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**Social Competence, Peer Victimization, and Depression in Young
Adults with High-Functioning Autism Spectrum Disorders**

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**Social Competence, Peer Victimization, and Depression in Young
Adults with High-Functioning Autism Spectrum Disorders**

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Dedication

I would like to dedicate this dissertation to the Costello family and the Thompson family. You have all been influential in my career path and passion for helping children with autism spectrum disorders and their families.

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Social Competence, Peer Victimization, and Depression in Young Adults with High-Functioning Autism Spectrum Disorders

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The goal of this study was to examine the contributing factors to depression in young adult males with high-functioning autism spectrum disorders (HFASD) and controls. Specifically, this study examined the relationship between recalled relational peer victimization, self-perceived social competence, global self-worth, and symptoms of depression in individuals with HFASD compared to normal controls. Depression is one of the most prevalent comorbid conditions in the HFASD population. Individuals with autism are also subjected to high rates of peer victimization. Given that social abilities are impaired in individuals with autism, it was hypothesized that their experiences with victimization by peers, along with their self-perceived social competence and global self-worth, would help explain levels of depression. It was expected that higher levels of peer victimization, lower levels of self-perceived social competence, and lower levels of global self-worth would explain higher levels of depression. Additionally, it was expected that self-perceived social competence would mediate the effect of peer victimization on depression, global self-worth would mediate the effect of peer victimization on depression, and global self-worth would mediate the effect of self-

perceived social competence on depression. Variables were measured with self-report questionnaires. Multiple regression and bootstrapping measures of indirect effects were used to examine the presumed effects. Participants included 40 males, ages 18-26; there were 21 control participants and 19 individuals with HFASDs. Individuals with HFASD had significantly higher levels of depressive symptoms, lower levels of self-perceived social competence, lower levels of global self-worth, and a trend towards higher reports of peer victimization. Multiple regression analyses determined that peer victimization, global self-worth, and self-perceived social competence significantly predicted depressive symptoms in the total sample. Also, peer victimization significantly predicted self-perceived social competence and global self-worth. Additionally, self-perceived social competence significantly predicted global self-worth. Tests of indirect effects indicated that global self-worth mediated the effect of peer victimization on depression, self-perceived competence mediated the effect of peer victimization on depression, and global self-worth mediated the effect of self-perceived competence on depression. As a follow-up, this study also examined select HFASD participants' responses about how they defined bullying, as well as their perceived experiences with victimization.

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CHAPTER 1

Introduction

Autism Spectrum Disorders (ASDs) are characterized by impairments in reciprocal social skills, communication abilities, and the presence of restricted and repetitive interests or behaviors (American Psychiatric Association, 2000). While there is no known cause for ASDs, there are various theories that involve heredity and environmental triggers (Folstein, Rowen-Sheidley, 2001; Libbey, Sweeten, McMahon, Fujinami, 2005).

Social skill impairments are one of the primary, most salient characteristics of autism spectrum disorders (Rogers, 2000; Wing, 1981). Difficulties with social skills can result in many negative experiences throughout the course of a person's life. Research has shown that social skill deficits can affect many levels of functioning, including academic achievement, peer relationships, mental well-being, job attainment, independence, and quality of life (Hendricsson & Rydell, 2006; Portway & Johnson, 2005). Since social skill deficits can contribute to depression, and social skills are significantly impaired in those with autism, it is not surprising that depression is one of the most prevalent comorbid psychiatric conditions in this population (Ghaziuddin et al. 2002; Howlin, 2005; Leyfer, 2006). Estimated rates of depression in individuals with autism spectrum disorders range from 5 to 82 percent (Barnhill, 2001).

Depression can lead to many negative outcomes and poor quality of life. Some examples of such outcomes include emotional distress, losses of productivity, absenteeism from work, and premature death (Hirschfeld et al., 1997). There is also evidence of economic drain on individuals, families, and society; risk of suicide (Cicchetti & Toth, 1998); and impaired marital, interpersonal, and occupational relationships (Hammen, 1991).

The development of depression in individuals with high-functioning autism spectrum disorders may be influenced by an increasing awareness, with age, of their deficits in the ability to interact with and relate to others (Klin et al., 2000). Cognitive abilities may also contribute to this awareness; children who were older and had higher IQs perceived more difficulties with their social abilities, which predicted higher levels of depression (Capps, Sigman, & Yirmiya, 1995; Vickerstaff, 2006; Williamson, Crig, & Slinger, 2008). This finding may lead to the assumption that individuals with high-functioning autism spectrum disorders (HFASD) (individuals with autism whose overall cognitive level is not impaired) may be more aware of their social difficulties as compared with individuals with autism who *are* cognitively impaired.

Because of the relatively recent public awareness of HFASD, it is not uncommon that some adults with HFASDs have not been officially diagnosed until later in life (Portway & Johnson 2005; Tantam, 1991). Indeed, some adults are not diagnosed until a major event, such as a suicide attempt or an altercation with the law, which then results in a psychiatric review of the person's developmental history (Tantam, 1991). This finding

also suggests that these adults may be experiencing depression or other mental health difficulties that could lead to such negative life events. Additionally, some adults are not diagnosed until an episode of psychosis that results in hospitalization (Arora, Praharaj, Sarkhel, and Sinha, 2011). These findings provide compelling support for the importance of early diagnosis and intervention.

Early clinical reports suggested that children with autism have a desire for aloneness (Kanner, 1943). This notion has changed as it has been found that individuals with autism have a desire to develop relationships, but do not know how to do so (Bauminger, Shulman, & Agam, 2003). Children with HFASDs report less satisfaction with their existing friendships and experience loneliness more frequently and severely than typically developing children (Bauminger & Kasari, 2000). This desire to be accepted by others, in combination with low perceptions of their social skill abilities and frequent rejection from peers may, in part, help to explain depressive symptoms.

Individuals with HFASD may struggle with many aspects of social interaction. Although the degree of severity of social impairment and areas of weakness will vary among individuals, individuals with HFASD may display limitations in social interaction that hinder their ability to develop and maintain relationships. Such limitations include difficulties in nonverbal behaviors such as eye contact, reading and displaying appropriate facial expressions, and body language (Katsyri, Saalasti, Tiippana, von Wendt, Sams; 2008). Such individuals also often have difficulties in conversational skills, such as initiating and sustaining a conversation, using appropriate turn-taking,

changing topics appropriately, and understanding or using non-verbal social cues (Myles et al., 2007). Individuals with HFASD often interpret language literally and consequently have difficulty understanding non-literal language such as sarcasm, metaphors, figures of speech, and irony (Buettel, 2003).

Feelings of social inadequacy and perceptions of one's social competence are not instinctive or automatic. During school years, a child's negative interactions or exclusion from peers may be an important factor in the development of feelings of inadequacy in those with HFASDs. Research reveals high rates of peer victimization and exclusion of children with Asperger's Syndrome (AS), as reported by their mothers (Little, 2002). One study showed an increase in peer victimization as children with AS aged, which, in combination with comorbid conditions of anxiety and depression, placed these children at risk for suicidal ideation (Shtayermman, 2007). Similarly, repeated peer rejection and victimization in neurotypical children was found to be predictive of internalizing disorders, such as depression and anxiety (Reijntjes, 2006).

Social difficulties and depressive symptoms that occur during childhood and adolescence do not vanish when an individual enters adulthood. A study conducted by the National Autistic Society of Great Britain found that only 12% of individuals with HFASD were employed and that social difficulties at work were the leading cause of job failure (Bernard, Harvey, Potter, & Prior, 2001). Furthermore, many individuals who suffer with depression as children and adolescents may be at greater risk for experiencing depression as adults. Research demonstrates that individuals who experienced and

recovered from major depression during adolescence continue to have emotional difficulties as young adults (Lewinsohn, Rohde, Seeley, Klein, & Gotlib, 2003). Cognitive-vulnerabilities to depression have been hypothesized to become increasingly stable with age, but may show some change depending on the amount and severity of negative events (Hankin et al., 2009).

The potential negative outcomes and experiences mentioned above are significant reasons to determine what contributes to the development of depression in young adults with HFASD. Although there is research on the effects of peer victimization in neurotypical individuals, research is lacking on the effects of peer victimization in individuals with HFASD. Also, while there is extensive research on difficulties in social skills in individuals with HFASD, there is little research on their perception of their social abilities as well as overall self-worth, and subsequently, how these perceptions may affect levels of depression. Gaining a greater understanding of variables that contribute to depressive symptoms may have important implications for prevention and treatment of depression in individuals with HFASD.

The primary goal of this study was to examine how peer victimization, self-perceived social competence, and global self-worth explain depressive symptoms in individuals with HFASD and control participants. Another goal of this study was to examine how levels of autistic symptomatology may explain these individual's self-reported depressive symptoms, peer victimization, and self-perceived social competence.

