack of attentiveness (Madding, 1999), and may not consider these behaviors problematic. This is especially significant since increased irritability, more avoidant behavior and reduced attention to events have been strongly associated with a later diagnosis of autism spectrum disorder (Chawarska & Volkmar, 2005; Maestro et al., 2002; Palomo, Belinchón, & Ozonoff, 2006; Zwaigenbaum et al., 2005). One study found that Latino parents spoke of stereotyped behaviors and restricted patterns of interest in terms of obstinate or stubborn behavior (Maldonado, 2008). Other parents may not see stereotypic behaviors as indicative of developmental problems or may minimize the significance of problematic behaviors because they believe it might reflect badly on their parenting (Maldonado, 2008). In addition, if family members have similar social deficits these family members may not only unintentionally discount socially inappropriate behaviors, but they may also reinforce these behaviors (Snyder et al., 2008). Studies of gender differences and parenting among Latinos also suggest that males may be afforded greater freedoms compared to females (Raffaelli & Ontai, 2004). This is significant considering studies that have suggested the brain of an individual with autism spectrum disorder is “an extreme of the male brain” (Baron-Cohen, 2002). Therefore, behavioral problems observed by Latino parents among males with autism spectrum disorder may be interpreted as tolerable or even desirable.

Assessment of sensory integration/ sensory processing. A young child’s fascination with a specific routine can also be related to hyper- or hypo-reactivity to sensory input. In fact, extreme reactions to taste, smell, and texture or food restrictions are common in young children with autism spectrum disorder and may be a presenting feature of the disorder (American Psychiatric Association, 2013). The sensitivity to different stimuli is significantly different from typically developing children and even children with developmental delay (Baranek, David, Poe, Stone, & Watson, 2006). Many authors have noted early impairments in sensory functioning in children with autism spectrum disorder (Dawson, Osterling, Meltzoff, & Kuhl, 2000; Osterling et al., 2002; Wetherby et al., 2004; Zwaigenbaum et al., 2005). The subtle symptoms that are sometimes present during infancy include: mouthing of objects or excessive licking of non-edible items, repeatedly smelling of objects or an obsession with water; fascination with flickering lights or movement; sensation seeking behaviors; atypical sensory exploration of objects; sleeping problems; and touch aversion (Zwaigenbaum et al., 2005). Children with autism frequently exhibit oral aversions and intolerance to certain textures that results in a self-imposed restricted diet or irritability to certain tactile sensations such as various clothing textures. However, these children may also be indifferent to painful injuries, cold or other noxious stimuli, or the child may not exhibit an appropriate fearful response during dangerous or frightening situations, or the child may display an unwarranted response to harmless objects (Plauche-Johnson, 2004; Stevens et al., 2004).

The assessment of sensory issues can include interviewing family caregivers, questionnaires as well as clinical observation (Stevens et al., 2004). Checklists used to assess sensory integration address all the sensory modalities including tactile, auditory, visual, olfactory, gustatory, proprioceptive and vestibular. The child's patterns of responses that occur during everyday routines are noted such as bathing, meals and play. The few standardized measures used to test sensory integration specifically address fine motor, visual motor and activities of daily living, since sensory issues frequently affect everyday life and skills (Accardo, 2004; Stevens et al., 2004).

Cultural issues in the assessment of sensory processing/sensory integration. Perhaps the most obvious problem in the assessment of sensory functioning of Latino children suspected of having autism spectrum disorder is the limited number of instruments available in Spanish (Fernandez et al., 2007). Latino families may not have the knowledge of sensory processing problems or may not have the vocabulary to describe the problems. For example, English speaking parents will sometimes use the terminology of occupational therapy to describe their child's behaviors (Dickie, Baranek, Schultz, Watson, & McComish, 2009). However; without the jargon to describe the behaviors, Spanish speaking parents may have difficulty accurately describing the disorder. In addition, assessment of sensory reactivity that requires parent rating or parent report, necessitates an instrument that is also linguistically and culturally appropriate. The subtle difficulties in sensory functioning often present in infants at 9 to 12 months (Baranek, 1999) may not be accurately reported by a Latino parent and ultimately fail to identify those diagnostic features associated with the disorder.

Latino families with young children with autism spectrum disorder may under-report sensory problems, especially in non-verbal young children (Baranek et al., 2006). This can result in an under-estimation of sensory problems. This is even more significant since parents will frequently adapt the daily family routine to their child's sensory processing problems. This will certainly make parental report of sensory problems subject to parent bias. Studies also suggest that children living in stress may develop sensory deficits (Goldsmith, Van Hulle, Arneson, Schreiber, & Gernsbacher, 2006) and low income Latino urban preschool children with externalizing problems may in fact struggle with delays in sensory development that can impact their behavior (Gunn et al., 2009). These children may be consequently be inaccurately labeled as emotionally disturbed. Speech and language problems often coexist with behavioral problems and sensory processing difficulties. However, this is further complicated when assessing Latino children living in dual-language households. Latino children differentiating between two languages sometimes show auditory sensory processing difficulties (Dickie et al., 2009). Similarly the stress of learning two languages can increases the repetitive behaviors in bilingual children with autism (Chaidez et al., 2012; Gunn et al., 2009). Therefore, it is the responsibility of the examiner to consider these cultural differences when utilizing instruments to assess sensory processing and include these considerations in diagnostic conclusions.

Assessment of developmental and adaptive functioning. Intellectual impairment is one of the associated features supporting the diagnosis of autism spectrum disorder (American Psychiatric Association, 2013). In addition, the DSM-5 diagnosis of autism spectrum disorder requires the specifier "with or without accompanying intellectual impairment" (American Psychiatric Association, 2013). However, children with autism spectrum disorder often have co-morbid conditions including intellectual disability (American Psychiatric Association, 2013).

Recent epidemiological studies have indicated that a much higher proportion of children with autism spectrum disorder do not have accompanying intellectual disability than occurred in samples in the past (Autism and Developmental Disabilities Monitoring Network Surveillance Year 2000 Principal Investigators, Centers for Disease Control and Prevention, 2007; Autism and Developmental Disabilities Monitoring Network Surveillance Year 2002 Principal Investigators, Centers for Disease Control and Prevention, 2007; Autism and Developmental Disabilities Monitoring Network Surveillance Year 2006 Principal Investigators, 2009; Croen, Grether, Hoogstrate et al., 2002; Fombonne, 2005; Honda, Shimizu, & Rutter, 2005; Wiggins, 2006; Yeargin-Allsopp et al., 2003). The downward trend in coexistent mental retardation in some populations has been influenced by improved professional training and more effective strategies, methods and tools for evaluating intelligence in children with autism spectrum disorder (Croen, Grether, Hoogstrate et al., 2002). Current estimates suggest the proportion of individuals with autism spectrum disorder who have intellectual impairment is between 40% and 55% (Baird et al., 2006; Bonde, 2000; Chakrabarti & Fombonne, 2001; Fombonne, 2005; Yeargin-Allsopp et al., 2003). However, to make the comorbid diagnosis of autism spectrum disorder and intellectual disability, social communication must be significantly impaired relative to the developmental level of the child’s nonverbal skills (American Psychiatric Association, 2013). Intellectual disability without autism spectrum disorder is difficult to differentiate in young children. This can also ultimately result in a primary diagnosis of global developmental delay or intellectual disability. Unfortunately, this may also be one of the contributing factors in the widespread misdiagnosis of Latino children.

Overall, young children with autism spectrum disorder, exhibit a relatively slower rate of development than their peers. This difference becomes particularly noticeable early in the second year of life (Landa & Garrett-Mayer, 2006). There is limited stability of cognitive skills in children between 2 and 4 years of age overall (Charman et al., 2005; Chawarska et al., 2007) and children can show large improvements in IQ scores from the preschool to elementary school years (Chawarska & Bearss, 2008; Klinger, O'Kelley, & Mussey, 2009). Therefore, the evaluation of young children suspected of having autism spectrum disorder utilizes developmental assessment measures rather than standardized cognitive instruments that may produce an unmeaningful IQ score (Klinger et al., 2009). A developmental assessment can determine whether or not the child is meeting the expected developmental milestones, to identify motor deficits that are often present such as walking on tip toes and to document those low severity symptoms that are often missed by parents, but can be observed with specific prompts and behavioral probes (Chawarska & Bearss, 2008).

The goal of a developmental assessment with young children suspected of having autism spectrum disorder is to understand the child's level of functioning across several domains including: verbal cognition and communication; non-verbal cognition; personal-social skills; motor skills; and adaptive functioning (Chawarska & Bearss, 2008). Identifying intra-individual discrepancies as well as the child's strengths and weaknesses as part of the developmental assessment, has been found to be particularly important given that the development of children with autism spectrum disorder is characterized by significant intra-individual scatter the first 3 years of life (Chawarska & Bearss, 2008; Dawson et al., 2002; W. S. Gilliam & Mayes, 2004; Klinger et al., 2009). A developmental assessment can also help determine whether the child's social and communicative delays are greater than expected from the child's developmental level; a necessary part for interpreting diagnostic features. If the discrepancy between developmental level and social communication is not present, then it is recommended that the examiner consider a diagnosis of intellectual developmental disorder or social (pragmatic disorder) communication disorder[1]. Standardize cognitive assessment instruments for young children are limited due to the lack of appropriate assessment tools for children with autism spectrum disorder. There are also inherent difficulties when testing children with autism spectrum disorder since they are often difficult to engage during the assessment (Chawarska & Bearss, 2008; Klinger et al., 2009) and often spend less time attending to tasks presented during testing (Akshoomoff, 2006; Chawarska & Bearss, 2008). Therefore, it is extremely important that the examiner have extensive knowledge of child development in general and also be familiar with a variety of strategies to grasp the child's attention and motivation without compromising testing procedures.

One of the most limiting factors when determining an appropriate measure of developmental functioning is the verbal ability of the child. Some available measures allow for separation of verbal and nonverbal ability when producing useful scores. Therefore it is imperative to determine the child's level of language use and level of understanding of verbal directions when choosing an instrument (Klinger et al., 2009). In addition, attempts to measure cognitive abilities in children with autism spectrum disorder must always include separate estimates of verbal and nonverbal skills (Accardo, 2004; American Psychiatric Association, 2013; Department of Developmental Services, 2002). When assessing the development of a child suspected of having autism spectrum disorder, it is also useful to choose an instrument that is appropriate for a child several years younger than the examinee to limit floor effects. If the age-appropriate measure is too difficult for the child, then an alternative measure that utilizes age equivalents, rather than standard scores, may be more reasonable (Klinger et al., 2009).

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[1] Social (pragmatic disorder) communication disorder is a new condition in the DSM-5 involving persistent difficulties in the social uses of verbal and nonverbal communication.

The discrepancy between intellectual and adaptive skills is often large in children with autism spectrum disorder (American Psychiatric Association, 2013). Assessment of a child suspected of having autism spectrum disorder should also include a measure of adaptive functioning in order to determine if the child meets the diagnostic criteria for intellectual disability as described in the DSM-5 (American Psychiatric Association, 2013). Adaptive functioning in infants and toddlers encompasses all the skills necessary for age appropriate daily functioning such as expressive and receptive language, socialization and the ability to interact appropriately with others, the beginnings of social reasoning and social understanding, basic self-care such as dressing, bathing and toileting, and a child's involvement in household chores (Chawarska & Bearss, 2008). Although many children with autism spectrum disorder may demonstrate cognitive capability, they will often exhibit significant deficits in their ability to translate these skills into real life functioning. Adaptive skills are often measured through clinical observation as well as standardized measures (American Psychiatric Association, 2013; Corbett, Carmean, & Fein, 2009; Klinger et al., 2009).

Cultural issues in the assessment of developmental and adaptive functioning. Significant racial disparities have been found in the number of children with autism spectrum disorder and intellectual disability. Latinos are less likely than White children to have documentation of autism spectrum disorder in their records and Latino children are more likely to be diagnosed with intellectual disability (Mandell et al., 2009). Although the presence of a significant intellectual disability can complicate the diagnosis of autism spectrum disorder, when clinicians observe cognitive impairment they may be less likely to further assess some Latino children and simply diagnosis intellectual developmental disorder (Mandell et al., 2009). Few studies have been devoted to assisting clinicians who work with Latino children suspected of having autism spectrum disorder, in order diminish this disparity. There are several cultural considerations when utilizing cognitive and developmental testing, while attempting to make this differential diagnosis.

In general, children from ethnocultural backgrounds usually score lower than those students from the majority culture on typical standardized measures. African Americans have been noted to score one standard deviation below Whites, and Hispanics score on a range between African Americans and Whites (Herrnstein & Murray, 1994). Latino children may be seriously disadvantaged if their developmental functioning is assessed by any of the commonly used traditional, language loaded cognitive batteries. The disadvantage is evident in the linguistic or cultural demands that are placed on the person, that are not essential to the process of assessing development (Bracken & McCallum, 2001). Although verbally and socially relevant developmental factors can be an important component of the assessment, the underlying assumption is that all examinees have had similar exposure to the culture and language of the test. This assumption is invalid for many Latinos within the U.S. population (Bracken & McCallum, 2001). Many Latino children are unfairly disadvantaged on these language loaded tests because they speak a language other than English or because they have not fully integrated into U.S. culture. In addition, children with autism spectrum disorder inherently have more issues that limit their effective communication with others. These non-cognitive factors are unrelated to the assessment of their developmental functioning (Bracken & McCallum, 2001).

Social and family practices as well as values and behaviors can also provide useful information about the child’s involvement with their culture, which can also influence testing. Several studies have found that Latina mothers of Mexican descent present little teaching to their children, provide primarily nonverbal instructions, use slow paced negative feedback, speak to their children using largely adult wording and do not ask children to “recite or perform” (Kayser, 1998; Madding, 1999). This suggests that testing children to determine information learned is rarely used in this population and may be an unknown experience to some young children and their families during the assessment process. In addition, many children with autism spectrum disorder become significantly distressed when aspects of their environment or routine are changed. This anxiety is even more evident when the child is placed in novel surroundings, in order to meet a new person and the child is asked to complete new tasks as part of the developmental assessment (Klinger et al., 2009). This can be exacerbated when assessing a Latino child suspected of having autism spectrum disorder who has limited exposure to the structure and tasks utilized during the testing routine (Gutiérrez-Clellen & Simon-Cereijido, 2009). The child may exhibit behaviors that are not typical of their functioning in a more familiar environment, which can subsequently influence the external validity of the results and diagnostic conclusions.

The assessment of daily living skills often includes clinical observation and interview of the caregiver regarding target areas such as grooming, dressing of the upper and lower body and toileting. The examiner must attempt to determine how much assistance the child needs in each area in order to determine if the abilities of the child are age appropriate (Stevens et al., 2004). However, differing views in the appropriate development of self-help or adaptive skills may also influence the assessment process of a Latino child suspected of having autism spectrum disorder. For example, Dworkin and Pachter (1997) found varying ethno cultural differences in parental expectations of normal child development. The authors found that the Puerto Ricans mothers in the study expected their children to put on their shoes at a significantly later age than African-American mothers and White mothers. Therefore cultural expectations of adaptive skills may not only impact symptom presentation, but may also affect the evaluation of these deficits. Although there is significant heterogeneity in the Latino culture, these ethno cultural differences can result in failure to address adaptive skills deficits with a professional resulting in delayed care. In addition, the parents' concerns for their children's adaptive skills can predict developmental status (M. T. Stein et al., 2004). Therefore, it is important for the clinician to explore the parent's expectations of adaptive skills, since they are often culturally determined and may not necessarily be associated with autism spectrum disorder.

Summary

Autism spectrum disorder is a highly complex and a lifelong disability that requires early and accurate diagnosis to obtain the best prognosis. There is an increase in the number of children overall diagnosed with autism spectrum disorder that is most likely due to an increase in awareness of parents and teachers, changes in diagnostic criteria, leading to early and appropriate diagnosis by physicians (Croen, Grether, Hoogstrate et al., 2002; Fombonne, 2007; Wing & Potter, 2009). However, studies have documented significant ethnic and racial discrepancies in the diagnosis and treatment the disorder (Institute of Medicine, 2002). Although autism spectrum disorder is considered to be a universal disorder, with biological and genetic etiology, there is currently no epidemiological data specific to Latino children with autism spectrum disorder and the incidence and prevalence of autism among Latino children is often not documented, or the results are inconsistent (Mandell et al., 2009; Newschaffer et al., 2007). The accurate identification of autism spectrum disorder is imperative as this allows the families of Latino children with the disorder to obtain necessary early intervention and treatment services.

Latino immigrants who live in the United States are especially impacted by lack of access to health care, language and significant other variables that impact and interfere with access to treatment and can delay early evaluation and diagnosis. Poverty also influences the number of Latino children who are recognized with autism spectrum disorder, since lower than expected rates in the identification of the disorder have been noted in poor regions of the United States. Professional bias and dismissal of Latino parent concerns may also interfere with accurate detection. Many Latino parents lack awareness about normal development and behavior or delay concerns which further impedes the necessary early identification. Cultural perceptions of disability and illness can also hinder early identification. There are also significant variables that can complicate an understanding of the symptoms and impact the assessment process, such as language barriers and language fluency (Krauss et al., 2003). Latino children with autism spectrum disorder may be subsequently misdiagnosed with other psychological and behavioral disorders rather than autism spectrum disorder.

Although the diagnostic category of autism spectrum disorder is recognized around the world and the number of research studies on the disorder is on the rise, surprisingly little is known about autism spectrum disorder in a sociocultural or linguistic context (D. Rodriguez, 2009). This is surprising given that the symptoms of autism spectrum disorder include verbal and nonverbal deficits in social communication and problems in language used for reciprocal social interaction. Unfortunately, even less is available concerning the assessment of autism spectrum disorder in Latino children. There is little research and few appropriate assessment tools available to professionals who routinely work with children from diverse backgrounds, leaving clinicians ill equipped to conduct assessments and address important language and sociocultural issues. In addition, most research on interview and assessment methods with children with developmental disorders and their families has been conducted from a Western cultural perspective (Dyches et al., 2004; National Research Council, 2001). Research devoted to assessment instruments utilized to diagnose autism spectrum disorder in Latino children exposed to dual language environments or Latino children with monolingual Spanish speaking parents are lacking in number; therefore, limiting the number of instruments that can be utilized as part of the assessment process. In addition, there is insufficient research related to cultural perceptions of symptoms which may shape parental report, while educational attainment can impede the ability to complete questionnaires or parent behavioral reports. It is imperative to consider multicultural perspectives when conducting assessments of young Latino children with autism spectrum disorder. Today there is a great need to develop standardized evidence based diagnostic instruments to ensure the early identification and accurate diagnosis in young Latino children (Liptak et al., 2008).

Purpose and Importance of the Dissertation

From the review of the literature, it is apparent that the psychological assessment of autism spectrum disorder in Latino children is a complex, multi-faceted process. However; the dearth of research related to language, culture and the assessment of the disorder, highlights the dire need for an increased focus in this area. Given the census data and changing demographics, the likelihood of encountering Latino families in clinical practice is considerable. Prompt diagnosis is important for ensuring the child is eligible for appropriate services and arranging early intervention at a potentially critical period in time to achieve the most positive developmental outcomes (Howlin, 2002). There are few studies related to the awareness of Latino parents and autism spectrum disorder and there is a need for general outreach and education in the Latino community (Mandell et al., 2010). There is also an increasing need to ensure culturally appropriate and accurate assessment and diagnosis of young Latino children. Therefore, this dissertation provides a critical review of the current tests used with or available for psychological assessment of autism spectrum disorder in young Latino children as well as recommendations for appropriate diagnostic instruments.

Chapter II. Review of Instruments

To conduct the critical review of existing psychological tests, the following process was followed: (a) tests were identified for the specific domains of functioning relevant to assessing autism spectrum disorder in Latino children; (b) the relevant literature was identified and obtained; (c) the information relevant to completing a critique of the test was organized and extracted; (d) a description of the test, its psychometric properties including reliability and validity and the strengths and weakness of each test by the specific assessment domains is provided.

Identification of Psychological Tests

The present dissertation provides a review of measures used to assess autism spectrum disorder in infants and young children. Due to the urgency of identifying Latino children at an earlier age, and certainly before they enter the school system (Accardo, 2000; Zwaigenbaum et al., 2009), the age range of measures was limited to birth to 5 years of age. Psychological measures and tests were grouped into the following domains: (a) diagnostic measures of autism spectrum disorder; (b) social communication and social interaction; (c) speech, language and communication; d) developmental/cognitive functioning; (e) adaptive behavior; and (f) sensory processing/sensory integration functioning. Information regarding each of the tests within each domain was identified utilizing the PsycINFO database and PsycArticles, test publishers materials and catalogues and major test reference books. Tests were also identified and located through internet searches, such as the Ercicae.net Clearinghouse on Assessment and Evaluation, the Buros Institute of Mental Measurements online database, Tests in Print and Test Critiques on line database and the Test Collection of ETS. The results from these searches were used to conduct further searches based on additional key words and citations that were noted. The targeted World Wide Web search included reviewing specific websites for companies and organizations that publish assessment tools, such as Pearson Assessment, Hartcourt Assessments, Psychological Assessment Resources, Inc. and Western Psychological Services. The targeted web search also included reviewing specific websites of relevant organizations related to autism spectrum disorder, early childhood organizations, pediatric organizations and school district websites for discussion of assessment tools. Additional data and copies of specific measures were obtained by directly contacting test developers and authors.

The inclusion criteria for the specific measures were as follows: tools were required to assess the above mentioned domains of functioning; applicable to infants and young children (0-5 years of age); measure the particular domains/deficits; and are available in Spanish or may be appropriate for use with Latino children and/or Spanish speaking families. These tools were also selected because they were frequently cited in the literature as being used in the assessment or diagnosis of autism spectrum disorder (e.g. recommend tools, practice parameters, and books on the assessment of autism spectrum disorder). A few measures, although not available in Spanish, were included because they are frequently cited in the literature as related to the assessment of autism spectrum disorder and are used to diagnose the disorder in Latino children. Tools that have been documented to have questionable psychometric properties were included, in order to review the research associated with the instrument and comment on its psychometric properties as it related to young Latino children and their families. Due to the recent changes to the name and diagnostic criteria from the DSM-IV to the DSM-5, this dissertation is limited to measures used to diagnosis autism; therefore, tools that are used to assess theory of mind or Asperger's were excluded. Measures used to assess functional behaviors were also excluded since this type of analysis is frequently conducted by school personnel to assist in treatment and intervention planning within the classroom, rather than diagnosis; therefore it is beyond the scope of this dissertation. See (Paul, 2005) for more information related to the functional behavioral assessment of children with autism spectrum disorder identifying target behaviors, antecedent, consequent stimuli and reinforcers. Measures used to assess general mental health/psychiatric conditions or comorbid disorders such as anxiety or mood disorders, family/parenting stress or response to intervention were omitted as they are beyond the scope of this dissertation. However, several measures that are available in Spanish and are sometimes used to make a differential diagnosis between autism spectrum disorder and common comorbid conditions are included in the review. In addition, relevant literature used to aid in the differential diagnosis of autism spectrum disorder and emotional and behavioral disorders in Latino children (Overton et al., 2007) was included in the dissertation.

Identification of Relevant Literature

The literature that offers critiques of the psychological tests was identified using the PsycINFO database and PsycArticles. The general internet search utilized Google Scholar as the search engine for relevant articles. Key descriptors used for searching these databases individually and/or in combination included autism spectrum disorder, Latino/Hispanic, translation/adaption, cross-cultural, evaluation/testing/assessment of ethnic ethnocultural children, specific names (e.g., Autism Diagnostic Observation Schedule) and assessment domains (e.g., speech and language) of psychological tests were included in the review. Refworks was used to manage references that were identified. Other means of identifying the relevant literature included manual searches through the Hispanic Journal of Behavioral Sciences, Cultural Diversity and Ethnic Ethnocultural Psychology, Journal of Psychological Assessment, Journal of the American Academy of Child and Adolescent Psychiatry and the

Journal of Autism and Developmental Disorders, Research in Autism Spectrum Disorders, Focus on Autism and Other Developmental Disabilities, Pediatrics, and Assessment for Effective Intervention. The researcher also obtained suggestions for references through an email sent to the electronic mailing list of the California Latino Psychological Association, National Latino Psychological Association and other APA Division electronic mailing lists. The author also consulted with professionals whose expertise is in the area of assessment of autism spectrum disorder in young children and Latino mental health issues, and identified books on the topic of the assessment of autism spectrum disorder with ethnic minorities and Latinos specifically. The focus of all searches was limited to empirically based research that was written in the English language; however the included table of research of autism spectrum disorder in other countries includes articles that were written in the native language of that country.

Organization and Extraction of the Relevant Information

All literature collected was maintained in spreadsheets by assessment domains. The following column headings were used for organizing the information extracted from the relevant resources and literature: (a) name of most recent version of test; (b) test author and developer information; (c) Spanish language version availability (c) test purpose; (d) test construction and normative data; and (e) evaluation/criticism for use with Latino children.

Description of the Strengths and Limitations of the Psychological Tests

Once the spreadsheets were completed, a description of the test, its validity and reliability and the benefits and limitations of each of the psychological tests organized by assessment domain was conducted. When appropriate, suggestions are included as to how the test might be adapted for use with Latino children. In some cases, alternative methods of assessment are suggested. This dissertation concludes with a discussion section of the advantages and disadvantages of a select few tools that are expected to be the best options for the purposes of implementing comprehensive family centered assessment of autism spectrum disorder with young Latino children and their families.

Chapter III. Review of Instruments

Notable Level 2 Screening Instruments

This dissertation is intended to provide guidance to psychologists and other early childhood professionals completing further testing of young children who have already been identified as being at risk of having autism spectrum disorder. Therefore general screening and surveillance measures were omitted from the dissertation. The main distinction between autism spectrum disorder instruments involves their intended purpose as a screening device or a diagnostic measure. Screening tools are instruments that are designed to help clinicians identify infants and children who are at risk of having a developmental delay or concerns and/or those who would most benefit from a more comprehensive assessment (Baird et al., 2001).

Screening measures vary according to the level of screening. Level 1 screening includes routine developmental surveillance usually provided by pediatricians or others who provide general health services to young children. These measures screen for deficits across a broad range of developmental problems (i.e. motor, cognitive or language delay) in general populations of children. These measures often identify children with autism as well as those with a broad range of developmental disorders. Many Level 1 screening measures are used to evaluate large numbers of children, are brief and easy to administer and completed by parents (Coonrod & Stone, 2005; Filipek et al., 2000). Therefore many are available in Spanish in the form of parent report questionnaires. A complete list of screening tools frequently used as a first step in identifying autism spectrum disorder, including those measures available in Spanish is available online from Health Partner's.

Level 2 screening measures for autism spectrum disorder are specifically used to differentiate children at risk for autism spectrum disorder from those children at risk for other developmental disorders such as language impairment (Coonrod & Stone, 2005). Level 2 measures are sometimes used after a child fails the initial screening (Coonrod & Stone, 2005). Level 2 screening measures for autism spectrum disorder differ from diagnostic measures in that they typically require less time, training, and experience to administer. Therefore they are frequently included as part of a more comprehensive diagnostic assessment. The purpose of a comprehensive assessment is to obtain and interpret data necessary for diagnosis and effective intervention. Therefore, assessment measures are instruments that provide a thorough assessment of developmental, language/communication, social or neuropsychological functioning.

For further review of Level 1 and Level 2 screening measures available for use with children suspected of having autism spectrum disorder (Baird et al., 2001; Coonrod & Stone, 2005; Filipek et al., 2000; Matson & Sipes, 2010; J. Williams & Brayne, 2006). Several measures are available in Spanish including the Checklist for Autism in Toddlers (CHAT); the Modified Checklist for Autism in Toddlers (MCHAT); the Battelle Development Inventory Screening Tool- Second Edition (BDI-ST); and the Brigance Screen-Second Edition. Additional information related to screening tools can also be found on the First Signs Website, the American Academy of Pediatrics and the Centers for Disease Control.

Despite the fact that these instruments are often the first step in the diagnostic process and are sometimes used to confirm a diagnosis in order for a child to receive services, research on the use of the Spanish translations or their use with Latino families is scarce (M. Williams et al., 2009). These screening measures cannot be used as the primary diagnostic tool; however since these brief screens are often used to complement a more comprehensive evaluation a few notable measures specific to autism spectrum disorder were selected for review.

Autism Detection in Early Childhood- Spanish Version (ADEC-SP). The manual of the Autism Detection in Early Childhood-Spanish Version (ADEC-SP; Hedley, Young, & Gallegos, 2010; Deteccíon del Autismo en la Infancia) is still a research version that is only available by contacting the author. Although the ADEC-SP was initially introduced as a screening instrument to assist with the early identification of young children with autism, it is a notable measure since it was effectively validated on a sample of children in Mexico (Hedley et al., 2010). The ADEC-SP also shows promise as a useful measure to assist with the diagnosis of autism spectrum disorder since it was meant to be administered with limited training. Unlike the ADOS, that requires a significant amount of time and training to administer, the ADEC-SP appears to be a more clinically useful alternative. In addition, the ADEC-SP relies primarily on observation and the administration is mostly non-verbal, therefore reducing cultural factors that can sometimes interfere with obtaining accurate information.

The original English version of the ADEC was developed in Australia (Vacca, 2007) and is available to purchase on line. The ADEC-SP is designed as an interactive, behaviorally based Level 2 screener to detect autism spectrum disorder in preverbal toddlers as young as 12 months. The 16 items of the ADEC-SP including an "Adaptation Period" can be completed quickly (approximately 10 to 15 minutes) and can be integrated as part of a more comprehensive assessment. The ADEC-SP includes behaviors that are consistent with the DSM-IV criteria for autism and are included in the "Sequence to be followed for the Evaluation" (response to name; imitation; ritualistic play; joint attention; eye contact; functional play; pretend play; reciprocity of smile; reaction to common sounds; gaze monitoring; following verbal commands; delayed language; anticipation of social advances; nestling; use of gestures; and impairment in task switching). Administration of the ADEC-SP is play based and child centered. The behaviors of focus are observed and easily rated with “0” denoting a typical response and a “1” or “2” indicating an atypical response. Following observation, the ratings are summed to provide an overall score with total scores ranging from 0 to 32 with a score of 11 and over indicating risk for autism.

The ADEC-SP was translated from the original English version into Spanish using international guidelines for cross cultural translation including consideration of cultural and linguistic differences (Hedley et al., 2010). The translated instrument was also field tested and reviewed by several bilingual psychologists to identify any misinterpretations in application following the translation. Participants in the research sample were recruited from several clinics in Mexico that treat children with autism and other disorders. Functional equivalence of the ADEC-SP was confirmed with the sample of Mexican children.

Overall, the ADEC-SP showed good correlation between sensitivity (.79 - .94) and specificity rates ranged from .88 to 1.00 across all of the samples. Inter-rater reliability was reported to be high between the ADEC-SP and the English version (.96) and internal consistency was .73. Score means and standard deviations of the translated version did not differ significantly from the original means in the Australian sample, suggesting good test score equivalence. In addition, the Spanish version was able to accurately identify a diagnosis of PDD in a group of toddlers 19 to 36 months who had previously been identified as having a delay and was also able to accurately predict autism in children who were referred due to a suspected diagnosis. ADEC-SP scores were also significantly correlated with the Childhood Autism Rating Scale (CARS; Schopler, Reichler, & Renner, 1988) and the Autism Diagnostic Interview-Revised (ADI-R; Le Couteur, Lord, & Rutter, 2003) . In fact, the ADEC-SP was found to have greater sensitivity for autism in toddlers less than 36 months when compared to the CARS and the ADI- R (Hedley et al., 2010).

A notable benefit to using the ADEC-SP is that it relies on observation and is mostly non-verbal which can reduce concerns related to the Spanish language translation. This may also lessen the impact of cultural factors since the examiner is not dependent on inaccurate parental reports or the use of assessment methods where the behavior is not directly observed by the assessor (Hedley et al., 2010; Overton et al., 2007; Reznick, Baranek, Reavis, Watson, & Crais, 2007). The ADEC-SP can be used to supplement a parent interview, since obvious signs of abnormality in the way a child plays with toys to a parent might be seen very differently in direct observation to the experienced clinician. A noteworthy strength of the ADEC-SP is its' diagnostic sensitivity with young children. The authors caution against using the ADEC-SP with children over 36 months. This is dissimilar to other measures that have been noted to lack sensitivity, such as the Autism Diagnostic Observation Schedule (ADOS; Lord, Rutter, DiLavore, & Risi, 1999), when used with young children, subsequently requiring alternative modules and algorithms. The ADEC-SP promises to be a useful instrument to increase the early identification of autism in Latino infants. Future studies of the Spanish version of the ADEC must be conducted to support its' validity with Spanish speaking infants in the U.S.

The Childhood Autism Rating Scale (CARS). The Childhood Autism Rating Scale (CARS) was developed by Schopler, Reichler, and Renner (1988) and is one of the earliest rating scales to assess autism. Although not available in Spanish, the CARS is one of the most frequently used measures of behaviors associated with autism (Allen, Robins, & Decker, 2008; Lord & Corsello, 2005; Luiselli et al., 2001), therefore it was included for review. Initially developed as a Level 2 screen to rate behaviors, its' use is widespread as a diagnostic tool

(Luyster et al., 2005), and has also been adapted to assess the parent's perception of their child's level of functioning (Tobing & Glenwick, 2002). The most recent version of the CARS, was published in 2010 and as of this writing, limited research is available that includes the second edition. Therefore the following includes a review of the first edition of the CARS.

The CARS was developed to discriminate children with autism from those with other developmental disorders. The CARS is appropriate for use with children over 24 months of age. It consists of 15 items that examine behaviors frequently associated with autism relevant to typically developing childhood norms including: relating to people; the ability to engage in imitative behavior; range and appropriateness of emotional response; body use and any presence of motor stereotypy; object use; adaptation to change; visual, auditory and tactile responses; fear or nervousness; verbal and nonverbal communication; activity level; cognitive skills; and general impressions of the degree of autism observed. The CARS uses a Likert scale ranging from 1 to 4 (1 = appropriate; 4 = severely abnormal). A total score is calculated and summed into a composite score ranging from 0 to 60, with scores above 30 considered to be consistent with a diagnosis of autism; scores between 30 and 36.5 suggest mild to moderate autism; and scores between 37 and 60 suggest severe autism.

Several sources of information can be used to complete the CARS including direct observation of the child by the clinician, parent interview, parent rating of the child's behaviors or a chart review. Although use of the CARS requires prior knowledge and experience in the diagnosis of autism, the publishers note that professionals with only minimal exposure to autism can be easily trained in its' use. One of the benefits of the CARS is that it is quick and inexpensive to administer.

Although the CARS is frequently used, it is also criticized since it is based on conceptualizations of autism prior to the DSM-IV (American Psychiatric Association, 1994) and does not measure some constructs now considered important to the autism diagnosis (e.g., joint attention) subsequently decreasing its' validity (Rellini, Tortolani, Trillo, Carbone, & Montecchi, 2004; Saemundsen, Magnusson, Smari, & Sigurdardottir, 2003). Several studies of the CARS have reported good reliability and validity (Lord & Corsello, 2005; Perry, Condillac, Freeman, Dunn-Geier, & Belair, 2005; Rellini et al., 2004; Volkmar & Marans, 1999). However, sensitivity and specificity levels vary, with some studies reporting sensitivity estimates ranging from 47% to 98% and specificity ranging from 92% to 94% (R. C. Eaves & Milner, 1993; Wiggins & Robins, 2008). The CARS has also been compared to several instruments including the ADI-R and ADOS-G (Rellini et al., 2004; Saemundsen et al., 2003; Ventola et al., 2006). It is important to recognize that these results are based on outdated diagnostic criteria, yet the CARS continues to be used to confirm the validity of other measures of autism (Matson, Hess, Mahan, & Fodstad, 2010) as well as to diagnose autism spectrum disorder in young children (Delinicolas & Young, 2007; Stone, McMahon, Yoder, & Walden, 2007). Several studies have found that the CARS tends to over identify children with intellectual disability but who do not have autism, as having autistic disorder (DiLavore, Lord, & Rutter, 1995; Lord, 1995; Pilowsky, Yirmiya, Shulman, & Dover, 1998; Saemundsen et al., 2003; Volkmar & Marans, 1999).

The CARS has been found to be a valid and reliable measure when translated and used in Brazil (A. Pereira, Riesgo, & Wagner, 2008), Korean (Shin & Kim, 1998) and Japan (Tachimori, Osada, & Kurita, 2003). It is important to note that although the CARS is frequently used to identify autism in Latino children (M. Williams et al., 2009), including studies of prevalence (Yeargin-Allsopp et al., 2003), few studies have been conducted that include a significant sample of Latino children. In addition, neither the original CARS nor the second edition have been translated into Spanish or validated on a Spanish speaking population in the United States. Published studies using a Spanish version of the CARS have primarily been conducted on adults with autism (García-Villamisar & Muela, 1998; García-Villamisar & Muela Morente, 2000). Although the CARS can be completed based on the clinician's observations or a parent who is interviewed in Spanish, it has not been normed on a Spanish speaking population and is frequently translated informally by Spanish speaking users (M. Williams et al., 2009). Many professionals continue to use the CARS due to its' ease of use and brief evaluation time; however the CARS is not well validated for the Latino population; is translated into Spanish without regard for the loss of psychometric properties; and has little research to support its' use with Spanish speaking children and their families (M. Williams et al., 2009). In fact, use of the CARS may contribute to the under diagnosis of autism in Latino and Spanish speaking children. Future studies utilizing the CARS- II will hopefully fill this gap in the research.

Gilliam Autism Rating Scale (GARS). The Gilliam Autism Rating Scale (GARS) is a checklist they can be used to identify and diagnose autism in individuals ages 3 and older (J. E. Gilliam, 1995). Like the CARS, the GARS is not available in Spanish but is frequently used to diagnosis autism spectrum disorder in children (Allen et al., 2008; M. Williams et al., 2009), therefore a review and critique is included. Although the second edition of the GARS (GARS- II) was released in 2006; the majority of research utilizes the original version. Therefore, the following review will be limited to the first edition of the GARS.

The GARS examines autistic symptoms and their severity based on the DSM-IV (American Psychiatric Association, 1994) and the Autism Society of America (Autism Society of America, 1994). The rating scale can be completed in five to 10 minutes by a parent, teacher or mental health professional. Little training is required to complete and score the GARS. The 56 items on the instrument are divided into item 3 core subtests evaluating early stereotyped behaviors, communication skills and social interaction. The Developmental Disturbances subtest is optional and gathers information from the caregiver about developmental history the first 3 years of life. Ratings are made using a four-point Likert Scale (ranging from 0 to 3), summed and converted to standard scores based on percentiles on the reference sample. The GARS ratings also yield a total score called the Autism Quotient (AQ). The AQ can be calculated from two, three or four subscales from the GARS. The total score of the AQ measures the "likelihood" that the child has autism and the severity of the disorder (AQ of 90 and above = likely autism; below 70 = unlikely autism). The Communication subtest is not completed for non-verbal children and the Developmental Disturbance subtest is not completed when the respondent is not aware of the child's developmental history.

The test was normed on 1,092 representative subjects with autism from 45 states in North America and in Canada; however, the diagnosis was not verified by a professional (J. E. Gilliam, 1995). The normative group included ratings by 720 teachers and 372 parents of children between 3 and 22 years old with autism. The GARS manual reported internal consistency, test-retest reliability and inter-rater reliability all in the .80s and .90s (J. E. Gilliam, 1995). It is important to note that test-retest reliability was computed using the standard scores of a small sample of only 11 children, restricting the range of scores and impacting the results (Lecavalier, 2005). Neither item agreement nor classification agreement across time or rater were reported (J. E. Gilliam, 1995). Convergent validity was conducted using the ABC in a sample of 69 children from the normative group. Subscale correlations between the instruments ranged from .37 to .92 and the correlation of the total scores was .94 (J. E. Gilliam, 1995). Very little information is reported in the manual regarding the methodological procedures, the raters or the children with and without a diagnosis of autism. In addition, the children were not matched on demographic variables when the discriminant validity was determined.

Critics of the GARS have noted its' poor sensitivity which may lead to false negatives and can ultimately interfere with early identification, delay referrals and early intervention (Lord & Corsello, 2005). Lecavalier (2005) found that almost half of all the items on the GARS were associated with the factor measuring repetitive and stereotyped behaviors as well as stereotyped and repetitive use of language and motor mannerisms. In addition, several social and communicative deficits, commonly seen in children with autism spectrum disorder, such as play and imitative behaviors were not included or covered in the GARS. Lecavalier (2005) also reported the average AQ was significantly lower than reported in the test manual, suggesting low sensitivity. The Developmental Disturbance subscale was not significantly associated with the AQ or any of the subscales. The authors recommend caution when using the GARS as a diagnostic tool, and suggest a lower AQ cut-off score when screening for autism spectrum disorder.

South et al. (2002) found the GARS to have overall poor convergence with other measures as well as low sensitivity. The authors examined data from the GARS on 119 children (average age 6.2 years old). The children had a diagnosis of autism confirmed by the ADOS and the ADI-R. The average AQ was 10 points below the suggested cut-off. The sensitivity of the GARS was low (.48) failing to correctly classify over half of the sample. In addition, the Developmental Disturbance subscale was not associated with the other subscales and was also weakly correlated with the total score (South et al., 2002). Convergent validity was also investigated comparing the GARS to the ADI-R and the ADOS. There were no significant correlations between the GARS and the ADOS. Correlations between the GARS and the ADI-R subscales were low (ranging from .21 to .26).

Due to the high rate of false positives, the GARS cannot be used in isolation for diagnostic purposes. Some research projects have used the GARS in conjunction with other instruments (Asano et al., 2001; Owley et al., 2001); however this can still result in misdiagnosis and under classification of children with autism spectrum disorder. Although the GARS is frequently used and has been recommended by many organizations and in many texts (Filipek et al., 2000) and it is frequently used to diagnose autism spectrum disorder in young children (Schreck & Mulick, 2000; M. Williams et al., 2009) little empirical research exists reporting its psychometric properties. Those independently published studies have found poor reliability and validity due to the under-diagnosis of children with autism (Lecavalier, 2005; Sikora, Hall, Hartley, Gerrard-Morris, & Cagle, 2008; South et al., 2002). Since the GARS was normed on individuals 3 years and older, it is unsuitable to use with young children. Due to weaknesses with the GARS (Sikora et al., 2008) as well as questions related to its' standardization and norming procedure (Norris & Lecavalier, 2010), it is not recommended for use with Latino or Spanish speaking children and their families. The use of the GARS may be problematic and children can be missed and not referred for appropriate services.

The recently revised GARS-II uses new norms based on the 2000 Census data, a more clearly described sample and less ambiguous items. The publisher reports adequate validity and reliability; however, those studies examining the GARS-II report poor sensitivity (Norris & Lecavalier, 2010). This may be due to the retention of the same three defining areas of impairment of autism (social, communication and repetitive or stereotyped play) that have been identified as contributing to its' poor diagnostic validity (Lecavalier, 2005). The GARS-II requires much more study related to its’ use as a diagnostic tool and its’ compatibility to the DSM-5.

Pervasive Developmental Disorders Screening Test- Second Edition (PDDST-II). The second edition of the Pervasive Developmental Disorders Screening Test (PDDST-II) is composed of three stages (Siegel, 2004). Stage 1 can be used with children up to 3 years of age and was designed for primary care settings to help healthcare providers identify those children who require further evaluation. The following will include a review of Stage Two; the Developmental Clinic Screener (DCS) and Stage Three; the Autism Clinic Severity Screener (ACSC).

Development of the PDDST-II was conducted between 1986 (with the first version) and 2002 on children in an autism clinic. The standardization sample included 714 males and 229 females from 19 months to 8 years of age. The children had various diagnoses including autism spectrum disorder (autistic disorder, Asperger’s syndrome, PDD, NOS, language disorder, mental retardation, very low birth weight and other psychiatric and neurodevelopmental disorders (Chittooran & Volpe-Johnstone, 2007). Demographic information such as location or race/ethnicity was not included.

The Stage two screener of the PDDST-II; the DCS, is a 14 item measure and can be used with toddlers, 12 to 48 months and can be completed in 10-15 minutes. The DCS is intended for use in developmental clinics that specialize in developmental disabilities to determine if a more specific diagnostic assessment should be conducted. The DCS was designed to aid in differentiating a possible diagnosis of autism spectrum disorder from other disorders such as language delay, intellectual disability or ADHD. The DCS was validated on 490 children with confirmed autism spectrum disorder, including autism, PDD, NOS, or Asperger syndrome and

194 children who were evaluated for autism spectrum disorder but did not receive a diagnosis (Siegel, 2004). Sensitivity was reported in the moderate range- between .69 and .73 (Siegel, 2004). Specificity was low- between .25 and .63 (Siegel, 2004) suggesting the DCS does not correctly identify children without autism spectrum disorder (Dumont-Mathieu & Fein, 2005).

The Stage Three, ACSC is for use in a clinic specializing in autism spectrum disorder, or in a clinic conducting a complete diagnostic assessment. The ACSC can also be used to help confirm or indicate severity of a diagnosis of autism spectrum disorder. Stage Three is a 12 item tool that is administered to the caregiver of a child 12 to 48 months of age. Failing Stage Three suggests the child most likely has a diagnosis of autism (as defined in the DSM-IV), rather than one of the other autism spectrum disorders (as defined by the DSM-IV). The sensitivity was reported to be .58 and specificity was .60. The insufficient reliability and validity suggest that the ACSC is insufficient for use as a sole screening tool. All stages yield a Total Score that is obtained by summing the "yes" responses. This sum is compared to a "cut-score". A score below the cut-score is considered to be a negative score, while a score equal or greater than the cut-score is considered a positive rating for the particular Stage being scored. One particular weakness of the PDDST-II is the authors do not specify the parents who provided the ratings and there is no additional information in the internal consistency, inter-rater reliability, test-retest reliability, concurrent validity, or predictive validity. This is especially significant given the weak sensitivity and specificity and its' use as a screener in a clinical setting (Chittooran & Volpe-Johnstone, 2007) .

Like many other parent report measures included for review, the PDDST-II is based on the parent's report of behaviors that frequently occurred long before administration of the measure. For example, the ACSC includes one question focused on birth to 6 months; none related to 6 to 12 months; three related to 12 to 18 months; four ask about 18 to 24 months; two are focused on 24 to 30 months; and, two which address the 30 to 36 month range (Chittooran & Volpe-Johnstone, 2007). Therefore, it is important to supplement the PDDST-II with behavioral observation in a variety of settings.

The Spanish version of the PDDST-II, Stages one to three are available from Pearson Assessments. The publisher specifies that the PDDST-II is an exact translation of the English edition and no changes were made to items or tasks. In addition, the authors do not clarify the reading level of the English instrument. Although the English version of the PDDST-II may be easy to use and can be completed quickly by the caregiver; it is unclear if the Spanish version is an appropriate translation that measures the same constructs. Language differences and the meanings attributed to the symptoms of autism vary across cultures (Dumont-Mathieu & Fein, 2005) and necessitate further inquiry into the use of the PDDST-II with Latino families. The authors also suggest that the English PDDST-II be administered in an interview format for those who are not fully literate or for those parents for whom English is a second language. Even though this recommendation was made prior to the development of the Spanish version, communication barrier in any form that interferes with the clinician's proficiency in eliciting information from the parents is detrimental to the evaluation of the child, because parents provide vital information that is necessary to making an accurate diagnosis. Some parents may be illiterate in their primary language and unable to communicate their concerns effectively resulting in biased assessment. If there are any questions regarding the parent's English language proficiency the assessment should be completed in the family's home language.

Another critique of the PDDST-II is the positive wording all of the items in the DCS and ACSC (e.g. "Does your child play with some toys in ways that aren't the main way such toys are meant to be used?”). This can be leading and cause a parent to respond positively or incorrectly to items (Chittooran & Volpe-Johnstone, 2007). The PDDST-II requires caregivers to respond with “yes, usually true” or “no, usually not true”. This may cause substantial misclassification with some Latino respondents who have been found to use extreme responses on questionnaires (Marin & Marin, 1991). Some authors have suggested that 3-point scales may more appropriate with Latino families and may reduce this cultural variation (Marin & Marin, 1991). Parents of different socio-economic groups may interpret the questions differently, which can also yield different results. Responses to these poorly worded items on the PDDST-II may result in a false positive or false negative (Chittooran & Volpe-Johnstone, 2007). Further examination of the Spanish version is required to determine whether any differences exist.

At the time of this writing no research has been dedicated to the Spanish version, it has not been validated and it results depend on the original English normative data. In addition, the original standardization sample is not reflective of the general population. The Spanish version of the PDDST-II may lack validity across cultures since use of the original norms with a population that is very dissimilar can result in the subsequent misdiagnosis of a child.

Social Communication Questionnaire (SCQ). The Social Communication Questionnaire (SCQ; Rutter, Bailey, & Lord, 2003), formerly the Autism Screening Questionnaire (ASQ) is a 40 item parent report questionnaire used as a screening measure for PDD’s in individuals 4 years of age and older (with at least a mental age of 2 years old). The SCQ is based upon questions from the original ADI, but questions were modified so that they would be understood by parents without additional explanation (Le Couteur, Rutter, Lord, & Rios, 1989). The SCQ taps into the areas of communication, reciprocal social interactions, and restricted/ repetitive behaviors and interests (Rutter et al., 2003).

The SCQ is unique in that there are two different versions: 1) a lifetime form that focuses on the child's entire developmental history. This total score that is obtained and compared to cut-offs and identifies children who may have autism and require further assessment and 2) a current version that looks at the child's behavior over the past 3 months. This form is frequently used for educational interventions and treatment planning. Items are checked as "yes" or "no", and assigned a point rating of "1" (presence of abnormal behavior) or "0" (absence of abnormal behavior). The points are summed for a total possible score and the total is compared to a cut off score. Total scores also take into account whether or not the child has language. For those children without language there is a different total score because the abnormal language items are inapplicable.

The SCQ was developed with the caregivers of 200 individuals (ranging in age from 4 to 40) with a variety of diagnoses included in the DSM-IV such as autism, PDD, NOS, Asperger's Syndrome, Fragile X and Rett Syndrome, conduct disorder, language delay, mental retardation and other clinical diagnoses. The sample was primarily White and was conducted in London (Berument, Rutter, Lord, Pickles, & Bailey, 1999). Initial studies of the SCQ report strong psychometric properties (Berument et al., 1999). Internal consistency using coefficient alpha was .90 for the total scale. The authors examined the cut- off points for the most effective diagnostic differentiation. The authors found that the ASQ has good discriminant and is able to separate children with general PDD disorders from those who have a diagnosis other than a PDD (sensitivity was .85; specificity was .75). When comparing autism to other diagnoses excluding mental retardation, the sensitivity was .96, and specificity was .67. A more stringent cut-off score was needed to differentiate autism from other PDD's and this yielded a sensitivity of .75 and specificity of .60. This suggests that the SCQ does not differentiate children with PDD disorders into more specifically defined categories, such as autism and Asperger's. However, this distinction is not necessary when using the DSM-5 (American Psychiatric Association, 2013).

Berument et al. (1999) also reported on the convergence of the SCQ with the ADI-R. The SCQ domain total score correlated with the corresponding ADI-R subscales (coefficients ranged from .55 to .59). Several subsequent studies have found high correlations and good agreement between the SCQ and ADI-R (D. Bishop & Norbury, 2002; Chakrabarti & Fombonne, 2001; Howlin & Karpf, 2004; Le Couteur et al., 2003; Vrancic et al., 2002). The high correlation between SCQ and the ADI-R is not surprising given the content parallels the ADI-R. Preliminary research indicates that the specificity and sensitivity of the SCQ are slightly poorer for younger children and that the cut-off should be adjusted for this age group (Baird et al., 2006; Corsello et al., 2007; L. C. Eaves, Wingert, & Ho, 2006; L. C. Eaves, Wingert, Ho, & Mickelson, 2006; Howlin & Karpf, 2004; Oosterling et al., 2010; Snow & Lecavalier, 2008; Wetherby, Watt, Morgan, & Shumway, 2007). Therefore, caution should be taken when using the SCQ with younger children; however, further research is needed including children less than 4 years of age.