CHAPTER 2

Literature Review

The aim of the following literature review is to explore a possible connection between peer victimization, self-perceived social competence, and global self-worth as possible influences on depression in individuals with HFASD and neurotypical individuals. While this specific study includes young adults, much of the literature review addresses research with children and adolescents with and without HFASDs. There are several important reasons behind the decision to include varying developmental periods in the review. One significant reason is because most of the literature regarding individuals with autism, particularly with the variables of interest, involves children and adolescents. Another reason is that research indicates that experiencing depression in childhood results in a higher chance of developing depression as an adult (Harrington, Fudge, Rutter, Pickels, & Hill, 1990). Furthermore, peer victimization begins when the individual is of school age, and this study measures recalled victimization during the high school years. It is hypothesized that the individual's experiences with peer victimization during school will be instrumental in forming later self-perceptions of social competence.

First, a brief history of autism is described, followed by symptomatology of ASDs, current theories of etiology of ASDs, and theories explaining the increase in the prevalence of ASD. Next, theories of depression in children and adolescents are discussed, followed by a description and analysis of depression research on individuals

with HFASD. Developmental implications for depression are also described. Subsequently, social competence, global self-worth, and peer victimization research is discussed, with a focus on how these variables might contribute to depression in individuals with HFASD and controls. Lastly, a discussion on self-perceptions and self-report measures in individuals with autism is discussed, with a particular emphasis on self-reports/self-perceptions of depression, social competence, self-worth, and peer victimization.

Autism Spectrum Disorders

Diagnostic Criteria for Autism

Autism spectrum disorders have provoked many debates and controversies in the autism field; etiology, prevalence, diagnostic criteria, treatments, and interventions are some of the primary topics under constant research and dispute. Of most relevance to the proposed study is the debate surrounding the diagnostic criteria for autism spectrum disorders. Per the fourth text revision, of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR), there are five distinct diagnoses of pervasive developmental disorders: Autistic Disorder, Childhood Disintegrative Disorder, Asperger's Disorder, Rett's Disorder, and Pervasive Developmental Disorder, Not Otherwise Specified (PDD-NOS) (American Psychiatric Association, 2000). Within the overarching category of pervasive developmental disorders are autism spectrum disorders, which include the diagnoses of Asperger's Disorder (also referred to as Asperger's Syndrome), Autistic

Disorder, and PDD-NOS. These disorders are all characterized by atypical development in socialization, communication, and behavior.

While not recognized officially by the DSM-IV-TR, another specific diagnostic subcategory of “high-functioning autism” is widely accepted in clinical practice and research. The term is a qualifying phrase, which indicates that an individual who meets criteria for autism has normal intelligence. Researchers and practitioners have had difficulties distinguishing between Asperger’s Disorder and high-functioning autism (HFA) (Freeman, Cronin, & Candela, 2002; Scituito & Cantwell, 2005; Tryon, Mayes, Rhodes, & Robert, 2006). DSM-IV-TR criteria for Asperger’s Disorder indicate qualitative impairments in social interaction, restricted repetitive stereotyped patterns of behavior, interests, and activities. In addition, the individual should have no clinically significant language delay or a cognitive development delay in order to qualify for an Asperger’s Disorder diagnosis. The term HFA is recognized as a form of autism in which the individual has normal intelligence, but developmental delays in language during early development (Noterdaeme, Wriedt, & Hohne, 2009). Lastly, the diagnosis of PDD-NOS includes individuals who do not meet full criteria for a specific autism spectrum disorder, yet display a severe and pervasive impairment in social interaction related to impairments in communication skills or the presence of stereotyped behavior, interests, and activities (American Psychiatric Association, 2000). Individuals with PDD-NOS may or may not be “high-functioning” as indicated by their cognitive ability.

Much debate has circulated among professionals, clinicians, and researchers in the field of autism regarding the validity of the current DSM (Kamp-Becker et al., 2010). Recent discussions have proposed that there may not be an actual empirical difference between autism and Asperger's Disorder, and that they are merely variations of the same disorder (Sanders, 2009), while some argue that the current categorization system should remain in place until further research is conducted regarding diagnostic instruments and disorder characteristics to better understand the diagnostic nosology (Lecavalier, Gadow, DeVincent, Houts, & Edwards, 2009). However, it has been anticipated that in the next edition of the DSM (DSM-5), expected release in May 2013, the specific categories of Autistic Disorder, Asperger's Disorder, and Pervasive Developmental Disorder, Not Otherwise Specified (PDD-NOS) will be consolidated into a singular diagnostic criteria of "autism spectrum disorder" (Barrett & Fritz, 2010). Therefore, for the purposes of this paper, the term "high-functioning autism spectrum disorders" (HFASD) will be used as an encompassing term that includes diagnoses of Asperger's Disorder, high-functioning autism, and individuals with PDD-NOS who do not have cognitive impairments.

Additional symptoms of autism spectrum disorders are also under debate. Symptoms that are not included in the DSM-IV-TR that are under further investigation by researchers include impairments in adaptive behavior, motor difficulties, emotional vulnerabilities, sensory sensitivity, and academic difficulties (Lee, H.J. & Park, R.H., 2007; Myles et. al, 2007; Rinehart, 2006).

History of Autism Spectrum Disorders

Autism is known as a developmental disorder characterized by impairments in social interaction, communication, and by repetitive or stereotypic behavior (Newschaffer, et al., 2007). An in depth description of the early accounts of autism was presented by Lyons and Fitzgerald (2007) and is summarized as follows: The term autistic (from the Greek word “autos”, meaning self) was first used in 1911 by Eugen Bleuler, a Swiss psychiatrist, who used the label to describe characteristics of withdrawal in schizophrenic individuals. In 1943, two authors described autistic psychopathology: Leo Kanner in Baltimore, USA, and Hans Asperger, in Vienna, Austria. Asperger’s writings were known within the German speaking community, but became more widely known when his work was described by Lorna Wing in 1981, and when his writings were translated by Frith in 1991. In 1994, the American Psychiatric Association recognized Asperger’s Disorder as a subtype of pervasive developmental disorder with distinct criteria from autism.

Prevalence and Etiology

The prevalence rates of autism have increased significantly since initial prevalence surveys in the 1960s (Newschaffer, et. al, 2007) and after prevalence surveys in the early 2000s (CDC, 2009). The Medical Research Council in the UK argued that the drastic increase in the prevalence of autism is likely from changes in diagnostic practice, public and professional knowledge and awareness, and methodological differences between studies (MRC, 2001). The increase may also be due to changes in the definitions of the disorders over the years and better assessment tools (Fombonne,

2005). Recent prevalence reviews in the US indicate estimates of roughly 1 per 110 (9 per 1,000) (CDC, 2009). Also, the mean age of diagnosis has decreased in 2006 as compared with 2002 (CDC, 2009), indicating that over the past few years, practitioners and parents are sooner and better able to recognize and respond to developmental concerns that warrant identification and intervention. Despite changing levels of reported prevalence, one consistency remains; there is a higher level of prevalence of autism in males than females. The CDC indicates that the ratios of males to females with autism spectrum disorders vary according to different states in the U.S., but the combined ratio was 4.5:1. Also, race and ethnicity rates vary among states, but overall, non-Hispanic white children had significantly higher rates than non-Hispanic African American children and Hispanic children (CDC, 2010). Explanations for this discrepancy are unknown. Palmer, Walker, Mandell, Bayles, and Miller (2010) examined the rates of autism in Hispanic children in Texas. While higher socioeconomic status and density of local physicians explained differences of autism prevalence in non-Hispanic Whites, these factors did not explain differences in rates for Hispanics. Furthermore, their results ruled out misdiagnosis as a possible explanation. The authors suggested future research to examine other factors, such as other socioeconomic factors, cultural factors, health care delivery, or biological factors.

Although there is no conclusive evidence regarding the etiology of autism spectrum disorders, it is thought that there is a complex interaction of genetics and environment (Moy & Nadler, 2008). Nicolson & Szatmari, (2003) examined findings

from genetic (chromosomal abnormalities and familial phenotypes) and brain-imaging studies that support a neurobiological basis for autism. Courchesne (2002, 2003) indicated that abnormal brain growth in individuals with autism was evident; head circumference showed significantly accelerated brain growth in the first two years of life that was followed by halted or slowed growth of various brain regions. Nicolson & Szatmari's review also described imaging studies of temporal lobe structures, specifically the amygdala and hippocampus, which have demonstrated inconsistent results. The cerebellum is thought to be an important area of examination due to many findings of abnormalities in this region among individuals with autism (Allen, 2005). Furthermore, both animal and human research that has examined lesions and tumors in the cerebellum show evidence of behavioral and cognitive impairments similar to those displayed by people with autism (Berntson & Schumacher, 1980; Bobee, Mariette, Tremblay-Leveau, & Caston, 2000; Eluvathingal et. al, 2006; Weber, Egelhoff, McKellop, & Franz, 2000).

Evidence for a genetic component to autism is demonstrated by twin studies that yield high concordance rates of 70-80% between monozygotic twins (Folstein, Rowen-Sheidley, 2001). Research has demonstrated higher rates of concordance for autism in monozygotic twins as compared to dizygotic twins (Bailey et. al, 1995; Ritvo, Freeman, Mason-Brothers, Mo, Ritvo, 1985), providing further evidence for a genetic component for autism. Nicolson and Szatmari's review (2003) of four twin studies that examine the rates of monozygotic twins compared to dizygotic twins all showed similar results. The

studies showed heritability estimates greater than 90%, which places autism as the most heritable psychiatric disorder (Folstein & Rosen-Sheidley, 2001).