Although the SCQ is available to purchase from several publishers, the Spanish version has not yet been validated and as of this writing no published studies exist utilizing the Spanish translation. One of the strengths of the SCQ is that it is easy to administer and complete in short period of time. The SCQ is considered to be an abbreviated ADI-R checklist, and may be a viable option in a clinical setting, where time with Latino families is usually limited and does not allow for use of the ADI-R. It is frequently recommended that the SCQ be used with another measure such as the ADOS (Corsello et al., 2007). This is especially important with Latino parents who may report fewer symptoms (Mandell et al., 2009) and may not endorse items on the SCQ. Therefore a questionnaire that uses a cut-off and is dependent on the parents' report of symptoms may not be accurate. Although the questions included in the SCQ were modified so that they would be understood by parents without additional explanation (Le Couteur et al., 1989), future studies should address the cultural and linguistic validity of the Spanish translation. Future studies must address the use of the SCQ with Latino families, as well as validate the Spanish adaptation with families.

Diagnostic Instruments

Social Responsiveness Scale (SRS). The Social Responsiveness Scale (SRS; Constantino & Gruber, 2005) is used to screen, identify and support a diagnosis of autism spectrum disorder in children 4 to 18 years of age. The measure was designed to be used as part of a comprehensive battery of assessments to determine clinical diagnosis and should not be used in isolation. Separate forms are available for parents and teachers. The 65 items measures the child's impairments including social awareness, social information processing, and the capacity for social responses. The SRS can be completed in 15 to 20 minutes by a parent or teacher who is knowledgeable about the child's behavior. The SRS uses a Likert style format scale (0 = never true to 3 = almost always true) making it easy to use. Raw scores for the total test and the subscales are converted into T-scores (norms for males and females) that can then be plotted on a profile sheet that shows strengths and weaknesses in certain social behaviors. When SRS scores are converted to T-scores, Total T-scores of 76 and higher are indicative of autism. T-scores between 60 and 70 suggest the presence of mild autism spectrum disorders such as PDD, NOS. The SRS yields an overall score as well as five treatment subscale scores. Interpretation is best when scores are integrated from more than one rater.

The SRS was initially used as a tool in research investigations of autism spectrum disorder. The norms for the instrument were developed in part with the data from these initial studies. The manual includes development of the SRS items which were reviewed by potential users including special education teachers, school psychologists, clinical child psychologists, neuropsychologists, pediatricians, child neurologists, child psychiatrists and parents of children with autism and other pervasive developmental disorders. Additional information on this systematic review of the test is limited, and the manual does not indicate whether the items were piloted prior to the final test construction.

The standardization sample included 1,636 participants from diverse metropolitan cities. The manual notes that the norms were developed from five different large scale epidemiological studies over a period of several years including 272 children from a suburban Midwestern school district, 552 children from a large suburban school district in the Midwest and a large urban district in the West. These studies all generated parent report information while another study was conducted to specifically compile teacher report data (Conway & Venn, 2005; Naglieri & Chambers, 2009). Most of the scores used to develop the norms were from children in Missouri, many of whom lived in and around St. Louis. Additional normative data were later obtained from school aged children in Missouri and California (Conway & Venn, 2005). The racial composition of the normative group was reported to be 74% White, 11% African-American, 11% Hispanic, 2% Asian, and 2% other (Naglieri & Chambers, 2009)

Group differences for the type of rater (i.e. teachers or parents), gender and age were analyzed. Data analysis by the authors, found significant differences in scores by parents and teachers and by the gender of the rater, therefore separate norms were developed for parents and teachers and the norms were further separated by the rater’s gender. The authors also completed analyses that checked for differences among participants of the five studies, and later combined and compared the studies. Variables such as ethnicity, age and education were taken into consideration when determining norms. The manual notes that the norms did not require age stratification because there was no evidence of systematic age differences within the sample.

The SRS manual reports internal consistency, construct temporal stability and inter-rater agreement. The internal consistency was examined using ratings completed by more than 1,000 parents and 500 teachers. Alpha coefficients ranged from .93 to .94 for the parent ratings and .96 to .97 for the teacher ratings (Conway & Venn, 2005; Naglieri & Chambers, 2009). T-Scores analyses showed that mean ratings by different groups were not significantly different. Inter-rater reliability was obtained for mother-father rater pairings (.91), mother-teacher pairings (.82), and father-teacher pairings- .75 (Conway & Venn, 2005; Naglieri & Chambers, 2009). Inter-rater reliability correlations between teachers and parents ranged has also been reported to be between .73 and .75 (Constantino & Todd, 2000; Constantino et al., 2004). Alpha coefficients for the SRS subscales ranged from .77 to .92 with a median coefficient of .87. This low reliability suggests the need for caution when interpreting subscale scores. The Treatment subscales were added to the SRS after the total score was developed and validated and may not clearly measure separate dimensions of autism spectrum disorder behaviors. Although the treatment subscale scores are highly correlated to each other there are questions about the utility of the subtest scores and caution should be used when conducting subscale score analysis. Construct temporal stability was assessed with a 17 month delay. Baseline scores were correlated with maternal reports (.85 for males and .77 for females). Test retest reliability was established with correlations between .83 and .88 (Constantino, Friesen, Przybeck, & Todd, 2000; Constantino et al., 2004).

The authors report that the SRS is able to distinguish autism spectrum disorder from children with other psychiatric disorders. One study included 158 children with psychiatric problems with and without autism spectrum disorder and 287 randomly selected children from a metropolitan school district (Constantino et al., 2000). However, a study examining the discriminant validity of the SRS (Constantino et al., 2000) found some overlap occurred between some children in the PDD, NOS group and in scores between some psychiatric individuals without autism spectrum disorder. This suggests it should primarily be used as an instrument for measuring symptoms severity and response to treatment (Lord & Corsello, 2005). Studies examining the concurrent validity of the SRS have found strong correlations with the ADI-R (Constantino et al., 2003; Constantino et al., 2004). Studies have also found the SRS to be effective at measuring overall traits of autism spectrum disorder in children (Constantino & Todd, 2000; Constantino & Todd, 2003; Constantino, Hudziak, & Todd, 2003; Constantino et al., 2004).

Spanish Version Social Responsiveness Scale. WPS offers a Spanish research version of the SRS (main form, ages 4-18), which is available for license under WPS copyright, solely via WPS Rights and Permissions, for application in qualified funded investigations. At the time of this writing no studies have been published that utilize the Spanish translation. Overall, the authors confirm the cross cultural validity of the SRS in this large European sample. Although the Spanish version is currently being used in research in Latin America, the normative sample of the English version is still problematic when used with Latinos in the U.S. The majority of the sample was primarily from one Midwest area of the country. In addition, the procedure used to develop the norms is not representative of the general population. The data used to develop the normative sample was obtained from studies that were not conducted or designed to yield normative information. Therefore, caution is recommended when using the English version with Latino families.

A significant strength of the SRS is that SRS scores were found to be unrelated to IQ and have been found to be continuously distributed in the general population (Constantino et al., 2003; Constantino et al., 2004). This is an advantage since it reduces the chance of this interfering variable especially with children from a different culture from the normative sample, such as Latino children. Another strength of the SRS is its' ability to distinguish autism spectrum disorder from other psychiatric disorders (Constantino et al., 2000). This is particularly important when used as an aid to diagnosis Latino children, who are frequently misclassified with emotional or behavioral disorders (Overton et al., 2007).

Even the Spanish version of the SRS still relies on parent report of the child's behaviors and should not be used in isolation. Some have suggested using different raters to determine if the child exhibits behaviors typically seen in children with autism spectrum disorder. In addition high agreement has been found between the SRS, the ADI-R and the Vineland Adaptive Behavior Scales (VABS; Sparrow, Balla, & Cicchetti, 1984), discussed in a later section (Pine, Luby, Abbacchi, & Constantino, 2006). Since the VABS has a Spanish version and supplementary norms for individual with autism, it may be useful to examine use of the Spanish translations of the SRS, VBAS and ADI-R when detecting social deficits in Spanish speaking Latino families (Pine et al., 2006).

Autism Diagnostic Interview-Revised (ADI-R). The Autism Diagnostic Interview-Revised (ADI-R) is considered to be the "gold standard" for diagnosis in many countries and the English version of the ADI-R is the most widely used diagnostic instrument in research of autism spectrum disorder (Lord & Corsello, 2005; Mazefsky & Oswald, 2006). The most recent version of the ADI-R (Le Couteur et al., 2003) is a comprehensive structured interview that combines developmental history and current behaviors to indicate whether the child meets the DSM-IV criteria for autism or another related disorder. The ADI-R is also closely linked to the diagnostic criteria set forth in the ICD-10. The ADI-R has standardized and streamlined the interview process with an exhaustive list of items related to the patterns and behaviors pertinent to the diagnosis of autism spectrum disorder. The ADI-R is appropriate for children and adults with a mental age of at least 2 years, 0 months. The instrument is frequently criticized for its lengthy administration time of approximately 1.5 to 3 hours and therefore it is rarely utilized in clinical settings. The most recent version takes about 2 hours for an experienced clinician to administer (Le Couteur et al., 2003). In addition the ADI-R requires specific training and validation procedures to use in a research setting. Although not required, training to use the ADI-R as a clinical tool is recommended via video training materials. Due to the extensive training required to administer the measure effectively, use of the ADI-R is limited in community settings. Its' use is also restricted among Spanish speaking children and their families since there are few bilingual Spanish speaking clinicians qualified to administer the ADI-R.

The clinical version of the ADI-R focuses on three functional domains including Language/Communication; Reciprocal Social Interactions; and Restricted, Repetitive and Stereotyped Behaviors and Interests. The primary caregiver is asked questions about each domain and the interviewer scores the responses on a scale from 0 to 3, in which "0" indicates no pertinent features of autism spectrum disorder and "3" denotes severe abnormality. The examiner systematically records and codes detailed responses to the 93 questions using the Interview Protocol. The scores are ordinal raw scores that are then used to determine if the children meets the cut-off score for the individual domains, and using one or more of the five age specific algorithms to produce interpretable results. The diagnostic algorithms focus on the child's developmental history at ages 4 to 5 years of age. The ADI-R also includes algorithms for current behaviors that reflect symptoms that the child is exhibiting at the time of testing. This can be used to address specific behaviors in treatment and educational planning. Summary scores are calculated for each of the four domains including: Qualitative Abnormalities in Reciprocal Social Interaction; Qualitative Abnormalities in Communication; Restrictive, Repetitive and Stereotyped Patterns of Behavior, to determine whether the behaviors displayed by the child were evident for the Diagnostic Algorithms. A child must exceed the cut-off points in all domains to be diagnosed with autism. The ADI-R manual includes limited information on the comparison sample. Since the diagnostic classification is not based on norms and instead uses algorithms, the ADI-R was administered to several hundred caregivers on individuals with and without autism, age preschool to early adulthood. No additional information related to the comparison group is provided in the manual.

Initial studies of the reliability and validity of the ADI-R were completed with primarily English speaking White preschool children in Alberta, Canada and North Carolina (Lord, Storoschuk, Rutter, & Pickles, 1993; Lord, Rutter, & Le Couteur, 1994). The parents of the children in the study all had at least an 11th grade education. The ethnicity of the children represented in this study was noted to be 15% Asian, 10 West Indian and 75% White. The ethnicity of the comparison group recruited to be comparable in mental age, race and sex were noted to be 14% African American, 79% White, and 7% Asian, Hispanic and Native American (Lord et al., 1993).

Initial studies of the ADI-R with preschool children reported good inter-rater reliability with kappas ranging from .62 to .89. More recent studies have found inter-rater reliability to be good to excellent for individual items and excellent for domain scores (Chakrabarti & Fombonne, 2001; Le Couteur et al., 2003). Intraclass correlation coefficients were also reported to be between .93 and .97 (Lord et al., 1993; Lord et al., 1994). Good concurrent validity of the ADI-R has been found via association with the Social Communication Questionnaire (D. Bishop & Norbury, 2002; SCQ; Rutter et al., 2003). Convergent validity between the ADI-R and the Autism Diagnostic Observation Schedule (ADOS; Lord & Corsello, 2005) is also good (Lord et al., 2000; Risi et al., 2006). Convergent validity with the CARS was excellent after 3 years of age (Lord, 1995; Pilowsky et al., 1998).

Although the ADI-R has been found to be reliable when measuring autism in preschool children (Lord et al., 1993; Lord et al., 1994), several studies have reported low sensitivity in children under 3 years of age since many do not meet the cut-offs in the Restricted, Repetitive and Stereotyped Patterns Behavior Domain (Chawarska et al., 2007; K. M. Gray, Tonge, & Sweeney, 2008; Ventola et al., 2006). Although young children with autism do exhibit some restricted and restrictive behaviors (Richler, Bishop, Kleinke, & Lord, 2007), those restricted and repetitive behaviors that are included in the ADI-R, such as compulsions and rituals are less prevalent in very young children with autism. Although the ADI-R is able to differentiate between children with autism and intellectual disability, limitations of the ADI-R note that it is not sensitive to differences in children with a mental age below 20 months or those with an IQ below 20 (Lord, 1995). In addition, the ADI-R has been found to be over-inclusive for children with a mental age of less than 18 months (Lord et al., 1993); children with mental retardation (Lord et al., 1993; Nordin & Gillberg, 1998); and, children with language delay (Lord, 1995).

Many studies and research centers have utilized the ADI-R for diagnostic purposes and have published independent psychometric data (Constantino et al., 2004; Cuccaro et al., 2003; de Bildt et al., 2004; Kolevzon, Smith, Schmeidler, Buxbaum, & Silverman, 2004; Saemundsen et al., 2003). Unfortunately, inclusion of “Hispanic” children is frequently extremely small or in some cases these families are excluded from the study if the caregiver's first language is not English. A recent genetic study examining autism did report race and utilized the ADI-R. The authors did not find any differences in the overall domain scores when adjusting for age, gender and race (Cuccaro, Shao et al., 2003). Although the study included a large sample of African-American families, it is important to note that this study was conducted with Hispanic families who spoke English. In addition there were no distinct behavioral patterns found in the groups studied, further supporting the genetic and/or etiologic pathways that underlie autism spectrum disorder. This suggests that when using the ADI-R, symptoms of autism spectrum disorder presented the same in each of the groups and looked the same in children and families with a history of autism, regardless of race.

Entrevista para el Diagnostico del Autismo, Edición Revisada. Although the ADI-R is available for purchase through Western Psychological Services, research of the Spanish version, Entrevista para el Diagnostico del Autismo, Edición Revisada, is usually limited to studies outside of the United States (Calahorro et al., 2009). A noteworthy study utilizing the Spanish version of the ADI-R in Costa Rica obtained mean domain scores comparable in severity to other genetic studies of autism spectrum disorder (McInnes et al., 2005). However, at the time of this writing, the ADI-R has not been validated on a Spanish speaking population and few published studies exist that utilize the Spanish version. In addition, the interview is frequently changed from its validated form by Spanish speaking clinicians who informally translate the English version during the assessment process rather than utilizing the publisher's version. One study was identified that utilized the Spanish version of the ADI-R with bilingual and monolingual Spanish speaking caregivers in a region of the United States that is 96.6% Hispanic (Overton et al., 2007). In addition, the schools in the region of the study are located in counties that are considered to be economically disadvantages with 39.7% of the students in the school identified as limited English learners. The study found that when only the ADI-R or only the ADOS was used, differences were not as clear between those children with mild to moderate impairment, those children who were most socially impaired and those children who did not have autism. In addition, the authors found that parents of children with mild to moderate impairments and parents of children with severe symptoms reported comparable symptoms, suggesting that the parents perceived and experienced their child's behaviors in the same manner (Overton et al., 2007). Overton et al. (2007) also found the ADI-R was useful in determining differential diagnosis. Following the comprehensive evaluation and recommended steps toward differential diagnosis the authors were able to accurately differentiate children with autism from those who were initially misdiagnosed with ADHD. Unfortunately, the authors do not address cultural or linguistic factors which may have contributed to the measures' lack of sensitivity.

The development of the ADI-R was conducted with a population that differs significantly from many Latinos in the United States. Initial studies of the ADI-R included primarily White children in Canada and North Carolina who were all English speaking and whose parents' had at least an 11th grade education (Lord et al., 1993). Although the Spanish version is available from the publisher, translating well established instruments such as the ADI-R from English into a new language is difficult and time consuming. At the time of this writing no study exists that examines the cultural or linguistic equivalence of the ADI-R.

A frequent critique of the ADI-R is its' reliance on parent memory of the child's behaviors during the entire developmental period. The ADI-R can lack sensitivity since parents may not accurately recall their child's behavior several years after the behavior occurred (Overton et al., 2007). Another limitation of the ADI-R is its' use with Latino parents who may not recognize the social deficits or repetitive behaviors that are behavioral characteristics seen in children with autism spectrum disorder (Maldonado, 2008; Mandell & Novak, 2005). One study using the English version of the ADI-R with White families found that the ADI-R failed to diagnosis autism in about 10% of two year old children who were later diagnosed with autism because the parents did not report significant abnormal repetitive behaviors or abnormalities in language (Lord, 1995). This is even more significant when the ADI-R is being used with Latino parents who may be less likely to report some of these behaviors as problematic and may not even recognize these behaviors as interfering with the child's functioning (Mendez Perez, 2000). The ADI-R, although thorough and comprehensive, still relies on caregiver report of behavioral descriptions, in order to gather historical information about the age of onset. This limits its' use and it should be administered in conjunction with an observational measure. Future studies of the Spanish translation of the ADI-R need to focus on language, function, culture and metrics to ensure a more non-biased assessment (Peña, 2007).

Autism Diagnostic Observation Scale (ADOS). The English version of the Autism Diagnostic Observation Scale (ADOS) is one of the most commonly used measures (Lord & Corsello, 2005). The ADOS is a semi-structured observational assessment that includes four modules of activities designed to assess communication, reciprocal social interaction, play, stereotypic behavior, restricted interests, and other abnormal behaviors. The ADOS was originally developed to be used primarily with children who had fluent or phrase speech (Lord, Rutter, Goode, & Heemsbergen, 1989). Whereas, the Pre-Linguistic Autism Diagnostic Observation Schedule (PL-ADOS; DiLavore et al., 1995) was designed to be used with children with little or no expressive language. The instruments were later combined into a single instrument. This was initially known as the ADOS-G and later labeled the Autism Diagnostic

Observation Schedule and is currently available to purchase through Western Psychological Services (Lord et al., 1999). A revision to the ADOS, the ADOS-2 was released in May 2012, which offers revised algorithms, a new Comparison Score for Modules 1 through 3, and a new Toddler Module. However; little research has been conducted using this instrument. It is also important to note, that a Spanish language ADOS-2 is currently not available for sale through the publisher. Therefore this review is limited to the first version of the ADOS. Since administration of the ADOS is approximately 30-45 minutes, it is a feasible tool to use in a clinical setting. However, the ADOS requires formal training in administration and the examiner must demonstrate reliability in the coding procedures before it can be used in a research setting. There are optional shorter trainings available for use in a clinical setting.

The four modules of the ADOS vary according to the linguistic ability of the individual and range from nonverbal to conversational. Module 1 is used with preverbal children who do not exhibit consistent spontaneous speech. Module 1 consists of 10 activities that focus on playing with toys. Module 2 is used with children who exhibit consistent flexible phrase speech; however the child may not be verbally fluent. Module 2 also focuses on the playful use of toys and contains 14 activities. Module 3 is for verbally fluent children and focuses on social, communicative, and language behaviors using 14 different activities. Module 4 is used with adolescents and adults in whom it may not be appropriate to use the games and toys used in the assessment of younger children. The authors recommend collecting a language sample at the beginning of administration to determine which module to use. If the child struggles to meet the criteria for a particular module, the authors recommend a "conservative" approach that uses the "lower" module, rather than placing high social demands on the child in addition to high language expectations. Each module consists of a different set of activities in which the child is placed in a structured task that invites the child to interact with the examiner and with specific stimuli. The tasks are designed to provide structured and semi-structured "presses" or social opportunities to observe the specific behaviors that contribute to the diagnosis of autism spectrum disorder. The examiner takes notes during administration. Observation of the child's initiation and joint attention, as well as imaginative play and social play skills are recorded, coded and scored on a scale ranging from 0 (indicating no evidence of abnormality related to autism) to 3 (indicating severe abnormality that interferes with the administration).

The ordinal scale raw scores are added in each domain and defined cut-off scores for each domain are used in order to make the diagnostic distinction between autistic disorder and PDD, NOS or the broader spectrum of autism spectrum disorders. The individual may use the cut-off score for two separate domains (Social Interaction and Communication) or the total score of combining communication and social domains. Each module has a different scoring algorithm used for the interpretation of each module.

Dates for data collection for the norms of the ADOS are not reported. Validity studies of the ADOS included 74 children for Module 1; 55 children for Module 2; 59 children for Module 3, and; 45 young adults for Module 4 (Lord et al., 1999). The individuals in the validity study were referred to the Developmental Disorders Clinic at the University of Chicago. Additional participants were included in the study of the validity of the ADOS and were chosen within each module to constitute samples that would be as close as possible across diagnostic groups in chronological age, gender and ethnicity. These participants were included from research centers including Yale, The University of California San Diego and Newcastle upon Tyne. The ethnicity reported in the development of the ADOS-G was noted to be comparable across modules and across groups with 80% White, 11% African American, 4% Hispanic, 2% Asian American, and

2% children and adults of other or mixed groups (Lord et al., 2000). The authors note that "these samples were not intended to be representative of a particular population" (Lord et al., 2000). In addition, all participants in the study were English speaking.

Overall, psychometric data of the ADOS-G reported by (Lord et al., 2000) found good test-retest reliability and good inter-rater reliability for individual items, excellent inter-rater reliability within domains and excellent internal consistency. The ADOS-G was found to be able to differentiate autism including PDD, NOS from non-spectrum children; however, less differentiation was made from autism and PDD, NOS. Little validity evidence is provided in the manual (Lord et al., 2000). The authors reported overall sensitivity and specificity of the algorithms, for autism and PDD, NOS versus non spectrum disorders were excellent; however, only moderate differentiation was found with autism vs. PDD, NOS (Lord et al., 2000). In the original norming sample, for Modules 1-3, the ADOS generally correctly classified 94% of the individuals (Lord et al., 1999). Sensitivity and specificity were high on Module 1 when comparing autism vs. children without autism spectrum disorder. Module 1 has the greatest sensitivity when comparing children with autism with children without autism spectrum disorder (Lord et al., 1999). When item totals and domains were correlated, correlation coefficients ranged from .46 to .90. Inter-rater reliability across administrations and domains ranged from a low of .82 for stereotyped and restricted interests to a high of .93 for social interaction. Inter-rater reliability of individual items for Module 1 was also examined and ranged from 18% to 100% agreement (Lord et al., 1999). Test-retest reliability correlations were low, ranging from .73 to .82, and the correlation for stereotyped behaviors was .59. Recent studies of the ADOS have reported good sensitivity (.89) between children with autism and children with non-autistic disorder including PDD, NOS and specificity of .67 (Ventola et al., 2006). Another study including the ADOS examined children with autism spectrum disorder and children with non-Pervasive Developmental Disorders, such as language delay and found sensitivity of 1.00 and specificity of .79 for Module 1 in a sample of 54 children ranging in age from 15 months to 10 years (Lord, Rutter, DiLavore, & Risi, 2001). Overall, studies show high agreement between ADOS and consensus with clinical judgment (K. M. Gray, Tonge et al., 2008; Ventola et al., 2006).

Several studies caution against using the ADOS with young children due to its' low specificity (Zwaigenbaum et al., 2009). Risi et al. (2006) administered the ADI-R and ADOS with children less than 3 years of age and reported ADOS sensitivity of .97 and specificity of .59. Ventola and colleagues (2006) also studied the ADOS with children with autism spectrum disorder, including PDD, NOS versus non- autism spectrum disorder groups, which resulted in good sensitivity (.97), but low specificity (.66). Although Chawarska et al. (2007) reported high agreement between Module 1 classification and a clinical diagnosis of autism on 19 children between 14 and 25 months, the rate of agreement dropped to 79% agreement 15 months later.

Although the design of the four ADOS modules increased diagnostic accuracy, it remains over-inclusive with children under 30 months; with young children with specific language impairments (D. Bishop & Norbury, 2002) as well as in children with mental retardation (de Bildt et al., 2004; Lord & Corsello, 2005). Algorithms were created that do include restricted/repetitive stereotyped behaviors and do not separate Social Interaction and Communication Domains, but rather use a Social Affect Domain (Gotham, Risi, Pickles, & Lord, 2007; Gotham et al., 2008). The ethnicity reported in the first study examining these revised algorithms ranged across module and across diagnostic group from (Gotham et al., 2007). A 2008 study of the revised algorithms noted the ethnicity of the sample to be 3% African

American, 3% Asian American, 1% Native American, 7% multiracial, 84% White, 2% other races, and 3% of the sample identified as Hispanic (Gotham et al., 2008). Predictive validity of the ADOS increased using these revised algorithms, in which each algorithm includes 14 items of similar content (Gotham et al., 2008); however it is important to note that the study was conducted with English speaking individuals only. To increase the sensitivity of the ADOS with young children under 30 months of age, a toddler module was developed (Luyster et al., 2009) and later included in the ADOS-2. However; additional studies are required to validate its' use with this population.

***Escala de Observación para el Diagnostico Del Autism*.** The Spanish language version of the ADOS, Escala de Observación Para El Diagnostico Del Autism, is available for purchase from Western Psychological Services. The Escala de Observación Para El Diagnostico Del Autism a direct translation of the ADOS-G or the ADOS-WPS Edition (Lord et al., 1999) and was developed with children included as part of a genetic study of autism in Costa Rica (McInnes et al., 2005). All professionals involved in the development of the Spanish translation were psychologists with significant experience testing children with autism (McInnes et al., 2005). The ADOS was initially translated by one of the translators of the ADI-R. Then, two professional translators read the document in English and Spanish and noted instances in which the translation was weak or ambiguous. The authors note this was completed in order to "avoid the introduction of synonyms and colloquialisms" (McInnes et al., 2005). Two, native Spanish-speaking clinical experts from Latin America and Spain reviewed the document for content and accuracy of clinical terminology and finally reached agreement with the original translator. The Spanish language version that is available from the publisher includes one U.S. Map, two storybooks and one pop-up-toy in Spanish as part of the materials that can be purchased with the instrument. Use of Spanish language toys certainly facilitates a more accurate assessment with a Latino child exposed to Spanish or a dual language environment.

The Spanish language translation is included on the website of the publisher as one of the "authorized translated materials" that have "undergone a formal review and approval process through WPS or one of our licensed international publishers". Although the publisher notes that "translation can significantly affect ADOS scores, and thus the reliability and validity of the test results", the website also indicates that "only properly reviewed translations can provide results that correspond with those published in the manual and research literature" (Western Psychological Services, 2011). Therefore it appears that the ADOS is expected to yield the same results across cultures as those that were obtained when using the English version.

Although the Spanish version of the ADOS is available from WPS, there is a dearth of information related to the Spanish version and limited studies including Spanish speaking or Latino children. The measure is currently being utilized in several notable research studies including the prominent Childhood Autism Risks from Genetics and the Environment Study (CHARGE) study. The CHARGE study is an ongoing population- based case-control study with participants from California and is one of the few organizations conducting studies of children with autism that includes English or Spanish speaking families. The CHARGE study administers several measures including the ADOS and the in Spanish (Heuer et al., 2008).

A notable study examined the specificity and predictive value of the revised algorithms of the ADOS with 26 Hispanic children from a southern region of Texas (Overton, Fielding, & de Alba, 2008). The authors report that the school population in the region of the study is 96.6% Hispanic and 39.7% of the school population live within economically disadvantaged conditions.

The sample included 24 children from bilingual homes and two children with monolingual Spanish speaking parents. It is important to note that the majority of the children in the study (*N* = 15) were non-verbal children who were administered module 1 (the age of focus in the present dissertation). Previous evaluations of the children, using the original ADOS algorithms, resulted in four false positives and one false negative. The authors found inconsistent results even when the revised algorithms were applied. Only one child in module 1 received a more accurate diagnosis, as the score moved from an initial diagnosis of autistic disorder to the group of non-autism spectrum, reflecting a lesser degree of social impairment. The authors attribute this to a lack of specificity of the DSM since the child has less social impairment than other children who were assigned a DSM diagnosis of autism. However, the four false positive cases and the one false negative case retained their classifications using the original scoring algorithm. The authors report this is most likely due to the loading of most items into one strong factor of Social affect, which can result in difficulty making a differential diagnosis of difficult cases. The inclusion of a separate Restricted, Repetitive Behaviors Domain using the revised algorithms did not contribute to a different classification with any of the children. The authors note this is most likely due to a small sample of behavior that is often observed during the ADOS administration. Unfortunately, the authors devote little writing to cultural considerations that may have influenced the score and only note that "differential diagnosis of children who are marginal and children who have other significant social and developmental disorders remains a challenge" (Overton et al., 2008).

The samples used in the development of the original ADOS, the revised algorithms and the initial toddler module are not representative for race, ethnicity or geographic distribution. Like the ADI-R, few studies have been conducted related to the psychometric properties or validity of the ADOS with Latinos in the U.S. A recent study also reported that the ADOS social domain is not sensitive to bilingual Latino children (Overton, de Alba, & Fielding, in press).

Like the ADI-R, the test instructions of the ADOS are often translated "on the fly" when administering the English language version. In fact, in the above mentioned study of bilingual Spanish speaking children, the authors reported providing Spanish interpretation of the ADOS during administration "when necessary" (Overton et al., 2007). Although this certainly compromises the standardization and interpretation of the instrument, the ADOS relies primarily on observation and the evaluation of conversational interchanges rather than the exact wording of the instructions or the precise evaluation of responses. This is even more apparent when administering the test to non-verbal children using Module 1. One of the principal authors and developers of the ADOS notes she has been able to reliably score Module 1 with other trained raters "in many parts of the world on all continents and even when I did not understand the language, with the parent transferring simple things" (Western Psychological Services, 2011). However, she cautions against using Module 3 and 4, even with a beginning understanding of another language, since her ratings, were "far off" and she was unable to "pick up odd intonation at all, and had quite different impressions of gestures and facial expressions than native speakers" (Western Psychological Services, 2011). The author highlights the subtle cultural differences in the higher modules that require the examination by someone from within the culture or someone who is very experienced with the culture (Western Psychological Services, 2011).

For younger Latino children who are non-verbal or pre-verbal, Module 1 of the ADOS can be used, which significantly reduces the possibility of biasing effects due to variation in language skill (Lord et al., 2000). Module 1 of the ADOS includes primarily play like presses to generate observations of spontaneous play behaviors such as preferential patterns of attention and calling the child's name. The child's prelinguistic communication is coded such as coordination of gaze, gestures, social and communicative reciprocity and facial expression (Klin et al., 2005). Although no studies have reported significant ethnic differences in symptom presentation of autism (Mandell & Novak, 2005), these behaviors and the general characteristics of autism spectrum disorder are suggested to be universal across cultures (Ametepee & Chitiyo, 2009; Papageorgiou, Georgiades, & Mavreas, 2008; Wakabayashi et al., 2007). Joint attention skills are part of several tasks and items on Module 1 the ADOS such as facial expressions directed at others; response to joint attention; spontaneous initiation of joint attention; unusual eye contact; shared enjoyment; pointing and showing; and, frequency of vocalization directed to others (Lord et al., 2000). However, some studies suggest that joint attention, eye gaze, and orientation; key components of the ADOS items, can vary across cultures (Akhtar, 2005; Cote, Bornstein, Haynes, & Bakeman, 2008). Akhtar (2005) notes that children in cultures such as the Guatemala Mayan toddlers, spend more time engaged in "smooth simultaneous attention to multiple competing events", compared to European toddlers who usually attend to one event at a time and may alternative between these events (Akhtar, 2005). The authors suggest that other behaviors, such as touch or posture may serve the same function, as gaze does in traditional studies of joint attention.

The publisher provides several recommendations on the website when using the ADOS with different cultural backgrounds, such as the use of an examiner who is familiar with the child's culture (Western Psychological Services, 2011). The authors also suggest that the examiner consider the behavior of the child being assessed in the context of individual's culture (Lord et al., 2000). However, the authors note that "cultural factors have not yet been addressed systematically in research, though the ADOS-G has been used in many European and some Asian countries" (Lord et al., 2000). And overall, the developers and the publishers caution against using the ADOS with cultures outside of that which it has been normed.

Autism Spectrum Rating Scales (ASRS). The Autism Spectrum Rating Scales (ASRS) are teacher and parent rating scales that can be used as part of a comprehensive diagnostic assessment to guide diagnostic decisions in children ages 2 to 18 years old. The measure contains 2 versions: the Preschool form for children ages 2 to 5 and the elementary and high school form for children 6 to 18 years of age. The ASRS uses a 5 point- Likert response scale in which the caregiver evaluates how often they observe specific behaviors in the child. The measure requires the rater to be able to read at a 6th grade reading level. Administration time for the 70 item (2-5 Years) form is 20 minutes; however the short form can be completed in 4 minutes.

The ASRS identifies symptoms and behaviors associated with autism according to the DSM-IV-TR symptom criteria. Scoring the ASRS yields scale scores and overall scores expressed as standard scores and percentile ranks. The ASRS yields a total score based on the Social and Communication scale, the Unusual Behaviors scale and the Self-Regulation scale (for children 6 to 18 years of age). The total score is considered to be the most reliable indicator of the degree to which the child exhibits behaviors seen in autism. The DSM-IV-TR scale is derived from the Treatment scales items that are part of the DSM-IV-TR criteria for autism. The Treatment scales that are a part of the ASRS include Peer Socialization; Adult Socialization; Social and Emotional Reciprocity; Atypical Language; Stereotypy; Behavioral Rigidity; Sensory Sensitivity; Attention and Self-Regulation (for children ages 6 to 18 years old) and; Attention (for children 2 to 5 years of age).

The developers of the instrument report that data was collected between 2006 and 2009 with over 7,000 children from across the U.S. being sampled at home and at school. The final normative sample was based on parent and teacher ratings of 2,560 children across the U.S., including 640 children ages 2 to 5, with 320 parent and 320 teacher rating forms. In addition the sample also included 1,920 older children, 6 to 18 years of age (S. Goldstein & Naglieri, 2009). The initial clinical sample also included more than 1,200 children with autism spectrum disorders (Autism, Asperger's, PDD, and NOS), ADHD, mood disorders, anxiety disorders and disruptive behaviors disorder. This composition of the reference group is helpful in distinguishing between those behaviors frequently seen in children with other psychiatric disorders. Normative data was stratified to match the U.S. Census on race/ethnicity, parental education level and geographic location. However, the normative sample is not evenly distributed across parent education level or geographic region (Simek & Wahlberg, 2010). The race/ethnic distribution of the ASRS Parent ratings was reported to be 4.1% Asian, 14.8 % African-American, 15.6% Hispanic, 61.0% White and 4.4% other. The racial and ethnic distribution of the teacher ratings of the ASRS were 4.4% Asian, 14.9 % African-American, 16.1% Hispanic, 59.2% White and 5.4% other (S. Goldstein & Naglieri, 2009).

Initial reliability data indicate high levels of internal consistency, good inter-rater agreement and excellent test-retest reliability (S. Goldstein & Naglieri, 2009). Internal consistency of the early childhood ASRS for the Total Score was .97 for both the parent and teacher rating forms. Reliability of the factor based scales ranged from .93 to .97, the DSM-IV-TR Scale was .95 and the reliability of the Treatment Scales ranged from .70 to .93. Test-retest reliability coefficients on both the parent and teacher forms for children 2 to 5 years of age, ranged from .81 to .90 for the Total Score, from .72 to .93 on the ASRS Scales, from .87 to .91

for the DSM-IV-TR Scale, and from .79 to .92 for the Treatment Scales (S. Goldstein & Naglieri, 2009). Across all scales inter-rater reliability between parents ranged from .73 to .92. Inter-rater reliability was not calculated for the ASRS (2-5 Years) teacher rating scale, since many children in this age range were only cared for by a single teacher or childcare provider (Simek & Wahlberg, 2010).

The authors note that ratings of children with autism (2-5 Years) were significantly higher on all analyses when compared to the general population group. Discriminative validity of the ASRS when predicting group membership between autism spectrum disorder and the general population group ranged from 90.48% on the total score, 91.80% on the ASRS scales and 92.60% on the treatment scales. The 2 to 5 Years autism spectrum disorder group also scored significantly higher on all analyses when compared to individuals with other clinical diagnoses. Overall, the mean correct classification rate of the scales was 92.10%. When compared to the ADHD group, the children with autism spectrum disorder scores significantly higher on all scales except for Self-Regulation and Attention scales on the parent and teacher rating forms (S. Goldstein & Naglieri, 2009; Simek & Wahlberg, 2010). Convergent validity of the ASRS was examined with the Gilliam Autism Rating Scale, Second Edition (GARS-2) and the Gilliam Asperger's Disorder Scale (GADS) and found a moderate relationship (S. Goldstein & Naglieri, 2009). The authors did not examine the criterion related validity with superior instruments such as the Autism Diagnostic Observation Scale, or rating scales such as the Social Communication Questionnaire or Social Responsiveness Scale.

Autism Spectrum Rating Scale, Spanish. The Spanish Parent and Teacher Forms of the ASRS (2-5 Years) are available to purchase from several publishers. To develop the Spanish version of the ASRS, the authors reviewed the translated forms to ensure content, cultural sensitivity and reading level were appropriate for Spanish speakers in the U.S. However, the English forms were translated into Spanish after the English forms had already been completed and were in the final format (Simek & Wahlberg, 2010). Simply communicating to the parent in Spanish does not assure appropriate and non-discriminatory assessment. The inherent biases in traditional assessment can be replicated even in Spanish. The ASRS was not specifically designed or developed for use with Latinos and the test content itself maybe culturally biased.

The ASRS is a newly created instrument and therefore little research has been conducted which includes either the English or Spanish versions. In addition, the authors do not provide reliability and validity data for the Spanish forms (Simek & Wahlberg, 2010). The ASRS includes a normative sample compared with the U.S. population based on the 2000 Census report. Although children from different ethnic backgrounds have been included in the norming sample, this may not mean that the norms are sensitive to those groups. An initial exploratory analysis of the ASRS found a very high consistency across race/ethnicity, suggesting the ASRS scale structure generalizes across demographic groups (Simek & Wahlberg, 2010). It is important to note however, that although the ASRS has been translated in Spanish, the Spanish forms are based on the same norming and standardization sample as the English version, limiting its' use.

One of the advantages of the ASRS is that it can be completed fairly quickly and easy. With Spanish speaking parents who may have literacy concerns, the measure can be administered orally, which also provides opportunity to offer examples or clarify items. An additional benefit of the ASRS is that it provides an opportunity to compare scores across raters. This can assist in determining if there is consistency across home and school contexts and help identify which symptoms maybe more prevalent in a specific setting. This is especially important with Latino parents who may not accurately report their child's behaviors. The ASRS requires independent validation and future research of the Spanish version should focus on caregivers in the U.S. as well as examination of its' cultural and linguistic validity and use with this population.

Developmental, Dimensional, and Diagnostic Interview (3di). The Developmental, Dimensional, and Diagnostic Interview (3di) is a very recent addition to the assessment of autism spectrum disorder. Although a Spanish version is currently not available in the United States, a research version is currently being developed in Latin America. The 3di is a computerized Developmental, Dimensional and Diagnostic parent interview that measures both the severity of features associated with autism spectrum disorder and comorbidity across a full range of child psychiatric disorders. The use of a computerized interview allows for a hybrid that is both structured and semi-structured during its' administration. The 3di draws upon short questions, each of which captures a very specific aspect of the child's behavior, reducing rater interference and increasing validity and reliability. This specificity is significantly different than the comparable ADI-R that poses a range of questions relating to impairment and then the examiner must decide on a summary score to represent the overall content of the responses received (Santosh et al., 2009).The 3di includes items related to demographics, family background, developmental history, motor skills; questions directly or indirectly associated with autism spectrum disorder; as well as questions that relate to other diagnoses. The authors recommend that the parents complete a package of questionnaires prior to the interview and these responses can be entered into the computer. The developers report that this reduces the time spent in face-to-face assessment and that the total time to complete the brief form is 45 minutes or the full autism interview in 90 minutes (Skuse et al., 2004).

The algorithm however draws on 112 questions to give dimensional scores and the full length interview can take up to two hours to complete (Skuse et al., 2004). Therefore a short version of the 3di was constructed (Santosh et al., 2009). The short-form is described as a stand-alone interview that provides rapid assessment (approximately 40 minutes or less) for autism spectrum disorder. The author notes that the full length and the short forms are inter-operable. Therefore, if a clinician completes the short-from, but necessitates greater detail, the program allows for the clinician to "revisit" the interview using the long assessment and effectively "fill in the gaps" (Santosh et al., 2009).

The 3di includes the full range of content of the ADI-R and was designed to emulate the ADI-R, but the 3di has a different structure and is wider in scope (Skuse et al., 2004). The 3di is constructed of modules. The modules related to autism spectrum disorder are mandatory, while those relating to comorbid conditions are optional. In addition since the 3di uses algorithms the interview flows much easier since questions are eliminated if they do not apply, such as questions about language skills in a non-verbal child. The authors note that if a specific diagnosis is suspected it is possible to use the software to route the interview to include only questions relevant to the diagnosis (Skuse et al., 2004). Reponses are coded on a 3 point scale with "0" indicating no such behavior; "1" indicating minimal evidence of the behavior; and "2" indicating definite or persistent evidence of the behavior. The authors report that the use of the computerized interview and complex algorithms that generate scales of severity follows the clinician's line of thinking when determining the meaning of a response (Skuse et al., 2004). In addition, the authors note that clarification of the parent's responses is unnecessary since algorithms have been developed that reliably weight and sum responses within domains, so that the clinician does not have to make complex judgments (Skuse et al., 2004). A structured computer generated report is available and can be printed immediately following completion. The 3di is still only one component of a comprehensive assessment, an observation of the child is still essential. Further assessment must be conducted in order for the clinician to have an opportunity to observe the language and social skills deficits that may be more recognizable as autism spectrum disorder.

The 3di was developed to assess autistic traits in children with normal intellectual ability; however that authors report that it can be used with those with mild to moderate mental retardation. The 3di was developed with children from 2 to 21 years old in the United Kingdom at Sunderland Royal Hospital. The authors report that Sunderland is considered socioeconomically disadvantaged compared to other areas of the U.K. All children were English speaking and in general education classrooms (Skuse et al., 2004).

The authors report test-retest reliability and inter-rater reliability correlation coefficients were all greater than .86. Concurrent validity was determined by agreement with an independent clinician formulation, with a mean of .74. The developers compared the 3di with the ADI-R and found excellent criterion validity. The 3di was also able to differentiate children with autism from those without autism, with almost perfect sensitivity (1.0) and specificity-.97 (Skuse et al., 2004). The short-form includes 53 questions related to autism spectrum disorder that were selected by statistical analysis as being the most diagnostically discriminating of the 117 autism spectrum disorder items in the full 3di. The short version of the 3di was also developed in the United Kingdom. A high degree of agreement in dimensional and categorical terms was found during the construction and development, between the short form and the full length versions (Santosh et al., 2009).

The full- length and short forms of the Spanish version of the 3di were developed using the process of back translation and are currently being developed and validated in Chile; however the Spanish version is the same as the original English version in terms of its' functionality and user interface. The original 3di incorporates the original version of the Children's Communication Checklist (CCC; D. Bishop, 1998). The CCC was developed to discriminate between children with a pragmatic language disorder and those children with pragmatic language difficulty associated with autism spectrum disorder. Although this instrument has been translated into several other languages, there are currently no studies validating this measure on a Spanish speaking population. The CCC can be administered either as an interview or a questionnaire; however it is a mandatory part of the 3di when assessing autism (Skuse et al., 2004).

The 3di is still an instrument that relies on parent report and the families' perceptions of the child's symptoms in relation to the development of other children. For example when addressing facial expressions, one item asks if the child's range of facial expressions is comparable to children of the same age ("¿Diría que Juan tiene la misma gama de expresiones faciales espontáneas que otros chicos de su edad?") (Warrington, 2011). This can impact assessment when used with Latino families who sometimes report fewer symptoms or may not be cognizant of developmental milestones and may not report deficits at all (Mandell et al., 2009). Although the 3di includes items which address the family's account of the onset of presenting problems (e.g. "¿Quién edad piensan que tenía cuando surgió la primera preocupación de que no estuviera desarrollándose con normalidad?") (Warrington, 2011), Latinos have been noted to report concern about their child's development later than other parents (Chawarska et al., 2007; Overton et al., 2007). Some hesitations have been raised about the validity of the parent report in populations of low income and ethnocultural families (Arriaga, Fenson, Cronan, & Pethick, 1998; H. M. Feldman et al., 2000). Therefore it may be necessary to use an alternative measure with families who may hold diverse beliefs about child development (Guiberson & Rodriguez, 2010; B. L. Rodriguez & Olswang, 2003).

The use of computerized assessment to aid in the diagnosis of autism spectrum disorder can be incredibly useful in a field lacking trained bilingual and bicultural clinicians to meet the needs of Latino and Spanish speaking families (Morrier, Hess, & Heflin, 2008). The 3di was initially developed with interviews conducted by senior psychiatrists and clinical psychologists (Skuse et al., 2004); however future studies of the 3di with bilingual Spanish speaking paraprofessionals or trained Spanish speaking interpreters might be worthwhile. Training in the use of the 3di is semi-automated via a DVD and the authors report that high inter-rater reliability can be achieved without intensive training (Skuse et al., 2004). The interview provides questions that are to be asked exactly the way they are written and are designed to sound as natural as possible. The computer program makes the interview process easy and simple to complete since it automatically tailors and adjusts the text of the questions. For example, the computer interview inserts the name of a family member; uses "Ud." or "Uds." depending on those present; and adjusts grammatical elements of the questions to agree in gender and number with the child's gender and the number of caregivers present during the interview (Warrington, 2011). The developers describe the 3di as an "informal style of questions" that condenses the interview to "simple decisions" with the computer effectively prompting the interviewer with the specific questions to ask (Skuse et al., 2004). The interviewer can also record probes with the respondent's replies and make coding decisions later (Skuse et al., 2004). In addition, detailed on- line guidance is provided about coding decisions. These components of the 3di appear to make it a plausible instrument to use without numerous training courses or training to criteria for agreement, as is required with other instruments used to assess autism spectrum disorder. This can increase access to assessment services for those underserved Latino families who may not have the resources to move closer to autism spectrum disorder specialists providing assessment and diagnosis.

Families with language barriers are not able to communicate their concerns effectively (The California Legislative Blue Ribbon Commission on Autism Report, 2007), which can impact an appropriate diagnosis. The Spanish version of the 3di may reduce the language barrier of a Latino family with limited English proficiency, when administered by a clinician who may not be of the same culture, but is fluent in Spanish. However, a cultural mismatch between the family and the professional completing the assessment may still occur and influence the assessment process (Morrier et al., 2008). The clinician-family relationship has been noted to be particularly important in the Latino culture that values trust and rapport (Prelock et al., 2003; Romero, 2000). Therefore, when using an instrument such as the 3di, it is still important to ensure that plenty of time is allotted to build rapport with the family by a clinician who has an understanding of the culture as noted in the previous section of the dissertation. Studies utilizing the short version of the 3di will also be helpful in clinical settings, as psychologists will increasingly come in contact with children and their family members with autism spectrum disorder.

Development of a culturally appropriate assessment instrument still entails an understanding of the ways culture constructs the environment for development and impacts the interpretation of normality and disability. For example, some items of the 3di address restricted/repetitive behaviors which are found in many children and cause problems for the child and even the family. In the Spanish version, the interviewer asks, "¿Alguna vez Juan tuvo un interés inusitado y absorbente en cosas que giraran, tales como el lavarropas, el ventilador, o las ruedas de un autito?" (Warrington, 2011). However, Latino parents of young children may have difficulty labeling their young child's behavior as "unusual", especially if they attribute a negative connotation to these questions in their undiagnosed child (Stone & Hogan, 1993). Some studies suggest the need to frame the questions in a way that will make sense to the parent (Klin et al., 2005). For example, the 3di provides descriptive examples of theoretical behaviors such as joint attention that may be difficult to explain or describe to parents: "Si yo quiero compartir mi interés en un objeto que está a cierta distancia, puedo mirarlo fijamente, señalarlo, volver mi mirada hacia Ud., esperando ver un gesto de que se dio cuenta, y quizás recibir una mirada de que comprendió. ¿Juan hace esto?" (Warrington, 2011). The specificity of the questions during the interview as well as some direct comparison of their children's abilities to peers has also been found to assist parents in making a more accurate determination of normalcy or atypical behaviors (Restrepo, 1998). For example when addressing early words and phrases the 3di asks: "Antes de tener un lenguaje que otros puedan seguir, los bebés hacen sonidos solo para ser sociables. Pueden tener una "conversación" con uno de los padres, que es en realidad una toma de turnos en la realización de sonidos. ¿Alguna vez Juan hacía esto?" (Warrington, 2011).

Future studies of the 3di must ensure it is also a cultural translation that adapts key concepts to ensure the same meaning is conveyed within a particular cultural context (Whitbeck, 2006). Therefore, a Spanish translation of the 3di must be more than a direct translation. Since parents report has been found to have strong concurrent correlation with direct assessment and a good predictor of later development (Arriaga et al., 1998; Patterson, 1998; L. Rescorla & Alley, 2001), it is imperative to increase the accuracy of measures such as the 3di with Latino and Spanish speaking families.

Psychoeducational Profile-3rd Edition (PEP-3). The Psychoeducational Profile- Third Edition (PEP-3; Schopler, Lansing, Reichler, & Marcus, 2005) is available to purchase from several well-known publishers. The PEP-3 is a recent edition of the original PEP which was published in 1979 and the revised version which was published in 1990. The PEP-3 is used to evaluate cognitive skills and behaviors typical of individuals characterized as having autism spectrum disorder. It is based on the Treatment and Education of Autistic and Related Communication- Handicapped Children Program (TEACCH) at the University of North Carolina at Chapel Hill. The PEP-3 is appropriate for children ages 2 to 7 ½ years of age. The instrument can be administered in 45 to 90 minutes. The PEP-3 includes a performance component which is administered via direct observation and testing and a caregiver report that is completed based on daily observations of the child. The Performance Part consists of 10 subtests (cognitive verbal/preverbal, expressive and receptive language, fine and gross motor, visual motor imitation, affective expression, social reciprocity, characteristic motor behaviors, and characteristic verbal behaviors) that form three Composite Scores (Communication, Motor, and Maladaptive Behavior). The Caregiver Report consists of two sections. The first focusing on the child's current developmental level and the second addresses degrees of problems in different diagnostic categories. The Caregiver Report has three subtests including Problem Behaviors; Personal Self-Care, and Adaptive Behavior (Naglieri & Chambers, 2009). Items included in the developmental subtest are scored upon three levels with a score of "2" indicating passing; a score of "1" is emerging and, a score of "0" indicating failing. The Maladaptive Behaviors subtests are scored as "2" indicating appropriate; score of "1" indicating mild; and, a score of "0" indicating severe. Developmental ages and Composite scores are based upon a normally developing sample of 148 children. Percentile ranks are based on a comparison sample of children with autism spectrum disorder and indicate whether or not the child falls on the "autism spectrum" and also suggest severity. Subtest scores are used to determine composite scores. The resulting profile of a child with autism will usually have an uneven and idiosyncratic developmental profile in relation to the developmental subtests. This profile can also be used to determine the child's strengths and weaknesses (Naglieri & Chambers, 2009).

Normative data were collected from 2002 to 2003 on a large national sample of individuals with autism spectrum disorder ($N = 407$ from 21 states) from 2 to 21 years of age and typical individuals ($N = 148$ from 15 states) ranging from 2 to 6 years of age. The sample is comparable to data from the 2001 U.S. Census related to race, ethnicity, family income and parent education level; however the sample of individuals with autism spectrum disorder is primarily White (71%) and the sample of typically developing individuals is also primarily White (84%). The sample was not representative of geographic region; however no significant differences were found by region (Mirenda & Nellis, 2007; Naglieri & Chambers, 2009).