Environmental risk factors are also hypothesized to contribute to autism, but findings are inconclusive (Miller & Reynolds, 2009). Early developmental risk factors, such as prenatal exposure to viruses (Libbey, Sweeten, McMahon, Fujinami, 2005) and early childhood exposure to antibiotics and vaccinations (Fallon, 2005; Kawashima et al., 2000) have been hypothesized to contribute to the risk for the development of autism, but convincing evidence for these hypotheses is lacking.

It is likely that the risk factors that contribute to autism are complex and multifaceted, perhaps involving an interaction between both environmental exposures and genetic predispositions.

Depression in Individuals without Autism

The development of depression is thought to have many possible causes that include affective, environmental, biological, and cognitive influences. The interaction of such influences, rather than a single influence, is likely to result in a greater predisposition and vulnerability to the development of depression. Many theories focus on affective, environmental, biological, or cognitive influences, while some theories have a more integrated approach to discussing the interplay of potential contributing factors. The diagnostic criteria for depression and current prevailing theories and models of depression will be described.

The DSM-IV-TR (American Psychiatric Association, 2000) provides diagnostic criteria for depression under three categories in the mood disorders section: Major Depressive Disorder (MDD), Dysthymic Disorder (DD), and Depressive Disorder Not Otherwise Specified (DDNOS). Major Depressive Disorder criteria include the following: a depressed mood or loss of interest in pleasurable activities for at least two weeks, and at least four additional symptoms that include changes in weight, appetite, sleep, activity level, feelings of worthlessness or guilt, suicidal ideation, and problems concentrating. Dysthymic Disorder criteria include a depressed or irritable mood that persists over a period of one year and two of the previously mentioned symptoms. Depressive Disorder Not Otherwise Specified is diagnosed when an individual's symptoms do not qualify for diagnoses of Major Depressive Disorder or Dysthymic Disorder (American Psychiatric Association, 2000).

Many theories suggest that cognition plays a role in the development of depression. Cognitive vulnerability-stress models suggest that people with a negative cognitive style may have a higher predisposition towards developing depression when they are faced with negative events. The development of a negative cognitive style may be extremely complex. A review provided by Hankin et al. (2009) describes possible mechanisms for the development of cognitive vulnerabilities, with a focus on genetic factors, temperament, parents, peers, and stressful life events.

Three extensively researched cognitive vulnerability-stress models include Beck's cognitive theory of depression (1964), Abramson's hopelessness theory (1989), and

Nolen-Hoeksema's ruminative response styles theory (1991). While the theories focus on different aspects of cognition, they all share the perspective that when people with certain cognitive styles encounter stress, depression can result.

Beck (1964) proposed a cognitive theory of depression that suggested that depressed individuals have distorted and negative cognitions about the self, world, and future. These negative thoughts are explained to be a result of early experiences that contribute to a person's negative schemas. These negative schemas may predispose the person to focusing on negative aspects of encountered events. In other words, when confronted with a negative event, the person with a negative self-schema may interpret the event based on their negative self-perceptions.

Abramson's et al. (1989) hopelessness theory of depression suggests that the individual who makes negative assumptions about the causality, self, and consequences in response to stressful or negative life events will have a higher propensity to develop depression. Specifically, a person may make attributions to the causes of negative events, including global, stable, and internal causes, which predisposes him to develop depression (Abramson, Metalsky, & Alloy, 1989).

Lastly, Nolen-Hoeksema's (1991) theory is another cognitive based theory that focuses on rumination style in relation to becoming vulnerable to depression. The theory suggests that individuals who continually think about their symptoms of depression and negative events are susceptible to depression by increasing a negative mood and reducing functional behaviors, such as problem solving or other positive behaviors.

Other cognitive theories focus on more specific areas of negative cognitions, rather than pervasive cognitive styles combined with negative life events. For example, research has also proposed that negative beliefs about self-worth in domains such as interpersonal, academic, and body image, especially at the time of puberty, may predict depression (Hyde, Mezulis, & Abramson, 2008). Also, research has shown that initial episodes of depression are likely to be triggered by negative life events, especially in adolescence (Monroe & Harkness, 2005; Grant, Compas, Thorn, McMahon, & Gipson, 2003).

Genetics and biological predispositions may put an individual at risk for developing depression, especially with an interaction of environmental and cognitive triggers. Twin studies show that the concordance of depression in monozygotic twins is greater than dizygotic twins (McGuffin & Katz, 1989; Sullivan, Neale, and Kendler, 2000). Specific genes such as the serotonin transporter (5-HT) gene have been associated with depression, and selective serotonin reuptake inhibitor antidepressants have been shown to be effective in treating depression (Tamminga et al, 2002). The puberty process has also been suggested as a contributing factor to depression because of hormonal and developmental changes that are combined with children's perceptions of body ideals (Hyde, Mezulis, & Abramson, 2008).

An individual's family environment may also contribute to the development of depression. Stark, Rouse and Livingston (1991) hypothesized that children's family relationships and early learning experiences contribute to their core schemata of

developing negative thoughts about the self, the world, and the future. Specifically, negative interactions with parents, receiving messages of rejection, and overly punitive discipline contribute to the child's feelings of low self-worth and subsequently affect future interactions with others that serve to maintain their schema. Also, family conflict and parental depression have been shown to be associated with depression in children (Davies & Windle, 1997). Although parental depression has been shown to be environmental stressor for the child, one must also consider the role of genetic influences when there is a family history of depression.

As suggested previously, social competence and self-perceptions of social competence may also play a role in the development of depression. A study that examined perceived social competence and depression in young adults indicated that higher depressive symptoms were associated with a greater negative discrepancy between self and peer ratings of social competence (when the person viewed themselves more negatively than did their peers). Conversely, lower depressive symptoms were found when the subject overestimated his or her social competence relative to peer ratings, resulting in a positive discrepancy (Whitton, Larson, & Hauser, 2008). Another important finding was that peers rated the young adults who had higher depressive symptoms as less socially competent. One possible reason for such a correlation is that poor social skills may cause a cycle of isolation and depression, as suggested by Coyne (1976). That is, individuals who are viewed as less socially competent may have reduced or negative interactions with their peers, which subsequently fuels their depressive symptoms and

makes them even less likely to be accepted by their peers. Therefore, individuals with poor social skills are likely to receive little social reinforcement from others, which may contribute to depression (Lewinsohn, Mischel, Chaplin, & Barton, 1980). Joiner (2000) also described how social skill deficits can bring about depressive symptoms, which can result in a cycle of depression and stagnation of social skill development.

Developmental Implications for Depression

While there are many complexities of the development and subsequent implications of depression, it is apparent that many individuals who suffer with depression as children and adolescents may be at greater risk for experiencing depression as adults. Longitudinal research has shown that individuals who experienced and recovered from major depression during adolescence continue to have emotional difficulties at age 24 (Lewinsohn, Rohde, Seeley, Klein, & Gotlib, 2003). Additionally, children who had elevated trajectories of depressive symptoms during their childhood or adolescence had significantly more depressive symptoms in young adulthood compared to those with normal trajectories (Dekker, Ferdinand, van Lang Bongers, van der Ende, & Verhulst, 2007). Young adults, in the period of emerging adulthood (end of high school through most of the twenties) may also be at risk for affective disorders if they do not have the appropriate coping skills and resources to help them with the phase of developing adult roles, responsibilities, and transitions (Carbonell, Reinherz, and Beardslee, 2005).

Research suggests that the prevalence of depressive symptoms increases significantly in early to middle adolescence for both boys and girls. Adolescent girls tend to have significantly higher rates of depressive symptoms (Nolen-Hoeksema, Girgus, & Seligman, 1994; Hankin et al., 1998). Some theories explaining this gender difference posit the increasing levels of estrogen (Angold & Costello, 2006). From another perspective, girls may have higher depressive symptoms in adolescence due to higher emotional sensitivity and ability to recognize feelings of distress (Hill, 2009). Regarding symptom variation in developmental stages, a unique characteristic to depression in children is irritability may be more prevalent than sadness.

When discussing the possible causes of depression, it is important to note the concepts of equifinality and multifinality. Equifinality refers to the concept that different routes may lead to equal outcomes in different individuals, while multifinality refers to the concept that similar paths can lead to different outcomes in different individuals (Hinshaw, 2008). These constructs are important to consider when examining psychopathology because it is important to maintain the notion that every individual is unique and has different experiences, and the development of depression is not necessarily imminent if a child has certain characteristics and experiences.