Overall, and across all subtests, the children with autism spectrum disorder scored significantly lower than their typically developing peers. Internal consistency was reported to be high on the Performance Scales ($M = .90$), Caregiver Report ($M = .84$) and Composites ($M = .97$). Internal consistency coefficients were calculated for the typically developing sample and ranged from a low of .75 (Affective Expression) to a high of .94 on Cognitive/Preverbal. In addition, coefficient alphas were examined across six different subgroups of individuals with autism including gender (male range .77-.99; female range.81-.99), other race (range .80-.99), White (range 78-.99), Hispanic (range .79-.99), African-American (range 81-.99) and from the sample of typically developing individuals (range .75-.97). Test-retest reliability coefficients ranged from .94 to .99. Inter-rater reliability for the Caregiver Report was also good. The mean correlation coefficients were reported to be .85 for Problem Behavior, .90 for Personal Self-Care, and .78 for Adaptive Behavior (Mirenda & Nellis, 2007; Naglieri & Chambers, 2009).

To examine item bias, a logistic regression procedure using the entire autism sample was applied to all of the PEP-3 subtests. Comparisons were also made between males and females; Black versus non-Black individuals and Hispanic versus non-Hispanic individuals. Four of the item comparisons were significant at the .001 level; however, the test authors suggest this is benign and does not appear to be gender-related, ethnocentric, or related to racial or ethnic stereotypes (Mirenda & Nellis, 2007; Naglieri & Chambers, 2009). Criterion predictive validity was examined by comparing scores with several instruments including the original Vineland Adaptive Behavior Scales, the Childhood Autism Rating Scale and the Second Edition of the Autism Behavior Checklist (ABC-II; Krug, Arick, & Almond, 2008). Although correlations with the PEP-3 scores were high it is important to note that the CARS was written by the same authors (Mirenda & Nellis, 2007).

The developmental subtests of the PEP-3 are frequently used in research to establish the developmental level of children with autism and the measure is frequently cited as a recommend tool in the assessment of autism. Fulton and D’Entroment (2013) found that scores on the cognitive and language subtests were correlated with other measures of autism; however scores were negatively correlated with scores on the ADOS social communication total. Although the PEP-3 is currently available in English, Danish, Chinese, German, Portuguese, French and Japanese, at the time of this writing a Spanish version of the caregiver report was not available. However, several studies examining the PEP-R and PEP-3 support the cross-cultural validity of the measures. Studies examining the Chinese version of the Psychoeducational Profile-Revised (PEP-R; Lam & Rao, 1993; Shek, Tsang, Lam, Tang, & Cheung, 2005) as well as the Italian version (Villa et al., 2010) have found that the psychometric properties of the PEP-R were stable across cultures. The Brazilian version of the PEP-R was also found to be reliable and valid, but only after making significant cultural adaptations to the measure (de Leon, Bosa, Hugo, & Hutz, 2004) such as replacing a baseball with a soccer ball. The developers of the Portuguese translation successfully back-translated the instrument; however, the authors note difficulty adapting the drawings, such as a turkey (de Leon et al., 2004). The image traditionally associated with a festive occasion (Thanksgiving) was replaced with elements of the Brazilian culture. Letters presented for matching, copying for fine motor performance and for cognitive performance were also modified according to their frequency of the letters in the Portuguese language rather than the English language. The developers of the Estonian version of the PEP-R made cultural and linguistic changes; however the authors report some differences in the cognitive verbal domain (Kikas & Häidkind, 2003). The authors note that tasks that required learned knowledge (e.g. counting, identifying numbers, solving addition and subtraction problems and reading) were difficult for the Estonian kindergarteners who did not even get "emerging" scores. The developers also note problems with tasks that they attribute to socio-cultural factors. Children answered the question "What is your name?" by providing their first name but not their last. The authors also believe some children were confused when asked "Are you a boy or a girl?" and these items were primarily scored as "emerging".

Further independent studies are needed to confirm any differences; however, the PEP-3 appears to provides initial validity of its' use with English speaking Latino children in the U.S. One of the strengths of the PEP-3 is that the sample closely matched the U.S. population with regard to geographic area, gender, race, Hispanic ethnicity, family income and educational attainment of the parents. In addition, reliability coefficients were computed for age by gender and race/ethnicity within the normative sample. The PEP-3 may also be appropriate for use with young Latino children since the tasks are not timed, many do not require oral language ability and items can be presented out of order to be flexible and meet the child's needs. In addition, for some tasks, the examiner can use verbal directions, gestures, demonstrations, or physical guidance to communicate instructions to the child (Mirenda & Nellis, 2007). This is beneficial for a young Latino child with little interaction outside of the home or who has not attended a formal school program, and may require additional time to elicit certain behaviors. Future examination should also address any differences on the Performance Part that may be impacted by the child's exposure to early school skills as well as language differences for those children in a dual-language environment. The development of an appropriate Spanish version of the Caregiver Report would also be a valuable addition when using the PEP-3 with Spanish speaking families.

Instruments to Assess Social Behaviors

The pervasive impairments in the social behaviors of a child suspected of having autism spectrum disorder is concentrated on early deficits in social-emotional reciprocity such as little initiation of social interaction, reduced imitation of others' behaviors, joint attention, eye gaze, pointing, gestures, attention and self-regulation (American Psychiatric Association, 2013; Mundy & Newell, 2007; Mundy & Stella, 2000; Wimpory, Hobson, Williams, & Nash, 2000). There is also some diagnostic overlap in very young children with autism spectrum disorder between language and communication and social behaviors (American Psychiatric Association, 2013). Several of these instruments that are available in Spanish, have already been discussed in the chapter dedicated to diagnostic measures of autism spectrum disorder such as the CSBS-DP, the ADOS and the ASRS. Additional measures that are sometimes used to assess social behaviors and emotional problems in young children with autism spectrum disorder and can be included as part of a more comprehensive assessment, are included below.

Child Behavior Checklist/1 ½ -5 (CBCL/ 1 ½ -5) and Caregiver-Teacher Report Form (C-TRF). The Achenbach System of Empirically Based Assessment (ASEBA), which includes the Child Behavior Checklist for children 18 months to 5 years old (CBCL/1 ½-5) and the Caregiver-Teacher Report Form (C-TRF) for children 1 year and 6 months through 5 years (L. A. Rescorla, 2005), as well as other measures for the assessment of older children and adults is the most widely used single measure of child behavior. The CBCL/ 1 ½ -5 asks caregivers or parents to rate specific behavioral and emotional problems. The C-TRF is designed to be completed by preschool teachers or day care providers. The CBCL/ 1 ½-5 and C-TRF have 82 similar items, and 17 items that are specific to home or school contexts, as well as an open-ended section for the addition of other problems that may not have been listed on the forms. Both forms rate the child’s behavior over the past 2 months, using a 3-point rating scale (0, not true; 1, somewhat or sometimes true; and 2, very true or often true). The questionnaires require a fifth grade reading level and each can be completed in 10 to 20 minutes. Results are grouped together into syndrome scales (Emotionally Reactive; Anxious Depressed; Somatic Complaints; Withdrawn; Sleep Problems (CBCL/ 1 ½-5 only); Attention Problems and Aggressive Behavior) and DSM oriented scales (Affective Problems; Anxiety Problems; Pervasive Developmental Problems; Attention Deficit/Hyperactivity Problems; Oppositional Defiant Problems). Scores are summed to yield an Internalizing Scale score; and Externalizing score, and a Total Problems score. More recently a Stress Problems scale was added. T-scores cut-offs are recommended to ascertain the presence of emotional and behavioral problems with scores greater than or equal to 64 in the high or clinical range (L. A. Rescorla, 2005). An additional feature of the CBCL/1 ½-5 is the Language Development Survey (LDS), which utilizes the parents' report to assess the child's expressive vocabulary and word combinations and also identifies risk factors for language delays (relative to norms for ages 18-35 months). Additional information regarding the LDS can be found in the review of Language instruments.

Norms for the CBCL/ 1 ½-5 were developed based on data from a large national survey of children, youth and adults that yielded a final sample of 700 non-referred children (L. A. Rescorla, 2005). The CBCL/ 1 ½-5 normative sample consisted of 362 males and 338 females with a diverse sample representative of the U.S. population (56% non-Latino White; 21% African American; 13% Latino children; and 10% mixed or other). In addition, languages other than English were spoken in 25% of the homes, with Spanish as the primary other language spoken. Socioeconomically, 33% of the sample was classified as upper SES, 49% was middle, and 17% was lower SES. Regional distribution of the sample was described as 17% Northeast, 22% Midwest, 40% South and 21% Western U.S. (L. A. Rescorla, 2005). The C-TRF normative sample was obtained from 203 children whose parents had completed the CBCL/ 1 ½-5. The authors also augmented the sample with data from the C-TRF/2-5, a previous version of the C-TRF (L. A. Rescorla, 2005). The final normative sample of the C-TRF included 1,192 children (588 males and 604 females). Demographics of the sample comprised 48% non-Latino White children; 36% African American children; 8% Latino; and 9% mixed or other. The sample was reported to be 47% upper SES, 43% middle SES and 10% from lower SES. The regional distribution of this final sample was 29% Northeast; 17% Midwest; 32% South and 22% West (L. A. Rescorla, 2005).

Internal consistency coefficient alphas for the syndrome scales of the CBCL/ 1 ½-5 ranged from .66 to .92 and alphas for the DSM oriented scales ranged from .63 to .86. The internal consistency coefficient for the Internalizing scale was .89, .92 for the Externalizing Scale and .95 for the Total Problems scale. Coefficient alphas for the syndrome scales of the C-TRF ranged from .52 to .96. Alphas for the DMS-oriented scales ranged from .68 to .93; the Internalizing Scale was .89; the Externalizing Scale was .96 and the Total Problems Scale was .97. Agreement between mother and father scores was examined and mean scale scores were not significantly different (mean correlation was .61). Cross-informant agreement was also calculated between caregivers and teachers and the mean correlation was found to be .65 (Achenbach & Rescorla, 2000). Test-retest reliability analysis was conducted on the CBCL/ 1 ½-5 and the C-TRF, with most correlations, across the syndrome and scales in the .80s and .90s. The mean correlation across all scores for the CBCL/ 1 ½-5 was .85 and the mean correlation was .81 for the C-TRF (Achenbach & Rescorla, 2000; L. A. Rescorla, 2005). Validity of the CBCL/ 1 ½-5 and the C-TRF has been examined with referred children scoring higher on all problems scales (L. A. Rescorla, 2005). Age effects and gender effects on the CBCL/ 1 ½-5 were small. The authors also report that no significant SES effects were found on the C-TRF and a small effect (1-3% of the variance) was found for 8 of the 15 CBCL/ 1 ½-5 scales (L. A. Rescorla, 2005).

Spanish Child Behavior Checklist/1 ½ -5 and Caregiver-Teacher Report Form. The CBCL/ 1 ½-5 and the C-TRF have been translated into Spanish (Castilian), Spain- Catalan and Spanish (Latino) by the publishers (Achenbach, 2011).The CBCL/ 1 ½-5 and the C-TRF have been used extensively in cross cultural research and with Latinos in the U.S., Puerto Rico and in Latin America (Achenbach, Bird, Canino, & Phares, 1990; H. R. Bird, 1996; Crijnen, Achenbach, & Verhulst, 1997; Ivanova et al., 2010; Weiss, Goebel, Page, Wilson, & Warda, 1999). In addition the authors recently published a multicultural supplement to the manual for the ASEBA Preschool forms that includes the multicultural norms for the CBCL/ 1 ½-5 and the C-TRF (Achenbach & Rescorla, 2010). The Multicultural Supplement can be particularly helpful as it provides norms based on approximately 30,000 CBCL and C-TRF responses from 26 societies. Problem scales can be compared to norms from societies with relatively low problem scores, intermediate scores or high scores. Norms can also be viewed in comparison to the parent's home society or the host society to determine if the scores are clinically deviant (Achenbach, 2011).

There are several advantages to using the CBCL/ 1 ½-5 and/or C-TRF with Latino and Spanish speaking families. The DSM-oriented scales were initially developed with experienced psychiatrists and psychologists from 10 cultures who rated items that were consistent with DSM categories (L. A. Rescorla, 2005). Therefore, from the inception, close attention was paid to the development of a culturally appropriate measure. In addition, several recent studies including Spanish and English speaking Latino families have supported the reliability and validity of the measure across different racial, ethnic, income and language groups (Gross et al., 2006). One notable study found that English and Spanish speaking Latino parents found the CBCL/ 1 ½-5 to be culturally sensitive and unbiased (Sivan, Ridge, Gross, Richardson, & Cowell, 2008). However, gender differences have been found among some Latino parents when using the measure. More specifically, one noteworthy study utilizing a previous version of the CBCL/1 ½ -5, found that Puerto Rican mothers reported the fewest problems in their male children (Leadbeater & Bishop, 1994).

The Pervasive Developmental Disorders Problems Scale of the DSM oriented scales consists of 13 items that assess the child's ability to adapt to change; lack of social responsiveness; rocking behaviors, speech problems and strange behavior. Test-retest reliability is high for the Pervasive Developmental Disorders Problems scale for both parents (.86) and teachers- .83 (Achenbach & Rescorla, 2000). The authors also report Inter-rater reliability on the Pervasive Developmental Disorders Problems scale was moderate between parents to parent ratings, which were .67 and teacher to teacher ratings , which were also .67 (Achenbach & Rescorla, 2000). Several recent studies of children with autism have used the CBCL/1 ½ -5 (Baker, Messinger, Lyons, & Grantz, 2010; Mirenda et al., 2010; Möricke, Swinkels, Beuker, & Buitelaar, 2010; Pandolfi, Magyar, & Dill, 2009; Sikora et al., 2008; I. M. Smith et al., 2010). Independent studies of the Withdrawn and Pervasive Developmental Disorder Problems scales of the CBCL/1 ½ -5 have been shown to distinguish children with autism from children without autism, better than the GARS autism quotient (Sikora et al., 2008). Conversely, poor specificity for the CBCL Withdrawn Scale and the Pervasive Developmental Disorders Scale, underscores the need to utilize the CBCL as part of a more comprehensive assessment process (Sikora et al., 2008). Pandolfi et al. (2009) also encouraged use of the CBCL/1 ½ -5 to assess emotional and behavior disorders in young children with autism.

Both English and Spanish versions of the CBCL/1 ½ -5 have been used in several large and diverse samples of children with autism, as well as in population based studies of children with autism (Duarte, Bordin, de Oliveira, & Bird, 2003; Goodlin-Jones, Tang, Liu, & Anders, 2009; Krakowiak, Goodlin-Jones, Hertz-Picciotto, Croen, & Hansen, 2008). In fact, several studies utilizing the measure have found no ethnic differences in children with autism spectrum disorder and maladaptive behaviors (Duarte et al., 2003; Hartley & Sikora, 2009; Kanne, Abbacchi, & Constantino, 2009). Overall, results of the CBCL/1 ½ -5 and/or C-TRF with Latino families can provide valuable data to assist in the diagnosis of autism spectrum disorder. The measures are particularly useful when differentiating co-occurring disorders that can complicate the diagnostic process and can mean a later diagnosis for a Latino child (Levy et al., 2010; Overton et al., 2007).

Developmental Behavior Checklist- Second Edition. The Developmental Behavior Checklist (DBC; Einfeld & Tonge, 1995) is a questionnaire that is used to assess emotional and behavioral problems in children with developmental delay and intellectual disability. The Parent/Carer version (DBC-P) contains 96 items and is used with children 4 to 18 years of age. The Teacher Version (DBC-T) is completed by a teacher or someone who is familiar with the child's behavior in a school setting and is also used with children 4 to 18 years old. The measures can be completed quickly (approximately 10-20 minutes). Items are scored on a 3-point rating scale from "0" (not true as far as you know) to "2" (very true or often true). The DBC yields five subscales scores (Disruptive/Antisocial; Self-Absorbed; Communication Disturbance; Anxiety; and Social Relating) and a Total Behavior Problem Score (TPBS). A score greater or equal to 46 on the TPBS has been found to identify those children with a clinically significant level of behavioral and emotional disturbance (Einfeld & Tonge, 1995). Norms are available for males and females as well as according to level of intellectual disability (mild, moderate, severe and profound). The Second Edition of the DBC-P and DBC-T were published in 2002 and a version is currently being developed and will be made available from Western Psychological Services (Einfeld & Tonge, 2013).

The norms for the measure were derived from a large epidemiological study in New South Wales and Victoria Australia (Einfeld & Tonge, 1996a, 1996b). The items for the measure were identified from the review of the medical files of 664 children and adolescents with behavior disorders and intellectual disability who were seen at a developmental assessment clinic over 12 years. The items were reduced to 96 items and translated into language suitable to be read and easily completed by parents and caregivers. Item content of the checklist was refined further by review with informant parents. The measure was then standardized on a sample of 1,093 children and adolescents with intellectual disability. The authors report high test re-test reliability (.83) and internal consistency (.94). The inter-rater reliability between parents was .80 and intra-class correlations for teachers was reported to be .60. The authors found excellent discriminative validity (.92). High correlations were found between DBC scores and other measures of behavioral problems in children with intellectual disability such as the Adaptive Behavior Scales (.86; Lambert & Windmiller, 1981) and the Scales of Independent Behavior- .72 (Bruininks, Woodcock, Weatherman, & Hill, 1984). The DBC was found to be able to distinguish between children with psychiatric disorders from those children without behavioral problems (Einfeld & Tonge, 1995). Independent studies of the psychometric properties of the DBC have also reported high levels of internal consistency (Hastings, Brown, Mount, & Cormack, 2001).

The authors have developed the Developmental Behavior Checklist Early Screen (K. M. Gray & Tonge, 2005). The Developmental Behavior Checklist Early Screen consists of 17 items from the DBC-P and has been shown to be an effective tool to screen for autism in children with developmental delay ages 18 to 48 months of age (K. M. Gray et al., 2008). However, the measure is only available in English. The authors also developed the DBC Autism Screening Algorithm (DBC-ASA) using items from the DBC-P (Brereton, Tonge, & Einfeld, 2006). The 29-item scale can be used with children 4 to 18 years of age and has been found to have good validity in discriminating young people with autism and intellectual disability from those with intellectual disability (Brereton et al., 2006). The algorithm was developed from a sample of 180 children with autism (4-18 years old) referred to an autism assessment clinic in Victoria and New South Wales, Australia and a control group of 180 children (4-18 years old) from an epidemiological sample from the same region of Australia (Einfeld & Tonge, 1996b). Item analysis, confirmatory analysis and unit weighing were used to determine the items to include in the algorithm. The 29 items are scored and a cut-off of 17 or greater is used to identify those children who require additional assessment. The authors found that the DBC-ASA sensitivity was .86 and specificity was .69, suggesting that the measure can be used to indicate risk for autism, but should only be used as part of a more comprehensive diagnostic assessment. The DBC-ASA has also been independently validated on a Swiss sample of children and was found to be a suitable screening tool for autism (Steinhausen & Metzke, 2004).

Developmental Behavior Checklist- Spanish Translations. Although the DBC-P and DBC-T are available in Spanish, the two additional measures designed to assess and screen for autism spectrum disorder in children with intellectual disability, the DBC-ES and the DBC-ASA are currently only available in English. The DBC-P can be particularly useful since it is one of the few tools available to measure emotional and behavioral problems in children with intellectual disability and there are even fewer that have been translated into Spanish. Several studies have examined use of the DBC-P with children with autism (Brereton et al., 2006; Mooney et al., 2006). Children with autism scored significantly higher above the cut-off than the psychiatric cases and the children with intellectual disability (Brereton et al., 2006). The study found that children with autism were highly disruptive; self-absorbed (a range of stereotypical, repetitive and preoccupied behaviors); and anxious; had more problems with communication and social relating (aloofness, not wanting to be cuddles, poor eye contact and preferring to be alone) and had more symptoms of ADHD and depression than children without autism (Brereton et al., 2006).

There are significant limitations to using the DBC-P with Latino children suspected of having autism in the U.S. The DBC-P, the DBC-EC and the DBC-ASA were developed in Australia with a sample of children that differ considerably from English and Spanish speaking Latinos in the U.S. Although the sample is diverse and includes a broad range of demographic characteristics (Einfeld & Tonge, 1995), the ethnic background, SES and urban/rural environment of Australia is not representative of the intended population in the U.S. This is especially important since the social values that are emphasized in a Latino family may vary considerably as compared to the mainstream ideals in Australia. Therefore, it is imperative to use appropriate measures of social behaviors to ensure that Latino children are not misdiagnosed. Further studies utilizing the Spanish translations of the DBC with Latinos in the U.S. would increase its' validity.

Matson Evaluation of Social Skills with Youngsters (MESSY). The Matson Evaluation of Social Skills with Youngsters (MESSY) is used to evaluate "appropriate and inappropriate social skills" in children and adolescents. The MESSY was initially developed in 1983 for assessing social skills deficits of children 4 to 18 years of age (Matson, 1988). The original measure was normed on a primarily White sample of 744 typically developing children (4-18 years of age) from Northern Illinois (Matson, Rotatori, & Helsel, 1983). The initial items were determined by a review of standardized measures and items that assessed social skills. Two independent raters identified 92 items that were subsequently administered to 422 children using the self-form and 322 teachers completed the teacher-report form. Test-retest reliability was conducted and items with correlation coefficients higher than .50 for the self-form and higher than .55 for the teacher-report form were retained. The final version of the Self-Rating form included 62 items and the Teacher rating included 64 items. The items of the MESSY are rated on a 5 point Likert scale from “1” (not at all) to “5” (very much). The scores of the measure yield two factors: Appropriate Social Skills and Inappropriate Assertiveness/Impulsiveness Scale. T-scores can also be computed for the subscales and the total score. A high total score indicates poor social skills, whereas a low score suggests good social skills.

The authors reported good reliability and validity. Internal reliability was reported to be .93 for the Teacher Form and .80 for the Self-Report Form (Matson et al., 1983). The original MESSY was also found to be significantly correlated with several measures of social skills- ranging from .23-.30 (Matson, Esveldt-Dawson, & Kazdin, 1983). A recent study examined the psychometric properties of the MESSY, using an updated normative sample of 885 children ages 2 through16 years of age (Matson, Neal, et al., 2010). The study found good internal consistency reliability (.84 for 2-5 year olds; .93 for 6-9 year olds; .93 for 10-16 years olds). Psychometric properties for the older age groups were found to be stronger than for the 2 to 5 year old children (Matson, Neal, et al., 2010). The MESSY was also found to be significantly correlated with the Behavior Assessment Scale for Children (Reynolds & Kamphaus, 2004) and the Autism Spectrum Disorder- Comorbidity for Children (Matson & González, 2007), suggesting good convergent validity. This resulted in the second edition of the MESSY (MESSY-II) which was recently published (Matson, 2010), utilizing this updated normative sample.

The MESSY-II can be completed by a parent or teacher who rates items based on observations of appropriate and inappropriate social behaviors. The scale consists of 57 items that are based on a Likert rating scale from “1” (not at all) to “5” (very much). The scores on the

MESSY-II are summed to yield three factors (Hostile Scale; Inappropriately Assertive/Overconfident Scale; Adaptive/Appropriate Scale). A high score on the Hostile and/or Inappropriate Assertiveness/Overconfident factors indicates the presence of poor social skills. A low score on the Adaptive/Appropriate factor suggests a lack of positive social skills. Cut-offs have also been developed for this most recent edition (Matson, Kozlowski, Neal, Worley, & Fodstad, 2011).

The MESSY has been used with different populations including children with intellectual disability and autism (Matson & Wilkins, 2009). An early study using DSM-III criteria for autism, the CARS and the MESSY, examined 17 children (2-21 years of age) with autism (Matson, Compton, & Sevin, 1991). The ethnicity of the children in the sample was reported to be 5 White, 11 Black and 1 Asian child and the children were matched with controls on age, sex and race (Matson et al., 1991). The children with autism were noted to have the most problems with items such as “Gets upset when she/he has to wait for things”, “Tries to get others to do what he/she wants”, “Is stubborn”, “Makes sounds that bothers others, such burping, sniffing” and “Takes or uses things that are not his/hers without permission” (Matson et al., 1991). Although frequently rated by parents of typically developing children, there were several appropriate social behaviors that were not endorsed for the children with autism including: “Does nice things for others who are nice to him/her”, “Helps a friend who is hurt”, “Feels good if (s)he helps others”; “Makes other people laugh (tells jokes, funny stories, etc.), and “Works well on a team” (Matson et al., 1991). Overall, the MESSY was found to be an effective tool to evaluate the social behaviors of children with autism; however it is important to note that this study utilized the original version of the MESSY and outdated diagnostic criteria from the DSM-III-R. A more recent study examined the applicability of the MESSY-II with children with autism (Matson et al., 2011). Children with autism spectrum disorder were found to score above the cut-off score and differences were noted between the typically developing children and the children with autism spectrum disorder on the Adaptive/Appropriate factor. The study also revealed that children with autism spectrum disorder did not score significantly different on the inappropriate social skills factors (Hostile and Inappropriately Assertive/Overconfident) suggesting that children with autism spectrum disorder may exhibit deficits in appropriate social skills, but do not display an excess of inappropriate social skills (Matson et al., 2011).

Overall, the MESSY has been found to be an appropriate instrument to use for evaluating the social behaviors of children with autism spectrum disorder. Children with autism spectrum disorder have been noted to score significantly above the cut-off (Matson et al., 1991; Matson et al., 2011) and the measure includes items that measure social skills deficits frequently seen in children with the disorder including: saying thank-you; initiating social conversation; feeling empathy or feeling sorry after hurting someone else; making eye contact, and smiling at people they are familiar with. However, use of the original self-report version of the MESSY is not recommended for use with young children with autism spectrum disorder, due to the inherent communication and social skills deficits in this population. Assessment of social behaviors in early childhood does not require the child to report on his or her own experiences, but relies instead on observation and parent report (Shea & Mesibov, 2009). Although the MESSY-II employs the more standard method of caregiver report of the child's behaviors, those studies of children with autism, using the MESSY-II have been conducted with a primarily White sample of children. Even more significant, is the fact that those studies using a more diverse sample of children from varying socioeconomic backgrounds (albeit they have been conducted in other countries) have reported significant SES differences (Teodoro, Käppler, Lima, de Freitas, & Haase, 2005; Torres, Cardelle-Elawar, Mena, & Sanchez, 2003).

Matson Evaluation of Social Skills with Youngsters (MESSY) Spanish Translation. The MESSY has been translated into many languages including Japanese, Turkish, Chinese, and Dutch and was also successfully adapted in Brazil (Teodoro et al., 2005). The Portuguese adaptation found good internal consistency; however they found children from urban middle-class areas scored higher than low income children from "slums" (Teodoro et al., 2005). The MESSY was also translated and adapted with a normative sample in Spain (Méndez, Hidalgo, & Inglés, 2002). This particular study included 634 adolescents 12 to 17 years of age from Spain and utilized the original self-report version of the MESSY. Although the authors translated the original English version into Spanish, the "connotative meaning of the items" remained the same in both languages "although the translation of some of the items was not literal" (Méndez et al., 2002). The authors reported high internal consistency (.88) and overall, consider the psychometric properties of the Spanish translation of the MESSY to be adequate. Another study using a Spanish translation of the MESSY found good internal consistency- .89 (Torres et al., 2003); however, the study revealed significant SES differences among the 11 to 12 year olds of varying sociocultural backgrounds including inner-city, middle income and suburban families (Torres et al., 2003). The authors suggest this is most likely due to cultural variations in evaluating social behavior as well as differing demands to meet social objectives according to "disadvantaged and comfortable environments" (Torres et al., 2003).

Although the MESSY has been translated into Spanish, the Spanish translation is not culturally or linguistically equivalent. Appropriate back-translation procedures were not conducted and the Spanish language spoken by children in Spain is significantly different from variations of Spanish used with Latinos in the U.S. In addition, the MESSY assesses appropriate and inappropriate social skills that are developed within a socio-cultural context and vary across cultures. In general, further research on the MESSY should comprise a more diverse sample of children and should take into account SES, since the normative population does not appear representative of the population in the U.S. Future examination of the Spanish translation must be conducted outside of Spain, before implementing the measure with Latino and Spanish speaking parents in the U.S.

Social Skills Improvement System (SSIS-RS). The Social Skills Rating System (SSRS; Gresham & Elliot, 1990) is a series of questionnaires that assesses social behavior for children 3 to 18 years of age. The SSRS includes three different complementary version of the SSRS: The Preschool Form (from age 3), Elementary Form (Grades Kindergarten-6th Grade) and the Secondary Form (Grades 7th -12th Grade). Ratings are completed by parents, teachers, and a self-report measure for children and adolescents (Grades 3-12). Items on the SSRS are rated according to the frequency and perceived importance of behaviors related to social competence at school and in the home. The Social Skills Scale measures positive prosocial skills. The subdomains of this scale include: Cooperation; Empathy (student only); Assertion; Self-control; and Responsibility (parent only). Scores also include scales of potential Problem Behaviors including Externalizing Problems; Internalizing Problems; and Hyperactivity. Academic Competence is also rated by the teacher and measures reading and math performance, cognition functioning, motivation, and parent support (Gresham, Elliott, Vance, & Cook, 2011). The SSRS has been one of the most widely used measures of children's behaviors and had been used in many foreign countries and translated into several languages including Spanish (Jurado, Cumba-

Aviles, Collazo, & Matos, 2006); Portuguese (Pedro & Albuquerque, 2007); Hindi; Dutch; German; Russian; and Korean (Gresham et al., 2011).

The SSRS was revised in 2008 and renamed the Social Skills Improvement System (SSIS-RS; Gresham & Elliot, 2008). The SSIS-RS can be used with children 3 to 18 years of age. Parent and teacher forms are available for children ages 3 to 18 years of age. The SSIS-RS can be administered in 15 to 20 minutes. Like the SSRS, the SSIS-RS also includes different forms reflecting three developmental ranges: Preschool (3-5 years), Elementary (Grades Kindergarten -6th grade); and Secondary Grades (7th -12th Grade). Parents and teachers rate items on the SSIS-RS on a 4-point frequency scale from "0" (Never) to "3" (Almost Always) to describe how often the behavior occurred during the previous 2 months. All of the SSIS-RS forms, with the exception of the Student Elementary Forms, use a 3-point Importance Rating- 0 = Not Important, 1 = Important, 2 = Critical (Gresham et al., 2011).

The revised instrument includes an expanded definition of social skills based on current research on social skills and achievement with four new subscales. The Social Skills Scale describes the student's positive social behaviors while interacting with others and includes: Communication, Cooperation, Assertion, Responsibility, Empathy, Engagement Behaviors and Self-Control. The Problems Behaviors Scales includes negative behaviors that can interfere with social competence: Externalizing (fights with others, talks back to others); Bullying (bullies others, keeps others out of social circles); Hyperactivity/Inattention (fidgets or moves around too much); Internalizing (acts sad or depressed); and the Autism Spectrum Subscale (Gresham et al., 2011).

To develop the SSIS-RS, items from the SSRS were reviewed and less effective items were eliminated from the forms if they retained an item-total correlation less than .40 on the

Teacher and Parent forms (Doll, Jones, Lee-Farmer, & Meikamp, 2010). Statistical analysis of items was conducted to determine the final forms of the scales. Items were also revised to improve alignment in topics covered across raters (Gresham et al., 2011). The SSIS-RS also includes updated national norms for 4,700 children (3 -18 years of age) in 36 states at 115 sites and improved psychometric properties from its' predecessor. The sample was matched to the 2006 U.S. Census data for age, gender, geographic region and educational diagnosis. In addition, the normative sample included special populations with a wide range of educational disabilities and diagnoses including autism spectrum disorder, developmental delay, emotional and behavioral disorders, intellectual disability, specific learning disability and speech and language impairment. Children with ADHD were also compared to the non-clinical group of children (Doll et al., 2010). The normative sample for children 3 to 5 years of age, included responses from 200 Teacher forms and 400 Parent forms. The developers also attempted to obtain multiple raters for each student to allow for comparisons across raters. Internal consistency reliability for the Teacher form was found to be .91 and .86 for the Parent form. Reliability coefficient alphas for the Social Skills Scale ranged from .83 to .97 across age groups on the Teacher form and ranged from .74 to .96 on the Parent form (Doll et al., 2010). Coefficient alphas for the Problem Behavior Scale ranged from .75 to .96 across age groups for the Teacher form and from .76 to .95 for the Parent form (Doll et al., 2010; Gresham et al., 2011). The authors also calculated test-retest reliability coefficients which were reported to be .82 for the Teacher form and .82 for the Parent Form (Doll et al., 2010). Inter-rater reliability was reported to be .71 when rated across teachers and .68 when scores were compared across parents. The SSIS-RS was also found to be correlated with other measures of social behavior including the Behavioral Assessment for Children, Second Edition (Reynolds & Kamphaus, 2004) and the Vineland-II (Doll et al., 2010).

The authors conducted a psychometric comparison of the SSRS and the SSIS-RS to determine reliability and validity estimates across the rating scales for Teacher, Parent and Student rating forms (Gresham et al., 2011). Overall, reliability estimates were common across the two instruments, suggesting consistency with which the items and subscales measure the same constructs (social skills and problem behaviors; Gresham et al., 2011). However, the authors reported higher internal consistency for the SSIS-RS than the SSRS. Convergent relationships were found among the common subscales across all forms of the two instruments. The authors described the SSIS-RS as an improved version of the SSRS and recommend using the SSIS-RS due to its' higher reliability (Gresham et al., 2011).

Although the SSRS has been widely used in research and schools, there are several limitations to use of the original measure with young children. Neither the preschool tryout sample nor the standardization sample of the original SSRS are truly nationally representative (Demaray & Ruffalo, 1995). The sample is inadequate due to its' over-representation of White and African-American children and underrepresentation of Latino children. In addition, reliability estimates for the original preschool forms are limited and are not recommended for use (Demaray & Ruffalo, 1995; Gresham et al., 2011). However, the norms for the revised SSIS-R are more representative and include a more diverse sample of children. Several studies have utilized the SSRS with low income early Headstart children (Fagan & Fantuzzo, 1999; Jeon et al., 2010; Qi & Kaiser, 2004). However, several studies using the instrument suggest differences due to race or ethnicity. For example, when developing the SSIS-RS, the authors found a small number of Social Skills Scale items showed significant differences in differential functioning analyses, across ethnic groups. The differences were not observed consistently across forms; therefore only one item was subsequently excluded from the final form (Doll et al., 2010).

Walthall, Konold and Pianta (2005) examined the factor structure of the SSRS with a large national sample and did not find any significant gender or ethnic differences. It is also important to consider that the Parent form of the SSIS-RS requires a fifth grade reading level, which can limit its' use with some Latino parents with low educational attainment or limited English proficiency.

There are some advantages to use of the SSIS-RS since each area is measured against age level expectations and definitions. In addition, the examiner has the option to obtain ratings from multiple respondents to examine the child's behavior in various settings and from different perspectives. This can be especially helpful with Latino families, since some studies have revealed differences in parent and teacher scores using the SSRS (Fagan & Fantuzzo, 1999). In this particular study with primarily Latino and African American parents, the parents rated their children's social competence differently than the White, middle class teachers. For example, Fagan et al. found that some parents in the study indicated that one particular item on the SSRS, "asks sales clerks for information or assistance," was not relevant to their child's experience (Fagan & Fantuzzo, 1999). Another strength of the SSIS-RS is the addition of three validity scales (F Index; Response Pattern; and Response Consistency), which allow the examiner to examine the veracity of the rater. Unusual response patterns or those responses that must be interpreted with caution, require follow-up and additional query by the examiner.

Social Skills Improvement System, Spanish Translation. Although the publisher offers a Spanish translation of the SSIS-RS Parent and Student Forms (Ages 8-12 and Ages 13-18), it is based on the English edition with no changes to items or tasks. Items were translated by Spanish speaking psychologists and the translation was then verified by a professional translation service. Children who were rated with the Spanish forms were included in each normative sample. This included respondents who were deliberately selected because of their Spanish language abilities as well as a group of respondents who were initially recruited and later identified as Spanish speaking (Doll et al., 2010). Item-total correlations were calculated separately for the Spanish language respondents and were slightly lower than the results for the English language respondents. Internal consistency for the Spanish language subscales was reported to be adequate (Doll et al., 2010). An independent study in Puerto Rico of the Spanish version of the SSRS-Teacher form, found the instrument to be reliable and valid measure to use with Latino children (Jurado et al., 2006). Although the Spanish language rating scales were central to the development and standardization of the SSIS-RS (Doll et al., 2010) the inclusion of Spanish speaking raters in the normative sample does not make it applicable for use with this group.

Overall, caution is recommended when using the SSIS-RS with Latino and Spanish speaking families, since the scores are based on the rater's perceived value of the behavior being assessed. The SSIS-RS reflects a mainstream, adult perspective of appropriate social behaviors (Doll et al., 2010); however, Social Skills Importance ratings may vary considerably across cultures (Brice, 2002). For example, the Parent form of the SSIS-RS includes items such as "Questions rules that may be unfair"; "Is well behaved when unsupervised" "Follows household rules", "Asks for help from adults", and "Pays attention to instructions" (Gresham & Elliot, 2008). Social competency rating scales such as the SSIS-RS, often fail to include low income and culturally diverse groups in the development and evaluation of the scales. Therefore the scales are limited in their cultural relevance and require further investigation with Spanish speaking Latino families.

The SSRS and the SSIS-RS have been used with children with Asperger's and high functioning autism to examine theory of mind (Ozonoff & Miller, 1995; Qi & Kaiser, 2004) and is frequently used as an outcome measure or to assess response to intervention (Barry et al., 2003; White, Keonig, & Scahill, 2007). Items included in the Autism Spectrum Subscale of the SSRS-IS, were guided by diagnostic criteria for autism spectrum disorder and ADHD from the DSM-IV-TR (American Psychiatric Association, 2000; Demaray & Ruffalo, 1995). The measure includes items that address deficits frequently noted in children with autism including: "Takes turns in conversation"; "Makes friends easily"; and "Feels bad when others are sad" (Gresham & Elliot, 2008). The authors report scores on the Autism Spectrum Subscale were elevated in a small sample of children with autism spectrum disorder; however scores were also high in a sample of children with generic developmental disabilities (Doll et al., 2010). The Autism Spectrum Subscale can provide a preliminary rating of the symptoms of pervasive developmental disorders. However; this scale is not sufficient for a comprehensive examination of the child's symptoms and it is not recommended for use with children with autism (Doll et al., 2010; White et al., 2007). In addition, parent report of the child's social behaviors is limited since parents may not have the experience, knowledge or awareness to recognize the ways their child may not conform to the normative expectations (Mandell & Novak, 2005). For example, the measure asks parents to rate whether their child: "Has nonfunctional routines or rituals"; "Repeats the same thing over and over"; "Has stereotyped motor behaviors"; or "Speaks in an appropriate tone of voice" (Gresham & Elliot, 2008). Not only is it unclear whether the Spanish translation is measuring the same construct or behavior, but Latino parents may be less likely to report unusual social characteristics or repetitive behaviors seen in children with autism spectrum disorder (Lord, 1995; Mandell & Novak, 2005; Mendez Perez, 2000).

Overall, the SSIS-RS comprises broad based behaviors associated with social skills; however it does not assess the nuances of social reciprocity and other social behaviors that are common deficits in children with autism spectrum disorder (White et al., 2007). In addition, the SSIS-RS Behavioral Problems Scale is limited. Therefore it is not useful for identifying co-morbid behaviors or when making a differential diagnosis that is imperative with Latino children. Although the measure included children in the normative sample with autism spectrum disorder, the measure was not designed to diagnose autism spectrum disorder and is not recommended for use with this particular population (Doll et al., 2010; White et al., 2007). Studies including the Spanish translation are limited. Therefore, additional research including the SSIS-RS with children with autism and samples with Latino and Spanish speaking families would support its' validity.

Vineland Social-Emotional Early Childhood Scales (SEEC). The Vineland Social-Emotional Early Childhood Scales (SEEC; Sparrow, Balla, & Cicchetti, 1998) is used to assess the social and emotional functioning in infants and young children birth through 5 years, 11 months of age. The SEEC is administered as a caregiver interview and consists of 122 items and takes approximately 15 to 25 minutes to complete. The instrument is composed of three scales including: Interpersonal Relationships (44 items); Play and Leisure Time (44 items); and Coping Skills (34 items) that combine to yield a Social-Emotional Composite. Scores are provided as standard scores, percentile ranks, stanines, and age equivalents.

The SEEC is derived from the Socialization Domain of the Vineland Adaptive Behavior Scales, Expanded Form (ABS; Sparrow et al., 1984); therefore norms were developed using data gathered from the early childhood sample of the original national tryout and standardization sample. The full sample of the ABS included 3,000 children and adolescents (from 35 sites in 24 states) that best matched the 1980 U.S. Census data with respect to ethnicity (African American, Hispanic, White, and Other), gender, community size, geographic region and parent education.

From this total sample, a subsample of 1,200 children ranging in age from birth through 5 years, 11 months constituted the SEEC norming sample. It is important to note that although parent education was distributed similarly to the U.S. population, slightly fewer parents in the sample had less high school education (12.8%) than did adults age 20 to 44 in the population (15.7%). In addition, White children were somewhat overrepresented (75.7% vs. 72.0%) and Hispanic children in the sample were slightly underrepresented (7.6% vs. 10.1%) (Kush & Stovall, 2001). Items for children less than 6 years of age, from the Socialization Domain of the ABS were reviewed and selected for inclusion in the SEEC. All the items on the SEEC are from the original ABS and the subscales are the same as those obtained for the Socialization Domain of the ABS. Median internal reliability coefficients ranged from .80 for the Play and Leisure scale to .84 for the Interpersonal Relationships scale, and .87 for the Coping Skills scale. Internal reliability consistency coefficients for the Social Emotional Composite across six age groups ranged from.89 to .97. Test-retest reliability coefficients were reported to be .73 for Interpersonal Relationships; .74 for Play and Leisure Time; .54 for Coping Skills; and .77 for the Composite. Use of the Coping Scale with young children (2:0-2:11 years) is not recommended by the authors due to the unacceptable stability coefficient (.54). Test retest reliability of the SEEC scales also dropped when administered by different interviewers (ranging from .47-.60). However, the authors do not make suggestions for improving inter-rater reliability (Kush & Stovall, 2001). Inter-rater reliability coefficients ranged from .47 to .60. Validity of the ABS is generalized to the SEEC since the item content and scale structure of the SEEC replicates the socialization domain of the ABS. Convergent validity studies of the ABS note correlations with similar tools including the Battelle Developmental Inventory which was .65 (Newborg, Stock, Wnek, Guidubaldi, & Svinicki, 1984) and the Scales of Independent Behavior, which was .63 (Bruininks et al., 1984).

Although the standardization sample for the SEEC included children classified in special education categories, there is limited information available regarding adaptation or use with children with delays such as autism. The authors note several studies that have found associations between ABS Socialization domain scores and children with autism (Vig & Jedrysek, 1995; Volkmar, Sparrow, Goudreau, & Cicchetti, 1987); however studies exclusively dedicated to the SEEC are limited. The SEEC has been used to validate other measures of social and emotional functioning of young children (Squires, Bricker, Heo, & Twombly, 2001); and although the most recent edition of the Vineland Adaptive Behavior Scales (VABS; Sparrow, Cicchetti, & Balla, 2005) is frequently used in the assessment of children with autism only a few studies have utilized the SEEC (Toth, Dawson, Meltzoff, Greenson, & Fein, 2007; van IJzendoorn et al., 2007).

There are several strengths of using the SEEC with children with autism spectrum disorder. The Interpersonal Relationships scale consists of items that assess skills that are impaired in young children with autism spectrum disorder such as responsiveness to social stimuli, the ability to recognize emotional expression and appropriately express emotions, the ability to cooperate with others, establish and maintain friendships and initiate social communication. The Play and Leisure Time Scale consists of items that describe the child's interest in the environment and exploration, characteristic of toy play, playing games and sharing with others, as well as the child's ability to construct make-believe activities. The Coping Scale, which is not administered to infants less than 2 years of age, includes behaviors that are sometimes impaired in children with autism such as the development of impulse control and managing feelings and the child's ability to pay attention and follow rules. In addition, the SEEC can be used in conjunction with the Mullen Scale of Early learning (discussed in a later chapter) to provide a complete developmental evaluation.

Overall, there are questions related to the validity of the instrument due to the development and ascertainment of the normative sample. The SEEC uses dated norms and antiquated items from the original ABS, developed in the 1980s. Changing cultural norms and significant demographic shifts in the U.S. population can affect the population norms for the items and scales. Therefore, the instrument may not be valid if currently used with a Latino family. A recent study utilized the SEEC with primarily White preschoolers and found high agreement and consistency on parent and teacher scores of the SEEC (Gagnon, Nagle, & Nickerson, 2007); however further studies of the SEEC that include a more diverse sample would increase its' validity.

The SEEC interview is only available in English; however, the manual, available through Pearson Assessments, includes Blackline Masters of a Report to Parents in English and Spanish in the manual, as well as an additional scoring program that can produce a letter to the parents in English or Spanish. There are several cultural considerations when using the SEEC with Latino and Spanish speaking families. Although the manual and scoring software offer supplementary materials (e.g. parent report and letter) the measure should not be translated and administered "on the fly" with parents in Spanish as the wording can influence parents responses and result in biased results. The SEEC employs a largely unstructured interview with open-ended questions designed by the clinician to elicit responses. This may be beneficial in building rapport with the Latino family through the conversational tone of the interview. However, the examiner must be familiar with the Latino culture and must have developed good rapport with the family in order to obtain valid and accurate responses. This is especially important since the examiner controls the scoring. For example, items on the SEEC are scored by the clinician as “usually performs”, “sometimes or partially performs”, “never performs”, “no opportunity for the child to perform” or “don’t know if the child performs”. If the symptoms are not accurately classified by the clinician completing the assessment, the identification of the child with autism will consequently be delayed.

One of the most significant limitations to use of the SEEC with Latino families is parent report and the expectations of social behavior vary significantly across cultures. Items in the SEEC evaluate behaviors such as manners, following rules, play and independence. However, these social behaviors are developed in cultural context, which can consequently impact scores on the measure. In addition, age appropriate social interaction behaviors vary across cultures. The subscale items of the SEEC are ordered from lowest to highest level of difficulty according to the ages at which children would be expected to achieve the specific behavior. However, this developmental sequence is based on middle class White expectations of child development that may be different from the pattern of social development in some Latino families (Gonzalez-Ramos, Zayas, & Cohen, 1998; Zayas, Canino, & Suárez, 2001).

In general, the clinician should gather information via an observation or from another informant rather than relying solely on a parent report measure such as the SEEC. However, there are still significant limitations to using the SEEC since it is based on data obtained from interviews using the ABS sample a decade earlier. The SEEC was subsequently developed using statistical results of the longer ABS. Further validity studies of the SEEC as a separate instrument are needed in addition to updated norms. Although the Socialization scale of the VABS is frequently used as part of a battery of test in the assessment of autism, the SEEC is not as well utilized. In addition, the SEEC was not standardized with a large sample of children with autism spectrum disorder; therefore alternative measures that are specifically designed to assess the social behaviors of a child suspected of having autism spectrum disorder (i.e. ADOS, SRS, SSRS) may be more appropriate.

Instruments to Assess Speech, Language and Communication

The assessment of language and communication in children with autism spectrum disorder can include metalinguistics, grammatical development, narrative skills, as well as communication assessment in older children with autism spectrum disorder (Klin et al., 2005). However, the assessment of these skills is beyond the scope of this dissertation limited to young children suspected of having autism spectrum disorder. In addition, those Spanish language measures that are used to assist with educational and treatment planning (i.e. the Assessment of Basic Language and Learning Skills) were also excluded from this review. Therefore the following review was limited to the assessment of pre-linguistic communication deficits that are common in young children with autism spectrum disorder including joint attention; communicative intents and gesture with communication (Zwaigenbaum et al., 2005). In addition, several measures for assessing early language development in pre-school aged children with autism spectrum disorder were included in the review, which can also assist when determining the specifier “with or without accompanying language impairment” as indicated by the DSM-5 (American Psychiatric Association, 2013).

There a several factors that can impact tests administration and interpretation of language of Latino children. Therefore several measures were included that can be administered prior to assessing the Latino child from a dual language home, to assist in considering the child’s language dominance, exposure to each language, the child’s use of Spanish in daily life or in the home, as well as the parent's attitude toward bilingualism. Although not specific to autism spectrum disorder, this section also includes several notable measures that are available in Spanish that can be used to assist in differentiating children with language differences from those children with specific language impairment (SLI).

Bilingual Language Proficiency Questionnaire (BLPQ). The Bilingual Language Proficiency Questionnaire (BLPQ; Mattes & Santiago, 1985) is for children ages 3 years and older. This parent interview/questionnaire can be used to obtain information about the child's bilingual language development as well as speech and language skills in English and Spanish. The measure explores articulation; language; voice, fluency and pragmatics through open-ended questions. The 30 questions address situation in which the child uses language, how often these situations occur, the ability of a child to make himself understood by others, the child's ability to understand and give instructions, and any speech problems the child may have noticed. The BLPQ is an unstandardized instrument and can be used to distinguish children with language disorders from those bilingual English/Spanish children who may lack fluency due to limited opportunities or language use. The BLPQ is sometimes used to evaluate bilingual children in the classroom who are referred for speech therapy. The authors also suggest that responses on the BLPQ be used to re-interpret scores on standardized tests when low scores may be due to limited language exposure, rather than language ability. The measure does not have norms and no comparisons are made with the general population. The authors did not examine the validation of the instrument or complete any statistical tests. Therefore the measure may be more appropriate in determining the extent of the child's exposure to English and Spanish, the family/home language and assist the clinician in deciding what measures to use.

The Bilingual Classroom Communication Profile. The Bilingual Classroom Communication Profile (Roseberry-McKibbin, 1994) can help professionals working with bilingual Latino children in the classroom distinguish those children with communicative differences from those children with language disorders. Structural and functional aspects of communication are assessed by a classroom teacher.

The Diagnostic Evaluation of Language Variation (DELV). The Diagnostic Evaluation of Language Variation (DELV; Seymour, Roeper, de Villiers, & de Villiers, 2005a) can be used to identify the risk of a language disorder while considering dialects other than mainstream American English. Although the DELV was designed to be sensitive to the linguistic and cultural characteristics of many African American children it can be used for children of any race or ethnicity, since it measures aspects of speech and language that are common across varieties of American English (Guyette & Langlois, 2005).The DELV assesses phonological, syntactic, semantic and pragmatic skills in children 4 to 9 years, 11 months of age. The screening test can be administered in 15 to 20 minutes (Seymour, Roeper, de Villiers, & de Villiers, 2005b) while the DELV-Criterion Referenced Tests and DELV- Norm Referenced Test are more comprehensive diagnostic language tests and can each be completed in 45 to 50 minutes.

One of the strengths of the DELV is that materials and picture stimuli were selected to be appropriate for children from diverse ethnic and cultural backgrounds. In addition, prior to administration of the DELV, the clinician can decide whether to use the adjusted or non-adjusted scores based on the parent education level (Guyette & Langlois, 2005). This is especially important with Latino children, whose parents may have low education attainment, since maternal education and differences in maternal speech impact a child's language development (Hoff, 2006).

The normative samples of the DELV include the general population and demographically adjusted norms. In addition, the research sample included children of difference races and ethnicities who spoke many varieties of American English (Guyette & Langlois, 2005). The psychometric properties as well as complete information related to the standardization sample are available on the publisher's website. The authors note that the DELV is appropriate for children whose first language is English; however it may be appropriate for those Latino children who are exposed to dual language environments, since the scores are based on "the most culturally and linguistically diverse populations to date"(Guyette & Langlois, 2005). Overall, the DELV may be useful as a first step in the assessment of Latino children since it was designed to reduce the over-identification of ethnocultural children in speech and language services.

The American Speech-Language-Hearing Association (ASHA) has also made a technical report available that addresses accents and non-standard dialects that are sometimes seen in Latino children who were born in the U.S. and learned Spanish before acquiring English (ASHA Joint Subcommittee of the Executive Board on English Language Proficiency, 1998). These children are usually born to parents who speak Spanish in the home and then they go on to learn English in a daycare or school. Further examination of Latino children with accents is important especially when differentiating accents from intonation, atypical vocalizations and prosody deficits commonly seen in young children with autism spectrum disorder.

Clinical Evaluation of Language Fundamentals Preschool- Second Edition (CELF-Preschool-2). The CELF Preschool-2 (CELF-Preschool-2; Wiig, Secord, & Semel, 2004) is a comprehensive language evaluation for children ages 3 to 6 years old. The CELF-Preschool-2 can assist in determining if a child has a language disorder, the nature of the disorder, measure literacy fundamentals and evaluate communication in context. The test can be administered in 2 hours (15 to 20 minutes for the Core Language Composite Score; varying times with additional subtests). Subtests on the CELF Preschool-2 include: Concepts and Following Directions; Word Structure; Expressive Vocabulary; Recalling Sentences; Sentence Structure; Basis Concepts; Recalling Sentences in Context; Word Classes; Phonological Awareness; a Preliteracy Rating Scale; and a Descriptive Pragmatics Profile. The subtest raw scores are converted to subtests scale score and are combined to obtain standard scores, percentiles and confidence intervals for Core Language, Receptive Language, Expressive Language, Language Content and Language Structure.

The CELF-Preschool-2 was based on the first edition of the measure, the CELF-Preschool (Wiig, Secord, & Semel, 1992). The final version of the CELF-Preschool-2 was standardized on a nationally representative sample of 800 children (100 children in each of the eight 6 month age groups) from 42 states. The sample included children with special needs and was stratified by gender; racial and ethnic background; geographic region; and primary caregiver education. The ethnic composition of the sample was reported to be 69.6 % White, 14.9% African-American, 11.6% Hispanic, and 3.9% other. It is also interesting to note that bilingual children were included in the normative group if the primary language was English (Eigenbrood & Schwarting, 2007). The examiner's manual does address use of the measure with culturally and linguistically diverse children, dialectical variations, and children with sensory, cognitive and/or motor impairments. Specifically, the manual includes discussion of the Spanish influence on English production. However, the possibility for misdiagnosis still exists even when no statistical differences are found.

The developers report test-retest reliability, internal consistency, and inter-rater reliability. Test-retest correlations with the ages combined were all above .80 except Sentence

Structure, which was .77. The composite scores were all greater than .90 across age groups. The average alpha coefficients across all ages for the standardization sample were between .77 and .95. Average alpha coefficient and split-half coefficients for the clinical groups were .90 or higher for the subtests. The authors also report adequate validity (content validity; construct validity; and criterion validity). The subtests were found to be highly intercorrelated (between .50 and .93). Strong concurrent validity was found when comparing the CELF- Preschool-2 to the original CELF Preschool (Wiig et al., 1992); the CELF-4 (Semel, Wiig, & Secord, 2003); and the Preschool Language Scale (Eigenbrood & Schwarting, 2007; I. L. Zimmerman, Steiner, & Pond, 2002). Due to the overall low sensitivity and specificity, the CELF- Preschool-2 cannot be used in isolation and must be used with other measures to especially when determining diagnosis and disability.

Some studies have supported the use of the CELF as a standardized instrument to use when assessing children with autism (Condouris, Meyer, & Tager-Flusberg, 2003; Lloyd, Paintin, & Botting, 2006); however the CELF is primarily used for children with specific language impairment. One study examined the use of the CELF- Preschool with children with autism; children with speech and language impairment; and children who shared characteristics of both groups (Lloyd et al., 2006). The authors found different patterns of impairment between the groups. The children with speech and language impairment had lower expressive language scores; word association was a relative weakness for the shared and autism spectrum disorder groups but not for the speech and language impaired group; and listening to paragraphs was the least difficult across all groups (Lloyd et al., 2006)

One of the limitations when using the CELF-Preschool-2 to assess children suspected of having autism spectrum disorder is that the measure does not provide any information about the child's social interaction deficits. Therefore, use of the CELF- Preschool- 2 means lengthy administration time, in addition to further assessment of social behaviors. In addition, use of the CELF- Preschool-2 requires a certain level of pragmatic and cognitive ability to understand the tasks and children with autism spectrum disorder frequently fail to reach the basal on items in the CELF (Hale & Tager-Flusberg, 2005). In fact, in a study utilizing the CELF-Preschool with children with autism, only 49% of the children were able to complete the test children. Some children were unable to attend to the examiner's stimulus materials; other children displayed behavioral problems during testing; some children repeated the examiner's utterances; and others perseverated across stimulus items (Kjelgaard & Tager-Flusberg, 2001). Critics of the CELF have also pointed out that the CELF- Preschool-2 assumes a typical developmental path, whereas children with autism spectrum disorder usually exhibit deviant developmental language, rather than delayed (Lloyd et al., 2006). Results of the CELF-Preschool-2 also need to be considered in light of the fact, that the CELF-Preschool-2 was not normed on a population of children with autism spectrum disorder.

Clinical Evaluation of Language Fundamentals Preschool- Second Edition, Spanish. The Clinical Evaluation of Language Fundamentals Preschool- Second Edition, Spanish (CELF-Preschool-2 Spanish; Wiig, Secord, & Semel, 2009) is a parallel edition of the CELF- Preschool 2 and is not a simple translation. The Spanish version is also for children age 3 to 6 months, 11 years of age and can be administered in 15 to 20 minutes if completing the Core Tests, with a longer administration time depending on what additional subtests are included. The CELF Preschool-2 Spanish version is also a measure of a broad range of expressive and receptive language skills and is used for assessing concepts, syntax, semantics, and morphology in Spanish.

The CELF-Preschool-2 Spanish was standardized on 464, monolingual and bilingual preschoolers in the United States and Puerto Rico. The CELF-Preschool-2 Spanish was adapted to include an item set and themes specifically developed for a diverse range of Spanish speakers. In addition, item order and normative scores were based on the standardization sample. Spanish speakers from different regions were included in the sample. Item order and normative scores were also based on the standardization sample. This is significant since frequency of word use is related to word difficulty. Therefore, since the CELF-Preschool-2 Spanish is not just a translation of the English version, it represents what the child is expected to know, with appropriate basals and ceilings.

Studies utilizing the Spanish version of the CELF are usually limited to children with speech and language impairment (Girbau & Schwartz, 2007). The CELF-Preschool-2 Spanish appears to be a more valid measure for accurately identifying language disorders in bilingual children, since it provides separate norms for bilingual and monolingual speakers. However, at the time of this writing, no studies of children with autism spectrum disorder have included this measure. Since many young Latino children remain at home with monolingual Spanish speaking caregivers, at age three or four, they may not hear or speak much English. Therefore, the CELF-Preschool-2 Spanish may be an appropriate measure to use when assessing language development in Latino children. However, it is important to consider that the test was not normed on a population of children with autism spectrum disorder. Future research using the CELF-Preschool-2 Spanish with children with autism, would verify its usefulness with this population.

Communication and Symbolic Behavior Scales, Developmental Profile (CSBS- DP). The Communication & Symbolic Behavior Scales, Developmental Profile (CSBS-DP; Wetherby

& Prizant, 2002) is a standardized tool can be used to identify children at risk, but can also be used to evaluate the communication and symbolic abilities of young children. The measure is a published version that is based on an earlier research version (Wetherby & Prizant, 1993). THE CSBS-DP includes 3 separate parts, including the CSBS DP Infant Toddler Checklist; a Behavior Sample; and a Parent Questionnaire. The CSBS-DP requires training to administer and score.

The CSBS DP Infant and Toddler Checklist is primarily used by a physician as a first step in a routine screening. It is a one page, 24 item checklist that can be completed quickly (in about 5 to 10 minutes) and includes items about typical communication milestones and questions about parent concern. The Infant Toddler Checklist can be used with children 6 to 24 months and was designed to identify communication disorders, rather than autism spectrum disorder in particular. The CSBS DP Infant Toddler Checklist is copyrighted but remains free for use. The Spanish version of the Checklist can be found on the First Signs website.

If scores from the checklist result in concern or a positive screen, the next step is further evaluation using the Caregiver Questionnaire and the Behavior Sample. The Caregiver Questionnaire is a 4 page questionnaire that can be completed in 15 to 25 minutes. The Questionnaire was nationally tested on 790 children (Wetherby & Prizant, 2002). The behavioral sample is a 30 minute face to face evaluation of the child interacting with a parent and clinician. The authors recommend that parents not only complete the checklist, but also participate in the Behavior Sample which increases the role of the family in the assessment process. The procedure for the Behavior Sample is semi- structured and consists of strategies designed to encourage spontaneous behavior in the child. The clinician uses various materials such as action-based toys to entice spontaneous communication, children's books, and play materials that evaluate how a child uses and plays with objects symbolically and constructively.

The CSBS DP Behavior Sample scores behaviors including: three point gaze shifts; shared positive affect (presence or absence during communicative temptations and play); gaze/point follow (looking towards a target in joint attention probes); rate of communicating; behavior regulatory bids; acts for social interaction; acts for joint attention; inventory of gestures; inventory of consonants; words and word combinations used communicatively; number of words comprehended; inventory of actions; pretend play actions; and number of blocks stacked. Results from the Caregiver Questionnaire and play observations from the Behavior Sample, are tallied on a record form that identifies the 22 communication and symbolic rating scales. Scoring the CSBS-DP yields raw scores and scale scores for the 22 scales; percentile ranks and standard scores for the seven clusters; and percentile ranks and a standard overall composite score. Normative scores are included by chronological age or by language stage (prelinguistic, early one-word, late one word, or multiword).

The normative data for the CSBS-DP was collected primarily in Florida with American-English speaking children. The racial composition of the sample is representative of the region but differs from the 2000 U.S. Census. The Infant-Toddler Checklist was normed on 1,891 children (from 6 to 24 months old); the Caregiver Questionnaire, 600 children (from 6 to 24 months); and the Behavior Sample was normed with 300 children (from 12 to 24 months). Several studies have examined the reliability and validity of the CSBS (Wetherby & Prizant, 2002; Wetherby, Allen, Cleary, Kublin, & Goldstein, 2002; Wetherby, Goldstein, Cleary, Allen, & Kublin, 2003). All three measures of the CSBS- DP have been found to have a high degree of internal consistency, with coefficients ranging from .86 to .92. The authors report good test–

retest reliability for standard scores over a 4-month interval. Interrater reliability for the CSBS DP is high with coefficients ranging from .92 to .97 for the composites and total (Wetherby et al., 2004). The authors report high validity. Construct and concurrent validity has been supported by the developmental progression of scores from 6 to 24 months of age, intercorrelations among cluster and composite scores, and correlations between the parent report measures and the Behavior Sample.

Overall, only a small number of children with autism spectrum disorder were included in the validity studies and the majority of children had general developmental delay and/or specific language delay and not autism spectrum disorder. Several studies have examined the use of the CSBS DP with children with autism (Landa et al., 2007). Wetherby et al. (2004) found that children with autism spectrum disorder performed significantly lower in gaze shifts, gaze/point follow rate, rate of communicating, acts for joint attention and inventory of conventional gestures. These five core deficits appear to be evident in children with autism spectrum disorder by 18 to 24 months of age. In addition, the Behavior Sample was found to be more accurate in detecting communication problems than the Infant-Toddler Checklist (Wetherby et al., 2004); however the Behavior Sample did not distinguish children with autism spectrum disorder and developmental delay with a high degree of accuracy. Wetherby et al. (2007) also examined children with autism spectrum disorder using the CSBS. The authors found that children with autism spectrum disorder scored significantly lower than typical children on all social communication measures.

Although it appears the CSBS-DP is a useful tool to identify those verbal and nonverbal communication deficits in young children with autism spectrum disorder (Wetherby et al., 2004) the CSBS-DP does not have a Spanish translation of the Caregiver Questionnaire. Those studies utilizing the CSBS-DP with children with autism spectrum disorder include primarily White families and exclude children whose family's first language is a language other than English (Landa et al., 2007). In addition, studies of the validity of the CSBS-DP included primarily high SES White children, with a sample of Hispanics that was lower than the 2000 national average of 12%. In addition, the education level of the sample (40% having a college degree) was higher than the national average of 20% (Wetherby et al., 2002).

The Behavior Sample may be appropriate for use with some young Latino children suspected of having autism spectrum disorder since it measures pre-linguistic communicative skills such as sharing, showing, pointing, vocalizing and joint attention (Landa et al., 2007). While observing these behaviors, the communicative patterns that are typical in children with autism spectrum disorder can also be seen. However, few studies have been dedicated to examining any variations in these behaviors across cultures, SES or in children in dual language homes. Overall, results of the CSBS-DP, which measures communicative intentions and frequency of different types of social communicative behaviors, should be interpreted with caution, since even nonverbal communication can be culture specific. Further studies of the CSBS-DP should include examination of these culturally based communicative interactions, especially joint attention skills related to language development in different cultures and among families of varying SES.

The Expressive One Word Picture Vocabulary Test: Spanish Bilingual Edition (EOWPVT: SBE). The Expressive One Word Picture Vocabulary Test: Spanish Bilingual Edition (EOWPVT-SBE; Brownell, 2000) is an individually administered standardized assessment of expressive vocabularies of individuals who are bilingual in Spanish and English. The measure is appropriate for use with children ages 4 to 12 years 11 months of age. The test can be administered in 15 to 20 minutes. The EOWPVT: SBE assesses word retrieval on a single word level. Children verbally label objects and people as well as identify with one word, a single object or a group of objects based on a single concept. The child names the illustration in their dominant language, and if unable to respond, the child is given an opportunity respond in their second language. Since the measure allows the child to respond in both languages, the measure provides an estimate of total acquired vocabulary, rather than monolingual proficiency in either language. Raw scores are converted into standard scores, percentile ranks, and age equivalents.

A Spanish translation of the English EOWPVT was developed by translators with various Hispanic dialects. Items that were found to be difficult to translate accurately or varied significantly between dialects were eliminated. A form was created for the remaining items; however all 170 test plates from the EOWPVT were left in the test plate booklet. The form and test plates were reviewed by Spanish bilingual educators in four states with large Hispanic populations. Alterations were made to the test based on comments related to the translation and alternative responses. Item analysis was conducted based on quantitative and qualitative feedback when this edition was administered. The subsequent test was rescored with a basal of eight and a ceiling of six consecutive failures (Jenkins, 2001). The test was normed on a national sample of 1,050 Spanish-bilingual children in the U.S. (150 sites in 50 cities in 17 states). The demographics of the sample were similar to the U.S. Hispanic population from 2001. However, children from the western region whose dialect was Mexican are overrepresented. Almost half of the parents of the children in the sample had an education up to Grade 11 or less.

The developers compared the test scores among groups divided by language dominance. The results indicated that no more than 3% of the test variance was due to language dominance group. Therefore, the authors determined to use one set of test norms. Internal consistency was examined with coefficient alohas found to be between .92 and .97. Test-retest reliability was found to be .91. Content validity was examined by comparing the EOWPVT: SBE with the English EOWPVT. Criterion–related validity between the EOWPVT: SBE and the ROWPVT: SBE was .36. Analysis of the constructs of expressive and receptive language was completed by comparing the EOWPVT: SBE and ROWPVT: SBE. The authors suggest that the great difference between the receptive and expressive language results (moderate correlation of .43) may be because a bilingual individuals may have less morphological knowledge to draw upon when choosing answers (Jenkins, 2001).

Overall, there are many studies related to bilingual children with language impairment (E. K. Bird et al., 2005; Gutiérrez-Clellen, Simon-Cereijido, & Wagner, 2008; M. E. Smith et al., 1997); however, there is limited research on bilingualism in children with autism spectrum disorder. Although not specifically designed for use with children with autism, the EOWPVT: SBE is sometimes included as language measure in a more comprehensive battery. At the time of this writing no studies of children with autism spectrum disorder have included the EOWPVT: SBE. When using the EOWPVT: SBE with children with autism spectrum disorder, it is important to consider that single word production, known to be a common area of peak performance in children with autism spectrum disorder, is not representative of overall linguistic abilities or communicative competence (Klin et al., 2005). Even young Latino children with autism spectrum disorder may exhibit age appropriate skills when examining limited aspects of language, such as vocabulary. However, when considering the child's performance across a range of language tasks (even when scores are within normal limits), a Latino child with autism spectrum disorder may show a profile that differs from children with speech and language impairment (Lloyd et al., 2006). Unfortunately, it appears that many Latino children whose language experiences differ from American expectations of language usage may be labeled language disordered and under-identified with autism.

One of the advantages when using the measure with Latino children is that it was normed on a large national sample of Spanish-bilingual individuals, as opposed to an exact translation of English children like many other instruments. Since the EOWPVT: SBE is one of the few measures suitable for use with Latino children exposed to dual language environments; it is frequently used to identify language deficits in this population (Allman, 2005; Peña et al., 1992). However; Gray and colleagues (1999) reported low sensitivity and sensitivity of the EOWPVT: SBE resulting in misdiagnosis of almost 30% of the children. Some have suggested that overall, vocabulary tests are not accurate identifiers of language impairment (S. Gray, Plante, Vance, & Henrichson et al., 1999). Others have suggested that vocabulary tests do not differentiate children with and without language disorders using national or local norms (Peña & Quinn, 1997). For example, Pena, Iglesias and Lidz (2001) found that when using national norms with African-American and Puerto Rican children with and without language impairment, approximately 91% of the children were identified as having a vocabulary deficit. However when the local norms were applied, none of the children who were initially suspected as having a vocabulary deficit were identified.

For some children low scores on a vocabulary test may not necessarily mean vocabulary deficits, but rather culturally based differences. The task of labeling pictures, as is seen in the EOWPVT: SBE, is one of the most frequently used type of language tests; however there are variations in socialization practices that influence vocabulary development (Lidz & Peña, 1996). Therefore, a child may score poorly on a vocabulary test such as the EOWPVT: SBE, when in fact he or she may have the semantic knowledge that is not captured in a single word vocabulary test (Peña, 2001).

Differences in vocabulary scores may reflect individual experiences, home language and familiarity with mainstream school curriculum. This is especially significant when using the EOWPVT: SBE which is an adaptation of the English EOWPVT. The basic words of the test items were selected by asking parents to identify the first words spoken by their child. The rest of the words were selected based on frequency in written materials and the particular grade level they appear in school curriculum materials (Jenkins, 2001). Words commonly found in vocabulary tests are learned as children are exposed to books and literacy tasks. In addition, language use in preschool tends to follow mainstream, middle class norms which may be different from the language spoken at home for many Latino children (Crago, Eriks-Brophy, Pesco, & McAlpine, 1997; Hoff, 2006). Therefore, a child's ability on the EOWPVT: SBE may not be accurate if the child has not been exposed to literacy activities in the home (Gutiérrez-Clellen & Simon-Cereijido, 2009; Hoff, 2006). In addition, the young Latino child who has never been enrolled in daycare or attended preschool may not be familiar with the social, interpersonal or academic testing practices inherent in the EOWPVT: SBE, such as question-answer routine, stimulus items and pictures on an easel format. Therefore, the context in which items are presented can influence performance, especially for a child who is not familiar or comfortable with the testing process (Hwa-Froelich & Vigil, 2004; Peña, 2001). Overall, tests of this format are often difficult to administer to young children with autism spectrum disorder. Therefore, several authors have made recommendations to assist with administration to children with autism spectrum disorder in general (Paul, 2005).

Language Development Survey (LDS). The Language Development Survey (LDS) is a parent report measure of the child's vocabulary and word combinations. The LDS was specifically designed to screen toddlers and can be used to identify children age 18 to 35 months at risk for language delay. The LDS requires the caregiver to have fifth grade reading skills and can be completed in approximately 10 minutes (L. A. Rescorla, 2005). The LDS consists of 310 vocabulary words alphabetically arranged within 14 semantic categories such as food, animals, action words and people. The caregiver checks off each word the child uses spontaneously and the LDS includes a section for noting words spoken by the child that are not on the list. The measure also asks whether the child has begun to combine two or more words into phrases. If so, the parent also writes down the child's longest and best phrases or sentences (L. A. Rescorla, 2005). The LDS also lists questions about the child's family, birth history, medical history such as ear infections, child care experience, languages spoken at home, and whether the parent is worried about the child's language development.

The LDS words were chosen based on diary studies of early language development and were developed via several revisions of varying lengths (L. A. Rescorla, 1989). Gender specific norms are provided for ages 18-23 months; 24-29 months; and 30-35 months. For the average length of phrases, norms are only provided for ages 24-29 months and 30-35 months, since many children do not combine words or produce phrases prior to 24 months. LDS vocabulary scores below the 15th percentile are suggestive of delayed vocabulary development and scores below the 20th percentile suggest delayed phrase development (L. A. Rescorla & Achenbach, 2002; L. A. Rescorla, 2005).

Psychometric studies of the LDS have reported sensitivity ranging from .75 to 1.0 and specificity ranged from .85 to .98 (Klee et al., 1998; L. A. Rescorla, 1989; L. Rescorla, Hadicke-

Wiley, & Escarce, 1993; L. Rescorla & Alley, 2001). They also note high test-retest reliability with coefficients ranging from .97 to .99 (Patterson, 1998; L. A. Rescorla, 1989; L. Rescorla & Alley, 2001). Several studies have found a high degree of congruence between parent reported vocabulary scores on the LDS and the child's actual tested vocabularies (Klee et al., 1998; L. A. Rescorla, 1989; L. Rescorla et al., 1993; L. Rescorla & Alley, 2001). Validity of the LDS has been reported by correlations between .66 and .86 of the LDS vocabulary score and the number of objects and pictures named on various tests (L. A. Rescorla, 2005). LDS vocabulary scores were also fond to correlate (coefficients ranged from .56 to .87) with a variety of other measures of early language development such as the Reynell Developmental Language Scale (Reynell, 1977), the Bayley Scales of Infant Development (Bayley, 1969; Thorndike, Hagen, & Sattler, 1986) and the Vineland Adaptive Behavior Scale (Sparrow et al., 1984).

Studies of the LDS with children around 24 months report mean LDS vocab scores between 175 and 195 words (Klee et al., 1998; L. Rescorla & Alley, 2001). In most previous studies the mean vocabulary size is usually higher for girls than boys (Klee et al., 1998; L. A. Rescorla, 1989; L. Rescorla & Alley, 2001). Several studies using the LDS have examined the prevalence of expressive language delay using a cut-off of fewer than 50 words or no word combinations at 24 months of age. In samples of children 24 to 28 months of age, the delay rate using this cut-off ranged from 10% to 20% with males having a higher rate of delay than females (Klee et al., 1998; L. A. Rescorla, 1989; L. Rescorla et al., 1993; L. Rescorla & Alley, 2001).

The authors report that the LDS has proven to be a reliable and valid measure of the child's early language development, by parents across a range of SES and parent education (Klee et al., 1998; L. A. Rescorla, 1989; L. Rescorla et al., 1993; L. Rescorla & Alley, 2001). However several studies have found that the LDS vocabulary score is significantly related to SES in samples where the SES range is wide (L. A. Rescorla, 1989). In addition most studies of the reliability and validity of the LDS included primarily upper-middle class, English speaking White samples (Achenbach & Rescorla, 2000; L. Rescorla, Ratner, Jusczyk, & Jusczyk, 2005). The sample in a study by Klee and colleagues (1998) was limited to families in which English was the primary language spoken in the home. Almost all of the parents had completed high school (98%) and almost half had a degree in higher education. The authors note that this may have resulted in a sampling bias towards more educated parents and excluded those parents who may have been illiterate in English and unable to complete the questionnaire. The authors caution against using the LDS with children from multilingual homes or low SES backgrounds. More recently Rescorla and Achenbach (2002) examined a national probability sample of 278 children ages 18 to 35 months old used to validate the LDS and the CBCL/1 ½-5. This highly diverse sample included varying SES (low SES 18%; middle SES 45%; upper SES 31%); ethnic composition (57% White; 22% African American; 13% Latino; 9% Other); and language background (25% of the sample lived in homes where another language other than English was spoken; 19% of the other group came from homes in which only English was spoken; the other language was typically Spanish). In those bilingual homes at least one of the parents had to be sufficiently able to complete the LDS. These parents counted English equivalents of words spoken in other languages as present in the child's vocabulary and also wrote in additional vocabulary items from the child's other language (i.e. an example of a phrase that was frequently included was "more agua"). The authors found several significant SES and language differences. The study found that White females and males had significantly higher vocabulary scores and higher mean phrase length than females and males in the African American group, or children of other ethnicities which included Hispanic children, even when SES was used as a covariate. The study also found the rate of delay was associated with SES and ethnicity. The rate for language delay, using the cut-off of fewer than 50 words or no word combinations was lower in the White group (4%) than in the African American group (29%) and the other group (24%). The rate of delay was also found to be 21% in the lower SES group, 14% in the middle SES group and 6% in the upper SES group. The authors note that it is unclear if the differences in reporting or real differences in the children's language skills.

Significant differences were also found in this large sample between bilingual children and monolingual children (L. A. Rescorla & Achenbach, 2002). Children from bilingual homes had significantly lower LDS vocabulary scores than children from monolingual homes, but there was no difference in mean length of phrases. The authors suggest that the parents in bilingual homes may have under-reported the LDS English equivalents of words in the child's non-English vocabulary, because they were faced with a more challenging reporting task. The authors also theorize that families in bilingual homes focus less on vocabulary and more on phrase production; therefore children from bilingual homes may acquire vocabulary slower but may be similar to monolinguals in terms of phrase development. It is also likely that some English words do not have an equivalent in the other language, such as particular foods, or games, which may not be relevant to the child's life experiences (Patterson, 2004). However, it is important to consider that the authors utilized the English version of the LDS with the bilingual children. Simply including Spanish speaking Latinos in the standardization sample in proportion to their population representation does not necessarily improve a test's suitability for them.

Language Development Survey (LDS), Spanish Translation. The Spanish version of the Language Development Survey is included as part of the Latino Spanish Child Behavior Checklist/ 1½-5 (CBCL/1 ½ -5/LDS). A few studies have examined the LDS with Spanish speaking children. One Spanish language article included a sample of 240 children from Mexico City who were 15 to 31 months of age (Stelzer, 1995). A more notable study of the LDS included only bilingual Spanish and English speaking toddlers 23 to 25 months of age in the U.S. (Patterson, 1998). The sample in the study was very diverse with 79% of the mother and 90% of the father's with no college education and 29% of the mothers and 36% of the father's had not completed high school. The author used an adapted version of the LDS; the Spanish-English Vocabulary Checklist (SEVC). The SEVC was designed specifically for Spanish and English speaking families and contained two parallel word checklists in each language. The SEVC had 280 items in each language, whereas the LDS has 315 English words. The author found a mean vocabulary score of 128 words with both Spanish and English combined. This was lower than the typical vocabulary score of middle class, monolingual English speaking White toddlers of 175 to 195. The study also found significant gender differences, consistent with the trend for boys to have a lower vocabulary size than girls. The authors attribute some of the differences to parental misunderstanding when completing the checklist. Patterson later examined the validity of the SEVC by comparing reported parent vocabulary using the measure and observed vocabulary produced by the child during a free play session with the parent (Patterson, 2000). There was strong concordance between observed and reported use of word combinations, and correlations between observed and reported vocabulary were similar to monolinguals (Patterson, 2000). Overall however, results suggest high test-retest reliability and consistency in parents' reports across questions in the interview even though many parents in the sample had low educational attainment.

Although the CBCL/1 ½-5 is frequently used in research to examine behavioral problems in children with autism, few studies have utilized the LDS to explore the language skills of children with autism spectrum disorder (Delinicolas & Young, 2007). Although the LDS is reported to be a useful measure to evaluate language acquisition in children with autism (Tager-Flusberg et al., 2009), at the time of this writing, no studies of children with autism spectrum disorder have included the Spanish version of the LDS. The LDS does have several advantages including, its' shorter administration time than the Macarthur Bates Communicative Developmental Inventories (CDI; Fenson et al., 2007) (described below) which were designed to provide an in-depth parent report of vocabulary and syntactic development. The LDS has been found to yield the same information as would be obtained with the longer CDI (L. Rescorla et al., 2005), therefore making it a more practical option for clinicians with time constraints. The LDS is also a helpful tool to use since the parent is not asked to recall words from memory, but rather to check off a word from a list; therefore reducing the potential of bias from memory. This is especially significant for Latino parents who may be presenting with their child for assessment at a later age (Schieve et al., 2006; Shattuck et al., 2009). An additional strength of the LDS is that it appears to be able to distinguish between children with language delay and behavioral problems (L. A. Rescorla & Achenbach, 2002; L. Rescorla & Alley, 2001). This is also noteworthy for Latino children with autism spectrum disorder, who may be over-identified with behavioral problems and misdiagnosed.

There are however significant limitations to using the LDS with children from low SES backgrounds as well as children from multilingual environments due to differences associated with SES and language development (Arriaga et al., 1998; H. M. Feldman et al., 2000; Hart & Risley, 1995; Hoff, 2002; Mágnússon, Sexton, & Davis-Kean, 2009; Roberts, Burchinal, & Durham, 1999). Tests such as the LDS that are based on mainstream American English with primarily White children tend to underestimate the competence of some Latino English speakers

(Gutiérrez-Clellen & Kreiter, 2003) who may be learning a different style of language than higher SES children. It is also important to consider the words the child learns and is exposed to may be different from those emphasized and identified on the LDS due to cultural differences (Peña, 2001). For example, a child from the American mainstream might consider pizza and french fries typical foods, a Spanish speaker might consider rice and beans or a quesadilla more representative of the foods category. A young Latino child may be exposed to different vocabulary depending on their experiences and daily routines, subsequently influencing vocabulary scores on the LDS. In addition, the quality of the parent report may influence results. A parent may under or over report their child's ability when the child demonstrates different skill levels in each of the languages or the parent may report word usage in one language when the word was actually produced in the other (Patterson, 2000). A Spanish speaking parent may also underestimate their child's use of English given their limited exposure to situations in which the parent observes the child using English. Caution must also be exercised when using the Spanish LDS since at the time of this writing only a few published studies have used this measure. In addition, there are dangers when translating the English norms of the LDS even at early ages, with bilingual children. There is limited research regarding the level of proficiency in each language that should characterize bilingual children (Gutiérrez-Clellen & Kreiter, 2003). This can lead to bilingual children with autism spectrum disorder being misclassified with communication disorders when using language measures such as the LDS. Future research should focus on use of the LDS with a more diverse sample of children with autism spectrum disorder.

MacArthur-Bates Communicative Development Inventories, Second Edition (CDI's). The MacArthur-Bates Communicative Development Inventories (CDI's) Second

Edition (CDI-2; Fenson et al., 2007) is a standardized parent report measure to assess the emerging language and communication skills of young children. The CDI's have three separate components including: the Words and Gestures form; the Words and Sentences form; and more recently the CDI-III. The Words and Gestures (CDI: WG) form, originally called the infant form, is appropriate to use with children 8 to 18 months and is used for probing expressive and receptive vocabulary. The caregiver marks the child's understanding from a 396 word vocabulary checklist separated into semantic categories (e.g. animal names, household items and action words). Results yield different scores for words that the child understands (receptive) and words the child is able to produce (expressive). On the second part of the CDI: WG the parent records the communicative and symbolic gestures the child has attempted or produced from a list of 63 gestures, to assess the child's early communicative skills. The Words and Sentences form (CDI: WS) is for use with children 16 to 30 months of age and only assesses expressive language. The first part of the form asks parent's to note their child's production from a list of 680 vocabulary words divided into semantic categories and a set of 37 sentence pairs. The latter half of the form examines early grammar, including the complexity of the child's multi-word phrases. Parents can also provide written examples of the child's longest sentences. The CDI-III is a short form for use with children 30 to 37 months and can be used to measure vocabulary and grammar. Each form can be completed in approximately 20 to 40 minutes and can be scored by hand or with a computer scoring program. The instrument yields raw scores and percentile rankings. The Second Edition of the MCDI's was recently released in 2007 with the addition of the CDI-III (Fenson et al., 2007; Skarakis-Doyle, Campbell, & Dempsey, 2009); therefore the majority of studies included in the following review utilize the First Edition of the CDI published in 1993 (Fenson et al., 1993).

The authors report that 20 years of research led to the development of the first edition of the CDI. Preliminary normative studies between 1987 and 1988, led to modification of the initial four forms into the CDI: WG and the CDI: WS that were included in the original CDI's published in 1993 (Fenson et al., 1993). The authors also developed several short forms of the CDI (Fenson et al., 1997). Original normative data for the CDI were obtained from 671 families with infants and 1,142 families with toddlers from several sites in New Haven, Connecticut, Seattle, Washington and San Diego, California. The demographic profile of the original sample were reported to be 86.9% White; 4.0% African-American; 2.9% Asian; 4.6% Hispanic; and 1.6% all others. Maternal education of this sample was reported to be 4.5% for those mother's with some high school or less; 17.9% with a high school diploma; 24.3% with some college; and 53.3% with a college diploma or higher (Fenson et al., 1993). Several studies have established the CDI as a reliable and valid measure of expressive language (internal consistency was .95 and test-retest reliability was between .80-.90) that is highly correlated with other language measures (D. Bishop, Price, Dale, & Plomin, 2003; P. S. Dale, 1991; P. S. Dale, Price, Bishop, & Plomin, 2003; Reznick & Goldfield, 1994; D. J. Thal, O'Hanlon, Clemmons, & Fralin, 1999).

MacArthur-Bates Inventarios del Desarrollo de Habilidades Comunicativas (INV). The CDI's have been translated into many different languages including several different Spanish translations: Spanish/ Cuban (Fernández & Umbel, 1991), which is an adaptation of the first Mexican-Spanish version; Spanish/European (Altares, Nieva, & Lopez-Omat, 2010; García, Arratibel, Barreña, & Ezeizabarrena, 2008; Lopez-Ornat et al., 2005; Mariscal & Gallo, 2006; M. P. Pereira & Soto, 2003), an adaptation of the English version; and, Spanish/Mexican (Jackson-Maldonado et al., 2003), that is available to purchase through Brookes Publishing. The Spanish adaptation of the CDI's, the MacArthur-Bates Inventarios del Desarrollo de Habilidades

Comunicativas (INV; Jackson-Maldonado et al., 2003) was normed on more than 2,000 children and was developed separately from the English version to take into account cultural and linguistic differences. The Inventario I: Primeras Palabras y Gestos (INV-I) is the Spanish equivalent of Words and Gestures (CDI: WG) and contains sections on comprehension, gesture usage, and vocabulary. The Inventario II: Palabras y Enunciados (INV-II) is the Spanish equivalent of Words and Sentences (CDI: WS) and contains sections on vocabulary, sentences, and grammar usage.

The Inventarios were originally developed with monolingual Spanish-speaking children (8 months to 2 years of age) from various states in Mexico (Jackson-Maldonado, Thal, Marchman, & Bates, 1993). The children represent a lower socioeconomic distribution that the norming sample of the CDI. The authors used Spanish word-lists and linguistic studies to determine the items to include. During adaptation the developers focused on typology of the target language, word frequencies and word class (Fenson, Dale, Reznick, & Bates, 1994). Modifications were made to the Mexican Spanish adaptation (Jackson-Maldonado et al., 1993) as well as the Cuban Spanish adaptation (Fernández & Umbel, 1991; B. Z. Pearson & Fernandez, 1994) to ensure the instruments were linguistically and culturally relevant. In addition, lexical categories were added to reflect verb conjugation, gender in articles, pronouns, and adjectives, as well as number in articles and pronouns. For example the INV includes a list of early learned verbs from each of the three major verb classes (-ar, er-, and ir-) and the parent must indicate if the child produces the forms conjugated in the present, preterit, and imperative. The Spanish content also reflected culturally appropriate vocabulary and routines. When adapting the instrument into Spanish the developers also consulted with informants from the target population for which the instrument was intended to review the words and to include additional words that were not included. This method resulted in instruments that are appropriate for the specific population and that the measure has high reliability. In fact, the month by month norms for all of the words included in the Spanish language Inventarios can be accessed via on online database (P. S. Dale & Fenson, 1996).

The concurrent and predictive validity of the INV has been examined with comparable results for English speaking children with typical and delayed language development. Studies have shown that the vocabulary reported by parents on the INV is valid when compared to measures of vocabulary obtained from language samples- .84 (Jackson-Maldonado et al., 1993). The concurrent validity of the INV has been documented with language sample measures, such as the number of objects labeled in a naming task (.56) and number of different words produced in a language sample-.69 (D. Thal, Jackson-Maldonado, & Acosta, 2000). The relationship between reported and observed vocabulary for Spanish-speaking children of Mexican immigrants at 30–32 months suggests that the INV–II is a valid measure of lexical development (Guiberson, 2008b). Furthermore, the predictive validity of the INV–II was demonstrated in a longitudinal study of 10 children with low language production (Jackson-Maldonado, 2004a). Those children with lower than average vocabulary scores on the INV, continued to have lower language skills later on. The INV has also been included in studies of bilingual (Spanish and English) children. High levels of concurrent validity were reported when examining the relationship between the INV and naming tasks or observed vocabulary with bilingual, English and Spanish toddlers (Marchman & Martine-Sussmann, 2002). Conboy and Thal (2006) also examined the rate of acquisition of grammatical abilities in English and Spanish using the INV.

A Spanish MacArthur-Bates CDI-III is currently being developed and is an adaptation of two English versions but is based entirely on Spanish language data. The Spanish translation of the CDI-III is expected to be made available by the publisher or the CDI advisory group (Guiberson, personal communication, March 10, 2011). The Pilot INV–III is a translated version of the CDI–III (Guiberson, 2008a). The translation team included two bilingual SLPs, university faculty, and a hospital translator. Since the measure was initially developed to be used with a Mexican population, it was designed to reflect Mexican dialects of Spanish. The INV-III was translated, rather than adapted with differing items, in order to combine the results of the Pilot INV-III with the CDI-III with bilingual children and allow for comparison of scores (Guiberson, 2008a). Initial results support the validity and classification accuracy of the Pilot INV–III (Guiberson, 2008a). A more recent study of the Pilot INV-III found adequate sensitivity (.82) and specificity (.81) with a monolingual Spanish speaking Mexican sample of children, 3 to 5 years of age (Guiberson & Rodriguez, 2010).

Although the original standardization sample excluded infants and toddlers with disorders that might affect language development, such as autism spectrum disorder, several recent studies have used the CDI to examine language in children with autism spectrum disorder (Charman, Drew, Baird, & Baird, 2003; Luyster, Qiu, Lopez, & Lord, 2007; McDuffie, Yoder, & Stone, 2005; Stone & Yoder, 2001). The CDI has been found to be highly correlated with other measures of language in children with autism (Luyster, Kadlec, Carter, & Tager-Flusberg, 2008). Early predictors of language have also been found to predict CDI productive raw scores in children with autism (Charman et al., 2003; Luyster et al., 2007). Although one study used the INV with children with Down Syndrome (Galeote, Soto, Checa, Gomez, & Lamela, 2008), at the time of this writing no studies of children with autism spectrum disorder have utilized the INV. There are several precautions to consider when using the CDI or INV with Latino children suspected of having autism spectrum disorder. Critics of the CDI point to SES related differences that have been found in children's mean vocabulary scores using the measure (Arriaga et al., 1998; H. M. Feldman et al., 2000; Roberts et al., 1999). When vocabulary was assessed using the CDI in a homogenous middle class sample, SES accounted for less than 1% of the variance (Fenson et al., 1994). However; Arriaga et al. (1998) found that 80 % of the children in low income homes scored below the 50th percentile on the same instrument. A large community based sample using the CDI found that children with low expressive language came from homes with low education, low expressiveness, poverty and high levels of stress (Horwitz et al., 2003). Another study using the CDI with low income families in rural and urban areas of the U.S. found the predictive validity of the CDI differed by community and recommend caution when interpreting the results of parent report with families differing in race and ethnicity from this original sample (Pan, Rowe, Spier, & Tamis-Lemonda, 2004). Largely, studies have advised caution when using the CDI or the INV with children Latino, from low education and/or low income households or literacy levels that may be different from the original norming sample (Fenson et al., 1993).

Some studies investigating vocabulary scores on the CDI and INV have discovered contradictory results. One interesting study discovered that lower SES children tended to have larger vocabularies. The authors attributed these results to lower SES mother's tendencies to overestimate their children's abilities (H. M. Feldman et al., 2000; Fenson et al., 1994). However, a more recent study suggests that differences in scores are not due to inaccurate maternal reporting and the authors also found maternal reporting did not differ due to low SES (Furey, 2011). Another study using the INV also found that SES did not have a significant effect on vocabulary size (Jackson-Maldonado et al., 1993). Although studies examining SES and vocabulary size using the CDI and INV reveal inconsistent results, overall studies have reported that SES can have a negative effect on language acquisition (Mágnússon et al., 2009), subsequently impacting the child's score. In addition, the CDI depends on the parent's ability to read and understand the instructions. Most studies of the CDI exclude parents who are not able to speak English well enough to participate in self-report or interview in English. Therefore, the format may be inappropriate for some parents who have less than a high school education, or for those Latino parents who are not proficient or literate in English. Others have suggested that Spanish speaking parents of children in dual language environments may be reliable estimates of their child's Spanish language abilities; however those parent who have limited or no English proficiency may have difficulty determining their child's English language skills (Gutiérrez-Clellen & Kreiter, 2003).

The INV overall, appears to be a valid measure of vocabulary with Spanish speaking children especially since careful attention has been paid to ensure its' cultural and linguistic accuracy as opposed to a simple translation of the CDI. This is particularly important when using the INV to identify young Latino children suspected of having autism, since language and communication, even in its' earliest phases are noticeably different across cultures. For example, Jackson et al. (1993) included "tortillitas" and "ojitos" as an appropriate variant of patty cake and peek-a-boo used in Mexico when developing the INV. Nevertheless use of an instrument such as the INV, with Spanish speaking children in the U.S.; a culture and country outside of where it was developed, may affect results. The Second Edition of the CDI (normed on approximately 1,800 children in three sites) is noted to have updated norms that include a more demographically balanced sample with an increased percentage of ethnocultural children as well as caregivers with lower education levels. Therefore, future studies including Latino children from low SES will examine any differences in results related to SES.

It is important to consider that the INV was originally adapted from the CDI with monolingual Spanish speaking children. Initial studies of the INV with monolingual Spanish speaking children reported the Spanish speaking toddlers were comparable to the CDI: WS English speaking normative sample in vocabulary size (Jackson-Maldonado et al., 1993). However, studies containing the CDI and/or INV with simultaneous bilingual children have found differing results. Pearson, Fernandez, and Oller (B. Z. Pearson et al., 1993) used the CDI and the INV with Spanish and English speaking toddlers. The authors analyzed cross language differences and analyzed bilingual vocabulary size and found similar vocabulary sizes for bilingual and monolingual children. In addition, the monolingual and bilingual children developed vocabulary at the same rate and lexical development followed the same developmental path for both the monolingual and bilingual children. Conversely, Horwitz et al. (Horwitz et al., 2003) found that being in a bilingual household correlated with poor expressive language. Overall, use of a single language comparison to monolinguals using the CDI or INV with bilingual Latino children is problematic.

Use of the CDI with children with autism spectrum disorder is limited to English speaking families from the mainstream American culture, therefore limiting results. For example, McDuffie, Yoder and Stone (2005) report in their study of children with autism using the CDI that parents were noted to respond to a child's intentional communication by labeling the object. However, results cannot be generalized since adult-child interaction varies significantly across cultures (Lynch & Hanson, 2004a, 2004b). Specifically, Latina mothers have been found to use more commands and directives rather than the act of labeling objects with nouns (Kummerer, 2010), which may subsequently impact vocabulary scores on the CDI or INV. It is frequently assumed that children learn language mainly by adults in the context of labeling words; however cultural dissimilarities exist. In some Latino communities and cultures, infants and toddlers are not directly addressed in conversational interactions with adults and these children do not engage in many "language teaching" moments as has been described in many mainstream American White families (Akhtar, 2005). Children in cultures who are not directly spoken to may not begin talking by producing single word utterances as is frequently seen in the developmental course of middle class White families (Lieven, 1994; Wong, 1991). In fact, Marchman and Martine-Sussmann (2002) found in their study that included an early version of the INV, children were more likely to use English rather than Spanish labels during naming tasks. The authors suggest that the children may have been more familiar with English labels than Spanish ones. Therefore, use of the CDI or INV with these children, to obtain vocabulary scores may not be appropriate. Although the CDI is frequently cited as a parent report measure to use in the language assessment of young children with autism spectrum disorder (Shea & Mesibov, 2009), future research will hopefully explore use of the CDI and INV with Latino bilingual and Spanish speaking families.

Peabody Picture Vocabulary Test, Fourth Edition (PPVT-4). The Peabody Picture Vocabulary Test, Fourth Edition (PPVT-4; L. M. Dunn & Dunn, 2007) is a single word measure, designed to assess receptive English language vocabulary skills. The test can be administered to children and adults (2 ½- 90+ years) in approximately 10 to 12 minutes. The PPVT-4 contains two forms (A and B) to assess improvement over time, each with 228 items. Each page includes four colored pictures arranged on a single page. The examiner reads a single word aloud and the child selects from four colored picture options arranged on a single page, by pointing to the picture that best described the meaning of the word. Raw scores can be converted to standard scores, percentile ranks, normal curve equivalents, stanines, as well as age and grade equivalents. All reliability and validity coefficients are in the .90s range.

In order to developed the most recent revision data from the PPVT-III were reviewed to identify items that needed to be updated. Educators from the U.S., Canada, Great Britain and Australia examined the items to identify those that were not applicable across cultures. The scale was refined nationally and special populations such as ethnic minorities and children with special needs were over-sampled to obtain large data sets to allow for statistical analysis of these groups. Item difficulty and discrimination was conducted resulting in the elimination of biased items. The final standardization was conducted between 2005 and 2006 at 320 sites throughout the U.S. More than 5,500 individuals were tested and the final sample consisted of 3,540 individuals (ages 2 years, 6 months through 90+ years) used for the normative scores. The sample was divided into 28 age groups with 60 to 200 participants in each age group (Kush & Shaw, 2007).

Considerable attention was paid to the standardization of the most recent version to ensure that the norms would generalize to most populations in the U.S. Other than a small underrepresentation of the Western geographic region, the sample was matched very closely to the U.S. Census for gender, race/ethnicity (White, African-American, Hispanic and Other), region (Northeast, North central, South and West), SES (father's education level). School age children with clinical diagnosis or special education status were also represented including: ADHD; emotional/behavioral disturbance; specific learning disability; developmental delay; mental retardation; speech and language disorders; hearing impairment; and autism (Kush & Shaw, 2007). The PPVT-4 demonstrated high internal consistency with reliability coefficients all consistently above .95. Form reliability between forms A and B, was between .87 and .93 with a mean of .89. Test retest reliability was also high and ranged from .92 to .96. The PPVT-4 is significantly correlated to other measures of language such as the CELF-4 (Kush & Shaw, 2007). In addition, the Expressive Vocabulary Test, Second Edition (K. T. Williams, 2007), a companion expressive test was recently developed and co- normed with the PPVT, allowing for comparison of receptive and expressive vocabulary.

The PPVT was originally developed in 1959. The original PPVT was standardized on a restricted sample of 4,000 White individuals all living in Nashville, Tennessee. Significant revisions have been made to the instrument since the original PPV which comprised only one picture of someone who was not White (an African-American train porter). The Revised version (PPVT-R) was published 20 years later, in 1981 with additional adult norms (L. Dunn & Dunn, 1981). The age range was expanded to provide norms for individuals between 2 ½ years of age to 90 years and older with the third edition- PPVT-III (Kush & Shaw, 2007).

Test de Vocabulario en Imágenes Peabody (TVIP). The Test de Vocabulario en Imágenes Peabody (TVIP; L. M. Dunn, Padilla, Lugo, & Dunn, 1986) can be used to assess Spanish vocabulary of Spanish speaking children ages 2 years 6 months to 17 years, 11 months. The 125 item measure can be administered in 10 to 15 minutes. The TVIP is based on the PPVT-R (L. Dunn & Dunn, 1981). The PPVT-R items were based on English language dictionaries and words selected were based in item difficulty. These items were translated to Spanish and testing was conducted in Spain, to select words based on item difficulty. This version of the TVIP was standardized in Spain and another set of norms was later created in Mexico and Puerto Rico with a randomly selected sample of monolingual Spanish speakers (L. M. Dunn et al., 1986). Testing in Mexico took place between 1981 and 1982 and included 1,219 children from public schools, with approximately 20% of the children from public schools in Mexico City. Testing in Puerto Rico was conducted between 1982 and 1983 and included: 1,488 children from three public schools and two private schools in the San Juan metropolitan area (62% of the sample); three public schools in a small town; pre-schools, nursery schools, and homes on the island.

Internal consistency reliability was calculated, and the mean correlation coefficient was reported to be .93. The coefficient for children 2 and 3 years of age was .80. The authors do not describe any examination of test-retest reliability or inter-rater reliability. Concurrent validity of the TVIP was reported with several measures including the Assessment Battery for Children (Kaufman & Kaufman, 2004), with correlations between 25 and .69. The authors do not provide any information related to the predictive validity of the test.

Although the PPVT-4 Spanish edition is under development the TVIP has not been updated or revised. It is important to note that the TVIP was based on the PPVT-R. The PPVT-R was normed on American English speakers and consists of 175 plates. The TVIP has 125 plates arranged in increasing levels of difficulty. The TVIP only has one form/edition with 61 words on the form. Although the TVIP has the same format as the PPVT-4 it does not contain the same test items and it does not contain full color pictures like the PPVT-4. Both the TVIP and PPVT-4 raw scores are converted into standard scores with a mean of 100 and a standard deviation of 15. Raw scores from the TVIP can be converted into age adjusted standardized scores using combined and separate norms from the Mexican and Puerto Rican standardization samples or norms from a composite group.

The PPVT is sometimes used with children learning English as a second language and has even been used in research with Spanish speaking children to validate other measures of language (Millett, Atwill, Blanchard, & Gorin, 2008). The PPVT-4 and earlier editions of the test are frequently used to assess the language of Latino children since the measure requires no reading or writing and can be administered quickly. The authors report that all items of the

PPVT-4 have been evaluated for appropriateness with a diverse population. Even with very young children the reliability of the scale is described as “impressive” and is reported to be stable across all ages, ethnic backgrounds (Kush & Shaw, 2007). However, it is important to consider that the test was normed on English proficient children and results should be interpreted with caution when used with bilingual or Latino children with LEP. The authors make general recommendations when using the PPVT-4 with bilingual speaking children including: administering the TVIP if the child does not get at least two of the 4 training items correct on either Training Page A or Training Page B of the English version. In addition, the authors note that scores from the PPVT-4 with children with limited English abilities should be considered baseline data only.

There are also several considerations when using the TVIP with Latino and Spanish speaking children in the U.S. The authors of the TVIP report that all items were translated and selected by item analysis to ensure their universality and appropriateness for various Spanish speaking communities. However, even an adaptation created in Cuba required significant changes to the tests to ensure its’ cultural and linguistic applicability (Piñeiro et al., 2000). The developers of this Cuban adaptation note that the TVIP normed in Mexico and Puerto Rico should not be used in the Cuban population. Therefore, results of the TVIP with Spanish speakers outside of the countries in which it was normed should be interpreted with caution.

Critics of the TVIP report threats to the validity of the TVIP. The TVIP is a single word recognition task; however the words are presented without an article (i.e. “dog” not “the dog”). Although nouns frequently occur in English without articles, Spanish nouns typically include an article which marks gender and number (i.e. “el” for masculine singular, “los” for masculine plural). The test manual instructs the examiner to omit the article when saying the Spanish word because it may provide the child with cues to select the correct response on the basis of gender and number information. However, omission of the article may affect test performance since Spanish speaking children rarely hear nouns without the article (Peña, 2007). This is especially significant when using the TVIP with children suspected of having language delays, since research has shown that Spanish speaking children with language impairment frequently make article errors and this is one of the most common types of errors (Restrepo, 1998).