Depression in Individuals with High-Functioning Autism Spectrum Disorders

Depression is one of the most prevalent comorbid psychiatric conditions in individuals with autism (Ghaziuddin et al. 2002; Howlin, 2005; Leyfer, 2006). The risk for developing major depression throughout the lifetime in autism spectrum disorders is

higher than the normal population. Rates of depression in individuals with autism spectrum disorders range from 5 to 82 percent (Barnhill, 2001). Leyfer (2006) demonstrated that 24% of children with autism have had episodes of major depression (10% meeting full DSM-IV criteria and 14% who fell just short of meeting DSM-IV criteria). Ghaziuddin et al (1998) examined children and adults (ages 8-51) with AS and found 37% had comorbid depression disorders (including depression, dysthymia and bipolar disorder). Studies of young adults are sparse, but a recent study of comorbidity in young adults with Asperger's using a Structured Clinical Interview for DSM-IV Axis I Disorders showed that 70% had experienced at least one episode of major depression and 50% had suffered from recurrent depressive episodes (Lugnegard, Hallerback, & Gillberg, 2011). Regarding gender differences, a study of male and female adults with HFASDs found no gender differences in the amount of self-reported depression or anxiety symptoms (Lai, et al., 2011).

Barnhill suggests that establishing a prevalence rate of depression in individuals with autism has been difficult, perhaps because the symptoms of depression are masked by autism symptoms. Leyfer (2006) also indicated that the prevalence rates have varied because of differing criteria, biased samples (only including individuals who had been referred for psychiatric treatment), a variety of instruments that are not sensitive to the autism population, and some studies only inquiring about current symptoms.

Clinical Presentation of Depression in Individuals with HFASD

Symptomatology and presentation of depression were described previously in this literature review. However, the presentation of depression may include differences in individuals with autism, and therefore, the assessment and diagnosis of depression in such individuals may be more complex. Magnuson & Constantino (2011) provided a thoughtful synthesis of research with relevant information regarding the presentation and identification of depression in children with autism. They indicated that literature describes caregiver reports of an increase in sadness, tearfulness, apathy, anhedonia, sleep and weight disturbances, and increased aggression or irritability. Preoccupations with themes of death have also been noted. While these symptoms are also apparent in neurotypical individuals with depression, some of these symptoms can be confusing as they can overlap with symptoms of ASD. For instance, irritability (particularly with changes in routines) apathy, and withdrawal are also associated symptoms of individuals with ASD.

There are also nontraditional symptoms that may be associated with depression in individuals with ASD, such as increased compulsiveness or stereotypic behavior, hyperactivity, decreased adaptive functioning, self-injurious behavior, and decreased interest in preoccupations or restricted interests. To make matters of assessment and diagnosis more complicated, the authors pointed out that there are no standardized assessment tools for psychiatric comorbidities in individuals with ASD. It is clear that more research needs to be conducted with individuals with autism and comorbid psychiatric disorders. Future research should focus on changes in autistic

symptomatology as a result of comorbid diagnoses; etiology of comorbid symptoms; differentiating autistic symptoms with comorbid symptoms; differences in symptom presentation of individuals with intellectual disabilities versus individuals with high-functioning ASD; and assessment tools to accurately assess and diagnose comorbid psychiatric diagnoses for this population. Magnuson & Constantino (2011) also recommend that further research should be conducted with peer relations, social awareness, and self-perceptions among youth with ASD in order to develop interventions to sustain a positive self-concept.

Etiology of Depression in Individuals with HFASD

Although the influences involved in the high prevalence of depression in ASD are not fully understood, findings do suggest that poor social skills and low perceptions of these skills may contribute to the development of depression in this population (Capps, Sigman, & Yirmiya, 1995; Vickerstaff, 2006; Williamson, Crig, & Slinger, 2008). Since a defining impairment of HFASD concerns social skills, their perceptions may not be distorted, as some cognitive models of depression suggest (Beck, 1967). Their perceptions may be realistic, and their social inadequacies may be perceived by others and subsequently result in few positive interactions (Lewinsohn et al., 1980).

Other cognitive factors may also play a role in the development and maintenance of depression in individuals with HFASD. For example, there is evidence that attributional styles predict levels of depressive symptomatology in adolescents with HFASDs. Adding evidence to Abramson's (1989) previously mentioned theory,

adolescents with AS who attributed social failure and negative life events to more internal, stable, and global causes had higher rates of depression than their counterparts that made external attributions (Barnhill, 2001; Barnhill & Myles, 2001). Intelligence and interpretation of self-perceptions might play a role in the severity of depressive symptoms in individuals with HFASD. Findings have indicated that more intelligent individuals with HFASD attribute their lack of social ability to internal and stable traits and are more cognitively aware of their inadequacies (Barnhill, 2001; Vickerstaff, 2006). Those with higher cognitive abilities may be more aware of their difficulties and better appreciate the extreme complexities that are involved in social interactions. As these individuals experience negative social interactions, they may develop feelings of hopelessness with the realization that their difficulties are embedded in their personality. So, the development of depression in HFASD may, in part, result from a combination of cognitive factors and social impairments. Their social impairments may be perceived negatively by others, which results in little social reinforcement and unsuccessful interactions with peers, potentially making them more aware of their social inadequacies. Negative self-perceptions may cause individuals with HFASD to withdraw further from others as they realize that their impairments are part of the nature of their disorder.

Coping skills may also be a contributor to depression in individuals with HFASD. Effective coping requires flexibility and adaptation (Carbonell, Reinherz, & Beardslee, 2005). Positive coping skills that use flexibility include problem-solving or identifying different ways to positively respond to a negative event, and subsequently abandoning a

particular response when realizing its ineffectiveness. Individuals with autism often show difficulties with flexibility and can get “stuck” in their response styles for problem-solving (Kleinhans, Akshoomoff, & Delis, 2005). Much of the research in this area focuses on executive functioning through neuropsychological tasks. However, it may be logical to assume that since coping abilities require flexibility, perhaps flexibility needed for social and emotional skills are affected as well. In other words, individuals with autism may have more difficulty using effective coping skills due to cognitive inflexibility. Research is needed to examine this possibility.

Similar to neurotypical children, family relationships may contribute to depression in children with autism. There is evidence that family conflict predicts anxiety and depression in children with autism (Gadow, DeVincent, Schneider, 2008; Kelly, Garnett, Attwood, & Peterson, 2008). There is also evidence that families with children with autism report high levels of stress (Rodrigue, Morgan, & Geftken, 1990). Having a stressful home environment may create a cycle of depression and stress for both the parent and child.

Yet, it is not just the family environment that can impact depressive symptomatology. Genetic factors may also contribute to the development of depression. One study of individuals with Asperger’s found that there was positive family history for schizophrenia, depression, and the broader autistic phenotype (Ghaziuddin, 2005). Another study that examined the broader phenotype of parents of individuals with autism showed that parents of children with autism possessed depressive symptomatology that

was not associated with the burden of caregiving for an individual with a disability (Hodge, Hoffman, & Sweeney, 2011). However, this particular study did not examine levels of symptomatology predating the birth of their children. Instead, their conclusion stemmed from finding no differences in depressive levels for mothers and fathers. The authors' reasoning came from the assumption that if mothers had reported higher levels of depression, it would be related to burden of caregiving since mothers are often the primary caregivers and tend to show higher stress levels related to caring for a child with autism (Montes & Halterman, 2007). While this finding is noteworthy, further research should be conducted to examine the relationship between parental depression (pre and post-dating the birth of their children), parental stress, and family processes/relationships as contributors to depression in children with autism.

An increase in the severity of the level of ASD symptomatology is associated with higher levels of anxiety and depression in children with autism, per parent report (Kelly, Garnett, Attwood, & Peterson, 2008; Shtayermman, 2007). Similar findings have been found with college students with HFASDs. White, Ollendick, and Bray (2011) found that HFASD college students with higher autism quotient scores reported less satisfaction in college and life compared to the group with lower autism quotient scores, even though they had higher GPAs. These findings may imply that more severe symptoms of autism, including communication and social impairments, can result in further exclusion from peers and family members due to difficulty relating and developing relationships, subsequently affecting their emotional health. However,

another study demonstrated opposing results; the level of ASD symptomatology was associated with fewer symptoms of depression, per parent report. One caveat, however, was that this relationship was also associated with lower IQ (Mazurek, M.O., Kanne, S.M (2010). Therefore, IQ seems to be a moderator for depressive symptoms in individuals with a greater level of autism severity. Individuals with higher levels of autism severity may seem more depressed according to parents, but only when they also have higher cognitive abilities. However, further research should examine if higher levels of ASD symptomatology is associated with higher levels of self-reported depression, rather than parent reports.

Associations of depression and social abilities have been demonstrated in young adults without a formal diagnosis of an ASD, yet who had higher levels of autistic traits. Young adults who reported higher levels of ASD traits, compared with individuals with minimal ASD traits, also reported significant difficulties in many psychosocial abilities and emotional functioning. Reported difficulties include personal adjustment, more social stress, a greater sense of social inadequacy, more difficulties with interpersonal relationships, lower self-esteem, and less self-reliance (Kanne, Christ, & Reiersen, 2009).

Understanding the complexities involved in psychiatric comorbidity in individuals with HFASD is necessary for determining appropriate interventions that may greatly affect quality of life and outcomes for these individuals. Interventions for children and adolescents are numerous, varied, and extensively researched. Non-pharmacological interventions for addressing deficits and challenges associated with autism have included

behavioral (Reichow, 2012), dietary (Srinivasan, 2009), speech and language (Kane, Connell, Pellecchia, 2010), functional and symbolic play (Lang, O'Reilly, Rispoli, Shogren, Machaliecek, & Sigafos, 2009), and social skills (Schreiber, 2011), to name a few. However, there is scarce research on effective treatments for psychiatric comorbidities in this population; it will be important for continuing quality and rigorous research into appropriate interventions for psychiatric comorbidities, such as depression and anxiety, to improve their quality of life.

Social Competence

There are abundant definitions and conceptualizations of social competence. Many descriptions of the concept include possessing the necessary skills and strategies for successful social interactions and the maintenance of social relationships (Vickerstaff et al., 2006). Although it seems that “social skills” is a term that can be interchangeable with “social competence”, these can also be referred to as distinct concepts. Social skills can be defined as behaviors used to interact effectively with others, whereas social competence can be defined as the quality of a person’s social ability as perceived by the self and others (Gresham, 1986; Warnes, Sheridan, Geske, & Warnes, 2005). Therefore, social competence may be thought of as a person possessing social skills that are used appropriately to have successful interactions as *perceived* by all parties involved in the interaction. In other words, social competence is a more overarching term that has an element of judgment involved, and the judgment can come from one’s self, or others, such as teachers, peers, and parents.

Behavior can be considered socially competent if it predicts important social outcomes for individuals, such as peer acceptance, acceptance by adults, school success, and positive mental health (Gresham, 1986). Social competence has been shown to affect various areas of functioning, including educational attainment, ego development, self-esteem, psychological symptoms, and criminal behaviors (Hendricsson & Rydell, 2006; Larson, Whitton, Hauser & Allen, 2007; Libet & Lewinsohn, 1973; Rockhill, Vander Stoep, McCauley, & Katon, 2009). This review will focus on prevailing theories of social competence, skills that have been shown to be important for social competence, the difficulties of social competence that individuals with HFASDs may experience, and issues regarding self-perception of social competence.

Theories of Social Competence

Gresham (1986) proposed that social competence requires both adaptive behavior and social skills. Adaptive behavior includes independent functioning skills, physical development, language development, and academic competencies, while social skills include interpersonal behaviors (conversation skills, cooperative behaviors, etc.), self-related behaviors (expressing feelings, attitude towards self), and task related behaviors (following directions) (Gresham, 1986).

According to Gutstein & Whitney (2002), there are three separate elements of social competence that are essential to develop in order to experience social success: a) secure attachment (the bond between an infant and his or her caregiver that generally begins after 6 months of age; secure attachments allow the child to use the caregiver as a

source of support while experiencing distressing situations), b) instrumental social learning (interactions that have a specific goal, such as acquiring new information, help, obtaining specific objects, or meeting specific needs, and c) experience sharing relationships (the desire and skills necessary to understand others' emotions and be able to contribute to the social partnership in a give and take manner in a reciprocal nature of enjoyment and support). A secure attachment may be hard to measure in children with autism because of their difficulties in social interaction and communication. Research has found that children with autism are capable of forming attachment relationships with their caregivers. However, secure attachments are underrepresented in this population, while disorganized attachment is higher compared to the normal population (Naber et al, 2006).

Social Skills Necessary for Social Competence

Social competence includes a range of skills, including self-regulation, interpersonal knowledge and skills, self-identity, and social values and conventions (Talwar & Renaud, 2008). Other behaviors include social initiative and prosocial behaviors, such as willingness to help, share, and cooperate (Rydell, Hagekull, & Bohlin, 1997). A vital skill in developing social competence is the ability to take the perspectives of others and react properly (Warnes & Sheridian, 2005). Since perspective taking has been shown to be a major difficulty in children with HFASDs (Peterson, Slaughter, & Paynter, 2007), it is likely that frustration results from not being able to infer the driving forces behind the display of emotions and behaviors from others.

Warnes and Sheridian (2005) surveyed second and fifth grade children, their parents, and teachers about the skills needed to make a good friend. All respondents, including second graders, included the following social behaviors: compromise, empathy, helpfulness, loyalty, a happy disposition, and time spent together. It is important to note that empathy was expressed as an important social behavior, because empathy has been highly researched in the autism population due to difficulties in this area for such individuals and because of its relationship to perspective taking (Baron-Cohen & Wheelwright, 2004).

Social Skill Difficulties in Individuals with HFASD

Some of the social skill impairments of individuals with autism include difficulties in nonverbal behaviors such as eye contact, reading and displaying facial expressions, and body language (Katsyri, Saalasti, Tiippana, von Wendt, Sams; 2008). Other difficulties are apparent in conversational skills, which include initiating and sustaining a conversation, using appropriate turn-taking, changing topics appropriately, having trouble understanding or using non-verbal social cues (Myles, et al., 2007). Because those with HFASD generally interpret language literally, they consequently have difficulty understanding non-literal language such as sarcasm, metaphors, figures of speech, and irony (Buettel, 2003). Associations have been found between false-belief tasks (tasks that measure theory of mind, which is the ability to infer other's mental states), executive function, and social competence in neurotypical children (Razza & Blair, 2009). This finding speaks to the social vulnerability to which children with

HFASD are predisposed because of their difficulties with theory of mind (Peterson, Slaughter, & Paynter, 2007) and executive functioning (Verte, Geurts, Roeyers, Oosterlaan, & Sergeant, 2006).

Not only do individuals with HFASD lack many skills necessary for developing and maintaining relationships, they also may lack schemas for what it means to be a friend or have friends. In a study that interviewed adolescents with AS in regard to their perception of friendships, findings indicated that the adolescents had inadequate insights into the components of friendship, such as what it means to be a friend and who would not be a friend, as well as little knowledge of the language to describe friendships (Carrington, Templeton, & Papinezak, 2003).

Despite misconceptions or difficulties in understanding the concept of friendship, individuals with HFASD possess the desire to have relationships with others, but do not know how to initiate and sustain such relationships. Therefore, frustration and hopelessness may result from a lack of positive interaction with others. Individuals with HFASD have average or above average cognitive abilities; therefore during school years, they are placed in regular education classrooms. Although the intent of this placement may be to enhance their academic and social development with their peers, research has shown that children with HFASD experience low levels of involvement, acceptance, companionship, and reciprocity in the classroom (Chamberlain, Kasari & Rotheram-Fuller, 2007).

Individuals with HFASD may experience severe social impairments-even more so than other disorders that involve poor social functioning. In a study of adolescents (ages 11-19) with HFASD compared with peers with severe conduct disorders, those with HFASD were significantly more socially impaired than their peers with conduct disorders, had higher rates of unemployment, and had similarly high levels of depression and suicidal ideation (Green, Gilchrist, Burton, & Cox, 2000). Social competence is vital to quality of life, and the inability to develop it is likely a main factor contributing to the failure of most adults with autism to attain a good quality of life (Howlin and Goode, 2000).

Global Self-Worth

This study proposes that self-perceived social competence is important to consider in the context of depressive symptoms for individuals with autism, particularly because of associations found between low perceptions of social abilities and depression, and because social difficulties are inherent to a diagnosis of an autism spectrum disorder. However, global self-worth has also been shown to impact depressive symptoms (Sowislo & Orth, 2013), and is important to consider in relation to the variables in this study. Global self-worth is often used synonymously with self-esteem or global self-esteem in the literature. Global self-worth is a construct defined as the perception of one's overall worth as a person (Harter, Whitesell, & Junkin, 1998). While global self-worth and self-perceived social competence are different concepts, they are intertwined to some degree. Specifically, global self-worth is considered one's overall self-worth, which

is thought to include domains of competence that contribute to one's global self-worth, such as social abilities, athletic abilities, physical appearance, cognitive abilities, etc. (Harter, 1985, 1998). Theories of global self-esteem in relation to specific domains of competence are dated back to James (1890), who argued that high self-esteem occurs when an individual performs well in domains that he or she perceives as important. Research has supported this concept (Harter, Waters, & Junking, 1998). Harter et al (1998) also demonstrated that among adolescents, domains that topped the list of importance included Close Friendship, Job Competence, and Physical Appearance, even among varying groups of students including normally achieving students, students with learning disabilities, and students with behavior disorders.

In addition to examining the perceived importance of certain domains in relation to global self-esteem, it may also be important to examine how much control the individual has on particular domains. A study of Chinese university students conducted by Hu, Yang, Wang, and Liu (2008) demonstrated that domain self-esteem affected global self-esteem more strongly for individuals whose self-esteem was highly contingent on uncontrollable domains (such as nationality or appearance) as opposed to controllable domains (such as ability). Examining these results in individuals with HFASD or individuals with depressive symptoms may provide further information on the relationship between specific domains, global self-worth, and depression. For individuals with HFASD, it may be important to examine the importance of certain domains in the context of their global self-worth, but it may also be necessary to examine perceived

control over certain domains of importance. For instance, if self-esteem is highly dependent on social abilities for an individual with HFASD , it may be important to determine how much control the individual perceives over this domain. Furthermore, determining importance and level of control over certain domains may also need to be examined in the context of depressive symptoms, as individuals with higher levels of depression may be hopeless even over domains that are thought to be controllable. In other words, if an individual feels hopeless and negative about themselves, he may feel negatively about the possibility of improving in domains that are controllable and uncontrollable.