The TVIP is designed to provide data related to the language abilities of children when Spanish is the language of the child's home and community and when Spanish is the child's primary language of instruction and daily interaction. However, like the PPVT, the TVIP is frequently used with bilingual children. Although the TVIP was not normed with bilingual children in the U.S. the authors provided comparative information from pilot studies of bilingual children (L. M. Dunn et al., 1986). They found the Mexican and Puerto Rican children performed below the mean on the same item set compared to the Spanish children. In addition, the bilingual children from the U.S. performed one standard deviation below their monolingual Spanish speaking peers on the test. Similar results were also found in a study of the PPVT and the TVIP with bilingual children in Miami (Umbel, Pearson, Fernández, & Oller, 1992). Use of the test with bilingual children in the U.S. may result in lower scores because names for things vary across dialects of Spanish; the same words are used with different frequency in different language communities, even when the language is the same, which can influence order of difficulty (Peña, 2007; Umbel et al., 1992). In fact, Umbel, Pearson, Fernández, & Oller (1992) found significant differences in the order of difficulty of the words on the TVIP with their sample, from the order of difficulty found for the norming sample.

Studies examining the PPVT and TVIP with Spanish and English speaking children caution against using the TVIP to measure the language knowledge of bilingual children. Umbel, Pearson, Fernández, and Oller (1992) administered the PPVT-R and the TVIP to bilingual first-graders who were matched for SES. The children were found to be behind their same aged peers in English vocabulary and although the children were closer, they were still below the mean on the TVIP. Although a large proportion of the vocabulary items are shared by both tests, they did not overlap within the children's responses, which lowered the children's' total scores. Even when using the PPVT and TVIP together the authors report that the two single language scores do not provide an accurate picture of total language (Umbel et al., 1992).

Several studies of bilingual children have reported significant mean differences between the monolingual TVIP scores and the combined PPVT-R score (Loyola & McBride, 1991). Fernández, Pearson, Umbel and Oller (1992) examined PPVT and TVIP scores of Latino preschoolers in Miami. The English scores for the children were found to be significantly below the mean and the Spanish score was slightly below the mean from the Spanish norms. A study using the TVIP and PPVT reported that bilinguals demonstrated a higher level of vocabulary knowledge (Allman, 2005). In addition, the study found that bilingual's vocabulary developed at the same pace and rate as their monolingual peers and was only weaker when one language is evaluated (Allman, 2005). Each of the studies recognized that the English monolinguals advantage only in English vocabulary was most likely because single language measures do not capture the extent of the bilingual vocabulary knowledge. This suggests it is essential to test both languages when evaluating vocabulary knowledge for bilingual children.

The PPVT-4 and previous versions are frequently included in research with young children with autism spectrum disorder (Condouris et al., 2003; Delinicolas & Young, 2007; R.

Goin-Kochel, Mazefsky, & Riley, 2008; Hale & Tager-Flusberg, 2005; Malow et al., 2009; S. McGrew et al., 2007; Walker & Berthelsen, 2008). Children with autism spectrum disorder generally score lower than age expectations on the measure. The original version was even adapted to use with low functioning children with autism by cutting the plates into individual pictures to eliminate the pointing response, therefore allowing the child to hand the picture to the examiner (Levy, 1982). The TVIP is typically used in research of phonological awareness (Dickinson, McCabe, Clark-Chiarelli, & Wolf, 2004; Scarpino, Lawrence, Davison, & Hammer, 2011) and early literacy development (Duran, Roseth, & Hoffman, 2010). However, at the time of this writing no studies have examined use of the TVIP with children with autism spectrum disorder.

In general, the PPVT-4 should not be used to describe overall language abilities of a child with autism spectrum disorder. The PPVT may be a useful to include in a comprehensive assessment of the receptive language of a child with autism spectrum disorder since children are only administered items that are appropriate for their intellectual or developmental level. In addition, the PPVT is untimed, making administration easier for children with the disorder. Although early items of the PPVT may be useful, later items may be difficult for children with autism spectrum disorder to complete (Corbett et al., 2009). Scores obtained from the standardization sample supports the use of the PPVT-4 with children with speech impairment. However, additional studies are required with larger samples of children with autism spectrum disorder utilizing the PPVT-4. Use of the TVIP with children with autism spectrum disorder is not recommended since the TVIP is an older test; the sample is not representative of Spanish speaking children in the U.S. (Fernández et al., 1992) and; the sample did not include children with disorders such as autism spectrum disorder. The two measures may be used together;

however there are great individual differences within and between the two languages of bilingual children. Measures such as the PPVT and the TVIP were not designed to differentiate differences from true impairments in these children and they were certainly not developed to identify these differences in children with autism spectrum disorder. In addition, children learn vocabulary based on their experiences and this varies across cultures and languages. This may impact a Latino child's lower scores on the tests, which may or may not be reflective of the receptive language impairments seen in children with autism spectrum disorder (Paul et al., 2007).

Preschool Language Scale, Fourth Edition (PLS-4). The Preschool Language Scale, Fourth Edition (PLS-4; I. L. Zimmerman et al., 2002) is an individually administered measure used to evaluate the expressive and receptive language skills of children from 2 weeks through 6 years, 11 months. The measure can be administered in 20 to 45 minutes and also includes a supplementary Caregiver Questionnaire; a Language Sample Checklist; and an Articulation Screener. The PLS-4 provides scores for the two core subscales (Auditory Comprehension and Expressive Communication); Total Language (a composite of the two subscales); Standard Scores; Percentile Ranks; and Language Age Equivalents.

The standardization data was collected in 2000 and the final normative sample was based on a diverse group (62% White, 15% African American; 17% Hispanic; 5% Other and 1% did not report) of 1,564 children reflective of the 2000 U.S. Census. The sample was stratified on the basis of parent education level (17% with 2 years or less; 32% with 12 years; 28% with 13-15 years; and 23% with 16 or more years) geographic region (25% West; 24% North Central; 18% Eastern region; 34% South), and race. In addition, 13.2 % of the sample included children with diagnoses such as autism; developmental delay; articulation disorder; hearing impairment; and language disorder. The internal consistency reliability coefficients range from .66 to .96. Test-retest reliability coefficients ranged from .82 to .95 for the subscale scores and .90 to .97 for the Total Language Score. Inter-rater reliability was also high (.99) and the correlation between the Expressive Communication scores was also high (.99). Convergent validity of the PLS-4 was demonstrated with the Denver Developmental Screening Test, Second Edition (Frankenburg et al., 1990).

One of the most notable strengths of the PLS-4 is its' diverse standardization sample, with 39.1% of the sample identified as ethnic minorities. The authors note that the content of the PLS-4 was reviewed by a diverse panel to ensure that test items were appropriate for children from different cultural backgrounds, regional groups and different SES. In addition, statistical analysis was conducted to identify item bias and assure that any items that put particular children at a disadvantage were removed. An independent study examined differential item functioning of the PLS-4 with low income English speaking Latino preschoolers (3-5 years old) and low income English speaking White preschoolers (3-5 years old) at the same site (Huaqing Qi & Marley, 2009). The authors found no cultural bias for the PLS-4 against English speaking Latino children from low-income families in terms of item analysis. In addition, although low income children in the study scored significantly lower than the norm group; the English speaking Latino children in the study did not score significantly different from their English speaking White peers from the same site. This suggests that the children's lower scores on the PLS-4 are more likely due to risk factors associated with low-SES rather than cultural bias in the test. A panel of dialectical reviewers also refined the scoring rules of the PLS-4 to be consistent with known dialect rules and usage.

Although the standardization sample was conducted with children whose first language was English, the PLS-4 included a small percentage (3.4 %) of bilingual children who spoke languages other than English in their homes (Chinese $N = 52$, Tagalog $N = 1$, Korean $N = 1$, Spanish $N = 50$, other $N = 6$). Unfortunately, the authors do not address the development of language disorders in languages other than English, nor do the authors include special instructions in the manual for administration with children who might use another language or code-switch when administered the English version.

Preschool Language Scale, Fourth Edition (PLS-4) Spanish Edition. The Fifth Edition of the Preschool Language Scales was released in 2012; however the majority of studies related to autism spectrum disorder utilize the Fourth Edition of the Preschool Language Scales. Therefore, this dissertation will focus on research which uses the Fourth Edition. The Preschool Language Scale, Fourth Edition, Spanish Edition (PLS-4 Spanish; I. L. Zimmerman, Steiner, & Pond, 1993), like the English edition, is used to measure the child's emerging communication as well as receptive and expressive language skills. The PLS-4 Spanish also includes the reproducible Cuestionario Para Los Padres. Although the PLS-4 Spanish contains the same scales and composites, separate norms were developed for the PLS-4 Spanish with 1,188 monolingual and bilingual Spanish speaking children (ages 3:0-5:11 years) living in the U.S. The PLS-4 Spanish is not a translation of the English version. During development of the PLS-4 Spanish, the authors consulted with an expert bilingual panel to ensure that items were culturally and linguistically appropriate. The measure was adapted and modified to include test items that reflect the cultural experiences of Spanish speaking children; alternate vocabulary that reflects regional differences; and item order that reflects the developmental sequence of skills in Spanish. The sample is reported to be reflective of the demographic characteristics of the Hispanic population in the U.S. with a large number of children tested from the South and West regions of the U.S. Almost half of the parents in the sample have less than a high school education. In addition, children with language disorders were included in the normative sample.

The authors of the PLS-4 Spanish report test–retest reliability ranging from .77 to .86 and split-half internal consistency correlations ranged from .80 to .90. The authors calculated the concurrent validity of the PLS-4 Spanish and reported good sensitivity ranging from .83 to .91; however low specificity ranging from .57 to .61. This may have been due to the inclusion of children with language disorders into the normative sample; however this limits use of the PLS-4 Spanish when attempting to accurately identify a Spanish speaking child with a language disorder. Concurrent validity of the PLS-4 Spanish was examined by comparing the measure to the Third Edition of the Spanish Preschool Language Scale (PLS-3; I. L. Zimmerman et al., 1993), which has demonstrated overall poor reliability and validity (Restrepo & Silverman, 2001). The PLS-3 Spanish is a translation of the English version and although the test forms are different, the norms are the same as the PLS-3 English version. The small normative sample (*N* = 143) of children from the PLS-3 Spanish were from six states in the U.S. and Puerto Rico, from five different dialect groups, different cultures and different countries; however Spanish language proficiency was not established before administration of the PLS-3 Spanish. In addition, all the items were retained in the same order when the PLS-3 was translated into Spanish. Restrepo and Silverman (2001) found that although the items were linguistically equivalent, item difficulty at each age level varied.

The authors of the PLS-3 Spanish applied the English model of language development to Spanish language development and did not consider that concepts and linguistic forms are learned at different points in development in different languages so that items may be harder or easier cross-linguistically. The PLS-3 Spanish was found to have several other weaknesses including: test items that were not appropriate across cultures (i.e. wagons and money); high level of vocabulary that was difficult for Spanish speakers (i.e. parachute and stamps); object function was more difficult in English than in Spanish, whereas prepositions were more difficult in Spanish than in English; and the instrument did not take into account gender agreement in the noun phrase and person agreement in the verb phrase. In addition, children in the study performed below the test norms; suggesting that the test norms are not representative of the intended population. This can result in over or under-identification of language impairment in Spanish speaking children. Many of the deficits found in the Spanish version of the PLS-3 appear to have been rectified in the Spanish PLS-4 in which many test items overlap the English edition, but are placed in an order reflective of the developmental sequence of Spanish speaking children. This has made the PLS-4 Spanish a more culturally and linguistically test for use in the evaluation of Spanish language development (Peña, 2007). However, future study of the concurrent validity of the PLS-4 Spanish should compare the test with a more valid measure other than the Spanish Version of the PLS-3.

Significant variations of Spanish are spoken in the United States. Although the authors note the PLS-4 Spanish was customized for all Spanish speakers; 81% of the standardization sample came from homes in which Mexican Spanish was spoken. This limits its' use since this may impact the scores of a child whose Spanish language origin is not from Mexico. This is even more important when assessing language delay in children with the PLS-4 Spanish, since most differences in Spanish variants are observed in syntax and morphology (Brice, 2002). This may result in differences in vocabulary scores and impact results. Several studies have studied the PLS-4 Spanish with monolingual and bilingual preschool children (Ebert, Kalanek, Cordero, & Kohnert, 2008; Hammer, Lawrence, & Miccio, 2007; Hammer, Lawrence, & Miccio, 2008;

Marchman & Martine-Sussmann, 2002); it is frequently used in research related to phonological awareness (Scarpino et al., 2011); and the PLS-4 Spanish has been used to support the concurrent validity of other Spanish language measures (Guiberson & Rodriguez, 2010). However, no peer reviewed journals have included the PLS-4 Spanish with children with autism.

The English PLS-4 however, is a widely used instrument of overall expressive and receptive language levels (Corbett et al., 2009; Crais, 1995) and is often included in the assessment of the language abilities of children with autism spectrum disorder (Dawson et al., 2000; Green, Brennan, & Fein, 2002; Stone & Yoder, 2001). The PLS-4 has been found to be sensitive to differences in the language abilities of children with autism spectrum disorder and was also able to identify precursory and emerging language skills for children with very atypical communication styles such as autism (I. L. Zimmerman & Castilleja, 2005). In the norming sample, 44 children with autism were matched with 44 typically developing children on the basis of age (3:6-6:7 years), gender, ethnicity and parent education. The children were primarily White, with well-educated caregivers (39% with some college; 22% with four years of college or more). Across scales the typically developing children performed better than the children with autism. The mean standard scores for the children with autism were: 66.8 (Auditory Comprehension); 65.5 (Expressive Communication); and 64.4 (Total Language Scores). The standard scores for the matched control group of typically developing children were 102.8 (Auditory Comprehension); 102.3 (Expressive Communication); and 103.0 (Total Language Scores). The children with autism exhibited the most significant delays on language tasks targeting semantics and concepts; and social communication skills. The verbal children with autistic disorder had difficulty in morphology, syntax, and integrated language skills.

Overall, the PLS-4 and the PLS-4 Spanish are useful for evaluating the language skills of infants and toddlers suspected of having autism spectrum disorder since the early items focus on those precursors for language interaction and social communication that are frequently impaired in children with autism spectrum disorder such as the ability to pay attention and follow simple directions; whether the child glances at the person speaking to him or her; vocal development (i.e. babbling, ability to put two syllables together, production of consonant sounds; the ability to make sounds of pleasure; and the ability to vary the pitch); object play (bouncing a ball, stacking blocks; making a car "go"); and later behaviors including the ability to imitate words and vocabulary use.

The measure also includes relevant scoring rules for Latino children and their families. For example, young children are not penalized for failure to respond on the PLS-4 or the PLS-4 Spanish and the item is scored as "passed" whether the behavior is prompted from the examiner and produced by the child; observed by the examiner during spontaneous interaction with the examiner or caregiver; or reported by the caregiver. If the caregiver reports the child is able to perform the behavior at home, the caregiver must provide a specific example of the behavior (I. L. Zimmerman & Castilleja, 2005). Additional scoring rules also apply to English speaking Latino children. Scoring for the PLS-4 was also designed to pass items that would be considered correct in a dialectical response that may vary from mainstream English (i.e. African American English, Appalachian English, Southern English and English influenced by another language), even if the item would be considered incorrect in mainstream English (I. L. Zimmerman & Castilleja, 2005). This was designed to reduce the over-identification of children as having a language delay when in fact their performance is simply reflective of a language difference. Although the authors provide suggestions for administering the PLS-4 to children with developmental delays such as autism, the reliability and validity of the instrument with children with autism spectrum disorder is still unclear. Additional independent studies of the PLS-4 and the PLS-4 Spanish that include Latino and Spanish speaking children with autism spectrum disorder will support its' use with this population.

Rossetti Infant-Toddler Language Scale. The Rossetti Infant-Toddler Language Scale (Rossetti, 2006) was designed to identify preverbal and verbal language development in infants from birth to 3 years of age. The measure can be administered in 10 to 30 minutes depending on the age of the child. Items are administered based on the child's age in three-month intervals. The child's behaviors are elicited by the examiner, observed and reported via a parent questionnaire and an examiner evaluation. This criterion referenced measure assesses receptive and expressive communication and interaction including: interaction-attachment (relationship between the caregiver and the infant); play (individual and interactive); natural gestures; language comprehension; language expression; and pragmatics (the way the child uses language to communicate and affect others).

Although the measure is frequently used to assess the early language development of very young children, the Rossetti has not been standardized and there is no statistical information on the tool. The items included on the Rossetti are a compilation of the author's observations of infant behavior, descriptions of communication and language from developmental hierarchies, as well as behaviors frequently recognized and accepted in the field of infant and toddler assessment. The developer of the Rossetti does not provide any information related to the reliability, validity or characteristics of the norming sample. The author provides guidelines and recommendations for reporting results within developmental domains or globally: mild delay (if a child's celling level is two age ranges below chronological age expectations, child may be considered to be displaying a mild delay in developmental skills mastery); moderate delay (if the child's ceiling levels fall six to 12 months below chronological age expectations); and severe delay (if the child's performance falls more than 15 months below chronological age expectations) (Linguisystems, 2010).

Cuestionario Para Los Padres. The Rossetti includes the Parent Questionnaire (Cuestionario Para Los Padres) in Spanish which is available in the appendix of the manual. The report questions have also been translated into Spanish for the examiner to administer to the caregiver; however the instrument has not been standardized with Spanish speakers.

One of the strengths of the Rossetti is its' combination of direct assessment of the child, observation of the child's behavior while interacting with the caregiver, and report of the child's behaviors via a non-threatening parent interview. Use of the Rossetti at home, may provide a more natural representation of the child's skills, since the tool uses both baselines and ceilings to measure the child's level of performance in each of the developmental areas. The Rossetti also provides helpful testing tips throughout administration that appear to be very useful when testing a young Latino child who may not be familiar with the testing situation/environment (i.e. When the child is scheduled for an assessment away from home, encourage the caregiver to bring some of the child's favorite toys to use during the evaluation. Consult with the caregiver before you administer this item to ensure you call all objects by the same names that are used within the home (Linguisystems, 2010).

One of the obvious limitations to the use of the Rossetti is the norming sample is not representative and is based primarily on the research and experience of the author (Rossetti, 1990). For example, the author notes that "the child's performance is compared to known developmental parameters as opposed to a group of typically developing children that served as a group upon which norms are established" (Linguisystems, 2010). Not only is it unclear how these parameters were determined, but infant/toddler language and communication development, especially as it pertains to parent-child interaction varies significantly across cultures (N. B. Webb, 2001). For example, Question number 8 on the Parent Questionnaire assumes that the parent frequently "talks" to his or her infant/toddler. Latino mother's interaction with their children has been described as primarily non-verbal (Garcia Coll, 1990) with an interdependent interaction style that supports obedience, observation and discourages verbal behaviors and self-expression (Greenfield et al., 2006). This can lead to a failure to observe communicative and verbal behaviors in young Latino children and even more so in children with autism. This also limits use of the Rossetti with some Latino families and can result in inaccurate identification of many Latino children.

The Rossetti is frequently used by speech and language pathologists with children with impairment (Crais, 1995; Miyamoto, Hay-Mccutcheon, Kirk, Houston, & Bergeson-Dana, 2008; Nott, Cowan, Brown, & Cowan, 2003); it has been used to validate other instruments (Glascoe, 2002) however, only a few studies include the measure with children with autistic disorder (Green et al., 2002). Although the manual includes suggestions on how to elicit responses from young children, the author does not provide instruction on use of the Rossetti with children with developmental disability or adapting the measure. Critics of the Rossetti have noted that emergence of early vocal development, as measured by the Rossetti (i.e. babbling in children at 3 to 6 months) varies significantly from other instruments (Ogletree, Fischer, & Turowski, 1996). Therefore, due to the lack of psychometric properties for the Rossetti, the instrument may not accurately identify children with communication impairment, such as autism. If using the

Rossetti with a young Latino child suspected of having autism spectrum disorder, it should only be used as part of a larger assessment protocol.

Sequenced Inventory of Communication Development- Revised (SICD-R). The Sequenced Inventory of Communication Development-Revised (SICD-R; Hedrick, Prather, & Tobin, 1999) is used to assign developmental ages to the receptive and expressive communication skills of children 4 to 48 months. The Receptive Section assesses awareness, sound and speech discrimination and understanding. The Expressive Section measures behaviors including motor response; vocal response; verbal response; imitating behaviors; and initiating behaviors. Items are grouped into sets of 4 month intervals. The percentage of correct responses for these age-graded sets is used to determine the Receptive Communication Age and the Expressive Communication Age. The SICD-R can be administered directly to the child or via parent report in 30 to 75 minutes depending on the age of the child. The instrument also includes a 50-item language sample.

The test items from the revised edition are the same as the original 1975 SICD, but have been reclassified according to semantic-cognitive, syntactic, and pragmatic aspects of communication. The authors of the SICD-R supplemented the original sample of 252 children (21 at each of the 12 four- month age groups) with additional samples of children to develop the norms for this revised edition (Hedrick, Prather, & Tobin, 1984). The children were originally chosen to be reflective of the population of Seattle, Washington and were equally distributed among low, middle and high SES. All the children in the original sample were English speaking White children. Children whose parents judged their language to be abnormal, children living in bilingual homes, children with abnormal hearing, or children who had obvious physical or mental abnormalities were excluded from the sample. The test was later evaluated with a field test of 609 children from Detroit, Michigan, resulting in the supplemental sample. However, this sample included 276 African American children and 333 White children 31 to 48 months of age. Therefore, the revised norms are based solely on White children ages 4 month to 48 months. The test includes three age subgroups within each year. Each age subgroup included 21 children and the authors note that the children are evenly represented into three “social class” groups based on the parent education and occupation. Means and standard deviations are noted for each age group; however percentile ranks are not available. However, the authors not provide standard errors of measurement, which makes interpretation of the scores reported by 4-month increments difficult. Critics of the SICD-R also note that the sample sizes are small and some of the developmental and chronological ages do not match (Czudnowski & Pearson, 1989). Test-retest reliability (ranged from .88-.99) and inter-rater reliability (ranged from .90.-1.00) were reported, but should be interpreted with caution due to the small sample number of children used to determine the reliability of the instrument. Although the authors report correlations between the SICD-R and the PPVT ranging from .75 to .80, they do not include the number of children making up the sample. The authors do not report significant data related to the construct validity or the predictive validity of the measure (Czudnowski & Pearson, 1989).

The SICD-R was administered to several special populations including children with autism spectrum disorder. Although the authors report the children scored below the means on the SICD-R; no quantitative data or standardized procedures are available. The SICD-R is frequently used to assess the language abilities of children with autism spectrum disorder (DiLavore et al., 1995; Gabriels, Hill, Pierce, Rogers, & Wehner, 2001; Kaiser, Hancock, & Nietfeld, 2000; Lord & Pickles, 1996; Luyster et al., 2007; Stone, Ousley, Hepburn, Hogan, & Brown, 1999; Stone & Yoder, 2001; Stone, Coonrod, Pozdol, & Turner, 2003; Stone, Coonrod, Turner, & Pozdol, 2004; Thurm, Lord, Lee, & Newschaffer, 2007), but few studies have examined its' predictive validity. It has also been used to validate other language measures such as the MCDI (P. S. Dale, 1991). However, the participants in the studies of autism spectrum disorder are primarily from English speaking White families.

Sequenced Inventory of Communication Development, Spanish Translation. A Spanish translation of the SICD-R is included in the test manual and separate Spanish-language forms are available. The Spanish version is an exact translation of the English counterpart and it has not been normed with monolingual Spanish speaking children. The SICD-R has been used to examine the prelinguistic communication of infants (Brady, Marquis, Fleming, & McLean, 2004; Calandrella & Wilcox, 2000) and has also been used to evaluate the language development of low and middle income African American children at risk for language delays (Burchinal et al., 2000; Roberts et al., 1999). Several studies have used the SICD-R when evaluating ethnocultural children with multiple risk factors- i.e. low SES; high stress; ethnocultural group status; and limited support (Hooper, Burchinal, Roberts, Zeisel, & Neebe, 1998; Peterson, Carta, & Greenwood, 2005).

The SICD-R has been adapted and used to assess the language of monolingual and bilingual Spanish speaking infants (Gonzales, Montgomery, Fucci, Randolph, & Mata-Pistokache, 1997; Gonzales et al., 2001; Leadbeater & Bishop, 1994; Montgomery et al., 1995; Montgomery, Gonzales, & Gonzalez, 1999). One notable study investigated the language scores of Mexican-American infants using the SICD-R (Gonzales et al., 2001). The authors report that "appropriate adaptations were made so that the Spanish used with monolingual and bilingual Mexican-American infants was appropriate to the speech community in Southern Texas" (Gonzales et al., 2001). The parents in the study were asked to confirm whether or not the

Spanish vocabulary used was familiar to the infant and if the parent reported use of other lexicon, then those terms were included for that particular infant. In addition, the parents were questioned to ensure the language samples collected were representative of the child's abilities in a naturalistic setting. The authors also report they were able to minimize cultural and linguistic bias by assessing bilingual infants in both languages. Overall, the authors suggest that the mothers who had resided in the U.S. longer interacted with their children and "taught" their children in a way that closely resembled the educational system of the U.S., therefore influencing their higher scores on the SICD-R, which is a U.S. norm referenced test (Gonzales et al., 2001; Montgomery et al., 1999). Although the authors attempted to adapt the SICD-R to the culturally and linguistically diverse infant sample, they concede that the test may have still been biased towards some of the infants (Gonzales et al., 2001). The Spanish translation of the SICD-R has not been normed with Spanish speakers and the measure was standardized with White infants. Therefore, significant cultural and linguistic variables including acculturation can impact the scores of the SICD-R (Gonzales et al., 2001), when it is used with Spanish and bilingual speaking Latino children and their families, who differ significantly from the normative sample of the measure.

One of the strengths of the SICD-R is its' wide age range in the sampling of linguistic and social communication. In addition, the tool allows the examiner to take into account parent report, if the skill is not elicited during a formal evaluation session. This is particularly useful with children with autism spectrum disorder whose observed skills in a clinical setting do not always represent the full range of the child's ability. However, use of a language test normed on English speaking White children with bilingual or monolingual Spanish speaking children is not acceptable and may result in the erroneous classification of a Spanish speaking child. Although some studies have adapted the SICD-R with Spanish speaking infants and their families, further studies are required to determine the cultural and linguistic validity of the measure with Latinos in the U.S. It is not recommended that the SICD-R be used in the assessment of autism spectrum disorder in Latino children given the poor psychometric data and limited information related to use of the Spanish translation or administration with bilingual Spanish speaking children.

Test of Early Language Development- Third Edition (TELD-3). The Test of Early Language Development, Third Edition (TELD-3; Hresko, Reid, & Hammill, 1999) is used to assess the expressive, receptive and overall language of children 2 years to 7 years, 11 months of age. The results are converted into standard scores, percentiles and age equivalents. The TELD-3 provides an overall Spoken Language Score, as well as scores for Receptive Language and Expressive Language subtests. The Receptive subtest contains 37 items to measure how well the child can understand spoken language. For young children responses are obtained from the caregiver. The Expressive Language subtest includes 39 items. The test is individually administered in 15 to 45 minutes.

The TELD-3 was standardized with 2,217 children (during 1990-1991 and 1996-1997) from four regions in 35 states. The sample included 226 two-year old children; 266 three-year-old children; 423 four-year-old children; 494 five-year-old-children; 430 six year old children; and 378 seven year old children. The sample is representative of the U.S. population in 1997 as reported by the U.S. Census Bureau. However, the sample was noted to have small differences in percentages for African American children (13% vs. 16%) and a slight overrepresentation of children's whose parents had a Bachelor's degree (20% vs. 16%). The authors provide reliability and validity information for geographic area, race, urban/rural, ethnicity, income, educational attainment of parents, disability status and age.

Internal reliability coefficient were high for the TELD-3 subtests with mean coefficient alphas across age groups, reported for the Receptive subtest (.91); the Expressive subtest (.92); and the Total Spoken Language Score (.95). Test-retest reliability differed slightly by age and ranged from .83 to .87 for Receptive Language and from .82 to .93 for Expressive Language. Alphas were highest for the oldest group and slightly lower for the other age groups. Criterion predictive validity was reported between the two subtests and correlations to several measures including the Clinical Evaluation of Language Fundamentals- Preschool, Expressive One Word Picture Vocabulary Test, Preschool Language Scale- Third Edition and Peabody Picture Vocabulary Test-Revised, which ranged from .30 to .78. Overall, the TELD-3 does not greatly differentiate between other measures of expressive and receptive vocabulary. It is also important to note that scores on the Receptive and Expressive Language Scales were found to improve with age, with correlations for both forms of each scale and age ranging from .80 to .86.

Test of Early Language Development, Spanish Version (TELD-3:S). The Spanish version of the Test of Early Language Development (TELD-3:S; Ramos, Ramos, Hresko, Reid, & Hammill, 2007) is based on the TELD-3; however the TELD-3: S only has one form. The TELD-3: S is designed to be used with monolingual or Spanish dominant children ages 2 to 7 years, 11 months of age to measure the child's overall levels of comprehension and understanding of language as well the child's ability to express themselves verbally in Spanish. The Receptive Language Subtest contains 37 items (24 semantics items and 13 grammar items) and the Receptive Language subtest contains 39 items (21 semantic and 18 grammar). Both are added together to obtain the Total Spoken Language ability composite score. All scores are converted into standard scores with a mean of 100 and a standard deviation of 15. Percentiles and age equivalents are also provided.

To develop the Spanish version, the authors initially translated all of the TELD-3 items into Spanish. The pool of translated items was analyzed to ensure the items were characteristic of the language development of young Spanish speakers. The developers completed a thorough review of Spanish language development tests as well as the format of developmental checklists; educational curriculum materials and maps to address scope and sequence guidelines; a review by a panel of experts who subsequently made comments on test items and noted dialectical variations. Quantitative item analysis was conducted with the normative sample to determine item inclusion. The developers also completed item discrimination, item difficulty analyses and differential item functioning analyses to detect item bias. Test data were collected via caregiver report and examiner observation.

The TELD-3: S was normed between 2002 and 2005 with a large sample from the U.S. and internationally. The U.S. group included 971 children from 12 states, Washington D.C. and Puerto Rico. The group was stratified and matched with the 2000 U.S. Census and 2003 Census update for geographic area, gender, Hispanic origin, family income, parent education status, and disability status. The international group included 470 children with 48% from Mexico (6 states including: Chihuahua, Nuevo León, Querétaro, Tamaulipas, Veracruz, and Yucatán); 9% from Costa Rica (Cartago, Heredia, and San Jose); 31% from Chile (Santiago); and 12% from Spain (Sta. Cruz de Tenerife, Islas Canarias). The children from the international sample were from private and public preschools, elementary schools, university school and private denominational schools. Subgroups within the international sample included gender, national origin and the Mexican sample also added family income groupings (based on the Instituto Nacional de Estadística, Geografía, e Informática).

Internal consistency coefficient alphas by chronological age intervals were .85. Test retest reliability was conducted with a small group of 5 to 7 year olds from Mexico and ranged from .82 to .88. Inter-rater reliability correlations were reported to be .99 for subtests and the composite score. The authors also reported correlation coefficients for item difficulty and item discrimination ranging from .54 to .59. Validity coefficients were also calculated comparing the TELD-3 and several other measures of language including the CELF-3, Spanish version and ranged from .52 to .67. The authors also examined the validity of the test by calculating age discrimination correlation coefficients (.80) and group differentiation analysis (.99 -1.00). In addition, scores for the developmental delay group (.65) and the subgroup of children with language impairment (.55) were noted to be below average.

One of the strengths of the TELD-3: S is its large, diverse and international standardization sample (*N* = 1,441). In addition, the U.S. sample included eight states with the highest U.S. Hispanic populations (Arizona, California, Connecticut, Florida, Georgia, Illinois, New Jersey, New Mexico, New York, Texas, Oregon, and Washington). This makes the test valuable test to use with diverse Latino families clinicians will encounter when assessing for autism spectrum disorder. The TELD-3: S also includes an extensive chart of words that are included in the test and the corresponding vocabulary substitutions from several Latin American countries including Spain. This is especially helpful given the considerable number of variants and dialects of Spanish spoken in the U.S. Although the authors report that the instrument has been analyzed to reduce bias related to race, SES and ethnic group, the rate of language development and language comprehension is highly correlated to SES (Hoff, 2006; Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002); therefore additional studies with low income SES Spanish speaking and bilingual Latino families, would increase the validity of the test with this group.

Although the TELD-3: S has been used with bilingual children (Hammer et al., 2007; Hammer et al., 2008), few independent studies have examined its' validity with children residing in the U.S. One of the limitations of the TELD-3: S (as noted by the authors) is that it is not designed to be used with bilingual Spanish speakers due to the normative sample of monolingual Spanish speakers. However, the authors do not address how to determine the home language or adaptation for those children who may be exposed to dual languages. The English version of the TELD-3 has been used in research of phonological awareness (Scarpino et al., 2011); is frequently used to assess theory of mind; and has been used in research related to autism spectrum disorder (Hammer et al., 2007; Herbert et al., 2005; Koegel, Carter, & Koegel, 2003; Mandelbaum et al., 2006). However, the majority of the studies included monolingual English speaking White children and generalization to Spanish or bilingual speaking Latino children can result in misdiagnosis (Overton et al., 2007).

Overall, the TELD-3 and TELD-3: S may be useful in the assessment of children with autism spectrum disorder since the test is not timed. This is advantageous for those children who may require more flexibility during testing (Paul, 2005), and may also benefit from dynamic assessment practices (Artiles & Ortiz, 2002; Dyches, 2011). In addition the Receptive Language subtest, measures skills that are frequently impaired in children with autism spectrum disorder such as interpreting the needs of others, following simple directions, responding to his or her name and understanding complex conversations (Crais, Rwatson, Baranek, & Reznick, 2006). Expressive language items also address those communication and language deficits typically seen in children with autism spectrum disorder such as whether or not the child expresses pleasure or anger; vocabulary and sentence usage; and whether or not the child uses pronouns properly (Crais & Roberts, 2004). However, at the time of this writing no published studies have examined the use of pronouns or other early language impairments in Spanish speaking or bilingual children with autism spectrum disorder. Like other measures of language, the TELD-3 and the TELD-3: S are only a part of the diagnostic process. The results should not be used solely to determine a child's language abilities and should be only be used to compliment other measures of diagnostic evaluation.

Instruments to Assess Developmental and Cognitive Functioning

The evaluation of developmental or cognitive functioning to identify intellectual disability is an essential component of a comprehensive assessment for autism spectrum disorder. Intellectual testing in very young children is accomplished by using developmental scales that provide an estimate of the child's cognitive level. The IQ model is not appropriate in children younger than 3 or 4 years old, due to the interdependence of cognitive functioning with other domains of development. In addition, estimates of cognitive level at age 3 or 4 may not be predictable of IQ that is obtained in later school years. The developmental assessment of young children with autism spectrum disorder typically involves the observation of the child's play and exploration of standardized materials and his or her responses to events in the setting (Shea & Mesibov, 2009). Therefore, the following review includes measures in the cognitive and developmental assessment of children with autism spectrum disorder, rather than those measures of intellectual functioning, frequently used in the school system (Rosselli et al., 2001) such as the Batería III Woodcock-Munoz-Pruebas de Habilidad Cognitivas Revisada (Woodcock, Muñoz-Sandoval, McGrew, & Mather, 2007) or the Wechsler Preschool and Primary Scales of Intelligence-3 (Wechsler, 2002). In addition, tests such as the WPPSI are not indicated for infants. For a review of use of these measures with children with autism spectrum disorder see (Shea & Mesibov, 2009).

Early studies in the assessment of cognitive skills in children with autism spectrum disorder spectrum disorder relied primarily on the use of the Stanford Binet Intelligence Scale. Previous editions of the SBIS-5 (Roid, 2005) were heavily biased and intelligence was primarily interpreted as verbal intelligence. Therefore results were always prone to underestimate the cognitive abilities in children with communicative deficits like with autism spectrum disorder (Accardo, 2000). More recently, best practice guidelines of young children with autism spectrum disorder note alternative measures used to assess their developmental functioning (Klinger et al., 2009; Zwaigenbaum et al., 2009). Several measures, reviewed in previous chapters, such as the Psychoeducational Profile-Third Edition (Schopler et al., 2005) and the MacArthur-Bates Communicative Development Inventories- 2nd Edition (Fenson et al., 2007), are also used to assess the developmental skills of young children (Zwaigenbaum et al., 2009). Those developmental instruments that are available in Spanish and/or are frequently used with Latino children are reviewed below.

Battelle Developmental Inventory, Second Edition (BDI-2). The Battelle Developmental Inventory, Second Edition (BDI-2; Newborg, 2005a) is used for the developmental assessment of children birth to 7 years, 11 months of age. The BDI-2 evaluates five domains including: Personal-Social (Adult interaction, self-concept, social growth and peer interaction); Adaptive (Self-care, personal responsibility); Motor (Fine and gross motor and perceptual motor); Communication (Receptive and expressive communication); and Cognitive (Perceptual discrimination/conceptual development, reasoning and academic skills, attention and memory). The full battery includes 450 tests items; however items are administered based on the child’s age, so not all items are administered. Administration can be completed via direct child assessment, observation, and/or a parent or professional interview. Items are scored from 0 to 2: if the child is able to demonstrate the skill on a regular basis the examiner scores a “2”; if the skill is still emerging the child is scored “1”; and if the child is unable to demonstrate the skill the child is scored “0”. Raw scores from the BDI-2 are converted into scaled scores, standard scores, percentiles and domain scores. The domain scores are summed to obtain the total score that can be also be converted to a Total Developmental Quotient.

To develop the BDI-2, new items were analyzed and items that were problematic in the previous version were tested over several years. Item analysis during the tryout and standardization sample identified those items with poor validity which were subsequently omitted. In addition, new scoring criteria were developed for the updated version. The standardization sample for the BDI-2 consisted of 2,500 children, birth to 7 years, 11 months of age from more than 30 states in the U.S. The data were collected over 14 months in 2002 through 2003. The sample was closely matched to the 2001 Census and was stratified according to age, gender, race/ethnicity, geographic region and mother’s educational attainment.

The authors report high overall reliability of the test. The internal consistency coefficient of the BDI-2 total score was .99. The domain coefficients were all high except the Adaptive domain that was .80. The subdomain reliability scores were also low. The Attention and Memory subdomain of the Cognitive domain was .70 for children 60 to 65 and 66 to 71 months. The Perception and Concepts subdomain of the Cognitive domain was .70 for children 6 years, 11 months; .58 for children 12 to 17 months; and .76 for children 18 to 23 months. Correlation coefficients were also low for the Fine Motor subdomain: .75 for children 24 to 29 months, 60 to 65 months and 66 to 71 months. Test-retest correlations were primarily above .80 with the exception of the Personal Responsibility subdomain for 2 year olds and 4 year olds and the Attention and Memory subdomain for 4 year old children. Test- retest coefficients for the domains and the total score were all reported to be above .80.

Criterion related validity was determined through correlation with measures including the Bayley Scales of Infant Development, Second Edition (Bayley, 1993); Denver Developmental Screening Test (Frankenburg et al., 1990), Preschool Language Scale, Fourth Edition (I. L. Zimmerman et al., 2002), Social-Emotional Early Childhood Scales (Sparrow et al., 1998), and Wechsler Preschool and Primary Scales of Intelligence, Third Edition (Wechsler, 2002); with correlations between .60 and .75. The validity of the BDI-2 was also supported since the instrument was found to be able to distinguish children with autism, developmental delays, motor delays, speech and language delays and premature children from typically developing peers. However, the authors do not provide separate norms for these special populations. In addition, children with disabilities were not included in the normative sample reflective of national demographics.

Latinos were the largest minority group represented (18.9%) in the standardization sample of the English version of the BDI-2 (Newborg, 2005b). However, the assessments were conducted only in English. Therefore, this group may be more representative of more highly acculturated Latinos than the general Latino population. The authors attempted to make the materials more culturally fair in the BDI-2 by including ethnocultural families in the updated materials. The authors also conducted differential item function analyses based on race and utilized expert judgment to identify any potentially biased items. However, little attention is devoted to empirical factors of item fairness. Studies have cautioned against use of the BDI-2 with low- income African-American children (Lidz & Others, 1992). Those studies employing the BDI-2 with low-income and at-risk toddlers have reported that these children typically scored below the mean (Black et al., 2002; Gerken & Eliason, 1994).

The Battelle Developmental Inventory, Spanish Edition (BDI-2, Spanish). While the BDI-2 was being developed, the authors created the Battelle Developmental Inventory, Spanish Edition (BDI-2, Spanish; Newborg, 2005b), which is a translation and adaptation of the English version. The Spanish edition was developed using independent translators from several Spanish speaking countries. Initial translation included establishing a core set of Spanish text based on the tryout items of the BDI-2 and to identify items that would be difficult to translate due to differences in grammar or cultural biases (Newborg, 2005b). During standardization of the English BDI-2 a separate team of native Spanish speakers reviewed and translated revised items moving towards a consensus translation. The authors then identified items requiring adaptation to the English items. The authors note that 96% of the BDI-2, Spanish items and materials are direct translations of the English into Spanish. The remaining items are translated materials that were adapted to measure the same developmental milestones as the English language materials (Newborg, 2005b). Only 20 of the 450 BDI-2 English items required modifications for the Spanish edition: 16 Communication Domain items (7 Receptive Subdomain and 9 Expressive Subdomain); 2 Motor Domain; and 2 Cognitive Domain.

Items that necessitated modification included those items presenting new materials in Spanish for the child to use to respond to the task. For example, the child is asked to copy a word on a piece of paper as part of the Perceptual Motor Skills assessment of the test. This required the English word to be substituted with a word in Spanish of similar difficulty (Newborg, 2005b). The authors also identified those words requiring translation that did not have a comparable Spanish linguistic equivalent such as irregular plural forms (e.g. mouse/mice), irregular past tense (swim/swam) or plural nouns that end with an /ez/sound (e.g. box/boxes). Although these concepts are not part of the Spanish grammar or language structure, the authors deliberately retained these irregular components of English grammar in the Spanish version to allow the examiner to verify whether or not the child has mastered these English milestones (Newborg, 2005b). The developers of the Spanish edition also examined the assessment of rhyming; comparison/identification of beginning or ending sounds of words; and clear articulation of familiar words in the English version and considered how to measure the same milestones in Spanish. The developers first identified age appropriate words in Spanish that measured a wide range of fundamental phonemic sounds that the child must master in Spanish. The authors then identified words that could be presented easily as pictures and reviewed the words to ensure they were universally appropriate across different variations of Spanish (Newborg, 2005b). When modifying the Spanish items the authors also considered cross-cultural validity, language difficulty of items, reflected on auditory and pictorial concerns and also the presentation of the Spanish items (Newborg, 2005b).

Overall, the authors note that the BDI-2 Spanish was intended to preserve as much of the organization and structure of the English version. All of the materials and manipulatives can be used in the same manner as the English BDI-2 and the administration of the BDI-2 Spanish is almost identical to the English version. In fact, the translated Spanish text was inserted into the administration instructions so that it includes administration by an English and Spanish examiner (Newborg, 2005b). One particular strength of the Spanish edition of the BDI-2 is its' inclusion of a CD-ROM that contains all of the materials needed to create a full set of the Spanish materials. The examiner can print out those visual stimuli with accompanying text that the child must use when responding to items (Newborg, 2005b).

The BDI-2 Spanish is designed to be used with children and their families whose dominant language is Spanish. However, the instrument is particularly useful since it allows for flexible testing procedures. The measure can be administered entirely in Spanish or English; a combination of the structured items; it can be completed by the child in either language; or it can be interspersed with the dominant language of the adult caregiver. For those children who are exposed to dual-languages in the home, the authors suggest that the measure be administered to the child in English and the caregiver can be interviewed in Spanish. Those items the child does not respond to correctly can be re-administered in Spanish and administration can continue until the child reaches the ceiling for each subdomain. This type of administration allows the child to demonstrate his or her maximum developmental abilities in both languages (Newborg, 2005b). Unfortunately, this is not always feasible with young children with short attention spans or it may result in score differences due to practice effects. The examiner can also calculate the differences between the English and Spanish raw scores for each subdomain. This allows the clinician examination of the role that language plays in the child's development and the examiner can determine the extent to which the bilingual environment has impacted the child's cognitive and communication skills (Newborg, 2005b).

The BDI-2 has been used in Spain (Calahorro et al., 2009) and has also been included in a study of children with developmental delays in Brazil (Moura et al., 2010). However, there is limited data regarding the psychometric properties for the Spanish version and there are no published norms for the Spanish version. The BDI-2 provides age equivalents based on data gathered from the English national standardization sample of 2,500 children. Unfortunately, there are no age equivalents available for the Spanish speaking children. The developers of the BDI-2 Spanish edition do not believe any differences in scores will result between the English and Spanish items administered using the Observation/Interview administration procedures (Newborg, 2005b). However, the authors caution against calculating scaled and standard scores using the English BDI-2 norms and it is recommended that the scores be considered "experimental" (Newborg, 2005b). Although the authors report that there should not be any significant differences between the scores of the Latino children and the non-Hispanic children (Newborg, 2005b), culturally determined definitions of developmental abilities or knowledge can impact the way a family responds to an instrument (Zambrano & Greenfield, 2004).

The BDI-2 is relevant for children with autism spectrum disorder since it was specifically designed to identify children with special needs and to assess the functional abilities of these children. For example, items on the BDI-2 relate to the DSM-IV diagnostic criteria of autism such as the Adaptive Subdomain which assesses self-care such as feeding, dressing and toileting. The authors conducted several criterion related studies with various groups of children to identify distinctive score profiles including children with autism, cognitive delays, developmental delays, motor delays, premature birth, and speech and language delays. In addition, the studies of children with specific disabilities or delays included samples with large age spans and children of diverse ethnicities. Overall, results yielded large effect sizes demonstrating that the children scored lower than their matched peers in each of the domains as well as in the overall score (Newborg, 2005a). The BDI-2 also includes guidelines for use with children with developmental delays and also a description of accommodations for testing children with various impairments or disabilities.

The BDI-2 has been used in research of children with autism and is frequently used to develop other measures of the assessment of children with autism spectrum disorder (D. B. Bailey Jr., Hatton, Mesibov, Ament, & Skinner, 2000; Glascoe, 2002; Hauck & Dewey, 2001;

Matson, Neal, Fodstad, & Hess, 2010; Sipes, Matson, & Turygin, 2011; Stone, Coonrod, & Ousley, 2000; Stone et al., 2004; Wiggins, Bakeman, Adamson, & Robins, 2007; Wiggins, Robins, Bakeman, & Adamson, 2009; Wolery & Garfinkle, 2002). Since the test assesses the child's awareness and interaction with others, the BDI-2 is often used to make the diagnosis of autism (Matson et al., 2009; Matson, Boisjoli, Hess, & Wilkins, 2010; Matson, Hess, & Boisjoli, 2010). Overall, children with autism spectrum disorder exhibit lower levels of adult and peer interaction on the BDI-2 (Matson, Neal, Fodstad, & Hess, 2010) and lower levels of expressive and receptive communication when using the measure (Matson, Boisjoli, & Mahan, 2009). In addition, children with autism spectrum disorder have been found to be even more impaired on the BDI-2 than atypically developing children with seizure disorders (Matson, Neal, Hess, Mahan, & Fodstad, 2010).

The BDI-2 can assist with identifying children with autism spectrum disorder; however, it is important to remember that it has not been standardized with this group of children. Those children who were receiving support services or were diagnosed with a disability were excluded from the sample. Furthermore, the standardization sample focuses on milestones that are achieved by typically developing children. Several tasks on the BDI-2 may also be challenging to administer to a young child with autism (Brassard & Boehm, 2007). For example, the Communication Domain requires the child to respond to questions, follow verbal commands, match words to definitions and engage in sustained conversation with the examiner. Numerous items in the Cognitive Domain still require verbal skills that are inherently difficult for children with autism including: the child's ability to attend to objects, locate hidden items in a picture, note differences given in stimuli, categorize and repeat sequences.

There are some advantages to using the Spanish edition of the BDI-2 with young Latino children suspected of having autism spectrum disorder. The universality of the text increases its' use with a broad group of Spanish speaking cultures. When using the BDI-2 with Spanish speaking children there is a flexible framework and the option to gather information from multiple reporters. For example, many items from the Adaptive and Personal/Social domains are tasks the examiner cannot easily observe or naturally elicit from the child, such as helping with simple household tasks or imitating the play activities of other children. Therefore the authors recommend using the parent interview method, in which the examiner uses a script to obtain information about the child from the caregiver by engaging the parent in a dialogue about the child's development (Newborg, 2005b). The authors also encourage flexible testing procedures for those children who are not responsive to the examiner in a structured assessment environment or even observing the child in the home or another natural setting (Newborg, 2005b).

Although the BDI-2 evaluates social-emotional as well as adaptive skills that are an important component of the assessment of autism spectrum disorder, further study is required to determine if the BDI-2 is appropriate for use with Latino children or specific SES groups of children with autism spectrum disorder. Studies suggests that children with lower scores are at risk for diagnosed conditions when compared to their typically developing peers; however the standardization sample did not include sufficiently large subgroups of children with specific disabilities, such as autism, to generalize the results to those groups. Although the authors of the Spanish edition of the BDI-2 describe the developmental milestones assessed as part of the BDI-2 as "neither language nor culture specific" (Newborg, 2005b), no normative information is provided for the Spanish translation, limiting its' reliability and validity. Generally, the instrument should only be used on the population on which it was normed. The authors note that when interpreting the BDI-2, the first consideration should be cultural factors that may influence scores, such as those children who are recent immigrants or may not be familiar with the mainstream culture. In addition, all of the aforementioned studies utilizing the BDI-2 with children suspected of having autism spectrum disorder were conducted primarily with White children and their English speaking families. It is imperative to develop national norms of the BDI-2 Spanish with Latino and Spanish speaking children and their families as well as with diverse groups of children with autism spectrum disorder.

The Bayley Scales of Infant and Toddler Development, Third Edition (BSID-III). The Bayley Scales of Infant and Toddler Development, Third Edition (BSID-III; Bayley, 2006a) is one of the most widely used developmental scales with very young children (Chawarska & Bearss, 2008; Klin et al., 2005). The measure can be used with children from 1 month to 42 months of age. The BSID-III consists of three scales that are administered with child interaction: Cognitive; Motor (Fine and Gross); and Language (Expressive and Receptive); as well as two scales that are included as part of a caregiver questionnaire: Social-Emotional; and Adaptive Behavior (Conceptual, Social and Practical). The full battery can be completed in approximately 50 minutes for children 1 to 12 months and can take up to 90 minutes to administer in children 13 to 42 months of age. BSID-III scores include index scores or standard scores, subtest scaled scores and percentiles. Growth scores can also be calculated to chart the child's progress over time.

The Bayley Scales of Infant Development were originally published in 1969 and was later revised in 1993 (Bayley, 1993). The BSID-III maintains the same tasks as previous editions, focusing on play-based activities; however the BSID-III has improved psychometric properties from the previous edition. To develop the most recent edition, the authors removed items from the BSID-II that were difficult to administer or score, items that were unpleasant for the child, redundant with other items, potentially biased toward a racial or ethnic group, or items that were lacking in value. The authors incorporated a conceptual development phase as well as reviews by an advisory panel, a comprehensive review and feedback by experts to ensure the appropriateness of items.

The standardization sample for the Cognitive, Language and Motor Scales of the BSID-III included 1,700 children (16 days- 43 months, 15 days of age). The sample was based on the October 2000 U.S. Bureau of the Census population survey data and was stratified by race/ethnicity, age, sex, parent educational level and geographic location. It is important to note that the children in the normative sample understood or spoke English or their parents were able to communicate in English. The norms for the Social-Emotional Scale were gathered during an earlier tryout phase from 456 children (birth- 42 months) who were included in the normative sample of the Greenspan Social-Emotional Chart (Greenspan, 2004). Although it is a small sample, the authors note that it is representative of the U.S. population. The norms for the Adaptive Behavior Scale of the BSID-III were adapted from1,350 children (birth to 5 years, 11 months) in the normative sample of the Adaptive Behavior Assessment System, Second Edition (ABAS-II; Harrison & Oakland, 2003a).