Theories have also incorporated social influences on the development of self-esteem. A theory developed by Cooley (1902) suggests that an individual's self-perception is based upon their understanding of how others view him, also known as the looking-glass self. Harter, Stocker, and Robinson (1996) examined the looking-glass self orientation in the context of peer approval among young adolescents. The authors examined participants who reported self-worth preceding peer approval, those whose self-worth was based upon peer approval, and those who reported no connection between peer approval and self-worth. Their findings suggested that participants who based their self-worth on peer approval reported to be more preoccupied with peer approval and were subsequently distracted from their schoolwork. Harter, Waters, and Whitesell (1998) also demonstrated that young adolescents' perception of their worth as a person varied across interpersonal contexts, including with parents, teachers, male classmates, and female

classmates. Interestingly, the authors also described findings that support the looking-glass self perspective; specifically, that validation, support, or approval from others within the specific context (i.e. teachers, parents, male classmates, female classmates) was more highly predictive of relational self-worth in the particular context. The authors also suggested that understanding the importance of support from each of these contexts may be crucial in understanding self-worth, as suggested by James (1892).

The relationship between global self-worth and depression has been examined extensively in the literature. Sowislo and Orht (2013) conducted a meta-analysis to provide some clarity on the causal relationship between self-esteem and depression. Their meta-analysis of longitudinal data indicated varying causal theories; that low self-esteem contributes to depression (vulnerability model), or depression erodes self-esteem (scar model). Results suggested that the effect of self-esteem on depression was significantly stronger than the effect of depression on self-esteem. Therefore, the authors suggested interventions geared toward building self-esteem may reduce depressive symptoms.

Peer Victimization

Individuals do not develop perceptions of their social difficulties in isolation or by natural processes. They come to develop their awareness through observations and interactions with others. Their experiences might include negative interactions, isolation, and/or exclusion from their peers. There is insufficient research on the effects and prevalence of peer victimization or bullying in the autism population, especially regarding the rate and severity of its occurrence. Only in the past five years have

researchers begun to more thoroughly investigate this problem. Research findings of peer victimization in the autism population will be described, as well as research with peer victimization in neurotypical individuals.

Peer victimization is defined as physical, psychological, or verbal abuse by perpetrators who aim to cause their victims emotional or physical harm, and is often referred to as harassment, bullying, or ostracism. Peer victimization is often categorized into direct aggression and relational aggression; direct aggression includes actions that mean to establish an imbalance of power between the perpetrator and victim, such as physical intimidation, threatening, name calling, or hitting, while relational aggression damages the adolescent's relational ties, such as spreading rumors and social exclusion (Crick & Grotpeter, 1996). An international study estimated the prevalence of children bullying or being bullied to be between 9% and 54% throughout the world (Nansel, Craig, Overpeck, Saluja, & Ruan, 2004).

Peer victimization has been found to change through developmental stages, as physical aggression becomes less acceptable in middle to high school, resulting in higher rates of verbal abuse and exclusion (Harris, 2004). Social skills become increasingly important beginning in early adolescence as children develop more complex friendships and become more independent from their parents. The high levels of reported peer victimization in this age group may be related to the high demands on children to develop the necessary social skills that enable a child to belong to a social group and conform to social expectations.

Peer Victimization in Individuals without Autism

The negative effects of peer victimization have been extensively examined in individuals without autism. These negative effects may include depression (Hunter, Boyle, & Warden, 2007; Kumpulainen, Rasanen, Henttonen, 1999; Roland, 2002; Sourander, Helstela, Helenius, & Piha 2000; Sweeting, Young, West, & Der, 2006), anxiety (Grills & Ollendick, 2002) loneliness, hopelessness, lower academic achievement (Flemming, L.C. & Jacobsen, K.H., 2009; Graham, & Bellmore, 2007; Olweus, 1992) suicidal ideation (Roland, 2002), and school-related anxiety or avoidance (Kumpulainen et al., 1998). These negative mental health outcomes may develop, in part, because the victims tend to blame themselves for their harassment because they think that there is something wrong with them and that they cannot do anything to change their circumstances (Graham, & Bellmore, 2007). This finding parallels Abramson's theory in that making internal, global, and stable attributions to negative events can result in depression.

Victims of bullying may experience stable victimization, meaning that they are targets of repeated peer victimization over time (Sweeting, Young, West, & Der, 2006). A child who experiences victimization at one point is likely to be victimized in the future (Olweus, 1997). Recurring peer victimization may have even more profound effects on mental health than isolated victimization experiences, as research has shown that the severity of the level of reported depression is positively correlated with a greater number of experiences of being bullied (Flemming & Jacobsen, 2009). The relationship between

peer victimization and depression may be reciprocal, especially when the child reaches early adolescence, as victimization can lead to depression, which can consequently be an added vulnerability to future victimization (Sweeting, et al., 2006). Children may not always tell someone or seek help if they are being bullied (Frisen, Homqvist, & Oscarsson, 2008), which may result in continued victimization if gone unnoticed by adults. Furthermore, those who are teased early on have been shown to be overly sensitive to their peers and surroundings, even into adulthood (Kumpulainen et al, 1999). Another important consideration is that children who are bullied are not just unfortunate targets of bullies, but they often report having few friendships at all (Flemming & Jacobsen, 2009).

Experiences with victimization in school may not just affect the individual during their school years. Dempsey and Storch (2008) showed that recalled experiences with victimization in school may be associated with mental health problems in young adulthood. In this study, young adults completed a questionnaire of recalled peer victimization experienced during high school; the results demonstrated that those with recalled relational victimization had associated depressive symptoms and fears of negative evaluation.

Peer Victimization in Individuals with Autism

Individuals with HFASDs may be predisposed to experience peer victimization, perhaps because their social difficulties make them seem unusual and vulnerable in the eyes of their peers. In a study that surveyed a large sample of middle-class mothers of

children with AS and nonverbal learning disorders, the results showed overwhelming rates of peer victimization experiences of these children. The overall prevalence of victimization reported by mothers was an astounding 94%. The types of victimization were also described: 75% had been hit by peers or siblings in the past year, 75% were emotionally bullied, 10% of the children were attacked by a gang in the past year, and 15% were victims of nonsexual assault to the genitals (Little, 2002). Mothers also reported high rates of peer shunning, including not receiving invitations to birthday parties and eating lunch alone. The levels of peer shunning increased with age. Shtayermman (2007) also found high rates of victimization in adolescents and young adults with AS, with additional high rates of clinically significant levels of suicidal ideation and depression.

As mentioned for individuals without autism, victimization can lead to depression, which can consequently be an added vulnerability to future victimization (Sweeting, et al., 2006). The relationship of depressed individuals being more at risk for bullying is also a major concern of parents of children with autism; research has shown that parents of children with autism and a comorbid diagnosis of depression and anxiety are more concerned about their child's risk of experiencing bullying compared to parents of children with autism without comorbid conditions (McPheeters, Davis, Navarre, & Scott, 2011).

A more recent study conducted by Carter (2009) also investigated the bullying of students with AS, and found that two-thirds of all children and adolescents with AS were

victimized by peers, per parent report. Parents also indicated that their children's experience with victimization was prolonged and resulted in severe migraines, school phobia, and suicidal ideation. Heartbreaking qualitative results were also described, including one child's desire to be put in the street and run over due to prolonged bullying, a girl getting her locker vandalized and being physically harassed on the bus, and one child even being ridiculed by teachers.

One study of adolescents with autism spectrum disorders demonstrated that after an experimentally induced event of ostracism (through an internet game played with others), the participants were able to recognize that they were being excluded from a social situation and also reported reduced self-esteem. Nevertheless, the autism participants did not report significant changes in mood after the ostracism (Sebastian, Blakemore, & Charman, 2009). The authors argue that the individuals with autism may not have possessed the insight into how the ostracism may have affected them. However, one could also argue that this internet-based experimental ostracism may not be similar to typical ostracism that may single-out these individuals as a result of their differences, rather than a video game that involves strangers.

A fascinating study conducted by Samson, Huber, and Ruch (2011) examined the fear of being laughed at (gelotophobia) in regard to the recalled experience of having been laughed at in the past. Almost 50% of the individuals with Asperger's as opposed to 6% of controls had a slight form of gelotophobia. Also, the AS participants recalled being laughed at more often in their childhood and remembered these events more negatively

compared with controls. Moreover, the authors reported that the level of gelotophobia for the AS group is the highest in the literature, and that it was correlated with the frequency and severity of recalled experience with being mocked in the past. Sadly, individuals with autism may assume that other's laughter is maliciously directed *at* them, even when it may not be, or even if it is gentle teasing sarcasm, due to their deficits in theory of mind (Peterson, Slaughter, & Paynter, 2007) and reading other's social cues (Myles et al., 2007). In fact, Badenes, Clemente Estevan, and Garcia Bacete (2000) suggest that over time, chronic peer rejection in neurotypical children begins to negatively affect theory of mind abilities, particularly with understanding white lies and aggressive biases of other's intent. This finding adds evidence to the possibility that individuals with autism who have experienced chronic victimization may begin to develop aggressive or hostile attribution biases of other's intent, which may add further difficulties to theory of mind skills in social interactions.