Reliability coefficients for the Scale Composites of the BSID-III, ranged from .91 (Cognitive) to .93 (Language). Coefficients for the subtests ranged from .86 (Fine Motor) to .91 (Expressive Communication, and Gross Motor subtests). Internal consistency correlation coefficients for the Social-Emotional Scale ranged from .83 to .94 and .76 to .91 for the sensory processing items. Reliability coefficients for the Adaptive Behavior Scales were also good and ranged from .79 to .98. Additional studies of the test-retest reliability of the Cognitive, Language, Motor Scales and Adaptive Behavior Scales of the BSID-III found strong consistency. The authors also found that test-retest reliability also increased with age. Test-retest reliability coefficients for children in the lowest age groups (2-4 months) ranged from .67 to .80, while coefficients were higher for older children. Test-retest reliability coefficients for children 9 to 13 months ranged from .77 to .86; 19 to 26 months ranged from .71 to .88; 33 months to 42 months ranged from .83 to .94 (Vig & Sanders, 2007). The authors examined the validity of the BSID-III through a series of validity related studies with other cognitive, intellectual, language, motor, social-emotional, and adaptive behavior measures. The authors also studied the concurrent validity of BSID-III in relation to several other measures including the Wechsler Preschool and Primary Scales of Intelligence, Third Edition (.79; Wechsler, 2002) and the Preschool Language Scale, Fourth Edition (.57; I. L. Zimmerman et al., 2002).

Clinical cases of children constituted 9.8% of the normative sample to ensure the measure was more representative of the population. Studies were conducted by the author to examine use of the BSID-III with special populations including children with Down syndrome; cerebral palsy; pervasive developmental disorders; and specific language impairment (Bayley, 2006b). The authors reported that the BSID-III displayed good sensitivity and specificity in discriminating clinical cases from typically developing children. The average reliability coefficients for these groups were all greater than .94. Specifically data were obtained from 70 children (16-42 months) who met the DSM-IV criteria for PDD's (Bayley, 2006b). These children scored significantly lower on all of the subtest scales and the composite scores, than children in the matched control group. As expected, the scores on the Receptive Communication and Expressive Communication subtests and the Social-Emotional subtest were considerably lower for the group of children with PPD than their matched control group (Klinger et al., 2009; Piñon, 2010).

However, the data from these special groups should be interpreted with caution since the sample sizes were small and the individuals were not randomly selected (Bayley, 2006b).

Recent studies continue to utilize the BSID-II (Tomopoulos et al., 2006) which differs significantly from the BSID-III. Differences in scores between the BSID-II and BSID-III may be due to changes in demographic characteristics, specifically parent education level. In 1988, the number of parents with lower education levels (grade 12 or lower) was higher than in 2000. In addition, the proportion of children from various ethnic and racial backgrounds, and regions of the U.S. also changed with the Bayley-II and the Bayley-III. Although the BSID-II is frequently used with low-income and high risk Latino families (Brinker, Seifer, & Sameroff, 1994; S. R. Harris, 1994; Morisset, Barnard, Greenberg, & Booth, 1990), these groups are under-represented in the standardization sample and few studies have been devoted to determining the validity of the measure with diverse populations. Some have suggested that the lower test scores of low-income children using the BSID-II, cannot be explained by outdated test scores or test errors, but rather signifies vulnerability in development and behavior due to poverty and less stimulating environments resulting in delayed language and problem solving skills (Black, Hess, & Berenson-Howard, 2000; Coll, Buckner, Brooks, Weinreb, & Bassuk, 1998). Results from several studies have shown that scores on the test appear to be influenced by the parent's education level, higher quality home environment and higher quality parent-child interaction (Fuller et al., 2010; Hediger, Overpeck, Ruan, & Troendle, 2002; Rauh et al., 2006; Tamis-LeMonda, Shannon, Cabrera, & Lamb, 2004; Tomopoulos et al., 2006). Several studies including the BSID-II with Mexican-American infants have reported scores below the published norms, (Gonzales et al., 2001; Kolobe, 2004; Zahr, 1999). Others have noted that use of the Bayley with culturally and linguistically diverse children may result in an inaccurate picture of the child's skills and distorted results due to cultural bias of test items (McClain, Provost, & Crowe, 2000; Urquhart Hagie, Gallipo, & Svien, 2003).

Escalas Bayley de Desarrollo Infantil (BSID). A Spanish version of the Bayley has been used in Mexico (Fernald et al., 2006; Gomaa et al., 2002; Hu et al., 2006; Wright et al., 2003), Spain (Ribas-Fitó et al., 2006) and Costa Rica (McInnes et al., 2005). Studies of the Bayley with children in Costa Rica have noted that significantly more children in Costa Rica appeared to have intellectual disability than other epidemiological studies of children with autism (McInnes et al., 2005). The authors recognize that the skills and IQ's of the children in the study may have been underestimated due to the lack of appropriate norms (McInnes et al., 2005).

A Spanish version of the First edition of the Bayley was previously available from Tea Ediciones, an international test publisher; however, the measure was recently discontinued. The test is often informally translated and used with Spanish speaking families in the U.S. (Rauh et al., 2006). The lower scores of inner-city bilingual Dominican children in one study using the Bayley (Rauh et al., 2006), may have been related to failed language items due to bilingual practices in the home. Another notable study used the Spanish version of the Bayley with Mexican-American pregnant women and children of farm working families (Marks et al., 2010). The study found the Spanish translation to be internally valid in the population of primarily Spanish speaking women born in Mexico. However; scores decreased significantly when the children were 24 months old. The authors suggest the Bayley scales may not be a valid tool to use when translated into Spanish or when used with Latino immigrant families (Marks et al., 2010).

The BSID-III and its' predecessors are frequently used in research of children with autism spectrum disorder (Akshoomoff, Stahmer, Corsello, & Mahrer, 2010; Dawson, Meltzoff, Osterling, & Rinaldi, 1998; Dawson, Meltzoff, Osterling, Rinaldi, & Brown, 1998; Dawson et al., 2000; Gamliel & Yirmiya, 2009; Karmel et al., 2010; Lord, 1995; McEvoy, Rogers, & Pennington, 1993; Reddy, Williams, Costantini, & Lan, 2010; Rickards, Walstab, Wright-Rossi, Simpson, & Reddihough, 2009; Sallows & Graupner, 2005). The scales have also been used to develop and to evaluate the validity of other measures of autism spectrum disorder (Lord et al., 1994; Robins, Fein, Barton, & Green, 2001; Saemundsen et al., 2003; Stone et al., 2000). However; the individuals in these studies are primarily White middle class families.

There are several advantages to using the BSID-III to evaluate the development of young children suspected of having autism spectrum disorder. The scales are useful for children with autism who may not meet basal requirements on other instruments designed for preschool aged children. In addition, the extended floor and ceiling allows the clinician to evaluate the cognitive functioning of young or very low functioning children with autism spectrum disorder. The BSID-III is also valuable when used with children with autism spectrum disorder since it is primarily a play based test and the examiner can score the test through observation. This is beneficial for those children with autism spectrum disorder who may not respond well to elicited tasks. If a correct response is not initially elicited but is observed in a later session such as Gross Motor items or Expressive Communication subtest item, than the examiner can still score the item as correct.

The BSID-III includes items that are frequently noted to be deficient in children with autism spectrum disorder such as perspective taking and social responsivity. On the Cognitive Scale, the child completes tasks that measure their interest in novelty, attention to familiar and unfamiliar stimuli and also tasks that measure play. The Receptive Communication subtest includes several items that measure preverbal communication, such as the child’s responsiveness to sounds and the ability to comprehend and respond appropriately to words and requests. Items in the Expressive Communication subtest also assess preverbal abilities (the ability to vocalize, babble and coo), the ability to imitate sounds and words, gestures, joint referencing, turn taking, consonant and vowel production and object identification. Items included as part of the Social-Emotional Scale address self-regulation, interest in the world, affective expression and the child's ability to engage others and establish relationships. All of which are commonly impaired in children with autism spectrum disorder. Responses also indicate whether or not sensory processing difficulties may be present. The assessment of adaptive behavior is an important part of the testing process of a child suspected of having autism spectrum disorder and is a valuable component of the BSID-III. This scale estimates the child's functioning in areas of Communication, Community Use, Health and Safety, Leisure, Self-Care, Self-Direction, Functional Pre-Academics, Home Living, and Social and Motor. Using a questionnaire, the parent rates the child's attainment of practical, everyday skills required to function and meet environmental demands such as the ability to eat, dress and interact with others.

Overall, it is important to consider that the Bayley was designed to identify children with developmental delay not to diagnose a disorder. Use of the Bayley with children with autism spectrum disorder is limited because domain scores provide the average of highly discrepant skills. Examination of the scattered profile with significant unevenness can at times be more informative than the average scores. Actual test scores from the Bayley differ considerably even with typically developing children (Magiati & Howlin, 2001). The inherent variability in the day-to-day behavior of infants, limits the predictive value of the scales (Gonzales et al., 2001). These scores can be even more unreliable in children with autism spectrum disorder. For example, results from the Bayley scales have been found to produce significantly lower scores in children with autism, when compared to the Merrill-Palmer Scales of Early Learning-AGS Edition (Gabriels et al., 2001; Magiati & Howlin, 2001; Mullen, 1995). Although few studies exist utilizing the Bayley with Latino children with autism spectrum disorder, studies have noted differences in scores using the Bayley with Native American children (McClain et al., 2000) as well as Native American children with fetal alcohol syndrome and autism (S. R. Harris, MacKay, & Osborn, 1995).

There are additional considerations when using the Bayley scales with a Latino or Spanish speaking child suspected of having autism spectrum disorder. The previous BSID-II included language as part of the Global Mental Development Scale, which penalized children with language impairment. However the more recent BDI-III includes a separate Language Scale and attempts have been made within the Cognitive Domain to assess mental development through methods that minimize language. This is particularly beneficial since expressive language delays that are typically seen in young children with autism spectrum disorder do not affect the child's performance on the Cognitive Domain. However, studies have found differences in scores of lower income toddlers related to Orientation Behavior on the scales such as exploration of objects and the environment, engagement with tasks and others, energy, enthusiasm, initiation, persistence, and affective quality (Markus, Mundy, Morales, Delgado, & Yale, 2000).

Overall, child rearing practices and developmental expectations differ across cultures. Several studies have found developmental expectations of Latino parent's differs from mainstream families (Gutierrez & Sameroff, 1990; Kolobe, 2004; Zuniga, 1992). Although these maternal views of child development are often associated with level of acculturation, mother's education and SES (García-Coll & Vázquez García, 1995; Kolobe, 2004), lower developmental expectations can impact parenting behaviors which can subsequently influence development and scores on the BSID-III. For example, Gannotti, Handwerker, Groce, and Cruz (2001) found that Puerto Rican parents believed placing a baby or small child on the floor increased the possibility that the child would become ill, hit his or her head, or break his or her teeth. The parents also reported that children should avoid areas with ramps, stairs, hills, or uneven ground because they thought the child would fall easily and the families also thought children could become sick from walking barefoot outside. The Puerto Rican parents also held significantly different expectations of adaptive skills. The Latino parents believed doing things for their children, such as dressing and feeding, even if the child was able to do it for his or herself, demonstrates love for the child. This was especially true for those parents who believed good parents make sure their children have nice clothes and look good in public (Gannotti et al., 2001). Overall, parental expectations for what children are and are not allowed to do and varying social beliefs about child care can influence behavior and assessment results on the Bayley scales.

Although the BSID-III is one of the most commonly used instruments to assess the developmental functioning of infants and toddlers, the instrument itself does not provide a comprehensive sample of the child’s skills. The examiner must also ensure additional information as well as parent report is included to determine whether the child’s performance is representative of the child’s skills at home. The authors note that the measure should not be used for determining the child’s intellectual ability but rather can help determine if the child is meeting expected milestones in verbal, nonverbal, and motor skills domains (Zwaigenbaum et al., 2009). Unfortunately, there are significant limitations to using the test with Latino or Spanish speaking children. A Spanish version has not been standardized or validated with young children in the U.S. and many studies have reported cultural, SES and language differences using the

Bayley scales suggesting that the instrument is not sensitive to the cultural and linguistic differences of some Latino infants (Kolobe, 2004). Cultural issues of language development will impact scores on the Bayley (Lohaus et al., 2011; McClain et al., 2000; Urquhart Hagie et al., 2003). Unfortunately, Latino families are frequently excluded from and underrepresented in studies of the influence on culture and the environment on the development of the child and future research will hopefully utilize the BSID-III to determine its' validity with this group.

Differential Abilities Scale-Second Edition (DAS-II). The Differential Abilities Scale-Second Edition (DAS-II; Elliot, 2007) is a revision of the first edition, published in 1990 (Elliot, 1990). The DAS-II is an individually administered test that measures cognitive abilities including general conceptual and reasoning abilities. The DAS-II includes an Early Years battery that can be used with children 2 years, 6 months through 6 years, 11 months and a school age battery that can be used with children 7 years, 0 months through to 17 years, 11 months of age.

The Early Years battery consists of a lower level, for children 2 years, 6 months to 3 years, 5 months. The lower level contains four core subtests that comprise the General Conceptual Ability Score (GCA) score. Cluster scores for young children are the Verbal Ability and Nonverbal Ability. Verbal Comprehension and Naming Vocabulary contribute to the Verbal Ability cluster, and Picture Similarities and Pattern Construction comprise the Nonverbal Ability cluster. This lower level battery is considered more of a screening instrument for children in this age range since it takes approximately 20 minutes to administer. Children aged 3 years 6 months to 6 years 11 months can complete the upper level Early Years battery, which includes six core subtests, which form three core clusters and also yields a GCA score. In addition to the same Verbal Ability cluster, there is a Nonverbal Reasoning Ability cluster which consists of Picture Similarities and Matrices, and the Spatial Ability Cluster, which consists of Pattern Construction and Copying. The lower level battery takes approximately 30 minutes to administer. The Early Years battery also includes diagnostic subtests that measure short-term auditory memory, short-term non-verbal and visual memory and basic academic skills (Dumont, Willis, & Elliott, 2008).

Significant work went into the development of the second edition of the DAS including a national pilot study of a nationally representative sample of 300 children. The results from the pilot study were used with the national tryout phase of 900 children (ages 2 years, 6 months to 17 years, 11 months). The final standardization sample was conducted with 3,480 children (ages 2 years, 6 months to 17 years, 11 months) living in the United States during the period of data collection in 2005. The sample was stratified for age, gender, race/ethnicity (White $N = 2{,}176$; African American $N = 538$; Hispanic $N = 595$, Asian $N = 137$ and Other $N = 34$), parent educational attainment and geographic region. Total sample percentages were very close to the U.S. population for the 2002 U.S. Census. However, it is important to note that children and families with limited English proficiency were excluded from the normative group (Dumont et al., 2008).

The DAS-II was based on the original DAS, which was initially developed as a measure for use in the United States and Britain. The content of the original DAS was specifically selected to exclude culturally biased content. An expert bias review panel was also included in the development of the DAS-II to determine whether the items seemed biased against people from any culture. Item bias analysis was also included during the tryout phases of development. Regression analysis was then conducted to ensure test scores were able to predict the ability of children from different ethnic groups. In addition, African American and Hispanic children were over-represented in this prediction analysis of achievement for the separate subgroups. Results of this final analysis showed the DAS-II to be a fair measure of ability for African American and Hispanic children (Dumont et al., 2008).

The authors report internal reliability coefficients by age for subtests, clusters, and composites for the Early Years Battery. Overall, the DAS-II demonstrated excellent reliability across the standardization sample regardless of age. The authors reported average internal consistency reliability coefficients for the cluster scores between .80 and .99 for the Lower Years and the Upper Years. In addition, average internal consistent reliability coefficients for the GCA and the Special Nonverbal Composites for the Lower and Upper Early Years were above .90. Internal reliability scores for the Early Years subtests and composite scores range from .79 to .94. Specificity values were also reported to be between .30 and .60 on most of the subtests. Test-retest reliability was calculated with 369 children with individuals from each of the three wide age bands. Overall, stability coefficients were consistent over time for all age groups with coefficients of the cluster and composite scores ranging around .73 and many coefficients in good (.70s) or excellent (.80s and above) ranges. Inter-rater agreement was obtained using a stratified sample of 60 randomly selected cases from the normative sample. Inter-rater reliability was also high across age groups and ranged from .95 to .99. Several studies were conducted to determine criterion validity by comparing the DAS-II to similar measures such as the Wechsler Preschool and Primary Scales of Intelligence-Third Edition (Wechsler, 2002) and the Bayley Scales of Infant Development-Third Edition (BSID-III; Bayley, 2006a). Correlation with the BSID-III was low (.59) since the Bayley measures different abilities. However, the range of coefficients is reasonably moderate and the mean correlation was high- .80 (Dumont et al., 2008).

The DAS-II also includes an added clinical sample of children with special classifications including risk of developmental delay; learning disabilities; ADHD; specific language impairment; LEP; mild to moderate mental retardation; and gifted and talented. These groups are representative of the number of children with these characteristics in the general population. Overall, the DAS-II exhibited good to excellent convergent and divergent validity with other measures when used with children from these special groups. Specifically, the mean GCA score was 94.8 and the individual mean cluster scores ranged from 85.6 to 104.8 with children of limited English proficiency. The sample also obtained a mean GCA score of 92.5, with individual mean cluster scores ranging from 92.8 to 95.8 for children who were considered developmentally at risk (Dumont et al., 2008). Although the authors note that the DAS-II can accurately estimate the abilities of children with special needs, the authors warn against using the DAS-II alone to make a diagnosis.

The DAS-II was standardized using Spanish directions for the administration of the non-verbal subtests. The Spanish translation of the non-verbal subtest directions underwent an expert translation with blind back translation and an expert panel review. After this analysis 97 Spanish speaking children (ages 6 to 14) were administered the translated directions of four of the original non-verbal DAS subtests into Spanish. This yielded scores that correlated with other measures, just as the tests do when using the English directions (Sandoval, Antunez-Bellatin, & Lewis, 2002). Although the authors utilized the first edition of the DAS, the resulting final Spanish translation is available in the appendix (Sandoval et al., 2002). This allows for those subtests that do not require a verbal response from the child, such as the nonverbal reasoning and spatial scales, to be administered in the child's primary language or by gesture. This may be appropriate for Spanish speaking children since the examiner can calculate a supplemental nonverbal score from the core subtests. The Spanish translation also ensures that the use of the nonverbal tests with Spanish speaking children is done in a standardized fashion. The authors of the DAS-II caution that subtests with verbal content should not be translated. The Verbal subtests are only appropriate for those children who are English proficient and may not be suitable for bilingual children. In addition, if the complex directions of the verbal subtests are translated this may create a new order of item difficulty which may not equate with the expected order of item difficulty of the English items and subsequently produce inaccurate results.

Overall, studies using the original version of the DAS have shown racial and ethnic differences. Lynn (1996) found that Asian American children scored the highest and scores declined successively for White, Latino and African-American children. DiCerbo and Barona (2000) found convergent validity with the first edition of the DAS and WISC in assessing English speaking Latino children (ages 9 to 11) residing in the US. However, there was a discrepancy between verbal and performance scores for the Latino children. This further emphasizes the role that language plays in the cognitive assessment of children. In fact, when reviewing the original DAS normative data, the mean for Hispanic children (ages 6 to 17) fell 8.79 points lower than the average White child. The difference in the scores between the White children and the Latino children was greatest on Verbal Ability, suggesting language deficits in English with some of the children (Lynn, 1996). Others have suggested that the DAS subtests are less influenced by U.S. culture due to the abstract stimuli and require less culturally bound responding.

Differential Abilities Scales- Second Edition (DAS-II) Spanish Supplement. More recently, the authors have developed a Spanish supplement to the DAS-II, Early Years (Collin, 2012). This cognitive assessment battery is especially appropriate for children from monolingual

Spanish speaking homes. It consists of 17 subtests that are translations and adaptations (Recall of Objects, Recall of Objects Delayed and Phonological Processing) of the DAS-II, Early Years. This allows for a more accurate picture of the child's cognitive functioning by assessing them in their primary language (M. E. Williams, Sando, & Glen Soles, 2014). When developing the Spanish supplement, professionals from Argentina, Chile, Columbia, Costa Rica, Cuba, El Salvador, Mexico, Nicaragua, Panama, Peru, Puerto Rico, Spain and Venezuela were involved, to address cultural issues that might affect the assessment. Data was collected between May 2011 and January 2012 on a sample of 240 children (2 years, 6 months to 6 years, 11 months). The sample of children was then stratified by age, SES and gender. Only children who were monolingual, bilingual or predominantly Spanish speaking were included in the sample. Significant effort went into the development of the Spanish translation which was initially translated by an outside research group and reviewed by a bilingual panel. The translation was then administered to a small sample in the U.S. and Peru and modifications were made to the items and instructions by the bilingual panel based on the pilot data. The items were administered to a larger sample in the U.S. and Peru and changes were also made by an internal and external review as well as by the author. In addition, during development, each subtest was reviewed to determine whether or not it was appropriate to prompt the child in English and accept the English response. The authors note that the DAS-II Spanish is an assessment of cognitive ability and not language fluency. Therefore, if the child does not appear to understand the task in Spanish or if the child does not respond, the measure allows for prompting in English. If a bilingual psychologist is not available, the manual of the Spanish supplement includes information to assist the examiner in collaboration with an interpreter to administer the test. The manual also includes Spanish instructions that can be used by an interpreter.

It is important to note, that Spanish norms are not available for this measure. The raw scores of the Spanish supplement are equated to the English raw scores of the DAS-II and then converted to a weighted raw ability score (M. E. Williams et al., 2014). The child's resulting scores are compared with norms for the English version of the test, which were collected on an entirely English-speaking standardization sample. It is also important to note that a Spanish adaptation, the BAS-II, Escalas de Aptitudes Intelectuales is available from Tea Ediciones (Arribas Aguila & Corral Gregorio, 2011). The Spanish translation of this test, which is available from Spain, is a translation of the first edition of the DAS. The DAS–II Infantil is appropriate for children 2 years, 6 months through 5 years, 11 months. The authors developed the measure over a period of five years. The test was normed on 1,725 subjects in various regions of Spain and the manual includes appropriate validity and reliability information. However, as of this writing there are no published studies utilizing the Spanish version in the United States with Latino children.

Although clinical studies using the DAS-II have been conducted with special groups of children, including children with cognitive delays, no children with autism spectrum disorder were included in the standardization and no information is provided that indicates the specific profiles of children with autism. Overall, there is little research studies regarding its' utility with this population. The DAS has been used to assess cognitive abilities in several studies of children with autism spectrum disorders (Joseph, Tager–Flusberg, & Lord, 2002; Sherer & Schreibman, 2005; Sutera et al., 2007). In addition the DAS was also used to develop the Pre-linguistic Autism Diagnostic Observation Schedule (PL-ADOS; DiLavore et al., 1995). The convergent validity of the DAS has also been compared to the Mullen Scales of Early Learning (Mullen,

1995) in a sample of young children with autism spectrum disorder and non-spectrum diagnoses (S. L. Bishop, Guthrie, Coffing, & Lord, 2011).

Several studies recommend use of the DAS-II with children suspected of having autism spectrum disorder, since it is a quick but comprehensive assessment (Joseph et al., 2002; Klinger et al., 2009) and an intelligence quotient can be attained after administration of only a few subtests. In addition, the DAS-II contains procedures that allow for flexible testing. For example, the examiner can repeat or rephrase directions and items, demonstrate items or teach items if a child fails the task. This also ensures that the child did not obtain a low score because the instructions were not understood clearly. Since the subtests do not have to be administered in an exact order, the examiner can individualize the testing session for the child. For example, Klinger et al. (2009) recommends beginning with a nonverbal test in order to build rapport. This is particularly useful considering the wide range in ability level frequently seen in children with autism.

The DAS-II can also facilitate the assessment of children with autism spectrum disorder with a very low ability and the measure provides norms for a large age range. Although children begin taking the test at an age-specific starting point, it is possible for a child suspected of having autism spectrum disorder with limited skills to be administered items from an earlier age group. This may also be appropriate when assessing the developmental functioning of a child with autism spectrum disorder since it is based on the child's mental age rather than chronological age (Klinger et al., 2009). However, the DAS-II may not be as useful for children less than 2 ½ years of age, since they may not meet the basal requirements. The DAS-II also appears to be less verbally demanding than other developmental assessments and the DAS-II involves tasks that allow for hand on performance using manipulatives.

Overall, the special Nonverbal Composite of the DAS-II appears to be the most pertinent aspect of the measure in the developmental assessment of Latino children. Another benefit in using the DAS-II with Latino children is that it allows opportunities for the examiner to teach items. Although the DAS subtests are considered to have low linguistic and cultural demands (Flanagan, McGrew, & Ortiz, 2000), the test requires the child to complete tasks commonly included in instruments of early cognitive testing, such as the reproduction of a model with blocks, picture naming, copying figures and shapes, visual memory and number sequencing. At the time of this writing, there are limited published studies including the DAS-II Spanish Supplement (M. E. Williams et al., 2014). However, further evidence of its' utility with Spanish speaking children suspected of having autism spectrum disorder would be valuable.

Kaufman Assessment Battery for Children (KABC-II). The Kaufman Assessment Battery for Children (KABC-II; Kaufman & Kaufman, 2004) is a measure of processing and cognitive abilities that can be administered to children 3 years to 18 years 11 months of age. It is organized into three levels: age 3, ages 4-6 and ages 7-18. Results of the KABC-II will yield between one to five scales depending on the age of the child and the approach used to interpret the test. For 3 year old children, the global measure of ability is the only scale used and is composed of either five subtests (Mental Processing Index; MPI) or seven subtests (Fluid Crystallized Intelligence; FCI).

The second edition is significantly different and has improved upon the original KABC developed in the early 1980s. Normative data were based on 3,025 children from 39 states and the District of Columbia. The sample was noted to be representative of the 2001 U.S. Census; however, there was some over-representation of children from a family of a higher education level. Individuals were then stratified based on gender, ethnicity, and SES within ethnicity, parental education, SES, geographic region and special education. Atypical children were included in the standardization sample including children with speech and language delays (2.7%), cognitive disability (1.0%), emotional and behavioral disturbance (0.7%) and other impairments- 1.3% (Kaufman, Lichtenberger, Fletcher-Janzen, & Kaufman, 2005).

The average internal consistency coefficient for children 3 to 6 years of age was .95 for the MPI and .96 for the FCI. The Sequential coefficient was .91, Simultaneous was .92, Learning was .91 and Knowledge was .91 for children ages 3 to 6. The mean internal consistency value for the individual subtests was .84 for children ages 3 to 6. Values ranged from .69 for the Hand Movements subtest to .92 on the Rebus subtest for the younger children. Average test-retest coefficients showed stable results at .86 for children ages 3 to 5 years of age on the MPI. Average test-retest coefficients for the FCI were .90 for children ages 3 to 5. The Non-verbal index had an average coefficient of .90 for 3 to 6 year olds (Kaufman et al., 2005). Construct validity was supported by factor analysis studies and positive correlations with several measures of intelligence, supporting the convergent and discriminant validity of the measure (Kaufman et al., 2005).

The KBAC-II is frequently described as a “culturally fair” assessment of children from diverse backgrounds with small score differences between ethnic groups. Test items were designed to contain little cultural content to provide an accurate picture of the child’s abilities, even when administering the measure to a child with language difficulties or when cultural differences might affect test scores. Studies utilizing the original version of the KABC show varying results when comparing the differences in scores of African American, White and Latino children (del & Alvarez, 1990; Hernandez & Willson, 1992; Valencia, Rankin, & Livingston, 1995). However, it appears that the updated version of the measure may have corrected some of the test bias.

The authors conducted analysis using the standardization data of the KABC-II for the entire age range of 3 to 18 years, which included 1,861 European Americans, 545 Hispanics, 465 African Americans, 75 Asian Americans and 68 Native Americans. Mean MPI scores for African American, Hispanic and Native American children were closer to the normative mean scores, even before being adjusted for gender and SES. After the authors adjusted for SES and gender by ethnic groups, there was very little variation within the respective groups and between the various groups. The mean MPI was 101.7 for European Americans, 97.1 for Hispanics, 96.0 for African Americans, 103.4 for Asian Americans and 97.6 for Native Americans. When analyzing the scores of White and African American preschool children using the MPI model, there was a 3 points difference between their scores, suggesting the measure is a fair assessment of ethno cultural children (Kaufman et al., 2005).

Several studies including the KABC have been conducted including African American children (Campbell, Bell, & Keith, 2001; B. A. Dale, McIntosh, Rothlisberg, Ward, & Bradley, 2011). Overall, African American and White preschool children had similar patterns of results with no significant differences in their overall IQ scores. However, B.A. Dale, et al. (2011) noted that White preschoolers performed significantly higher on tasks of expressive vocabulary. An important study related to the cultural validity study of the KABC-II which included 46 Taos Pueblo Indians in New Mexico revealed that the children’s scores were commensurate with the national standardization sample (Fletcher -Janzen, 2014). Even the authors note that SES appeared to be a more relevant factor in test performance than race or ethnicity.

The KABC-II is frequently recommended for use with Latino children (Esquivel, Lopez, & Nahari, 2007; Flanagan & Harrison, 2012; Paniagua, 2010). The Spanish version that was previously available from Tea Ediciones has been discontinued. However, the subtests were initially designed to minimize verbal instructions and responses. In addition, children being administered the English version of the KABC-II can receive credit for Spanish language responses. It is important to note that although the KABC-II was developed with careful attention to cultural sensitivity; however, the manual indicates that the measure is not meant to be administered in Spanish (Kaufman et al., 2005). In addition, Spanish speaking children were not included in the standardization sample and Spanish norms are not available.

The KABC-II is frequently included as a measure when assessing the cognitive abilities of children autism spectrum disorder (Bearss, Johnson, Handen, Smith, & Scahill, 2013; Oppenheim, Koren-Karie, Dolev, & Yirmiya, 2012). The KABC-II may be effective for use with a child suspected of having autism spectrum disorder, since the subtests are very appealing to young children and can maintain their attention. Others have recommended the KABC-II, since unlike other measures of development and a cognitive skill, such as the WPPSI, the KABC is not stringently timed. This is beneficial since timing can have an adverse effect on children with autism spectrum disorder (McGonigle-Chalmers & McSweeney, 2013). The authors conducted special group validity studies with children 3 to 4 years of age with mental retardation, autism, emotional disturbance and hearing loss (Kaufman et al., 2005). The sample included 38 children who were diagnosed with autism and functioning from below average to the lower extremes in all domains. The global scores of the children were 68.6 on the NVI, 68.1 on the MPI and 66.9 on the FCI. It is important to note that although the Luria model is recommended for interpretation when administering the test to a child with autism, the FCI and MPI scores were similar in the sample. The lowest scores for the group were in the Knowledge subtests. The authors note that this may be due to the impaired language and communication skills inherent in children with autism as well as lower academic achievement (Kaufman et al., 2005). The highest scores were in the Learning scales, suggesting the children had the ability to learn new information over the course of the testing and they were also able to retain the information following a 20 minute delay. This suggests that the KABC-II provides an important assessment of learning ability that has not been previously measured by other cognitive tests (Kaufman et al., 2005).

Overall, there are many benefits when using the KABC-II with Latino children suspected of having autism spectrum disorder. Specifically, the measure allows the examiner to choose between two theoretical models when interpreting results. The clinician can choose use the CHC model for children from a mainstream culture and language background or the global score from the Luria neuropsychological theory which emphasizes the child's processing abilities and excludes measures of previous learning such as factual knowledge or vocabulary. This is the recommended model for children from a dual language background or children with autism spectrum disorder since crystallized intelligence would not be a fair indicator of the child's skills. The Luria model provides an overall cognitive estimate (MPI) which then provides composite scores for Sequential Processing, Simultaneous Processing, Learning Ability and Planning Ability. This approach provides scores that show little differences between ethnic groups (Kaufman et al., 2005). The examiner can also use the supplemental scores that are included in Kaufman et al. (2005) to assist in differentiating between ability and environment.

Although the KABC-II must be administered in English, the examiner can use whatever wording, including Spanish, for the sample and teaching items to ensure the child understands how to complete each task. The test allows credit for correct responses in Spanish and presents correct Spanish language responses on the record form. This provision in the standardization sample makes it possible for the examiner to overcome the child's initial failure to understand instructions and gives the Spanish speaking child as many opportunities to succeed as possible (Klin et al., 2005). This is especially important for those Latino children who may not be accustomed to the testing environment or the tasks presented. However, a study of low income children in India showed that the children's unfamiliarity with the KABC-II and the test situation affected the testing. The authors note that SES may have been more predictive of the children's scores as the children who were part of the Indian sample had few play materials at home and the children had limited experience with materials such as puzzles and geometrical figures (Malda, van, Srinivasan, Transler, & Sukumar, 2010). Unfortunately, a similar pattern has been demonstrated in other studies including Latino children whose parents report fewer books or literary materials in the home (Tabors, Roach, & Snow, 2001) or a less stimulating home environment (Mágnússon et al., 2009) which has been found to be related to cognitive skills. Scores on developmental tests are highly influenced by a child's cultural experiences and language functioning which is already of poor quality in the young child with autism spectrum disorder. Therefore, the value a culture or family places on certain activities can affect motivation and responses during testing and result in inaccurate results.

Another advantage to using the KABC-II is it provides a non-verbal option for children whose verbal skills are significantly limited. For children ages three to four, the subtests that are used to comprise the non-verbal scale include: hand movements (copy a sequence of taps on the table), triangles (assemble shapes to math a picture or model), conceptual thinking (identify a picture that does not belong) and face recognition (select the correct face from a group). The non-verbal index allows the examiner to test the child using only gestures to communicate instructions. This is especially appropriate for children suspected of having autism spectrum disorder and those Latino children with limited English skills. The non-verbal scales of the KABC-II seem particularly helpful in the assessment of Latino children suspected of having autism spectrum disorder; however, some of these tests require a motor response. This may interfere with testing since children with the disorder have been found to have impaired fine and gross motor skills (Matson, Mahan, Fodstad, Hess, & Neal, 2010). Further studies related to these confounding factors in motor development and the KABC-II would be useful.

Overall, the authors have attempted to create a non-verbal intelligence test that is not culturally biased. However, there are concerns when norm-referenced tests such as the KABC-II are employed with Latino children since development is tied to specific cultural experiences. In addition, although flexible testing procedures allow the examiner to administer teaching items in Spanish and the child can receive credit for Spanish language responses, the measure is not meant to be administered in Spanish and the Spanish language version of the test is currently not available. Further investigation of the KABC-II and how the instrument's norms translate to Latino children suspected of having autism spectrum disorder is necessary.

Leiter International Performance Scale-Revised (Leiter-R). The Leiter International Performance Scale-Revised (Leiter-R; Roid & Miller, 1997) is a completely non-verbal test of cognitive abilities. It was first developed in the 1930s and the Leiter-3 was released in 2013. However, the majority of studies utilize the Revised Edition. Therefore, the following review will focus on the revised version.

The Leiter-R can be used with individuals age 2 years to 20 years, 11 months. The test consists of 20 subtests in four domains; the Visualization and Reasoning domains (VR) for measuring IQ and the Attention and Memory (AM) domains. The VR battery measures traditional intelligence constructs such as non-verbal reasoning, visualization and problem solving. The AM battery was added to the revision to distinguish children with ADHD or other neuropsychological impairments from typical children. Two different sets of 6 subtests (one set for children ages 2-5) and a second set of for those between 6 to 20 years are used to obtain a full scale IQ score. The examiner can also calculate three different composite scores including the Fluid Reasoning Composite, which is for all ages; Fundamental Visualizations, for children 2 to 5; Spatial Visualization for 11 to 20 year olds. There are optional rating scales that can be used to gather observational information about the child from the examiner, the parent, the teacher or the person being tested (appropriate for individuals 9-20 years old). The rating scales provide information related to the child's activity level, attention, impulse control, and other emotional characteristics that may interact with test performance and functional performance at home and school.

The earlier version of the Leiter has discrepancies with respect to test psychometrics, but many of these issues have been largely rectified with the revised version (Leiter-R). The test used a stratified random sampling design based on the population survey of the 1993 U.S. Census. The sample included children ages 2 years to 20 years, 11 months. The VR Battery was standardized on 1,719 typical children and 632 children with disabilities such as severe speech or language impairment, hearing impairment, cognitive delay, learning disabilities, ADD/ADHD as well as children with limited English language skills. Tryout testing for the measure occurred in 1994 and standardization testing was conducted in 1995. The sample was representative in terms of geographic region, community size, socioeconomic status, gender, race, and ethnicity for both the tryout and standardization sample. The authors noted that Hispanic and African American individuals were oversampled for item tryouts so that there were almost equal sample sizes of White, Hispanic, and African American individuals in the groups.

Average reliability coefficients ranged from .75 to .90 for the VR across the age brackets with a median alpha value of .82. Reliability coefficients for the AM subtests ranged from .67 to .87 with a medium alpha of .83. The alphas for the AM special diagnostic scales ranged from .74 to .87. Test-retest reliability coefficients were based on a sample of 163 children for the VR battery and 45 children for the AM battery. However, the authors do not provide the length of the interval between testing. Most test-retest coefficients of the VR were in the .80s. The VR subtests were more reliable at the 11 to 20 year age group than at the other age groups. It is also important to note that the coefficients for the VR subtests were lower at the younger ages. The Leiter- R was found to correlate with other instruments including the Wechsler Intelligence Scale for Children- Third Edition (WISC-III) as well as selected subtests on the Stanford-Binet Intelligence Scale-Fourth Edition. Although the sample sizes were small and the correlations were low, they were still high enough to suggest that similar abilities are being measured.

Additional validity studies were conducted for children in the special groups. The median IQ for the typical children was 101 and the children with mental retardation had a median IQ of 58. The Leiter-R was able to accurately classify children with mental retardation with moderate sensitivity (.50 to .60). However, results suggest that the test was unable to correctly classify children with attention problems or children with learning disabilities since the sensitivity was between .40 and .67. The authors do not include a significant amount of information related to the development or use of the rating scales. The Examiner and Teacher Scales were noted to have excellent internal consistency reliability across the ages from the mid .80s to upper .90s. The Parent Scale has very good internal consistency with alphas in the mid .80s.

The Leiter was originally designed to be applicable across cultures. The measure was initially developed in 1929 to evaluate the intellectual abilities of Hawaiian children with verbal difficulties (Leiter, 1980). The test is recommended for use with culturally diverse groups (Paniagua, 2010) since it is believed to have limited cultural or language bias. In addition, the Leiter-R emphasizes fluid intelligence and excludes crystallized ability. Although norms for the different population segments are not provided in the examiners manual, psychometric studies including Native American, Latino and African-American groups, show the Leiter-R to be fair, regardless of the child's cultural, ethnic, or socio- economic background. Flemmer and Roid (1997) examined the non-verbal cognitive performance of adolescents from a variety of ethnic backgrounds. Studies at the subtest level yielded few significant differences between White and Latino samples and normative samples (Flemmer & Roid, 1997).

Although the Leiter-R has not been translated or adapted into Spanish, the Leiter-R was meant to assess the different domains of intelligence without being influenced by the subtleties of language. Several of the Leiter-R subtests are considered to be low in cultural and linguistic demand (K. S. McGrew & Flanagan, 1998). Therefore, the publisher recommends the Leiter-R for use with those who are non-English speaking or English-as-a-second language (ESL) populations. Special group studies using the Leiter-R with ESL children (Spanish $N = 73$ and Asian $N = 26$ or Other) found that these children scored within .33 standard deviations of the normative sample (Roid & Miller, 1997). The Leiter-R has been used in the assessment of Spanish speaking children (Flemmer & Roid, 1997) and bilingual children (Allman, 2005). In fact, Cathers-Schiffman and Thompson (2007) supported the validity of the Leiter-R with Spanish speaking students. The study found that use of the Leiter-R with Spanish speaking children reduced confounding intelligence assessment with English language ability.

Children with autism were not included in the standardization sample; however, the examiners manual provides mean scores for the special criterion groups including children with severe speech or language impairment and cognitive delay. The Leiter-R is often used to assess the intellectual functioning of children with autism spectrum disorder (Makkonen et al., 2011; Vrancic et al., 2002). In fact, Tsatsanis et al. (2003) recommends use of the Leiter-R with low functioning children who typically cannot be administered standard intelligence tests. Examination of the performance of children with autism spectrum disorder on the Leiter-R is consistent with other studies suggesting children with the disorder perform better on tasks measuring and visual spatial skills. Tsatsanis et al. (2003) found the children with autism in the study performed better on the Fundamental Visualization composite than on Fluid Reasoning. Kuschner, Kuschner, Bennetto and Yost (2007) studied preschool children with autism and also found the children displayed strengths in visual perception.

Overall, the Leiter-R is considered a non-verbal measure of intellectual functioning that requires minimal language demands in both its administration and responses. This is beneficial for children with low levels of linguistic skills such as the language deficits typically seen in young children with autism spectrum disorder (Klinger et al., 2009). The basis of each subtest of the VR battery is visual matching so that neither the examiner nor the child is required to speak and the child does not need to read or write. Items are presented through pointing, gesture, facial expression and pantomime and tasks are self-evident so that there is little need to interact with the examiner. The Leiter-R also is engaging and includes game-like tasks that are meant to keep the child engaged and holds the child’s interest. The structure of the Leiter-R is the same throughout testing. This minimizes set shifts or transitions that are often difficult for children with autism spectrum disorder. In addition, the child’s performance is untimed and all subtests begin with teaching trials. The teaching trials even allow the examiner to take the child's hand to demonstrate the task.

There are significant limitations when using the Leiter-R with young children. Although the Leiter-R was normed for children as young as two years of age, the floors of the composite scores are inadequate at the lowest age range (2 years through 2 years, 5 months). In addition, the test lacks adequate floors for children ages 2-6 years with disabilities. This may be related to the difficulty level of some tasks for young children (Vig & Sanders, 2007) since many test items are complex and require a high degree of abstract conceptualization. This can be even more problematic when using the Leiter-R with young children suspected of having autism spectrum disorder who may not understand task directions and may not even be able to complete enough items to obtain a valid score (Klinger et al., 2009). There are also difficulties to the communication of the directions completely through pantomime. Instructions that are provided using gestures or facial expressions may be challenging for children with autism spectrum disorder who often have difficulty with joint attention, minimal eye contact, and restricted non-verbal communication. For example, Tsatsanis et al. (2003) had problems administering the Leiter-R according to the instruction manual since children with autism inherently struggle to understand social stimuli. The authors developed a set of verbal cues for orienting the children to the task. Brief words and phrases such as "touch", "point" or "look" were designed to be a direct translation of the permissible gestures and hand over hand was also used. The Leiter-R also requires a significant amount of motoric skills, such as pointing, manipulating foam shapes or placing a stimulus card in an easel slot. This this may be challenging for those children who lack the degree of motoric ability to complete these tasks (Klin et al., 2005) and result in inaccurate results. In fact, Tsatsanis et al. (Tsatsanis et al., 2003), noted that some children with autism spectrum disorder in their study had difficulty with the pointing response. Even the developers of the Leiter-R caution against using the instrument in isolation when diagnosing a child.

Studies utilizing the Leiter-R that include Latino children suspected of having autism spectrum disorder are limited. However, the Leiter-R has been used in a study of children with autism in Spain (Calahorro et al., 2009) as well as a genetic study of autism in Costa Rica (McInnes et al., 2005). Unfortunately, the authors found that 83% of the children in the study in Costa Rica were diagnosed with intellectual disability, compared to other epidemiological studies that estimate that 75% of individuals with autism have IQ's less than or equal to 70 (Fombonne, 2003). In addition, the rate of intellectual disability in children with ADHD was also noted to be significantly higher than cases of ADHD in North America (McInnes et al., 2005). The authors suggest that this was due to the use of psychometric instruments such as the Leiter without Costa Rican norms. This is even more significant when using the Leiter-R to determine autism spectrum disorder diagnosis as clinicians may be more likely to diagnose the disorder in a White child and intellectual disability in a Latino child (Mandell et al., 2009).

Although the Leiter-R focuses on fluid abilities that are less dependent on familiarity to culture than crystallized intelligence, the authors caution against using the test with children who are not familiar with testing. In addition, although the developers of the Leiter-R, report that the measure is not significantly influenced by the level or quality of the child's education, social or family experience, the Leiter-R still requires prior experience with visual formation or problem solving strategies, which can affect performance. Overall, scores on non-verbal tests such as the Leiter-R are influenced in some way by culture and can never be truly eliminated. The psychometric properties of the Leiter-R are currently considered inadequate and outdated. In addition, some of the validity and reliability analyses were conducted with test scores from tests administered in the 1995 standardization administration while others were based on tests from the tryout and standardization administrations. There is limited information related to the Leiter-R rating scales, therefore it is recommended that another measure of development and cognitive skills be used. Further examination of the recently released Leiter-3 may address some of the limitations of the Leiter-R.

Merrill-Palmer- Revised Scales of Development (M-P-R). The Merrill-Palmer-Revised (M-P-R; Roid & Sampers, 2004) assesses the cognitive, social, emotional, self-help, and fine and gross motor development in infants and children. The test can be used with children from one month to 6 years, months of age. The M-P-R consists of four parent reports and two examiner reports. Parent or caregivers provide responses related to Expressive Language, Social-Emotional Development, Social-Emotional Temperament, and Self-Help/ Adaptive skills. The examiner report includes Expressive Language, a Cognitive Battery and Gross Motor Skills. The Cognitive Battery measures cognitive functioning, receptive language skills, and fine-motor areas. It also provides supplemental scores for memory, speed of cognition, and visual-motor ability. The Gross-Motor Scale consists of general gross-motor development, unusual movements, and atypical movement patterns. The Cognitive Battery can be completed in 30 to 40 minutes (Loew & Spenciner, 2007).

The M-P-R was developed over a six year period and included a pilot test, a national field test and a national norming of the standardized edition. Data was collected on 1,068 children from 1 month to 6 years, 6 months of age between 1998 and 2000. The sample also included 250 “atypical” children. The sample was stratified according to race, ethnicity, geographic region and SES and is representative of the 2000 Census. Overall internal consistency estimates range from .70 to .98. Internal consistency for the Cognitive Battery scales and all of the Gross Motor Scales exceeded .90. Reliability coefficients for the memory and speed scales were lower (.70 to mid .80s). Test retest reliability coefficients for the Cognitive Battery ranged from .84 to .90 after a three week interval. However, these estimates did not include the Expressive Language assessment. The Developmental Index of the M-P-R was correlated to the Bayley Scales of Infant Development (.92) (Bayley, 1993) and the Leiter-R- .97 (Loew & Spenciner, 2007; Roid & Miller, 1997).

Directions for the examiner are available in both English and Spanish. In addition, three of the parent reports (Social-Emotional Developmental Scale, Temperament Scale, and the Self-Help/Adaptive Scale) are available in Spanish. Since the Expressive Language Scale measures English usage, it is not available in Spanish. To develop the Spanish test instructions, an expert in test translation developed the initial set of examiner prompts to ensure the instructions would produce the same meaning rather than the literal translation. This was then reviewed by psychologists, school psychologists and educators representing different regional variations in Spanish language usage (Loew & Spenciner, 2007).

The test was created to be a fair assessment of children with cultural and linguistic differences; however research related to its' validity with Latino children is limited. Floyd, Gathercoal and Roid (2004) assessed the cultural validity of the tryout version of M-P-R using the archival data of 245 African American, White and Hispanic children, 3 to 6 years of age. Children were included from all over the U.S. The study found little item bias associated with ethnicity using the tryout version. In addition, the publisher recommends the test for the assessment of general cognitive developmental in English and Spanish speaking children. However, the reliability of the Spanish parent reports of the M-P-R is not supported. A Spanish adaptation is available from Tea Ediciones (Sánchez, Santa - María, Fernández-Pinto, & Arribas

Águila, 2004); however, the Spanish version was normed on children in various regions of Spain and its' use is limited in the U.S.

The M-P-R is frequently used to assess the developmental functioning of children with autism spectrum disorder due to its' wide developmental range and evidence of reliability and validity (Gabriels et al., 2001; Magiati & Howlin, 2001; I. M. Smith et al., 2010). The publisher recommends the test for the identification of developmental delays and the M-P-R has been used to assess the cognitive skills of children with autism (Sallows & Graupner, 2005; Virues-Ortega, Julio, & Pastor-Barriuso, 2013; Volden et al., 2011). The M-P-R has also been found to correlate with the other measures used in the assessment of autism spectrum disorder such as the PEP-3 (Fulton & D'Entremont, 2013) and has been used to develop other measures such as the PL-ADOS (DiLavore et al., 1995).

There are many advantages to using the M-P-R with children with autism spectrum disorder. The M-P-R can be used with young children with low cognitive functioning due to its' adequate floor. This is especially significant since the early identification of autism spectrum disorder in children less than 3 years of age is becoming essential. Some reports noted concerns when using the M-P-R with young children due to the choking hazard (Loew & Spenciner, 2007). However, the publisher's website notes that the test uses "colorful choke safe materials" (Stoelting, 2014). The test includes hands-on activities that can be beneficial when engaging young children. The authors of the test note that the M-P-R requires little or no verbal understanding as most of the tasks are self-evident. The developers of the test also considered special populations and provide recommendations for adapting test methods for children with limited expressive language, such as excluding certain language items as refusals or omissions.

In addition, the manual includes a section regarding procedures when administering the test to very young children, such as timing, pace, stop rules and establishing rapport.

Although a Spanish language version of the parent report is available, it may still provide inaccurate results for those parents who speak primarily Spanish, have a low reading level, or who have limited educational attainment. In addition, it may seem overwhelming for parents to complete four different forms related to their child’s functioning. More importantly, there is little information related to the validity of the Spanish language parent reports. The authors do not provide appropriate normative information for the Spanish caregiver forms. Although the method used to translate the M-P-R into Spanish is detailed in the manual, the questions, procedures and coding were developed for mainstream English speaking children and may not be appropriate with another group. It is unclear whether variables such as differences in parent-infant interaction were considered when adapting the test. Overall, the M-P-R is only recommended for use with children from English speaking families (M. E. Williams et al., 2014) and further research related to the efficacy of the Spanish translation is warranted.

Mullen Scales of Early Learning: AGS Edition (MSEL). The Mullen Scales of Early Learning: AGS Edition (MSEL; Mullen, 1995) measures cognitive functioning in children from birth through 68 months of age. The MSEL is a revised version of the original Mullen Scales of Early Learning, combining the Infant MSEL and the Preschool MSEL. The MSEL assesses 5 domains of functioning including expressive language, receptive language, visual reception, fine motor, and gross motor. The Gross Motor Scale is used for children birth through 33 months and the Cognitive Scale is used for children birth through 68 months. In addition, an Early Learning Composite standard score is calculated based on the four cognitive scales. The MSEL can be complete in approximately 15 to 60 minutes depending on the age of the child, with older children requiring more time.

The MSEL was developed over a period of 8 years and include a normative sample of 1,849 children between the ages of 2 days and 69 months. Children in the normative sample were 51.3 % male and 48.7 % female. The sample was representative of the 1990 U.S. Census and was stratified according to SES, geographic region and community size. The standardization sample did not include children with exposure to a language other than English. Internal consistency coefficients for the scales had median values ranging from .75 to .83. The composite mean was .91. Test-retest reliability was measured with two age groups (1-24 months and 25-56 months). Stability coefficients in the youngest groups ranged from .82 on the Fine Motor Scale to .96 for the Gross Motor Scale. In the older groups coefficients ranged from .71 for the Expressive Language Scale to .79 for the Fine Motor Scale. The MSEL was found to have moderate correlations with the Bayley Scales of Infant Development, Mental Development Index and Early Learning Composite (.70) as well as the four cognitive scales (.53-.59). The Gross Motor Scale correlated with the Bayley's Psychomotor Development Index (.76).

Although the Mullen is one of the most widely used instruments to assess the development of young children, there are significant shortfalls in the normative sample of the MSEL. Data for the MSEL was collected between 1981 and 1989. Although the demographics are similar to the 1990 U.S. Census, there are significant differences in the geographic distributions from the U.S. population in general and the data is considered outdated. In addition, the results were based on studies completed with previous versions of the Mullen and samples were small or had inadequate representation of older children (Bradley-Johnson, 2001). Ceiling effects were found on the Visual Reception Scale and floor and ceiling effects on the Receptive

Language Scale. In addition, the test–retest reliability coefficients were below .80 for children 25 to 56 months. There are also few independent studies to support the predictive, concurrent, or construct validity of the MSEL (Bradley-Johnson, 2001). For example, the validity of the MSEL scores compared to other tests of cognitive ability has not been thoroughly assessed. Therefore, it is not clear whether the MSEL yields similar results.

The MSEL is frequently used as a measure of cognitive skills in children with autism spectrum disorder (Baker et al., 2010; Chawarska et al., 2007; Hartley & Sikora, 2009; C. R. Johnson, Handen, Zimmer, & Sacco, 2010; Lord et al., 2006; Werner et al., 2005; Zwaigenbaum et al., 2007). Overall, studies show that children with autism spectrum disorder are delayed in all areas and have lower standard scores across all each of the scales of the MSEL (Akshoomoff, 2006; Landa & Garrett-Mayer, 2006). Children with the disorder have been found to display higher Visual Reception scores than Receptive Language scores (Landa & Garrett-Mayer, 2006). Children with autism also perform better on the Fine Motor Scale and exhibit lower scores on the Receptive Language scale (Akshoomoff, 2006).

The MSEL is often recommended for use with young children with autism spectrum disorder since most children would not meet the basal requirements on preschool assessment instruments. An advantage to using the instrument is that the different scales of the MSEL address all areas that are typically deficient in young children with autism spectrum disorder. The Visual Receptive Scale focuses on non-verbal visual discrimination, categorization, and visual memory skills. The Fine motor scale measures visual and motor planning and control including unilateral and bilateral manipulation of objects and writing readiness. The Receptive language scale focuses on the child's auditory comprehension and memory, such as responsiveness to sounds, and following simple adult instructions with and without prompting.

This is especially important in the assessment of autism spectrum disorder since this scale assesses the child's overall response to speech and non- speech sounds, response to name, as well as the overall understanding of communication. The Expressive language scale focuses on the child's ability to spontaneously produce vocalizations and words, while older children must name pictures and repeat numbers and phrases as well as answer vocabulary and practical reasoning questions. The MSEL separates the assessment of fine and gross motor skills as well as visual perceptual abilities from tasks measuring expressive and receptive language skills. This is extremely beneficial for the assessment of children with autism spectrum disorder due to the scatter that is often present in their performance. In addition, the MSEL can provide an estimate of the child's non-verbal ability, since children with autism who have greater non-verbal delays are less likely to develop functional language at age 5 (Akshoomoff, 2006).

Although the authors note that the MSEL is able to correctly distinguish between children with developmental delays and typically developing children, separate norms for children with special needs are not provided. In addition, children with physical disability or cognitive delay were excluded from the special group studies. There are many tasks that are required as part of the MSEL that can influence performance on the measure. Akshoomoff (2006) found that poor cooperation, problems attending to tasks, and low behavioral regulation that are commonly seen in children with autism spectrum disorder can influence performance on the Receptive Language Scale or the Visual Reception Scale, specifically those tasks which require imitation (stacking blocks or sorting items that match) and pointing to two items that match. Klinger et al. (2009) also suggests that young children may have difficulty with tasks on the MSEL that involve reciprocal social games such as peek-a-boo, using the index finger to point to objects, imitating the examiner's actions or using the pronouns "I" and "you" during testing. Although these skills are usually impaired in children with autism spectrum disorder, the MSEL may not be an appropriate measure of the child's ability if a significant amount of time is spent in off task behaviors or if the child is not engaged in the assessment (Akshoomoff, 2006).

Although the Mullen Scales have been used to assess children with autism spectrum disorder, including Latino children with Spanish speaking parents (Wetherby et al., 2004), it has not been translated into any language other than English. Diverse cultures were not taken into account when developing the measure and studies have found test bias in the MSEL related to lower language scores on the language and communication domains of the MSEL. Even the publisher indicates that the Mullen has a "heavy English language basis" (Stoelting Inc., 2010). However, it is important to note that the MSEL is one of the few measures reviewed in this dissertation that has been used in the assessment of bilingual Latino children with autism spectrum disorder (Ohashi et al., 2012; Petersen et al., 2012; Tek & Landa, 2012). Nevertheless, there are few published studies regarding its' validity with this population. One notable study examined the MSEL results of Latino children with autism (Chaidez et al., 2012). The authors conducted ethnic comparisons of cognitive scores and found that two out of four MSEL scales were very dependent on language abilities. The authors acknowledge that this is most likely related to multi-language use in the home, maternal education and even ethnicity. Unfortunately, the lower language subscale scores impacted the MSEL composite score, which suggested lower cognitive status in the Latino children. The varying skills of bilingual children may not be accurately reflected in scores on the MSEL which puts these children at risk for misclassification.

When using the MSEL with Latino children it is also important to consider the ethnic differences in modes of early communication that can impact scores. For example, Tamis-

LeMonda, Song, Leavell, Kahana-Kalman and Yoshikawa (2012) translated and back-translated the MSEL to assess Mexican, Dominican and African American mother- infant pairs and their gestural and verbal interactions. The authors found that the mothers of the three ethnicities differed in their gesturing and combination of language and gestures. In addition, the mother's ethnicity, language, and gestures were differently associated with the infant's two year skills. This is especially significant since children with autism spectrum disorder have difficulty with communicative gestures. However, it may be difficult to distinguish between the social communicative impairment inherent in children with autism spectrum disorder and differences in parent child communication related to ethnicity. Variations in parent report of a child's development due to ethnic differences can also influence scores on the MSEL. One study using the MSEL examined differences in autism in minority and non-minority children (Tek & Landa, 2012). Although all of the children in the study were from upper-middle and upper class families the minority children with autism had more delayed language scores on both the examiner administered and the parent-completed measures (Tek & Landa, 2012). The authors note that this may have been influenced by cultural differences in views of development. Tamis-LeMonda et al. (2012) also found differences in scores relative to parent report in the Mexican, Dominican and African American families in their study. The parent's report was not always reflective of how the infants performed on the tests that were administered. In fact, the infants were delayed on most measures, including the MSEL. This is especially significant since studies suggest later expectations of development and social and language milestones by Latino families (Dworkin & Pachter, 1997; M. T. Stein et al., 2004). The subtle communication delays that are integral in the assessment of children with autism spectrum disorder may go undetected or presumed to be unremarkable in the parents of Latino toddlers (Tek & Landa, 2012) when using the MSEL, resulting in inaccurate or delayed diagnosis.

Instruments to Assess Adaptive Behavior

Adaptive functioning refers to the child's typical ability in a familiar environment such as the home. Evidence of significant deficits in adaptive functioning is needed to assign a diagnosis of intellectual disability which is an element of the autism spectrum disorder diagnosis (American Psychiatric Association, 2013). Children with autism frequently display a discrepancy between intellectual level and the ability to translate these skills into real world functioning (Kanne et al., 2011) . In addition, the level of severity of the diagnosis of intellectual disability is defined on the basis of adaptive functioning (American Psychiatric Association, 2013). Instruments that have been recommended for use as part of a comprehensive diagnostic evaluation and are frequently used with Latinos or are available in Spanish are reviewed below.

Adaptive Behavior Assessment System, 2nd Edition (ABAS-II). The Second Edition of the Adaptive Behavior Assessment System (ABAS-II; Harrison & Oakland, 2003a) provides the comprehensive assessment of adaptive skills in individuals birth to 89 years of age. The ABAS-II assesses three general areas of adaptive behavior (Conceptual Domain, Social Domain and Practical Domain). These domains are then divided into 10 different skill areas according to the DSM-IV (American Psychiatric Association, 2000). The Conceptual Domain assesses Communication, Functional Academics and Self-Direction skills. The Social Domain includes Social and Leisure skill areas and the Practical Domain assesses Self-Care, Home or School Living, Community Use, Health and Safety. The Motor Skills area replaces the Work Skill area on the infant-preschool form. The sum of the scaled scores for each skill area is used to calculate a General Adaptive Composite (GAC).

The ABAS–II has five rating forms that can be completed by those who are familiar with the daily activities of the child. The Parent/Primary Caregiver Form is a diagnostic measure of the adaptive skills of an infant, toddler or preschooler. It is appropriate for children ages birth to 5 years old and includes 241 items. The Teacher/Daycare Provider Form is used for children 2 to 5 years of age and includes 216 items. Each form can be completed in 15 to 20 minutes. Respondents provide information about an individual's adaptive skills across a variety of settings. The frequency of the skills are rated using a four-point rubric of "not able", "never", "sometimes" and "always". Respondents can also indicate whether they have "guessed" on an item and provide additional information regarding the child's ability. There are no basals or ceilings and all items must be answered to obtain a score.

The normative data for young children age birth through 5 years is based on 750 teacher/daycare provider ratings and 1,350 parent ratings (Richardson & Burns, 2005). The sample was representative of the 1999 U.S. Census and was stratified according to gender, race, ethnicity and parent educational level. The ABAS-II contains data for special samples of children with disabilities including intellectual disability and developmental delay. The number of children with diagnosed disabilities in the normative sample of the Teacher/Daycare Provider Form was 2.93 %. Although the authors note that this was meant to be representative of the general population, the estimates are somewhat low compared to estimates of total school population with disabilities (Burns & Meikamp, 2012).

Internal consistency coefficients for the General Adaptive Composite (GAC) and the domain scores were near or above .90, except for children less than 1 year old. Internal consistency for most skill areas was .90 or higher. Test-retest coefficients for the GAC were also near or above .90 for all versions of the ABAS-II. Inter-rater reliability estimates are lower, but overall exceeded .80 and cross informant coefficients generally exceeded .70. The ABAS-II was also found to correlate to other measures of adaptive behavior such as the Vineland Adaptive Behavior Composite-.70 (Burns & Meikamp, 2012; Richardson & Burns, 2005). The authors note one of the advantages to using the ABAS-II is that it has a proportionate number of Hispanics included in the standardizations sample (Harrison & Oakland, 2003b). However, the effects of race were observed in the standardization sample, with White children scoring higher than Latino children (Harrison & Oakland, 2003a). Few published studies exist which examine the effects of ethnicity, language or parent education level on the ABAS-II.

Adaptive Behavior Assessment System, Second Edition (ABAS-II) Spanish Forms. The Parent/Caregiver Form and Teacher/Daycare Provider forms are available in Spanish from Western Psychological Services (Montero & Fernandez-Pinto, 2013). However, it is important to note that the Spanish adaptation was normed in Spain and as of this writing no published studies exist to confirm its' use with Latinos in the U.S. The manual indicates that the forms were written at a fifth grade reading level; however some items included on the ABAS-II parent rating for preschool children were noted to be from the end of third grade reading level (3.7) to the end of seventh grade- 7.9 (Richardson & Burns, 2005).

The ABAS-II does not contain separate norms for children with autism spectrum disorder; however, children with autism were included in the standardization sample for the Teacher/Daycare provider and Parent/Caregiver forms. The standardization sample included 20 clinical samples for autism; however the number of toddlers and preschool children with autism in the sample was small (Harrison & Oakland, 2003a) and the individuals in the sample were not randomly selected, therefore specific norms for children with autism spectrum disorder are not available. The manual does include special clinical validity studies of children with autism using the ABAS-II. Compared to a normal control group, children with autism, ages 3 years to 5 years, were significantly lower on seven of the eight ABAS-II adaptive skill areas including communication, school and home living, health and safety, leisure, self-care, and motor skills. The children with autism also displayed lower scores on the conceptual, social and practical composites and the GAC (Harrison & Oakland, 2003b). Research of children with autism using the ABAS-II is similar to those deficits observed on other measures of adaptive behavior. Overall, children with autism show lower general adaptive composites as well as specific deficits in social skills (Kenworthy, Case, Harms, Martin, & Wallace, 2010; Milne, McDonald, & Comino, 2013). Preschoolers with autism were found to have significantly lower GAC scores than controls. The mean GAC for the preschoolers with autism was 54, which was significantly lower than the mean of 101 for the matched control group (Harrison & Oakland, 2003a). The preschooler's greatest deficits were in communication, health and safety, leisure and social skills (Harrison & Oakland, 2003b). The ABAS-II is very useful as part of a comprehensive assessment since it measures many of the core deficits typically seen in young children with autism spectrum disorder. For example, the Infant/Preschool form includes: "speaks in sentences of six or more words" (Communication Domain); "asks to go to the park or favorite place" (Community Use); "turns TV on and off" (Home/School Living); "Shows interest in mobiles or other moving toys" (Leisure); "refrains from putting dirt or and in mouth" (Health & Safety) "resists pushing or hitting another child when angry or upset" (Self Direction); "smiles when he/she sees a parent" (Social); "shakes rattle or toy"- Motor (Harrison & Oakland, 2003a).

Sensitivity to cultural context is a critical part of the assessment of adaptive behavior. There is inherent cultural bias in several items that are part of the ABAS-II, such as "sings the alphabet song" or "recites nursery rhymes from memory." Child rearing practices vary and this can impact learning and the assessment of adaptive behavior when using the ABAS-II. For example, the ABAS-II measures whether the child is able to drink or eat independently. Some Latino families provide baby bottles to children up to age 8 to prevent spilling liquids on clothing outside of the house (Gannotti & Cruz, 2001; Zuniga, 1992). Other Latino children may not be feeding themselves if they are fed by an adult. Many 2 year old Puerto Rican children continue to be spoon fed by their mothers due to the belief that this care is part of being a good parent (Dworkin & Pachter, 1997). Since the ABAS-II is a relatively new instrument few published studies exist that include the measure. Further research utilizing the Spanish forms is necessary. However, adaptive behavior should be always be interpreted with caution when considering ethnic differences and family expectations.

Scales of Independent Behavior-Revised (SIB-R). The Scales of Independent Behavior, Revised (SIB-R; Bruininks, Woodcock, Weatherman, & Hill, 1996) is a revision of an earlier version (Bruininks et al., 1984). The SIB-R is comprehensive measure of adaptive and maladaptive behaviors for individuals 3 months to 80 years of age. The SIB-R consists of three separate forms: the Early Development Form for children 3 months to 8 years old; the Comprehensive Form for individuals 3 months to 80 years of age; and a Short Form. The Developmental and the Short Form contain a subset of 40 items from the Comprehensive Form. The SIB-R can be completed by the respondent or it can be administered via a structured interview.

The instrument yields standard scores for the Broad Independence Score, which is a measure of overall adaptive behavior or functional independence, and four domain scores (Motor Skills, Social and Communication Skills, Personal Living Skills, and Community Living Skills). The SIB-R contains 14 subscales distributed into these four areas. Each subscale has items ordered in ascending level of developmental difficulty and the items are rated on a four-point Likert scale with ratings of “0” (rarely or never performs), “1” (performs about 25% of the time), “2” (does fairly well or about 75% of the time), and “3” (does very well without being asked almost all the time). The full scale form takes less than an hour to administer. The SIB-R also contains eight problem behavior areas. Domains of problem behavior include Internalized Maladaptive Behavior, Asocial Maladaptive Behavior, and Externalized Maladaptive Behavior. In the SIB-R, scores are categorized as pervasive (reflecting developmental performance up to an 8-month level), extensive (reflecting developmental performance between a 9- and 12-month level), frequent (reflecting developmental performance between a 13- and 18- month level), limited (reflecting developmental performance between a 19- and 27-month level), intermittent (reflecting developmental performance between a 28- and 40-month level), and infrequent (reflecting developmental performance between a 41- and 71-month level).

Normative data to develop the SIB-R were collected from 2,182 individuals from 15 states and more than 60 communities through the U.S. The group ranged in age from 3 months to 90 years. The standardization sample was chosen to represent the 1990 U.S. census data and was stratified on the basis of gender, race, Hispanic origin, occupational status, geographic region, and type of community. Although the sample was noted to correspond to 1990 U.S. census data, the Midwest region was overrepresented in the sample. In addition, the sample contains more preschool and school-age children than adults. For adaptive behavior, median split half reliabilities ranged from .88 to .98 for the cluster scores and the full scale scores. The median split half reliability coefficients for the individual subscales ranged from .70 to .88. Test re-test reliability coefficients range from .83 to .96 across the different subscales. Convergent validity of the SIB-R was supported by good correlation between the SIB-R and the VABS Adaptive

Behavior Composite (Middleton, Keene, & Brown, 1990). Data were also collected on samples of children with intellectual disability and blind individuals during the development and standardization of the SIB-R. A few studies of children with autism spectrum disorder have utilized the SIB-R (Lecavalier, 2006; Lecavalier, Leone, & Wiltz, 2006; L. E. Smith, Greenberg, Seltzer, & Hong, 2008). In addition, the SIB-R has been recommended for use with preschool children with autism (Msall, 2005).

A Spanish version of the SIB-R is currently not available; however the measure is sometimes used with Spanish speaking Latino families. In fact, Blacher and McIntyre (2006) used the SIB-R with Latino families from East Los Angeles who had a child with autism. Although 73 % of the Latina mothers in the sample spoke Spanish and the SIB-R was administered verbally, the study does not indicate how the SIB-R was translated or adapted for the Spanish speaking families. Another notable study used the SIB-R with Latina mothers of a child with intellectual disability (Eisenhower & Blacher, 2006). The authors note that all materials, including the SIB-R were available in Spanish or translated, back translated and piloted prior to inclusion in the study. Blacher and Baker (2007) also used the SIB-R in a study that included Latino families of a child with intellectual disability. However, neither of these studies addressed limitations when using the measure with this population.

The SIB-R is one of the few instruments that specifically lists Hispanic origin in its' standardization review. However, the cultural validity of the measure has not been examined. Adaptive responses may vary considering some Latino parents have later expectations of developmental performance than White parents, on several developmental milestones that are included as part of the SIB-R, such as being fed from a spoon, feeding self with a spoon, smiling, recognizing mother, putting on shoes, and naming colors (Dworkin & Pachter, 1997). For example, a child scoring in what is considered to be the “limited range” is able to ambulate, feed himself or herself, use a spoon and cup, point, consistently indicate yes or no to basic need questions, and is able to say 10 words. A child who scores in the “intermittent range” on the SIB-R, is able to ask questions, negotiate stairs, and is toilet-trained with supervision. In addition, a child at 50 months is able to put on clothes such as gloves, get suitable portions of food, follow simple two step- directions, and say his or her last name. These distinctions of adaptive abilities may not be suitable for some Latino children, since parents from diverse cultures may not value these independent living skills in their young child (D. Zhang, Landmark, Grenwelge, & Montoya, 2010). Overall, some items on the SIB-R may be culturally dependent and further examination and use of the SIB-R with Latino children suspected of having autism spectrum disorder is warranted.

Vineland Adaptive Behavior Scales, Second Edition (VABS-II). The Vineland Adaptive Behavior Scales, Second Edition (VABS-II; Sparrow et al., 2005) is one of the most frequently used measures of adaptive behaviors (Chawarska & Bearss, 2008). It is based on the first edition of the Vineland Adaptive Behavior Scales (Sparrow et al., 1984), which is also a very well-known instrument. The VABS-II assesses the capacity for adaptive functioning of children and adults age birth to 90 years of age. The measure instrument consists of four broad domains including Communication (expressive, receptive, and written language), Daily Living skills (personal, domestic and community living skills), the Socialization domain (interpersonal relationships, play and leisure time and coping skills), Motor skills (fine and gross motor) and an optional Maladaptive Behavior Index (internalizing, externalizing and other). The Motor Skills domain is appropriate for children 6 years of age and under. All of the composite scores are summed together to make up the Adaptive Behavior Composite Score.

The VBAS-II contains four forms including the Survey Interview Form, Parent/Caregiver Rating Form, Expanded Interview Form and Teacher Rating Form (children and adults ages 3 years to 21 years, 11 months of age). The Survey and Expanded Forms are administered by the clinician in the form of a semi-structured interview while the Parent/Caregiver and Teacher Rating Forms are questionnaires that address the child's behavior in the home or school. The Survey Interview and Parent/Caregiver rating forms can be completed in 20 to 60 minutes. The expanded interview form can be conducted in approximately 25 to 90 minutes, while the teacher rating form can be completed in approximately 20 minutes. The Parent/Caregiver rating form includes the same content as the Survey Interview; however it uses a rating scale form and is a good option when time is limited. The Expanded Interview is an in depth interview with more items. The Teacher Rating form assesses the behavior of children in preschool, school or in a structured day setting and can be completed by a teacher or day care provider. This form includes the same domains as the Survey forms but covers content that a teacher in a classroom setting would observe.

A nationally representative sample of 3,695 individuals from birth through age 90 years of age provided normative data. Data was collected across 242 sites and 44 states and was stratified across 20 age bands by race and ethnicity, child sex, community size, geographic region, and SES. Normative data was based on 2001 U.S. Census data. The developers of the VBAS-II evaluated measurement bias using differential items functioning, at the item and scale levels and found small differences among sex, SES and ethnic groups (Sparrow et al., 2005). Several clinical groups were included in the validation sample including ADHD, verbal and non-verbal individuals with autism, emotional or behavioral disturbance, hard of hearing, learning disability, mental retardation and visual impairment. The VBAS-II also provides supplementary norms specific to autism and the other clinical groups (Carter et al., 1998; Sparrow et al., 2005). The VBAS-II profiles for children with autism were based on sample of 77 individuals with autism. The individuals ranged in age from 3 to 18 years and the majority was male. It is also important to note that the sample was predominantly White and over 68 % of the mother's had at least some college education (Sparrow et al., 2005).

Reliability coefficient alphas for the Adaptive Behavior Composite on the forms are in the mid to high .90s. The internal consistency reliability for the domain scores ranged from .84 to .93 on the Survey and Parent Forms. The internal consistency for the subdomains is lower than for the broad domains. Test-retest reliability coefficients for the Composite scores ranged from .83 to .94. One exception was the Expanded Form for children ages birth to 2 years (fair reliability; .70s), where rapid developmental changes are most likely to occur over shorter periods of time. Inter-rater reliability coefficients range from .62 to .78. Weak inter-rater reliability was noted on the Teacher and Maladaptive Behavior Index of the Survey Forms. This is most likely related to varying expectations and observations of a child that are based on personal experience (S. Stein & Windaman, 2012). The VABS-II has been found to correlate to other measures including the Bayley Mental Index and the Mullen Scales of Early Learning, expressive and receptive language areas (Akshoomoff, 2006).

The survey interview, parent rating forms and expanded interview of the VABS-II are all available in Spanish. The authors also note that the measure can be administered in any language by a bilingual interviewer since the semi-structured interview utilizes questions and probes in the examiner's own words. However, it is important to note that the Spanish version is a direct translation of the English edition with no changes to items or tasks. In addition, separate norms are not available for the Spanish forms. The VBAS-II is one of the most frequently measures to assess the adaptive behaviors of bilingual and/or Spanish speaking children (Ochoa, Powell, & Robles-Piña, 1996). Although the publisher indicates that the measure is suitable for individuals from “diverse cultural backgrounds” (Pearson Education, 2014) studies of Latino families using the Spanish language version are inadequate. The Vineland scales were used in a notable study of children with autism in Costa Rica. However, the authors note that multiple variables impacting scores, including scoring bias may be present when using foreign norms (McInnes et al., 2005). The VBAS-II is often used in research with Latino English speaking children and their families (Wetherby et al., 2004); however, sample sizes are often small and cultural limitations to the measure are often absent.

The VABS-II is the most commonly used measure to assess adaptive functioning and is often recommend due to its’ utility when diagnosing autism spectrum disorder in infants and toddlers (Klin et al., 2005; Luiselli et al., 2001; Paul, 2014). Due to the rapid developmental changes that occur during infancy, a relatively higher number of the normative sample was clustered at birth through age 5. This increases the scales validity and reliability with this population, making it a particularly useful part of the assessment of young children suspected of having autism spectrum disorder. There is significant research including the VBAS-II with young children with autism (Akshoomoff, 2006; Dawson, Meltzoff, Osterling, & Rinaldi, 1998; Howard, Sparkman, Cohen, Green, & Stanislaw, 2005; Klin et al., 2005; Ozonoff et al., 2005; Tsatsanis et al., 2003). The VABS has been used to develop and validate other measures of autism spectrum disorder (DiLavore et al., 1995; Villa et al., 2010). In addition, the VBAS-II is frequently used with the ADOS (Lord et al., 1999) and the ADI-R (Le Couteur et al., 2003), which has been shown to increase the accuracy when classifying children (Tomanik, Pearson, Loveland, Lane, & Shaw, 2007).

Overall, children with autism spectrum disorder show a specific profile on the VBAS-II compared to their same age peers. Young children with autism display deficits in the Socialization Domain, particularly on the Interpersonal Relationships subscale, low scores on the Expressive subscale of the Communication Domain and overall strengths in daily living skills and motor skills (Boelte & Poustka, 2002; Carpentieri & Morgan, 1994; Carter et al., 1998; Gillham, Carter, Volkmar, & Sparrow, 2000; Kanne et al., 2011; Paul, 2005; Perry, Flanagan, Geier, & Freeman, 2009; Ventola, Saulnier, Steinberg, Chawarska, & Klin, 2014). It is believed that children with autism exhibit lower scores in the Communication domain than on other measures of language because this domain on the VABS-II measures the child's ability to use language to meet the communicative demands in real life. In addition, a recent study using the VBAS-II found an adaptive deficit in the ability to respond to language that differentiated toddlers with autism from toddlers with developmental delay who had comparable language impairment (Paul, 2014). The young children with autism also displayed significant deficits in the early emergence of basic activities of self-care, home and community activities (i.e. feeding, dressing and bathing).

The most significant benefit when using the VBAS-II with a child suspected of having autism spectrum disorder is that the instrument includes supplementary norms for children with autism (Carter et al., 1998; Sparrow et al., 2005). In addition, the VBAS-II was developed specifically to assess children with developmental delays, intellectual disability, and other severe disabilities including autism. Therefore, it effectively discriminates among children at the lower end of the distribution of functioning. Specifically, the Expanded form has been found to be most useful with children with autism since their level of adaptive functioning is usually lower than their intellectual level (Volkmar, Carter, Sparrow, & Cicchetti, 1993).

The VBAS-II and its' predecessor are one of the few instruments reviewed in this dissertation, that have been employed in published studies of Latino and Spanish speaking children with autism spectrum disorder. One study containing the VBAS-II in a diverse clinical sample of children with autism, including a large number of Latino children, found no significant differences in domain scores based on race or ethnicity prior to interventions including parent education training (Baker-Ericzén, Stahmer, & Burns, 2007). More recently, Chaidez et al. (2012) reported that scores on the Vineland did not differ between ethnic groups in a large sample including Spanish speaking families. The VBAS-II has been recommended for use with Latino children referred for autism assessment (Overton et al., 2007) and bilingual children with autism since the lower levels of the instrument do not directly reference language-specific content (Hambly & Fombonne, 2009). The VBAS-II is a valuable tool because it allows the examiner to assess reliability by gathering information from multiple respondents including the parent or caregiver. In addition, use of the VBAS-II interview format assists in establishing rapport with Latino families by using open-ended questions (Tasse & Craig, 1999). However, several studies have identified the limitations of parent report when using the Vineland due to parent bias of their child's functioning (Baker-Ericzén et al., 2007). For example, Magiati and Howlin (2001) reported different intellectual functioning scores between the Vineland parent report and other measures requiring direct observation by the examiner. In addition, parents may be unable to provide accurate responses to specific items included on the VBAS-II such as whether or not their child is able to use pronouns or follow one or two step tasks (Scattone, Raggio, & May, 2011). This is even more significant when using the VBAS-II with children from dual-language households or with Latino families who may not be aware of language development.

Overall, the VBAS-II assesses areas typically deficient in children with autism spectrum disorder such as the child's ability to communication their needs or understand what communication is. The Socialization Domain of the VBAS-II is particularly sensitive in identifying children with autism spectrum disorder since it assesses the development of interest in others, emotional responsiveness, emotional expression, emotional understanding and success in making friends. Although these skills are typically deficient in children with the disorder, there is also significant cultural variation in the development of these abilities. In fact, a separate study demonstrated a relationship between family history and adaptive behavior scores on the VBAS-II including shyness and other psychosocial stressors (Mazefsky, Williams, & Minshew, 2008). Similarly, although the items included in the second edition of the measure were updated to reflect more current societal expectations there are limitations to use of the instrument since many of the items are culture bound. The VBAS-II measures adaptive needs commonly observed in young children with autism spectrum disorder including sleep, feeding and toileting. However, cross culturally toileting skills vary widely with some cultures beginning at 4 to 6 months of age and other as late as 4 years old (Groce & Zola, 1993). Self- feeding practices also differ according to cultural background. For example, Latino families typically introduce solids later than African American families (Crocetti, Dudas, & Krugman, 2004) and White families have been found to have earlier expectations related to feeding milestones (Schulze, Harwood, Schoelmerich, & Leyendecker, 2002). These cultural beliefs that impact caregiving practices can influence scores and result in misdiagnosis. In fact, a study using the Vineland with Indian children reported difficulty using the scale due to cultural differences in gender roles and differences in the way self-care tasks are performed (Manohari, Raman, & Ashok, 2013).

Identification of adaptive behavior deficits and children with autism has occurred with predominantly White populations. Therefore cultural diversity represents a significant confounding variable that can result in misdiagnosis of children with autism spectrum disorder. Adaptive behavior is usually defined in terms of cultural and societal expectations and although it is impossible to create or obtain measures that represent all cultural variables, it is important to develop instruments that are culturally sensitive or culturally specific. When using the VBAS-II the examiner must be aware of problems when comparing adaptive behavior performance across cultures groups. Examination of the validity of the VBAS-II with Latino and Spanish speaking families would increase the utility with this group.

Instruments to assess sensory integration/sensory processing

There are several tools that are designed to assess a child's reactivity or interest to sensory items in his or her environment (American Psychiatric Association, 2013) and are frequently used with children with autism spectrum disorder. However, at the time of this writing, only one measure is available in Spanish.

Infant/Toddler Sensory Profile (ITSP). The Infant Toddler Sensory Profile (ITSP; W. Dunn, 2002) was specifically developed to assess the sensory processing of very young children (birth to 36 months). Items on the instrument inquire about reactions to various sensory stimuli as well as some behavioral and emotional consequences of sensory sensitivity. A parent, teacher or other person who is familiar with the child completes the ITSP. Respondents endorse the frequency with which the infant responds to various sensory experiences (Almost Always, Frequently, Occasionally, Seldom or Almost Never). The Sensory Profile (W. Dunn, 1999) is also available for children 3 to 10 years of age. This form includes 125 questions and utilizes the same Likert format. The Sensory Profile provides separate cut-off scores for children ages 3 to 4 and children 5 to 10 years of age. A condensed version, including 38 items, the Short Sensory Profile (McIntosh, Miller, Shyu, & Hagerman, 1999), is also available for children ages 3 to 17 years.

The Infant/Toddler Sensory Profile is based on Dunn's Model of Sensory Processing (Kern et al., 2007). Sensation Seeking and Low registration indicate different high threshold responses, while Sensory Sensitivity and Sensation Avoiding reflect different low threshold responses. Items that are part of the General Processing score measure the child's responses to routines and schedules. For children birth to 6 months the questionnaire consists of 36 items, from which four quadrant scores including low registration, sensation seeking, sensory sensitivity and sensation avoiding as well as one combined quadrant score (low threshold) can be calculated. The Sensory Processing scores for children 7 to 36 months indicate the child's responses to five sensory systems: Auditory Processing (items measure the child's response to things seen), Visual Processing (items measure the child's response to things seen), Tactile Processing (items measure the child's responses to stimuli that touch the skin), Vestibular Processing (items measure the child's responses to movement) and Oral Sensory Processing (items measure the child's responses to touch, taste and smell stimuli to the mouth). For children between 7 and 36 months, four quadrant scores and one combined quadrant score can be obtained. An additional classification system describes the child's sensory processing abilities in each quadrant as either "Typical Performance" or "Consult and Follow-Up" (for children birth to 6 months) or "Typical Performance", "Probably Performance" or "Definite Difference" for children 7 to 36 months. These differences indicate the degree of sensory processing difficulty when compared to a normative sample of children without disabilities. Scores falling within the

“Probable Difference” and “Definite Difference” ranges are suggestive of challenges in the child’s ability to process sensory input and modulate or regulate responses to sensory input.

A pilot study was conducted to develop the ITSP (W. Dunn & Daniels, 2002). The instrument was then standardized between 2000 and 2001 and included 1,100 infants and toddlers without and without disabilities between birth and 36 months of age (Psych Corp, 2005). It is important to note that the majority of the sample was White (73.7 %) with Latinos representing 3.1 % of the sample, African Americans were 7.6 % of the sample and Asian families represented 2.2 %. It is also important to note that more than half (57.7 %) of the sample identified as residing in a “suburban” household and almost half of the sample (47.9%) specified their yearly income as between $31,000 and $75,000 (Psych Corp, 2005). To better represent the general population, the authors selected children from ethnic backgrounds other than White for the cut score group and White children were randomly selected to complete data sets for each group (Psych Corp, 2005). Cut-off scores were then derived from a sample of 589 children without disabilities.

The authors provide internal consistency for each sensory processing and quadrant grouping. Coefficient alphas were calculated for children from birth to 6 months ranged from .17 to .83. The coefficients for the various groupings of items for children 7 to 36 months, ranged from .42 to .86. Test-retest reliability was conducted with a sample of 32 children between the ages of 7 and 36 months. Test re-test correlation coefficients were .86 for the sensory processing sections and .74 for the quadrants (Psych Corp, 2005). Therapists also provided data on children including children with a diagnosis of pervasive developmental disorder, developmental delay, sensory integration dysfunction and reflux (Psych Corp, 2005). Although the number of children was small and definitive conclusions are not available, overall ITSP scores for children with disabilities were lower than those children without disabilities. Data suggests that seeking behavior increased for older children with and without disabilities in the normative sample. The Sensation Seeking score was similar for children with and without disabilities in the 7 to 36 month old group. In addition, sensory profiles of infants and toddlers with Down syndrome in the standardization sample were similar to those children without disabilities in all areas with the exception of lower scores in Auditory Processing.

Infant/Toddler Sensory Profile, Spanish version. A Spanish version of the ITSP is available. In order to develop the Spanish translation, the English version was translated into Spanish and back translated in an effort to ensure the Spanish version retained the original intent of the measure. The authors provide information for a small sample ($N = 29$) of Spanish speaking families who completed the Spanish translation of the ITSP. Children were matched by age and gender with English speaking children from the national sample in order to compare any language effects. The authors report that overall the Spanish and English speakers had the same scores and recommend use of the same cut-off scores for both groups (Psych Corp, 2005).

The ITSP is frequently used as part of the assessment of children with autism spectrum disorder (Ben-Sasson et al., 2008). Several studies have examined the profile of children with autism using the Sensory Profile, the Short Sensory Profile and the Infant Toddler Sensory Profile. Children with autism typically display low registration and low threshold differences. The ITSP is particularly useful since it provides a combined quadrant score (Low Threshold) that is a combination of Sensory Sensitivity and Sensation Avoiding quadrant scores. This suggests these children not only don't notice (more than others in low registration) but their systems don't require much stimulation to respond (low threshold). Studies utilizing the Short Sensory Profile with children autism have reported sensory processing dysfunction on the SSP total score

(Tomchek & Dunn, 2007). In addition, children with autism show the greatest difference on the Underresponsive/Seeks Sensation, Auditory Filtering or auditory hypersensitivity, visual stimulus-seeking behaviors and Tactile Sensitivity sections (O'Brien et al., 2009) compared to controls and children with learning disabilities. Studies also suggest the Sensory Profile is able to adequately discriminate between children with autism and children without a diagnosis of autism (Gal, Dyck, & Passmore, 2002; Kientz & Dunn, 1997; Rogers, Hepburn, & Wehner, 2003; Watling, Deitz, & White, 2001; Wiggins et al., 2009). Many items have been identified that differentiate children with autism spectrum disorder from typically developing children, such as "my child avoids eye contact with his/her caregiver" or "my child refuses all but a few food choices" (Kientz & Dunn, 1997). Additional items that appear to be pertinent to children with autism spectrum disorder address perception of body language or facial expressions.

A few studies have examined the Spanish version of the Short Sensory Profile. One particular study used the shorter version of the Sensory Profile with Puerto Rican children and examined socioeconomic variables (Román-Oyola & Reynolds, 2013). The study revealed that the overall prevalence rate of sensory modulation disorder was higher than studies conducted in the United States. However, the study did not find any differences in the overall prevalence of sensory modulation disorder based on SES. Although there were significant differences in subdomains based on caregiver educational attainment and household income, the authors report that variables associated with SES did not appear to contribute to the diagnosis. Still, the authors suggest that the measure may be appropriate for use with Latino or Spanish speaking families in the U.S.

Unfortunately, those studies utilizing the ITSP to distinguish children with autism spectrum disorder from typically developing children are limited to primarily White caregivers who have completed the English version. Therefore, there are certain limitations when using the ITSP with Latino and Spanish speaking parents of a child with autism spectrum disorder. The primary concern when using the Spanish version of the ITSP is there are significant language issues related to the vocabulary of the translated items. The Spanish language lacks the technical terms and phrases used to describe sensory processing issues, therefore making translation of the instrument extremely difficulty. When adaptation occurs, the intended meaning of the items can change and the validity of the measure can be compromised. In fact, Román-Oyola and Reynold (2010) reported confusion on numerous items when using the Short Sensory Profile with Spanish speaking parents in Puerto Rico. Participants reported misperception related to understanding of items content and to the use of specific vocabulary words such as “se emociona demasiado” (“becomes overly excitable”), “ruidos extraños” (“strange noises”) and “toca a gente y objetos” (“touches people and objects”). This is especially significant in the assessment of a Latino child suspected of having autism spectrum disorder, since those items that differentiate children with autism from children without the disorder (Kientz & Dunn, 1997) appear to be the precise items that caused Spanish speaking parents the most confusion. In addition, the authors note that several items are written in a negative format such as “dislikes activities where head is upside down” which translates to “no le gusta”. This led respondents to endorse the “never” alternative on the measure (Román-Oyola & Reynolds, 2010). Validation of the Spanish version of the ITSP necessitates specific criteria regarding the aspects that are intended to be observed in each item. This will increase the accuracy of items response rather than responses resulting from the respondent’s interpretations which may not be valid.

Another disadvantage when using the ITSP with Latino and Spanish speaking caregivers is the measure relies on the perspective of the parent or caregiver. In fact, the publisher describes that the measure as a "judgment-based caregiver questionnaire" (Psych Corp, 2005). Several studies utilizing the Spanish version of the measure have reported limitations since parent's perceptions about their child's behavior differ among cultures and this can influence responses on the instrument (Gunn et al., 2009; Román-Oyola & Reynolds, 2013; Román-Oyola & Reynolds, 2013). For example, in one study Latina mothers questioned what is considered to be a typical expression of the behavior, when completing the Short Sensory Profile (Román-Oyola & Reynolds, 2010). Parent sensitivity to their child's temperament and coping with their child's behavior can vary according to culture and SES (Martini, Root, & Jenkins, 2004) and result in cultural bias when using the ITSP as part of the assessment.

Overall, parent's perception of their child's sensory processing behaviors has been conducted primarily with White middle to upper class families. This is exacerbated even more by the few Spanish translations of tools designed to assess sensory processing in young children. The simultaneous English to Spanish translation of items from the ITSP appears problematic due to a lack of these phrases and terms in Spanish. There is obvious conceptual inequivalence of sensory behaviors and these behaviors have different connotations across cultures resulting in response bias. Examination of sensory processing disorders in ethnocultural populations needs to be conducted specifically using measures such as the Spanish translation of the ITSP.

Chapter IV. Discussion and Recommended Instruments

Although there are many recommendations available regarding best practice in the assessment of autism spectrum disorder (Brassard & Boehm, 2007; Department of Developmental Services, 2002), there is no gold standard for those clinicians evaluating Spanish speaking children or children in dual language households (Chabon, Brown, & Gildersleeve-Neumann, 2010; Dollaghan & Campbell, 1998; Skarakis-Doyle et al., 2009) and even less information is available regarding standardized measures for young Latino children suspected of having autism spectrum disorder. Given the dearth of research to evaluate instruments used in the assessment of Latino children and the limited research adapted for Spanish speaking children, the following dissertation builds upon previous research and examines the studies that have been completed including Latino children as well as studies that utilized Spanish adaptations of commonly used measures. The following discussion is meant to provide recommendations for combining various instruments into a comprehensive battery that may be most appropriate in determining a diagnosis of autism spectrum disorder in young Latino and Spanish speaking children and their families.

Screening Instruments

Although the emphasis of the following discussion is to assist in determining a diagnosis of autism spectrum disorder rather than screening measures, it is important to note that use of the Childhood Autism Rating Scale (CARS) or the Gilliam Autism Rating Scale (GARS) is not recommended in the assessment of young Latino children. Although both the CARS and GARS have weak psychometric properties, they continue to be used to diagnose children (Allen et al., 2008). In addition, the CARS and the GARS were developed and predicated on Western values, the standardization sample does not include Latinos and the instruments are frequently not normed with Latinos, therefore questioning the generalizability of the results.

Diagnostic Measures

Overall, use of both the Autism Diagnostic Interview- Revised (ADI-R) and the Autism Diagnostic Observation Schedule (ADOS) is recommended as this has been found to be more likely to differentiate Latino and Spanish speaking children with moderate to severe symptoms of autism from those children who are typically developing (Overton et al., 2007). In addition, use of the ADI-R and ADOS with Latino or Spanish speaking families can ensure accurate differential diagnosis from with other disorders such as ADHD (Overton et al., 2007). This is especially significant since it appears that the under-representation of autism spectrum disorder in Latino children may be due to the misdiagnosis of emotional and behavioral disorders.

The three domains contained in the ADI-R (Language/Communication; Reciprocal Social Interactions; and Restricted, Repetitive and Stereotyped Behaviors and Interests) are represented in the diagnostic criteria of autism spectrum disorder in the DSM-5; therefore the ADI-R appears to be very compatible when making a diagnosis using the DSM-5. The distinct domains scores for children with and without speech on the Communication domain of the ADI-R can also assist in determining the DSM-5 specifier of "with or without accompanying language impairment" (American Psychiatric Association, 2013). The ADI-R includes items that reflect varying levels of symptomatology severity and can capture those symptoms at different levels of development, which is also a pertinent component of the DSM-5 diagnosis. However, caution should be exercised with some Latino parents who may not consider their child's aberrant behaviors problematic and may not report symptoms or for those Latino parents who only report severe impairments. The ADI-R provides separate documentation of the presence of abnormalities in each area of the deficits. This can have unfortunate consequences for a bilingual speaking child who may obtain an elevated score in one area, such as communication. If the Latino parent does not report impairment in other areas, even though there may in fact be deficits, the child's problems may be mistakenly attributed to a communication disorder or erroneously assumed to be a result of a dual-language environment.

The primary concern when using the Entrevista para el Diagnostico del Autismo, Edición Revisada with Latino parents is the complex terminology associated with autism spectrum disorder that is used in the ADI-R. This jargon may not be well understood by parents when translated into Spanish and may not have test equivalence. Complex neurobiological and developmental concepts such as autism lack true equivalents in languages other than English, which can directly lead to a misunderstanding of symptoms. In addition, some Spanish speaking families may struggle to describe their child's social behaviors thereby impacting the child's score. More recently, a Spanish telephone screen of the ADI-R, the Autism Diagnostic Inventory-Telephone Screening in Spanish (ADI-TSS) was developed (Vrancic et al., 2002). When developing the ADI-TSS the developers rephrased all of the questions on the ADI-R, made clarifications to the items and included examples for the items, to obtain reliable answers over the phone. Therefore, when administering the ADI-R, it may be beneficial to use illustrative examples, such as those included as part of the ADI-TSS to assist respondents with those items that are difficult for parents to understand. Inclusion of examples using parent responses based on their own observations of the child may prove helpful in the administration of the ADI-R with Spanish speaking families who are relying on English terms to describe symptoms and criteria from the DSM. Cultural differences between the original English measure normed on a primarily White sample and the use of the same instrument with a very different population limits its' use.

Another limitation when using the ADI-R is its' dependence on the parent's recollection of the child's behaviors and development. As part of the evaluation it is necessary to ascertain the age at onset, age of manifestation of symptoms, determine if there was any regression following typical development and to ascertain the age of the child when the parents became aware of any apparent developmental problems. However, many of the subtle signs signaling a developmental delay may not be perceived by some Latino families. This frequently results in problems with the reliability of parental retrospection. This is even more problematic with Latino children who are frequently presenting for evaluation after three years old (Mandell et al., 2009). Bias in the recall of parents can frequently occur, even when the children are 3 or 4 years old at the time of the interview. In addition, simply asking the Latino parent when the child first began to talk or when the child began using first words may have a different cultural meaning in a culture outside of the mainstream. Therefore, use of the ADI-R with Latino families may be more effective, if the parents are also given an opportunity to describe how their child's speech and language skills differed from the child's cousins, siblings or same-aged peers.

There are several benefits to using the ADOS or its' Spanish counterpart (Escala de Observación Para El Diagnostico Del Autism) with Latino children. It appears that significant effort was taken to develop the Spanish translation of the ADOS. The Spanish version of the ADOS also includes suitable Spanish language toys and materials. Although there are some concerns related to the psychometric properties of the Spanish translation of the ADOS, when administering the instrument to young Latino children, the results are primarily dependent on observation rather than particular wording of the instructions. Therefore use of the ADOS by a bilingual examiner who is familiar with the Spanish language and can recognize minor cultural and language differences can provide more accurate results.

Another advantage when using the ADOS with Latino children is the measure provides multiple opportunities for the Latino child to engage in social interaction and communication that elicits spontaneous typical behaviors in a standardized context. During administration of the ADOS, the child's behavior is rated across the entire observational period, rather than on a task by task basis. This is advantageous for a young Latino child with limited experience in a "school environment", who may be unfamiliar with the clinical setting and require additional time in order to "warm up" or elicit certain responses. Therefore, if the child does not demonstrate spontaneous behaviors or social interaction during the administration of the ADOS, it is presumed that the task is difficult for the child and is most likely related to autism spectrum disorder and not cultural influences.

It is important to consider that the ADOS does not provide information to determine whether symptoms were present in the early developmental period, which is required to make a diagnosis of autism as specified in the DSM-5 and is only a measure of current functioning. This further supports use of the ADOS to capture behavior that corresponds to the parent report that is obtained via the ADI-R. The cut-off scores used in the ADOS to distinguish between autistic disorder and the broader spectrum of disorders are no longer relevant when considering the current DSM-5 diagnosis since a well-established diagnosis of one of these disorders according to the DSM-IV warrants a diagnosis of autism spectrum disorder (American Psychiatric Association, 2013). However, it is also important to note that there are no presses for repetitive and stereotyped behaviors as part of the ADOS therefore their presence or absence is not reliably assessed. In addition, although these items appear on the algorithm and the behaviors can be coded in a separate Stereotyped Behaviors and Restricted Interests Domain, they do not contribute to the total scores that result in a classification of spectrum versus non-spectrum.

Further studies are required to determine the applicability of the ADOS total score to the current DSM-5 diagnosis of autism spectrum disorder.

Since the ADOS administration may not capture the child's daily behavior many it is recommended that the examiner collect additional information from a home observation. This is especially relevant since those restricted and repetitive behaviors that are necessary for a DSM-5 diagnosis of autism spectrum disorder may be more likely to be observed in the child's natural environment. This means that the clinician must rely on parent report of any of these behaviors to make a diagnosis of autism. Some Latino families may perceive the restricted interests as stubborn behavior or the repetitive behaviors in children with autism as bad habits or "manas", rather than symptoms associated with the disorder. Those parents that believe these bad habits are under voluntary control may not bring these behaviors to the attention of a diagnostic professional. Therefore, use of the ADOS with Latino children may result in inaccurate classification since it may be difficult to ascertain evidence of repetitive behaviors due to cultural factors.

In general, observation of a young Latino child suspected of having autism appears to be one of the most culturally relevant methods of the assessment process. An observation in the home can be indispensable when working with Latino families, since observation in a naturalistic setting affords the clinician an opportunity to observe spontaneous behaviors and interaction with familiar members of the family, obtain a complete picture of the child's functioning and also enables the clinician to gather information that may not have been available during the formal evaluation. For example, if the ADOS is administered in the home, the examiner can use more culturally relevant tasks such as cooking, singing Spanish songs, or observing the child playing with siblings or other extended family members which may provide a more valid sample of the child's behaviors. Observation is also necessary for some young Latino children who may be apprehensive or have difficulty becoming accustomed to the testing setting or the environment in which the assessment takes place. Due to the interdependency between some Latino parents and their children, the child may not be able to tolerate separation from the caregiver during a formal evaluation. Therefore, assessment in a familiar environment, such as the home can assist the child in feeling more comfortable and this also reduces the need to ready the child and transport the child who may already be resistant to change and who may have difficulty with transitions to a novel situation.

Overall, naturalistic observation in addition to the ADOS and ADI-R is ideal in determining the most accurate diagnosis of a young Latino children suspected of having autism. However, it is important to note on the publisher's website the authors advise against using the ADOS in the home due to distractions and "the need to have the testing space in the control, to some degree, of the examiner". If the ADOS is administered in the home the publisher recommends that the examiner address with the caregiver ahead of time, the kind of space needed: "e.g., somewhere the examiner can blow bubbles and use Playdoh; somewhere without siblings, noisy appliances, or a television; somewhere the child will sit at a table without necessarily expecting to eat" (Western Psychological Services, 2011). If these expectations and modifications can be made, then the publisher notes that it may be suitable to administer the ADOS in the home environment. In the event that administration of the ADOS cannot take place in the home it is recommended that the examiner connect with the child's world experience by utilizing more culturally appropriate materials and relevant visuals since everyday activities or play in many Latino families differs from the play activities included in the ADOS. Therefore, the examiner can create a more realistic setting by asking the parents to bring familiar toys to the assessment or the examiner can ask the caregiver to perform typical routines such as changing the child's diapers or feeding the child since some Latino families may not understand "just play with your child" as is often requested.

There may be limited opportunity to include the lengthy ADI-R as part of the assessment. Therefore, the ADOS can be used to assess communication and social interaction while the Spanish adaption of the Social Communication Questionnaire (SCQ) can be used to provide parent report. The SCQ corresponds to the ADI-R checklist and although the SCQ is described as a screening measure, it is the preferred alternative if there are time constraints since it can be administered in a brief period of time. In addition, the SCQ appears to be an appropriate measure that is compatible to the recently released DSM-5. Although the Autism Detection in Early Childhood- Spanish Version (ADEC-SP) Detección del Autismo en la Infancia, is still being developed, the measure may be substituted if the examiner is unable to administer the ADOS. The ADEC-SP relies primarily on observation and can be used to complement a parent interview when used by a clinician who is trained to recognize symptoms of autism in young Latino children.

Measures of Social Behaviors

Few studies have focused on the assessment of social behaviors in culturally diverse children with autism; however, behaviors such as joint attention, have been recognized as precursors to social skills that develop without direct training from parents among typically developing children (Hodapp & Ly, 2005). In addition, impairments in social orienting and joint attention appear to best distinguish children with autism from their peers (Dawson et al., 2004). For example, Trillingsgaard, Sorenson, Nemec and Jorgenson (2005) identified specific "red flags" commonly seen in the social-communicative behaviors of children with autism spectrum disorder including: the child does not respond when others smile; the child does not respond when his or her name is called; the children does not respond when others point; the child does not “read” others faces for information’ and the child does not join functional play with an adult. Studies have suggested that the detection of these atypical behaviors can be useful when identifying autism spectrum disorder in children from any country (Trillingsgaard et al., 2005) and that these deficits can be observed in a child with autism spectrum disorder regardless of language, race, and ethnicity (Dawson et al., 2004). However, differences in child rearing practices vary across cultures and can influence the socialization of a child (Cote et al., 2008). Therefore it is important to judge any deficits in social interaction, against norms for the child’s culture (American Psychiatric Association, 2013). Overton, de Alba and Fielding (in press) also make specific recommendations for Latino families when the parent’s report of the child’s symptoms may differ due to cultural expectations and understanding. Overall, the emphasis must be on the core diagnostic features of abnormal social communication in children with autism spectrum disorder, when distinguishing the disorder from emotional or behavioral problems.