Several articles have proposed approaches to address the bullying problem of individuals with disabilities, particularly autism. Many of these approaches are team-based, and urge a variety of professionals in the school, clinical practice, and community, to take part in noticing and addressing bullying problems. Biggs, Simpson, and Gaur (2010) urge social workers to serve as educators and facilitators in helping physical education teachers, and other school professionals, to develop interventions to address the bullying of students with Asperger's Syndrome. This particular article focuses on the physical education setting because of the strong social component that is involved in this

unstructured and interactive setting, but also because of individuals' with Asperger's difficulty with motor and physical abilities, which may make them vulnerable to teasing and bullying. Another intervention for individuals with Asperger's that has been suggested for helping such individuals with peer relationships involves support groups for children, adolescents, and young adults (MacLeod & Johnson, 2007). This article recommends clinical and educational services working together to provide access to such a service, and that goals should be focused on peer support and peer learning. What makes this article even more compelling is that the author, Johnson, a woman with Asperger syndrome, participated in such a group and recounts her experience and growth from participating in the group along with other individuals with Asperger's.

As mentioned previously, individuals with HFASDs may be more predisposed to experiencing peer victimization because of their social difficulties and odd behaviors, rather than their autism diagnosis per se. A study by Butler and Gillis (2011) showed that social behaviors associated with Asperger's elicited stigmatization in a group of college students, but not the label of Asperger's. In fact, it is likely that many children, adolescents, or even adults are not aware that there is a label or disability for the behaviors demonstrated by an individual with high-functioning autism, especially since their cognitive abilities are intact. Butler and Gillis suggest interventions that focus on educating the public and helping minimize stigmatization of social behaviors associated with autism spectrum disorders.

Positive effects of friendships provide additional evidence for the relationship between peer relationships and depression. The importance of having high quality relationships may have protective benefits, as research has shown that having supportive and close peer relationships may serve as a safeguard from the development of depression and anxiety (Bukowski, Hoza, & Boivin, 1994; Rockhill, et al., 2009).

Bauminger, Shulman, and Agam (2004) demonstrated that high-functioning children with autism who reported a high self-concept through a self-perception questionnaire also attributed high friendship qualities to their relationship with a best friend. The authors also found that children with autism perceived friendship differently; more specifically, they described picture recognition of friendship with less affective characteristics, less attributions of sharing or intimacy, and more of a focus on activities and close proximity compared with controls. However, despite their different perceptions of friendship, Bauminger et al. showed that children with autism consider it to be important and influential to their self-worth.

The many negative effects of peer victimization strongly warrants additional research with children and adolescents with HFASDs, especially because of the high prevalence rates of peer victimization in these children.

Self-Reports of Individuals with Autism

This study proposes to examine young adults' perceived level of social competence. The term itself implies a level of self-awareness that composes this variable, which is measured by self-report. However, one could also argue that self-perception is

also involved in self-reports measuring depression, global self-worth, and experience with peer victimization. Therefore, this review will focus briefly on self-perceptions of individuals with autism with the use of self-report measures in general, with an emphasis on self-perceptions of the variables of interest. However, it is important to consider that self-reports for this particular study are quite different from one another, and may involve different cognitive processes, which is beyond the scope of this study. This study is examining insight of emotional states (depression), past experiences related to social involvement (peer victimization), and self-evaluation of social abilities (self-perceived social competence) and overall evaluation of self-worth (global self-worth). The primary goal of this study is to focus HFASD individuals' perception of themselves and their experiences, and how their self-awareness of social competence and recalled experience of peer victimization could affect self-esteem and mental health. The accuracy of these individuals' self-reports, or comparison with parent reports, while extremely important for clinical implications, is not the primary goal of this study. This study aims to gain a greater understanding of the self-awareness, insight, and ability to self-report these observations and experiences by the individuals.

According to Harter (1982), individuals older than age 8 are able to assess their self-competence in specific domains. To be able to assess one's personal abilities, one would assume that a degree of comparison of the self with others is necessary in order to develop a gauge of personal abilities. An awareness of being different from others may become increasingly apparent to children with HFASD, especially during adolescence as

social demands; including autonomy and peer group identification, become greater (Green et al., 2000; Klin, 2000; Wing, 1981).

There are inconclusive research results and generally an unclear understanding of HFASD individuals' self-awareness and ability to accurately report insights into their mental states, abilities, and emotional experiences. Frith and Happe (1999) suggested that some individuals with ASD may be deficient in their self-awareness, possibly related to their difficulties with theory of mind, which involves being able to infer mental states of others. Johnson, Filliter, and Murphy (2009) demonstrated that high-functioning children and adolescents on the autism spectrum showed some awareness of empathy abilities and autism spectrum traits, rating themselves lower on empathy and higher on autism spectrum traits compared to typically developing controls. However, their perceptions were discrepant from their parents, who rated more difficulties in both areas, indicating that individuals with autism may not be fully cognizant of their difficulties. This particular study involved children and adolescents, so further study is needed to examine if these results apply to older individuals.

Van Roekel, Scholte, and Didden's (2010) examination of the prevalence of bullying demonstrated that teachers reported higher levels of bullying than the adolescents with autism reported about themselves. However, the authors also measured perceptions of bullying by showing video fragments; results showed that the individuals with autism were just as able as controls to identify and describe bullying.

Despite research that indicates discrepancies between child and parent reports, there are other studies that report how self-awareness can contribute to mental health difficulties. In fact, while previously mentioned findings showed that individuals with autism underreported difficulties compared with parents, there is research that indicates otherwise. A study conducted by Hurtig et. al (2009) showed that adolescents with HFASD reported more anxiety and depressive symptoms than reported by their parents. It is also important to note that the adolescents' symptoms were commensurate with teacher reports, indicating that their emotional distress may have been more apparent at school than at home. However, the adolescents and parents were in agreement with levels of social problems and externalizing problems. Additionally, research has shown that children and adolescents with AS are able to compare themselves with others, and children who perceived themselves as more dissimilar to others reported higher levels of depressive symptoms (Hedley & Young, 2006). Furthermore, children who were older and had higher IQs perceived more difficulties with their social abilities, which predicted higher levels of depression (Capps, Sigman, & Yirmiya, 1995; Vickerstaff, 2006; Williamson, Crig, & Slinger, 2008).

Summary

Autism is a relatively new diagnosis that is increasing in prevalence, perhaps because of increasing public awareness, changes in diagnostic criteria, better assessment tools, and methodological differences between studies of prevalence rates. Individuals with HFASD have impairments in social skills and high rates of comorbid diagnoses of

depression. Although there are many theories of depression that encompass cognitive, affective, environmental, and biological factors, a focus on cognitive vulnerability models provides the basis for the reasoning in the proposed model for this study. Cognitive vulnerability theories propose that when a person with negative thought processes encounters stress or negative events, depression may follow when the person attributes the negative event to internal, global, and stable traits inherent to their personal weaknesses.

Peer victimization, global self-worth, and perceived social competence have been shown to affect depressive symptoms. Peer victimization contributes to depression in neurotypical individuals, but scarce research has examined the effects in individuals with HFASDs, despite the high rates of prevalence of victimization in this population. Research has also shown that peer victimization contributes to a person's global self-worth, which provides the basis for hypothesizing that peer victimization affects an individual's perceived social competence and global self-worth. Furthermore, research has demonstrated that lower perceptions of social competence may affect depressive symptoms. This study proposes that young adults who recall high levels of experience with peer victimization may attribute their experiences to their poor social abilities that are internal, global, and stable, subsequently increasing their risk for the development of depression.

Statement of Problem

Depression is one of the most prevalent conditions found in the autism spectrum disorder population (Ghaziuddin et al. 2002; Lainhart, 1999; Howlin, 2005). Depression has been shown to have many adverse effects on a person's quality of life and functioning (Hammen, 1991; Hirschfeld et al., 1997). Little research has examined the complexities of the influences of depression among children with HFASD. One of the most significant impairments of this population concerns social skills (Rogers, 2000; Wing, 1981), and research has shown that these children's perceptions of their social competence are negatively correlated with depression (Capps, Sigman, & Yirmiya, 1995; Vickerstaff, 2006; Williamson, Crig, & Slinger, 2008).

An area of concern in this present study is the high rate of peer victimization that occurs in children with HFASD (Little, 2002). Although there is research that demonstrates that peer victimization predicts depression in neurotypical children (Flemming, L.C. & Jacobsen, K.H., 2009; Graham, & Bellmore, 2007; Roland, 2002; Ladd & Ladd, 1998; Olweus, 1992; Slee 1995), there is little research that examines how peer victimization may contribute to the development of depression in individuals with HFASD. Furthermore, while there is research that demonstrates that peer victimization can contribute to the individual's overall feelings of self-worth (Crick & Dodge, 1994), there is little research examining how peer victimization contributes specifically to the individual's self-perceived social competence.