Use of the previously aforementioned ADOS is recommended when identifying those deficits in social behaviors since it focuses on the qualitative aspects of social and communication interactions that are pertinent to the diagnosis of autism spectrum disorder. Although, the Child Behavior Checklist CBCL/1 ½ -5 (CBCL/1 ½ -5) and the Caregiver-Teacher Report Form (C-TRF) are primarily designed to assess behavioral and emotional problems in children and adolescents, the instruments address a broad range of behavior problems and appear to be particularly helpful in the differential diagnosis of Latino children who are frequently diagnosed with ADHD or other emotional disorders. In addition, the English and Spanish versions of the CBCL/ 1 ½-5 are but a few measures included in this dissertation that have been used with Latino children with autism spectrum disorder.

It is important to note that a high score on the CBCL/1 ½ -5 DSM-oriented scale is not a direct equivalent to a DSM diagnosis. This scale is not intended to be used for diagnostic purposes, because it only focuses on behaviors during the past 2 months and does not correspond to the DSM-5 criteria. In addition, the Pervasive Developmental Disorders Problems Scale standard scores are based on age and gender comparisons and the DSM-5 criteria are not. Scores on the Withdrawn and/or the Pervasive Developmental Disorders Problems Scales should be considered along with other measures of social behavior, the parent interview, observation of the child and expert clinical opinion when determining an accurate and appropriate diagnosis.

The recently published multicultural norms have resolved much of the psychometric limitations of the instrument across different ethnicities, cultures and SES groups. The measures require a fifth grade reading level which can sometimes be difficult for some families of very low SES. However, use of the measure in an interview format will minimize error due to non-standardized procedures. When using the Spanish version of the measure it is important to address item number 95 with Spanish speaking Latino parents who have found the translation of the item to be offensive. The parents reported that rating how often the child "vaga sin dirección" (whether or not the child walks away) was interpreted to mean "roam the streets [like a street walker]" (Sivan et al., 2008). This is even more important when using the instrument to assist in the diagnosis of autism spectrum disorder, since children with the disorder frequently spin, walk in circles or are unresponsive to redirection and may wander or walk away.

There are several consideration when using the CBCL/ 1 ½-5 and/or the C-TRF and interpreting results with a Latino family. Latino parents may not consider their children's behaviors problematic and are less likely to report problem behaviors. Some Latino parents may deny problems due to shame and embarrassment particularly in the social domain. This can be exacerbated by a Latino cultural pattern where a negative response is considered impolite. This can result in the minimization of problems, different rates of reporting or an inaccurate score. In addition, Latino parents may use compensatory strategies in the home to engage their children or interact with the child in a way that masks the child's marked social inabilities. When a very young child does not look at the parents, the parent will often simply move into the child's line of vision, without registering that he or she has done so. For certain social behaviors, especially with young children, direct observation using the ADOS is often more effective. When parental report is incorporated with observational assessment of social behaviors and the parents are involved they have an opportunity to observe what takes place during the evaluation and to point out and discuss those behaviors, rather than discuss them as ambiguous symptoms. This is especially important for Latino parents who may not be as familiar with the symptoms of autism spectrum disorder as they are usually described in parent psycho-educational materials or literature in English. This can also eliminate the need to translate vague perceptions of autism spectrum disorder from English into Spanish in order to describe them to the family.

When interpreting results of the CBCL/1 ½ -5 it is imperative to consider gender norms in the Latino culture that can lead to different rating of boy's behaviors. The hyperactivity or abnormal quality of motor actions frequently seen in children with autism spectrum disorder may not be considered abnormal by the traditional Latino family if observed in a male child. Latina mothers at different levels of acculturation sometimes assess specific symptoms of ADHD differently which can ultimately influence the parent's perception and rating of the child's attention and maladaptive behaviors, which can impact an accurate diagnosis. Therefore, it is recommended that the examiner gather and compare multi-informant ratings of the child's behavior on the CBCL/1 ½ -5 and/or C-TRF to help identify differences in responses. For example if a Latino child exhibits difficulty following instructions in a child care setting, it may simply be due to limited English language proficiency. However, if the discrepancies in social behaviors are evident across settings, it can be more likely attributed to autism spectrum disorder. Overall, when using the CBCL/1 ½ -5 and/or the C-TRF as part of the assessment battery with Latino children, isolating those characteristic social communicative deficits typically seen in children with autism spectrum disorder will assist in distinguishing autism spectrum disorder from other emotional disorders.

Measures of Speech, Language and Communication

There are currently no reliable Spanish language tests for Spanish speaking infants and toddlers. In addition, milestones of language development are derived from monolingual speakers without consideration about how these models may be inappropriate to describe bilingual language development. Few studies exist specifically related to the language skills of bilingual or Spanish speaking children with autism spectrum disorder. Unfortunately, it appears that Spanish speaking Latino children are simply being labeled with language disorder at an early age, when clinicians are unaware, unable or hesitant to make a diagnosis of autism spectrum disorder. The child continues to receive services to address the language impairment, but valuable interventions for social impairment are delayed. Although the inclusion of lengthy speech and language measures in the assessment of a child suspected of having autism spectrum disorder, may increase the amount of time the child is involved in testing, it is necessary since many Latino children appear to be misdiagnosed primarily with communication disorders.

The most important aspect of the language assessment is to ensure the child is tested in the language of the home environment to reduce the chance of misdiagnosis. The clinician must also understand the normal development of Spanish in children who learn Spanish as a first language (Brice, 2002; Hammer, Miccio, & Rodriguez, 2004). Several instruments were previously incorporated to assist in determining the child's language dominance. It is also preferable to plan the assessment around family, siblings and same-age and same gender peers, since some Latino children from inter-dependent families' value quiet, respectful behaviors when communicating with adults which can be interpreted as non-verbal.

It is difficult to differentiate behaviors of autism spectrum disorder in bilingual Spanish speaking young children due to language issues. However, there are some non-verbal behaviors that are relatively universal and can be seen across cultures, and should be considered when assessing children exposed to English and Spanish. For example, infants with autism spectrum disorder frequently don't point, show, wave, or shake/nod their head to indicate "yes" or "no"; don't use expressions such as "oh-oh," "huh" and may use non- conventional means to communicate intention such as loud vocalizations, having tantrums or using aggressive behaviors (Plauche-Johnson, 2004; Schneider, 2004). In addition, abnormal nonverbal communication is not present in children with developmental language disorders. Therefore, if a child exposed to two languages is not making attempts to engage others in communication through eye contact or gestures or trying to compensate for the lack of language and is also displaying restricted patterns of behaviors or interests, this is most likely suggestive of autism spectrum disorder and not social (pragmatic) communication disorder.

The Communication and Symbolic Behavior Scales, Developmental Profile (CSBS-DP) is recommended to assess the communication skills of a young Latino child suspected of having autism spectrum disorder. The CSBS-DP is especially valuable since it measures prelinguistic skills often lacking in children with the disorder and appears to overlap with the ADOS. Therefore, the examiner can collect natural language samples during the course of clinician-child or caregiver-child interaction or other context that includes social presses, such as during administration of the ADOS and obtain scores using the CSBS-DP. It is preferable to administer the Behavioral Sample in a natural environment such as the home, where the clinician has access to familiar toys, books, and other play materials. It is also recommended that the examiner tape the behavior sample for later review, to keep the situation as natural as possible and later analyze and score. Unfortunately, at the time of this writing there is not a Spanish translation of the Caregiver Questionnaire and the normative sample of the Caregiver Questionnaire comprised primarily White children of high SES and excluded families who spoke Spanish. Since the CSBS-DP does not have true norms, the user must settle for approximating the quantitative guidelines obtained from the White and English norms. Therefore, use of the measure with Spanish speaking Latino children must be applied with caution since it is being applied to a language and culture the norms were not derived from.

The Behavioral Sample measures the number of different consonants and the number of different words the child produces. However, results may vary in languages other than English and in children from dual language homes. For example, Spanish speaking babies who may be attempting words with more syllables than those attempted by the other babies (i.e. “apple” in English versus “manzana” in Spanish) may present at a later word stage than babies of the same age in the other language groups. Thus, the number of words learned by a given age for the Spanish babies may be smaller. The CSBS-DP also measures canonical or “mature” babbling, early syllable and vowel like sounds and complex utterances in spontaneous speech, which are frequently impaired in young children with autism spectrum disorder. However, use of the CSBS-DP with bilingual children or Spanish speaking children may yield different results, since they are not well represented in the normative sample.

The MacArthur-Bates Communicative Development Inventories (CDI's) or the MacArthur-Bates Inventarios del Desarrollo de Habilidades Comunicativas (INV) are recommended for use during the assessment since it measures both receptive and expressive vocabulary as well as those communicative and symbolic gestures frequently impaired in children with autism spectrum disorder. The INV is especially appropriate as it was developed separately from the English version and cultural and linguistic differences were considered during its' adaptation. Use of monolingual vocabulary norms to evaluate bilinguals should be avoided whenever possible; however, some recommendations have been made if using the CDI and/or INV with bilingual children (Bedore, Peña, García, & Cortez, 2005; B. Z. Pearson et al., 1993; B. Pearson, 1998), such as collecting the Pilot INV-III and the CDI-III from bilingual parents or if the parents are monolingual Spanish speakers, the INV-III might be used with the parents and the CDI-III can be used with the teacher (Guiberson & Rodriguez, 2010). When implementing the measure it should be administered to the caregiver in an interview format if there are any concerns about literacy or if the parent has difficulty completing the instrument.

Since the INV is dependent on the parent's report of the child's language skills and some Latino and Spanish speaking parents may not recognize some of the language deficits seen in children with autism spectrum disorder, it is imperative to include multiple sources during the evaluation such as natural language samples and other measures of the child's social communication skills. More specifically, when using the CDI or INV with infants, it is sometimes difficult for the parent to distinguish between words that the child may use, from words the child truly understand. This may be even more problematic when using these measures to determine receptive language skills with young Latino children. Latina mothers of children with language disorders sometimes report that their child “understood everything”, they believe their child demonstrates good comprehension skills and they believe their child’s receptive language skills are fine (Kummerer, 2010; Mendez Perez, 2000). Latina mothers have also been noted to describe their child’s receptive language in terms of the child’s ability to follow commands or obtain requested objects (Kummerer, 2010). Those Latino parents who are unfamiliar with skills and activities indicative of receptive language capabilities may not provide valid results on a measure such as the CDI or INV, which depends on the parent’s perception of the child’s understanding. This can interfere with identification of a child with autism spectrum disorder since children with autism usually exhibit more severe receptive language skills can fall behind expressive language skills in children with the disorder.

One particular advantage to using the CDI and INV when assessing language skills in children with autism spectrum disorder is the reduction of memory bias, since the parent is simply checking words from a list. This is particularly useful for Latino families who often present with their child for a diagnosis after 3 years of age. The parent report format may also reduce the amount of time needed to expose the child to lengthy testing sessions. In general, it is difficult to evaluate child’s language skills by parent report alone; therefore, assessment of a Latino child suspected of having autism spectrum disorder should always include additional observation of the child’s language and communication in a natural setting. The CDI or INV should never been used in isolation to determine the early language skills of a child suspected of having the disorder, especially since lexical knowledge is sometimes a relative strength in children with autism spectrum disorder. This is made even more difficult when attempting to identify Spanish speaking or bilingual children with autism spectrum disorder. Since language impairment is common in other childhood disorders, the goal of communicative assessment in Latino toddlers is to isolate the more non-verbal aspects of communication that are displayed in autism spectrum disorder and differentiate them from those young children with other neurodevelopmental disorders.

The Preschool Language Scale, Fourth Edition (PLS-4) Spanish Edition also appears to be a suitable measure to include in the assessment of language. The fourth version of the Spanish measure was developed with significant consideration to its' cultural and linguistic applicability and particular attention was paid to Spanish language development. The instrument offers the flexibility to administer the measure in a variety of different settings and with the participation of the caregiver. If the instrument is administered in the home the examiner is more likely to observe a more accurate representation of the child's interaction with caregiver (i.e. ability to respond to requests such as "no-no"; ability to participate in turn taking routines). The Caregiver Questionnaire and the Spanish equivalent, Cuestionario Para Los Padres, each include open-ended questions, in which parents share their perspective of the child's typical communication at home. However, neither should be used as the primary parent report measure to identify autism, since some parents may under-report unusual features in communication in young children and the measure was not designed as a diagnostic instrument.

One of the more relevant aspects of the measure is the scoring rules that can reduce the impact of inaccurate parents report. The scoring is based on the child's performance when observed or prompted by the examiner or if the behavior is reported by the parent. The is especially significant for those Latino children whose scores may be erroneously depressed due to cultural expectations of obedience, respect and silence among adults and strangers. In addition, when the caregiver reports the child is able to perform the behavior at home, the caregiver must provide a specific example of the behavior. More importantly, when these behaviors are not present across multiple settings, it may be more suggestive of true communicative deficit. The scoring rules also recognize those English speaking Latino children whose language is influenced by Spanish, subsequently limiting its' cultural bias. Spanish influenced English speakers have difficulty with past tense verbs (Jackson-Maldonado, 2004b); however, the child receives credit for responses that are correct in his or her own dialect. Therefore, those Latino children in dual-language homes who exhibit difficulty in both languages may demonstrate the real deficits in grammatical form associated with autism spectrum disorder.

One limitation when using the PLS-4 with some Latino children is the format of the measure is highly representative of middle class mainstream culture and introduces test bias for those children who have limited exposure to books and early literacy activities in the home. For example, items on the PLS-4 require a two or three-year-old child to play with toys and objects; however the child is also asked to respond to pictures, tell stories about the pictures they see and answer questions. This task of talking about a picture might be unfamiliar to some Latino children. In addition, some Latino children may be unfamiliar with the interaction pattern of labeling or pointing to objects in the pictures required by standardized tests such as the PLS-4. This may make it difficult to differentiate between those verbal and nonverbal communicative deficits in children with autism spectrum disorder and responses influenced by culture and SES.

When administering the PLS-4 to bilingual children it may be beneficial to provide the child with additional time to complete the test items, but also provide the directions to tests in both languages as well as using a dual scoring system that provides a score in the first and second language. Answers can be accepted in Spanish although the test may be administered in English, and any code-switching should be noted during testing. Of course, it is imperative to note in the report any adaptations made during testing or any accommodations to the standardization procedures. If time permits, it is also recommended to test the child in both languages with the PLS-4 and the Spanish Edition since the child may have certain skills in Spanish and certain skills in English. Consequently, if the child is delayed in both languages, results may be more reflective of autism spectrum disorder rather than a language disorder. Unfortunately, time constraints as well as behavioral problems that can interfere with testing procedures generally mean that this is not a practical option.

Measures of Developmental and Cognitive Functioning

It is vital to include determine the child's developmental functioning as part of the assessment since many Latino children may simply be diagnosed with intellectual disability while symptoms of autism spectrum disorder are overlooked. However, there are significant limitations to all of the measures of developmental and cognitive skills included in the dissertation. The Bayley Scales of Infant and Toddler Development, Third Edition (BSID-III) is recommended for use since the measure can be used to assess the development of very young Latino children therefore increasing early identification. Although the BSID-III was designed to determine developmental levels and not a diagnosis, the measure addresses each of the deficits requires for a diagnosis of autism spectrum disorder including: social responsiveness and play, expressive and receptive communication, sensory functioning and adaptive behavior. The measure also comprises extended basals and ceiling which assist in testing children with autism spectrum disorder with severe deficits. The administration of the BSID-III may be suitable for some Latino children with autism spectrum disorder who may require more dynamic testing procedures. In fact, the authors have dedicated a special section of the technical manual that includes suggestions and modifications that can assist the examiner when testing a child with special needs such as autism spectrum disorder, while at the same time maintaining standardized administration methods.

The authors allow for a more naturalistic approach to testing, by administering the test in the child's home environment. This can especially helpful when testing a young Latino, since a child's presentation can also be impacted by setting. The examiner can also be flexible with the order of subtest presentation; however the clinician must comply with basal and ceiling rules. In addition, the verbal instructions to the test have been simplified from the previous version, many demonstrations and trials are allowed during administration of the measure and several test items allow for parent-caregiver involvement. For example, for those Latino children with limited exposure to a testing setting, the parent can present a stimulus item to the child themselves. This not only provides the examiner an opportunity to observe the parent-child interaction but assessment of the infant with a caregiver they know and trust is more likely to produce results that are representative of the child's best performance.

Although tasks on the BSID-III are primarily play based the overall structure of the BSID-III may not be culturally sensitive to Latino children from low income families. The scales comprise a strong emphasis on compliance and many items include table top activities such as replicating a block bridge, copying a plus sign with paper-and-pencil, listening to a story and responding to questions, completing an insert form board or pegboard or matching pictures. Some young Latino children not be familiar with these activities and may not be able to inhibit their own behavior. Therefore, it may be useful to assess the child's learning readiness, the ability to remain seated for a lengthy period of time, and the ability to attend to the Bayley materials prior to using the test.

Although the authors of the BSID-III have attempted to minimize the language requirements of the measure there are still significant language demands throughout the BDI-III. The measure requires significant verbal understanding and contains many language based items. Language is used even on non-verbal tasks to encode information and to solve problems. Few studies have examined use of the scales with Latino children from a dual-language environment and its' impact on scores. Consequently, it may be difficult to distinguish between a toddler's poor performance due to conversational interaction in the home or deficits in language impairment which frequently accompany autism spectrum disorder.

The BSID-III should never be informally translated and it is recommended that the Spanish version be utilized to increase its validity with Spanish speaking Latino families. However, few Spanish speaking clinicians are qualified to administer the BSID-III, which requires significant training and time to administer. Even when using the Spanish version, another concern is the parent's ability to accurately rate, report or predict their child's performance, especially when responding to items within the Adaptive Behavior Scale that occur in the home or the inclusion of parent information on the young child's social-emotional development. For example, the caregiver provides information on whether or not the child has been observed looking at interesting things, enjoys engaging in physical and social interaction such as being danced in the parent's arms, and using words with peers. Ratings of children's behavior sometimes vary significantly across raters with low correspondence between direct observations and Latina mother's reports of their infants' (Bornstein, Gaughran, & Seguí, 1991). In addition, cultures differ in their emphasis on specific developmental milestones and this may influence early developmental differences on scores on the Bayley, especially when used with Latino immigrant families of low SES.

In addition, the normative sample of the English version excluded children and/or their parents who were unable to communicate in English. Hence, there is no normative data for children whom English is not their primary language. Overall, the generalization of predictors of developmental outcomes in White infants to young Latino children and their Spanish speaking families is not appropriate. Further studies of the Bayley with children from differing cultural environments in the U.S. are needed, specifically with Latino children from dual-language homes.

Measures of Adaptive Functioning

The primary consideration when assessing adaptive behavior is that the child’s skills are usually based on someone else’s ratings of typical adaptive behaviors. Adaptive behaviors are defined by the expectations or standards of other people; therefore, limiting the results since the measure is dependent on the expectations of the respondent. This is particularly important when assessing the adaptive or social behaviors of a Latino child, whose parental report may result in a misrepresentation of the child’s abilities. In addition, there are significant differences between the parenting expectations of many Latino families and the U.S. mainstream families which can impact adaptive skills.

The Adaptive Behavior Assessment System, Second Edition (ABAS-II) appears to be a noteworthy measure to include as part of the assessment since it compromises Spanish parent/caregiver as well as teacher/daycare provider forms. In addition, children with autism were included in the standardization sample and the ABAS-II measures adaptive functioning skills typically exhibited in young children with autism. The ABAS-II also appears to be more compatible with the current definition of adaptive functioning as noted in the DSM-5 (American Psychiatric Association, 2013). The ABAS-II is also an appropriate measure of adaptive functioning when determining diagnosis since it allows for assessment by several respondents and evaluates functioning across various settings. It is important to obtain data regarding adaptive functioning from multiple sources, because Latino parents and other raters tend to provide qualitatively different data on the same child. However, the lengthy forms may be intimidating and difficult for Spanish speaking parents with limited reading skills to complete.

It is important to note that although Spanish forms are available when using the ABAS-II with Latino children and their families, there is no indication that the ABAS-II has been normed for use with specific cultures or ethnic groups. In addition, the ABAS-II manual does not address how score differences may be attributed to cultural differences. Since Latino and Spanish speaking families were not represented in the population used in norming the instrument, the interpretation must be considered in light of this fact, to avoid misdiagnosis. The familismo that is present in many Latino families promotes supportive attitudes but may also create an "overprotectiveness" that may hinder independence (Dworkin & Pachter, 1997). This is especially significant since measures of adaptive behavior such as the ABAS-II, which were developed with primarily White children, can result in a diagnosis of intellectual developmental disorder rather than autism spectrum disorder.

Overall, the Vineland Adaptive Behavior Scales, Second Edition (VABS-II) is recommended for use since it was specifically designed to assess the functioning of children with a variety of disabilities including autism and the VABS-II includes supplementary norms for children with autism. The VABS-II is recommended for use with the ADI-R and the ADOS, which can improve diagnostic accuracy. The VABS-II also provides for multiple respondents and an interview format. This is more useful than the parent simply filling out the scale directly as it provides valuable clinical information and assists the examiner in addressing cultural issues that may influence the results. Another advantage is the survey interview, the parent rating forms and the expanded interview are all available in Spanish. Although the authors do not provide normative information for the Spanish forms, studies involving Latino and Spanish speaking families did not find any ethnic differences when using the VBAS-II (Overton et al., 2007). In addition, the English version of the VBAS-II has been used in numerous studies including Latino children. However, there are several modifications to items that may be appropriate for Latino and Spanish speaking families. For example, the VBAS-II measures the child's ability to say his or her first and last name when asked. This may need to be adapted to accept the mother's last name which is often used as the surname in many Latino communities.

When interpreting results it is imperative to consider the impact of the Latino culture on items included as part of the VBAS-II. A Latino family may emphasize knowledge and skills that are different from those in the dominant American culture. For example, in some Latino homes parents do not allow a child younger than 6 years old to use a fork or knife due to fears they might harm themselves (Gannotti et al., 2001). While other cultures may provide opportunities and strategies in the home to promote learning, pride and independence (Schulze et al., 2002), a young Latino child may have limited experience with some items on the VBAS-II such as labeling colors, holding a crayon properly, completing puzzles or cutting with scissors. The VBAS-II also assesses gross and fine motor skills as part of the Motor Skills domain. Motor milestones may vary in Latino homes where toddlers may not be adept at crawling if they are frequently carried around, which can result in a lower score on the daily living skills and motor skills domains. Caution must also be exercised when using the Maladaptive Behavior Domain that is part of the Survey and Caregiver rating forms. Although this measures undesirable behaviors that can interfere with the child's adaptive functioning, use of this section can result in inappropriate scores since some Latina mothers may not consider these behaviors problematic. For example, the Maladaptive Behavior Domain includes internalizing behaviors or "clinging". Physical autonomy is viewed very differently in the United States than in the traditional Latino culture. A young Latino child may have difficulty separating from the mother, may not make eye contact with the examiner or may not spontaneously interact with the test materials; however, this may not be related to adaptive behavior deficits. Overall, the VBAS-II is one of only a few measures included in the dissertation that has been utilized in research with Latino and Spanish speaking children with autism and has also been recommended to include in the assessment battery when determining autism diagnosis.

Measures of Sensory Integration/Sensory Processing

Use of the Infant Toddler Sensory Profile (ITSP) during the assessment can assist in making a diagnosis of autism spectrum disorder according to the DSM-5 (American Psychiatric Association, 2013) which includes reactivity to sensory input as one of the manifestations of restricted or repetitive patterns of behaviors or interests. However, at the time of this writing, the ITSP is the only Spanish language measure of sensory processing at this time. Due to the subjective nature of parent report, assessment of sensory processing requires multiple and direct observations of the child in a natural environment in addition to use of the ITSP to strengthen the findings and interpretations. Assessment in the home can include observation of the child eating a meal that involves caregivers and/or peers appropriate to the social context.

To reduce language bias and to increase the reliability of information collected from the instrument it may be beneficial to complete the measure in an interview format and provide examples, clarification and guidance with specific questions. This can be useful since many Latino parents appear to underestimate the ways their child's sensory behaviors interfere with his or her functioning and often normalize the behaviors or even incorporate extreme sensory responses into their daily lives. This can impact results of the measure since children with sensory deficits frequently display common behavioral problems including excessive irritability; tantrums; defiant behavior; have difficulty calming themselves when upset; and run away from stimuli. Administration of the ITSP by the clinician can be beneficial for those Latino family members who might have limited educational attainment and difficulty reading the items included on the Spanish version of the ITSP.

The classification system and cut off scores of the English version of the ITSP were maintained for the Spanish translation of the ITSP. However, this is based on the assumption that children's sensory processing abilities are universal across cultures. Some traditional Latina mothers place more emphasis on respect and obedient behaviors and less on autonomy. Consequently, these differences in expectations of calm behavior and appropriate demeanor can influence ratings on the ITSP. Therefore, use of the Spanish version of the ITSP as well as a "tell me more about…" ("darme más información sobre….") approach (Dickie et al., 2009) to the assessment of sensory processing will not only help establish rapport with the family but can also identify those adaptations that the caregivers may have made to accommodate the child. This will subsequently, increase the identification of sensory problems related to autism spectrum disorder that are included on the ITSP.

Future Directions

It is clear from the research that Latino and Spanish speaking children are underdiagnosed with autism and are erroneously classified under different labels such as speech and language impairment, developmental disability, intellectual disability or other behavioral disorders (Noland & Gabriels, 2004; Shattuck, 2006; Worley, Matson, Sipes, & Kozlowski, 2011). More specifically, in the state of California, those Latino children who are diagnosed are regrettably diagnosed at a much later age than White children (The California Legislative Blue Ribbon Commission on Autism Report, 2007). Unfortunately, an inaccurate diagnosis neglects the implementation of necessary intensive behavioral interventions that are needed for children with autism.

Since autism does not have a known etiology and is based primarily on subjective judgment, the reasons for the underlying discrepancies may lie in the inappropriate use of diagnostic tools or the inaccurate interpretation of symptoms by clinicians. Although a few standardized measures have been proposed for use when assessing a Latino child suspected of having autism, these aforementioned instruments cannot replace the skill, expertise and clinical input of an experienced bilingual clinician (Tager-Flusberg et al., 2009). A clinical diagnosis based on the judgment of an experienced professional is the best single predictor of later diagnosis (Chawarska & Volkmar, 2005; Shea & Mesibov, 2009). However, it appears that inaccurate diagnostic decisions are being made by clinicians who do not implement culturally and linguistically diverse assessment practices or by clinicians who are not familiar with diagnosing autism in Latino children. Those who provide assessment to Latino and Spanish speaking children and their families must learn new practices and receive additional training on the accurate assessment and diagnosis of autism in culturally and linguistically diverse children.

It is apparent from the discrepancy in the identification of Latino children that possible cultural differences do exist (Mandell & Novak, 2005) and influence assessment and diagnosis. Unfortunately, the construct of culture is neglected among research in the assessment of autism despite explicit mandates by the regulating boards of professionals involved in the treatment and care of children with autism, for the development of culturally relevant research, diagnostic and therapeutic services (American Psychological Association, 2003). It is important to not only advocate for testing with more culturally diverse populations, but future research should also focus on the diagnosis of autism within a cultural perspective (Kishore & Basu, 2011). Data regarding the race of the individuals with autism is deficient in most surveys and examination related to prevalence and incidence, is considerably lacking with Latinos. Of the hundreds of studies and articles reviewed and synthesized in this dissertation, the majority did not report ethnicity or did not include a significant number of children who were not non-Hispanic White. The study of autism is recent and new research is continuously being added to the knowledge base; however research related to influence of culture and ethnicity on the assessment and diagnosis of autism was found to be frequently limited to dissertations or unpublished literature. The field has only recently begun to explore the significance of culture and ethnicity in autism. It is not only important to keep abreast of advances in the area of autism, but to also prioritize cultural factors in the assessment process and integrate these findings in the actual practice.

This review is limited by the lack of normative data for many of the Spanish adaptations of the tests. In addition, data regarding Latinos is limited since Latinos are frequently omitted from studies if they are Spanish speaking. Most research evaluates Latino children and their families by the degree to which they approximate their White middle class counterparts and it is unclear if the results from monolingual English speaking families are generalizable to bilingual or Spanish speaking Latinos in the U.S. There is little evidence to support the use of tests with ethnocultural groups that have not been included in the development of a measure that relies on assessing the behavioral symptoms of autism. There is a desperate need to replicate these studies among families that are most diverse with respect to socio-economic status, ethnicity, race and culture. Overall, there is a need for culturally valid and reliable assessment tools that can accommodate the diverse and increasing Latino population in the U.S. and identify autism in Latino children.

Lastly, access to care is significantly limited for the majority of Latino families in underserved communities who are not able to access and navigate services for their child (Krauss et al., 2003; Ruble et al., 2005; The California Legislative Blue Ribbon Commission on Autism Report, 2007; Thomas et al., 2007). In an effort to bridge the racial disparities in the identification of children with autism spectrum disorder the author of this dissertation created a non-profit organization dedicated to reducing those barriers to access and use of services that Latino families face. Apoyo (Ayudando Niños Autistas) conducts outreach in the Latino community in Southern California, provides much needed education regarding autism spectrum disorder to Spanish speaking families and supports Latino families with a child with the disorder. In addition, Apoyo has paired with local community organizations to provide free screening clinics with the assistance of pediatricians, psychologists and other early childhood providers with the hopes of decreasing the disparity in service use.

It is important to explore, identify and understand the contributing factors that are interfering with early diagnosis and identification of autism spectrum disorder in young Latino children. There is virtually no published research as to which instruments are most frequently used with this population and it is also essential to determine if the assessment tools currently being used with Latino children are accurate and reliable. Utilization of more appropriate assessment tools when diagnosis autism in young Latino children will assist in the accurate diagnosis and implementation of early intervention services that are so desperately needed for this population. It is the authors hope that this dissertation will increase the knowledge base of best practice guidelines in the assessment of autism with Latino children and their families and prove to be a valuable resource for those clinicians serving this population.

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APPENDIX A

The Study of Autism Spectrum Disorder in Countries Outside of the United States

Country	Author, Year of Publication
Africa	Ametepee & Chitiyo, 2009; Lotter, 1978; Lotter, 1980
Aruba	van Balkom, Ingrid D. C. et al., 2009
Argentina	Bleger, 1972; Cecchi, 1990; Dio Bleichmar, 1987; Mills-Costa, 1989; Oelsner, 1989; Sanua, 1981a; Sanua, 1981b; Sanua, 1984; Tallis & Soprano, 1991; Vrancic et al., 2002; Vrancic et al., 2002
Australia/ New Zealand	Brereton, Tonge, & Einfeld, 2006; Carter et al., 2011; Goin-Kochel, Mackintosh, & Myers, 2006; Gray & Holden, 1992; Gray, 1993; Jackson, 1983; Latif & Williams, 2007; Prior, 1984; Rickards, Walstab, Wright-Rossi, Simpson, & Reddihough, 2009; Williams et al., 2008; Williams, Helmer, Duncan, Peat, & Mellis, 2008
Bangladesh	Zaman & Yasmeen, 1990
Belgium	Maes, Fryns, Van-Walleghem, & Van-Den-Berghe, 1993
Bosnia	Bujas-Petkovic', 1993
Brazil	Barros- Pinto, 1982; Duarte, Bordin, de Oliveira, & Bird, 2003; Sanua, 1981a; Sanua, 1981b; Sanua, 1984
Canada	Ammara, 1982; Bradley, Summers, Wood, & Bryson, 2004; Bryson, Clark, & Smith, 1988; Fombonne, Zakarian, Bennett, Meng, & McLean-Heywood, 2006; Fotheringham, 1991; Goin-Kochel et al., 2006; Ringman & Jankovic, 2000; Shevell, Majnemer, Rosenbaum, & Abrahamowicz, 2001
Czech Republic	L. A. McInnes et al., 2007; Nesnidalova, 1972; Propper, Hrdlička, Lisý, & Belšan, 2001; Šimonová, 1996
Columbia	Audero, 1980; Villareal & Gaviria, 1987
Costa Rica	L. A. McInnes et al., 2010; L. A. McInnes et al., 2005; Richler, Reichert, Buxbaum, & Mclnnes, 2006
Chile	Donovan & Olivarí, 1989)
China	Chia & Kwang, 1989; S. Y. Chung, Luk, & Lee, 1990; Clark & Zhou, 2005; Gau, Lee, Lai, Chiu, Huang, Kao, & Wu, 2011a; Gau, Lee, Lai, Chiu, Huang, Kao, & Wu, 2011b; Gu, Jing, Jin, Tang, & Zhou, 2008; Ho et al., 2005; Ke et al., 2009; Ke et al., 2009; Kuo-Tai, 1987; Kuo-Tai, (continued)

	1992; Lam & Rao, 1993; Liu, Yang, & Jia, 2007; Sun & Allison, 2010; V. C. N. Wong & Hui, 2008a; V. C. N. Wong & Hui, 2008b; V. Wong et al., 2004; Yang, Zhou, Zhang, Ding, & Zhang, 2008; Yang, Zhou, Yao, Su, & McWhinnie, 2009; Zhou & Yang, 2005)
Denmark	Fombonne, 2003; Hvolbæk & Lind, 1991; Järbrink, 2007; Jørgensen, Nielsen, Isager, & Mouridsen, 1984; Lauritsen, Pedersen, & Mortensen, 2004; Trillingsgaard, Sørensen, Němec, & Jørgensen, 2005; Wing, Yeates, Brierley, & Gould, 1976
England	Baird & Charman, 2000; Baird et al., 2006; Baron-Cohen, Cox, Baird, Sweettenham, & Nighingale, 1996; Burgoine & Wing, 1983; Chakrabarti & Fombonne, 2005; De Giacomo & Fombonne, 1998; Fombonne, 2003; Fombonne, 2003; Goin-Kochel et al., 2006; Gray & Holden, 1992; Jackson, 1983; Järbrink, Fombonne, & Knapp, 2003; Järbrink, McCrone, Fombonne, Knapp, & Zandén, 2007; Leekam & Ramsden, 2006; McConachie, Le Couteur, & Honey, 2005; Norbury, Nash, Baird, & Bishop, 2004; Powell et al., 2000; Ricks, 1989; M. Rutter, 1983; Santosh et al., 2009; Wing, 1981; Wing, Leekam, Libby, Gould, & Larcombe, 2002
Egypt	Amr, Raddad, El-Mehesh, Mahmoud, & Mahmoud, 2011; Amr et al., 2012
Finland	Fombonne, 2003; Kielinen, Linna, & Moilanen, 2000; Santosh et al., 2009
France	Baghdadli, Picot, Pascal, Pry, & Aussilloux, 2003; Cialdella & Mamelle, 1989; de Ajuriaguerra, 1986; Fombonne & du Mazaubrun, 1992; Fombonne, Du Mazaubrun, Cans, & Grandjean, 1997; Fombonne, Du Mazaubrun, Cans, & Grandjean, 1997; Szweck, 1983; Zilbovicius et al., 2000
Germany	Bölte, Holtmann, & Poustka, 2008; Fehlow & Tennstedt, 1985; Fombonne, 2003; Gebelt, 1983; Guendel & Rudolph, 1993; Leppert & Probst, 2005; Noterdaeme, Mildenberger, Minow, & Amorosa, 2002; Poustka, Lisch, Ruhl, Schmotzer, & Werner, 1996; Steinhausen & Metzke, 2004; Tustin, 1993
Greece	Papanikolaou et al., 2009
Ghana	Ametepee & Chitiyo, 2009)
Hungary	Sanua, 1981a; Sanua, 1981b; Sanua, 1984
Iceland	Mágnússon & Sæmundsen, 2001; Saemundsen, Magnusson, Smari, & Sigurdardottir, 2003 (continued)

India	Daley & Sigman, 2002; Daley, 2002; Daley, 2004; Kapur, 1989; Kishore & Basu, 2011; Ricks, 1989; Sanua, 1981a; Sanua, 1981b; Sanua, 1984
Indonesia	Wignyosumarto, Mukhlas, & Shirataki, 1992
Iran	Ghanizadeh, 2008
Ireland	Fombonne, 2003; Goin-Kochel et al., 2006; McCarthy, Fitzgerald, & Smith, 1984
Isreal	Barak & Ring, 1995; Barak, Kimhi, Stein, Gutman, & Weizman, 1999; Bilu & Goodman, 1997; Shaked, 2005; Shaked & Bilu, 2006
Italy	Montoli-Perani, 1993; Piperno, 1982; Silvestrini, 1993; Zirilli, Cocconi, & Torelli, 1997
Japan	Fombonne, 2003; Fukuyama, Ishikawa, & Ishizaki, 1984; H. Honda, Shimizu, & Rutter, 2005; H. Honda, Shimizu, Imai, & Nitto, 2005; H. Honda, Shimizu, Misumi, & Niimi, 1996; H. Honda et al., 2009; Honio, 1984; Hoshino, Kumashiro, Yashima, Tachibana, & Watanabe, 1982; Ishii & Takahashi, 1983; Kanai et al., 2004; Kurita, Miyake, & Katsuno, 1989; Matsuishi, Shiotsuki, Yoshimura, & Shoji, 1987; Ohta, Nagai, Hara, & Sasaki, 1987; Ohtaki et al., 1992; Ohtaki, Kawano, Urabe, & Komori, 1992; Sun & Allison, 2010; Tanoue et al., 1988; Tanoue, Oda, Asano, & Kawashima, 1988; Toichi & Kamio, 2002; Wakabayashi et al., 2007
Jordan	Amr et al., 2011; Amr et al., 2012
Kenya	Ametepee & Chitiyo, 2009; Dhadphale, Lukwago, & Gajjir, 1982; Lotter, 1978; Mutua, Miller, & Mwavita, 2002
Korea	S. Chung, Hong, & Yoo, 2007; Kim, Kim, Park, Cho, & Yoo, 2007; Kobayashi & Murata, 1992; Lim, Kim, Nam, Chung, & Park, 2009; Seo, 1991; Shin, Kyung-sook Lee, Sung-kil Min, & Emde, 1999; Yoo et al., 2008; Yoo et al., 2009
Kuwait	al Saad, 2000; Fido & Al-Saad, 2005; Fields, 1996
Lebanon	Hajjar & Richa, 2008
Malaysia	Takeuchi, Kubota, & Yamamoto, 2002
Mexico	Campbell-Araujo & Duarte, 2001; Damián- Díaz, 2000a; Damián- Díaz, 2000b; de la Fuente, 1980; de Pla, 1991; Hedley, Young, & Gallegos, 2010; Marcin, 1991 (continued)

Nigeria	A. Akande, 1998; Ametepee & Chitiyo, 2009; Lotter, 1978
Netherlands	Begeer, El Bouk, Boussaid, Koot, & Terwogt, 2009; de Bildt et al., 2004; de Bildt et al., 2009; Hartman, Luteijn, Serra, & Minderaa, 2006; Luteijn, Jackson, Volkmar, & Minderaa, 1998; Luteijn, Luteijn, Jackson, Volkmar, & Minderaa, 2000; Oosterling et al., 2010; Reijneveld, Harland, Brugman, Verloove-Vanhorick, & Verhulst, 2005; Zwirs, Burger, Buitelaar, & Schulpen, 2006; Zwirs, Burger, Schulpen, & Buitelaar, 2006
Norway	Bussy, Curie, Delange, Brun, & Des Portes, 2010; Hollund-Møllerhaug, 2010; Sponheim & Skjeldal, 1998
Peru	Bhagwanji & Suarez-Sousa, 2002; Bondy & Frost, 1993; Gomberoff et al., 1991; Gomberoff, Noemi, & de Gomberoff, 1991; Gomberoff & Pualuan, 2001; Noto, 2005; Sanua, 1981a; Sanua, 1981b; Sanua, 1984
Philippines	Liwag, 1989
Poland	Grodzka, Szumbarska, & Pużyńska, 1992; Koscielska & Nowak, 1988; Pisula, 1996
Portugal	Da Silva et al., 2003; Gonçalves Leitão, 2004
Rhodesia	Ametepee & Chitiyo, 2009
Romania	Faur, 1981; M. Rutter, Kreppner, & O'Connor, 2001; M. Rutter et al., 1999
Russia	Lebedinskaya & Nikolskaya, 1993
Saudi Arabia	Al-Salehi, Al-Hifthy, & Ghaziuddin, 2009; Amr et al., 2011; Amr et al., 2012
Scotland	Melville et al., 2008
Senegal	Ellenberger, 1968
Singapore	S. H. Chen & Bernard-Opitz, 1993; Ooi, Lam, Sung, Goh, & Fung, 2008
South Africa	A. Akande, 1999; Ametepee & Chitiyo, 2009; Lotter, 1978; Molteno, Molteno, Finchilescu, & Dawes, 2001; Szabo & Aber, 1992
Spain	Basil, 1984; Calahorro et al., 2009; Díez-Cuervo, 2007; García Villamisar & Muela Morente, 1997; García Villamisar & Muela Morente, 1997; García Villamisar & Polaino Lorente, 1998; García Villamisar & Polaino (continued)

	Lorente, 1998; García-Villamisar & Muela, 1998; García-Villamisar & Muela, 1998; García-Villamisar & Muela Morente, 2000; García-Villamisar & Muela Morente, 2000; Glatzel, 1981; Jané Ballabriga, Capdevila Escudé, & Domènech Llaberia, 1994; Jarast, 1990; Jiménez, Pérez, & Ortiz, 2007; Martos Perez & del Sol, 1993; Moreno, Aguilera, & Saldana, 2008; Muñoz-Yunta et al., 2008; Palau-Baduell M et al., 2005; Palau-Baduell M, Salvadó-Salvadó B, Valls-Santasusana A, Ortiz T, & Muñoz-Yunta JA, 2005; Pedreira Massa, 1992; Saldaña et al., 2009; Seguí, Ortiz-Tallo, & De Diego, 2008; Sánchez-Valle et al., 2008; Sánchez-Valle et al., 2008; Toro, Mur, & Cantó, 2006
Sri Lanka	De Silva, 1988; Perera, Wijewardena, & Aluthwelage, 2009
Sweden	Arvidsson et al., 1997; Billstedt, Gillberg, & Gillberg, 2007; Bohman, Bohman, Bjorck, & Sjoholm, 1983; Cederlund, Hagberg, Billstedt, Gillberg, & Gillberg, 2008; Danielsson, Gillberg, Billstedt, Olsson, & Gillberg, 2005; Ellefsen, Kampmann, Billstedt, Gillberg, & Gillberg, 2007; C. Gillberg, Steffenburg, Börjesson, & Andersson, 1987; C. Gillberg, 1989; C. Gillberg, 1991; C. Gillberg, Steffenburg, & Schaumann, 1991; C. Gillberg, Schaumann, & Gillberg, 1995; C. Gillberg, Persson, Grufman, & Themner, 1986; C. Gillberg & Wing, 1999; C. Gillberg, Cederlund, Lamberg, & Zeijlon, 2006; C. Gillberg, 1984; Johansson et al., 2007; Järbrink et al., 2003; Kadesjö, Gillberg, & Hagberg, 1999; Nordin & Gillberg, 1996; Steffenburg & Gillberg, 1986; Steffenburg, 1991; Steinhausen & Metzke, 2004
Taiwan	C. Chen, Liu, Su, Huang, & Lin, 2007; Gau, Lee, Lai, Chiu, Huang, Kao, & Wu, 2011a; Li, Chen, Lai, Hsu, & Wang, 1993; C. Lin, Tsai, & Chang, 2008; L. Lin, Orsmond, Coster, & Cohn, 2011; Pan et al., 2011; Sun & Allison, 2010; Wen-Shing Hsu & Mei-Hwei Ho, 2009
Tanzania	Mankoski et al., 2006; Tungaraza, 1994
Turkey	Akkok, 1994; Kuloglu-Aksaz, 1994
Uruguay	Prego-Silva, 1980)
Venezuela	Montiel-Nava & Peña, 2008; Montiel-Nava, Peña, Montiel-Barbero, & Polanczyk, 2008; Sanua, 1981a; Sanua, 1981b; Sanua, 1984
Wales	Lowe, Felce, Perry, Baxter, & Jones, 1998; E. Webb et al., 2003; E. Webb, Lobo, Hervas, & Scourfield, 1997; Wing et al., 1976
Yugoslavia	Milacic & Radulovic, 1998; Milic-Rasic, Vranjesevic, Jovic, & Pantovic, 1996 (continued)

Zambia	Ametepee & Chitiyo, 2009

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APPENDIX B

Additional Resources for Parents and Professionals

1. Autism Speaks Spanish language resources:
http://www.autismspeaks.org/community/resources/spanish.php

2. Autism Speaks First 100 Days in Spanish:
www.autismspeaks.org/docs/family_services_docs/manual_de_los_100_dias.pdf

3. National Institute of Neurological Disorders and Stroke:
http://www.espanol.ninds.nih.gov/trastornos/autismo.htm

4. Action for Autism & Open Door list of Autism Organizations Worldwide:
http://www.autism-india.org/organisations-worldwide

5. Autism Society of American Spanish Pages:
http://www.autism-society.org/en-espanol/

6. Global Autism Collaboration:
http://www.autism.org/

7. Culturally & Linguistically Appropriate Services:
www.clas.uiuc.edu/

8. First Signs Website including Video Glossary:
www.firstsigns.org/about/index.htm

9. Bilingual/ESL Products available from Super Duper Publications:
http://www.superduperinc.com/search/topicSearch.aspx?id=19

10. Bilingual Therapies- A Monthly Blog for Bilingual Speech and Language Pathologists:
http://www.bilingualtherapies.com/

11. My Hermano Tiene Autismo (My Brother is Autistic) Spanish Language Edition (Hablemos De Esto!/Let's Talk About It!) by Jennifer Moore-Mallinos

12. El Manual del Autismo: Información Fácil de Asimilar, Visión, Perspectivas y Estudios de Casos de un Maestro de Educación Especial (The Autism Handbook-Spanish Edition) by Jack E. George

13. Introducción al Enfoque ABA en Autismo y Retraso de Desarrollo: Un Manual para Padres y Educadores (Spanish Edition) by Claudio Trivisonno

14. Comprender el Autismo/Engaging Autism (Spanish Edition) by Stanley Greenspan & Serena Wieder

15. Algunos Niños Tiene Autismo/Some Kids have Autism (Comprendiendo autism-Comprendiendo las diferencias/Understanding Differences (Spanish Edition) by Martha E.H. Rustad

16. Asperger…Que Significa Para Mí? Un Manual Dedicado A Ayudar A Niños y Jóvenes con Asperger o Autismo de Alto Funcionamiento (Spanish Edition) by Catherine Faherty, Karen Sicoli, Wayne Gilpin, Karen L. Simmons

17. California Autism Professional Training and Information Network: http://www.captain.ca.gov/

18. State of California Department of Developmental Services: http://www.dds.ca.gov/Autism/Home.cfm

19. Essential Spanish for the Speech-Language Pathologist Workbook

    Essential Spanish for the Speech-Language Pathologist & Audiologist Dictionary

    Essential Spanish for the Occupational Therapist

    http://www.essentialspanish.com/products.htm

20. Los Trastornos Del Espectro De Autismo De la A la Z: Toda la Información Que Quiere (Autism Spectrum Disorders from A to Z) by Barbara T Doyle and Emily Iland, Published by Future Horizons

21. Bilingual Spanish Resource Guide: http://www.asdatoz.com/autismResourceGuide.html

22. Association of University Centers on Disabilities- Autism Page: http://www.aucd.org/template/page.cfm?id=508

23. National Institute of Mental Health Information on Autism in Spanish: http://www.nichd.nih.gov/health/topics/autism/espanol/Pages/default.aspx

24. Center for Parent Information and Resources: "El Espectro del Autismo" http://www.parentcenterhub.org/repository/autismo/

25. Organization for Autism Research- Spanish language resources: http://www.researchautism.org/resources/reading/SpanishGuides.asp

26. Autism Research Institute Documents in Spanish: http://www.autism.com/trans_spanish

27. Spanish News Video: Niños Autistas:
    https://www.youtube.com/watch?v=Ac9Qdwgn994&list=PLAFF3409F79F08839
    https://www.youtube.com/watch?v=gNZR4cvw5Ow

28. The Different Shades of Autism- Available in Spanish: https://www.youtube.com/watch?v=npfz21Nn8q4

29. My next Steps: A Parent's Guide to Understanding Autism available in Spanish: http://depts.washington.edu/uwautism/resources/autism-resource-dvd.html

30. PBS website on Autism in Spanish: http://www.pbs.org/parents/inclusivecommunities/autism_sp.html

31. TEACCH Autism Program with Spanish articles: http://teacch.com/about-autism/a1las-20-preguntas-que-mas-se-preguntan-sobre-autismo-teacch-and-autism-society-of-north-carolina-1

    http://teacch.com/about-autism/errores-generalizados-sobre-autismo-vs.-informacion-de-la-sociedad-nacional-para-ninos-con-autismo

32. TEACCH Preschool Curriculum Guide in Spanish: http://www.lulu.com/product/paperback/guia-del-curriculo-preescolar/2845044

33. Keishas's Doors/Las Puertas De Keisha: An Autism Story/Una Historia De Autismo (Spanish and English) by Marvie Ellis, Illustrated by Jenny Loehr

34. Minnesota Department of Education Transcript and Video- Autism Spectrum Disorders videos: http://education.state.mn.us/MDE/EdExc/SpecEdClass/DisabCateg/AutSpecDis/

35. Tool Chest: for Teachers, Parents and Students handbook. Available in Spanish: http://shop.henryot.com/pk4/store.pl?view_product=3

36. Sensory Processing Disorder Foundation- Sensory Processing Disorder information in Spanish http://www.spdfoundation.net/flyer.html

37. The Hispanic Caucus: A related professional organization of the American Speech-Language-Hearing Association (ASHA)- List of commercially available materials: http://www.ashahispaniccaucus.com/commerciallyavailableresources

38. National Association of School Psychologists- Publicaciones en Español para padres y los maestros: http://www.naspcenter.org/espanol/

39. Cultural and Linguistic Diversity Resource Guide for speech and language pathologists by B. Goldstein

APPENDIX C

IRB Non-Human Subjects Determination Notice

PEPPERDINE UNIVERSITY

Graduate & Professional Schools Institutional Review Board

January 13, 2015

Protocol #: N1214D01
Project Title: The Assessment and Diagnosis of Autism Spectrum Disorder in Latino Children

Dear Ms. Sloan-Pena:

Thank you for submitting the Non-Human Subjects Verification Form and supporting documents for your above referenced project. As required by the Code of Federal Regulations for the Protect for Human Subjects (Title 45 Part 46) any activity that is research and involves human subjects requires review by the Graduate and Professional Schools IRB (GPS-IRB).

After review of the Non-Human Subjects Verification Form and supporting documents, GPS IRB has determined that your proposed research[1] activity does not involve human subjects. Human subject is defined as a living individual about whom an investigator (whether professional or student) conducting research obtains (1) data through intervention or interaction with the individual, or (2) identifiable private information. (45 CFR 46102(f))

As you are not obtaining either data through intervention or interaction with living individuals, or identifiable private information, then the research activity does not involve human subjects, therefore GPS IRB review and approval is not required of your above reference research.

We wish you success on your non-human subject research.

Sincerely,

Thema Bryant Davis

Dr. Thema Bryant-Davis
Chair, Graduate and Professional Schools IRB
Pepperdine University

cc: Dr. Lee Kats, Vice Provost for Research and Strategic Initiatives
Mr. Brett Leech, Compliance Attorney
Dr. Miguel Gallardo, Faculty Advisor

1 *Research m*eans a systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge. Activities which meet this definition constitute research for purposes of this policy, whether or not they are conducted or supported un-der a program which is considered research for other purposes. (45 CFR 46.102(d)).