It is hoped that the findings from this proposed study will lead to an increased awareness of the emotional functioning, self-perception, and social relationships of

young adults HFASD, which may provide important information for treatment or prevention of depression in individuals with HFASD of all ages.

Statement of Purpose

The purpose of this study was to examine the possible effect of peer victimization, self-perceived social competence, and global self-worth on symptoms of depression in young adults with HFASD as compared to controls. It was expected that higher levels of peer victimization, lower levels of self-perceived social competence, and lower levels of global self-worth would explain higher levels of depression. Additionally, it was expected that self-perceived social competence would mediate the effect of peer victimization on depression, global self-worth would mediate the effect of peer victimization on depression, and that global self-worth would mediate the effect of self-perceived social competence on depression. Variables were measured with self-report questionnaires for depression, social competence, global self-worth, and peer victimization.

This study also aims to examine exploratory hypotheses. The first was to examine if the level of autistic symptomatology predicted levels of depression, self-perception, global self-worth, and peer victimization. While research has shown that higher levels of autistic symptomatology predict depression (per parent report) it is unclear how autistic symptomatology affects self-perception and recollection of peer victimization, particularly in young adult individuals with average or higher cognitive abilities. Additionally, it has been argued that individuals with autism spectrum disorders may

underreport symptomatology compared to parental reports (Lopata et al. 2010) or may not be entirely accurate in assessing their emotions (Nicpon, Doobay, & Assouline, 2010). Lastly, this study aims to examine definitions and personal experiences of victimization discussed by select individuals with HFASD.

An important consideration of this study is that the data collected from this research is non-experimental. Therefore, there was no experimental manipulation of any of the variables in order to determine their effect on depression. For that reason, the hypotheses and discussions of the effects of one variable on another are contingent on the validity of the models tested. If the models are not valid representations of relations among the variables and their effects, then the estimates of effects, and the conclusions drawn from the results, are not reasonable estimates of the effects of social competence, global self-worth, and peer victimization on depression.

Research Hypotheses

Hypothesis 1

When compared with normal controls, it was hypothesized that young adults with HFASD would have significantly lower levels of self-perceived social competence.

Rationale. One of the most defining characteristics of autism spectrum disorders is impairment with social skills (Rogers, 2000; Wing, 1981). According to Harter (1982), individuals older than age 8 are able to assess their self-competence in specific domains. An awareness of being different from others may become increasingly apparent to children with AS, especially as they get older and social demands increase (Green et al.,

2000; Klin, 2000; Wing, 1981). Research has shown that children and adolescents with Asperger's syndrome are able to compare themselves with others, and children who perceived themselves as more dissimilar to others reported higher levels of depressive symptoms (Hedley & Young, 2006). Lastly, children with autism who were older and had higher IQ scores perceived more difficulties with their social abilities (Capps, Sigman, & Yirmiya, 1995; Vickerstaff, 2006; Williamson, Crig, & Slinger, 2008).

Hypothesis 2

When compared with normal controls, it was hypothesized that young adults with HFASD would have significantly lower levels of global self-worth.

Rationale. Since it is hypothesized that individuals with HFASD will have lower levels of self-perceived social competence, it is subsequently thought that these lower levels of self-perceptions of this domain will result in lower levels of global self-worth. Since individuals with HFASD have been shown to have higher levels of depression than the normal population (Leyfer et al., 2006), and since global self-worth is thought to be associated with higher levels of depression (Sowislo & Orht, 2013)), it is hypothesized that individuals with HFASD will have lower levels of global self-worth.

Hypothesis 3

When compared with normal controls, it was hypothesized that young adults with HFASD would have significantly higher levels of depression.

Rationale. Depression is one of the most prevalent comorbid psychiatric conditions in the autism population (Ghaziuddin et al. 2002; Howlin, 2005; Leyfer, 2006). Also, the risk

for developing major depression throughout the lifetime in autism spectrum disorders is higher than the normal population (Leyfer et al., 2006).

Hypothesis 4

When compared with normal controls, it was hypothesized that young adults with HFASD would have significantly higher levels of recalled peer victimization.

Rationale. Individuals with autism spectrum disorders may be more prone to bullying because of their social difficulties and odd behavior (Myles, 2007). In a study that surveyed the prevalence of bullying per parent report in children with AS and nonverbal learning disorders, the results showed an astounding rate of 94% of children who had experienced peer victimization. (Little, 2002). Roekel, Scholte, and Didden (2010) demonstrated that individuals with autism were just as able as controls to identify and describe bullying.

Hypothesis 5

It was hypothesized that young adults with HFASDs and controls' levels of self-perceived social competence would predict levels of depression, even after controlling for peer victimization and IQ. As self-perceived social competence decreases, it is expected that depressive symptoms will increase.

Rationale. One of the defining characteristics of ASD is a deficit in social skills (Rogers, 2000; Wing, 1981; Asperger, 1944). Individuals with autism often have few or negative interactions with peers, which would contribute to their understanding of their social abilities. In addition, they may also gain perceptions of their abilities by comparing

themselves to the abilities and successful interactions of their peers. By comparing themselves to peers and having poor interactions, children and adolescents are at risk of developing a negative perception of their abilities (Hedley & Young, 2006). Furthermore, having a low perception of their social skills may be associated with higher levels of depressive symptoms, as research in neurotypical children demonstrates that lower scores in self-perceived social competence are associated with significantly higher depressive symptoms (Chan, 1997). This same finding has been shown in children with HFASD (Vickerstaff et al., 2007). This study aims to replicate these findings.

Hypothesis 6

It was hypothesized that levels of the individual's experience with peer victimization will predict severity of depression, even while controlling for self-perceived social competence, and IQ. It was expected that as experiences with peer victimization increase, depressive symptoms would increase.

Rationale. Research has shown that peer victimization is associated with mental health difficulties, including depression (Graham, & Bellmore, 2007; Hunter, Boyle, & Warden, 2007; Hoglund & Leadbeater, 2007; Klomek, Marrocco, Kleinman, Schonfeld, Gould, 2008; Sweeting et al., 2006). Research has found that the level of reported depression is positively correlated with a greater number of experiences of being bullied (Flemming & Jacobsen, 2009).

Hypothesis 7

It was hypothesized that levels of peer victimization would explain levels of self-perceived social competence, while controlling for IQ. It is expected that an increase in experienced peer victimization will be associated with a decrease in self-perceived social competence.

Rationale. Beck (1982) stated that depressive emotional, cognitive, and behavioral reactions are a result of the person relating an event to the self, as signified by the relevance of the event content to their personal area of vulnerability. This theory applied to the proposed study would suggest that individuals who attribute peer rejection and harassment to their own inadequate social skills would be likely to develop depressive reactions. Research has found that negative interpretations of ambiguous interactions, along with self-blame, predict depressive symptomatology (Prinstein, Cheah, & Guyer, 2005).

Hypothesis 8

It was hypothesized that peer victimization would predict levels of global self-worth, while controlling for IQ. It was expected that an increase in peer victimization would predict lower levels of global self-worth.

Rationale. Researchers have hypothesized that children's tendency to develop negative self-evaluations from social experiences may influence their overall self-schemas and self-worth (Crick & Dodge, 1994). Victims tend to blame themselves for their harassment and think that it is because of internal characteristics that are unchangeable, resulting in feelings of hopeless (Graham, & Bellmore, 2007).

Hypothesis 9

It was hypothesized that global self-worth would predict levels of depressive symptomatology, while controlling for IQ and peer victimization. It was expected that a decrease in global self-worth would be associated with higher levels of depressive symptoms.

Rationale. An individual's feeling of overall value and self-worth can impact an individual's mood. Research has demonstrated that higher levels of global self-worth are associated with less severe depressive symptomatology (King, Naylor, Segal, Evans, & Shain, 1993; Harter, 1989).

Hypothesis 10

It was hypothesized that self-perceived social competence would predict levels of global self-worth, while controlling for IQ and peer victimization. It was expected that a decrease in self-perceived social competence would predict lower levels of global self-worth.

Rationale. James (1890) argued that high self-esteem occurs when an individual performs well in domains that he or she perceives as important. Harter et al (1998) demonstrated that among adolescents, domains that topped the list of importance included Close Friendship, Job Competence, and Physical Appearance, even among varying groups of students including normally achieving students, students with learning disabilities, and students with behavior disorders. Since individuals with HFASD, by nature of their

disability, struggle with social interactions, it is presumed that their awareness of these difficulties may result in decreased global self-worth.

Hypothesis 11

It was hypothesized that self-perceived social competence would partially mediate the effect of peer victimization on depression in the overall sample.

Rationale. Many theories of depression reason that cognitive processes contribute to negative thoughts about the self, especially when the person encounters negative events (Abramson, Metalsky, & Alloy, 1989; Beck, 1964; Nolen-Hoeksema's 1991). Logically, it seems that experiencing peer victimization itself isn't a direct influence on depression, but there is an additional variable in the equation of how peer victimization, (the negative event), makes the person feel about themselves, which subsequently contributes to symptoms of depression. Since social skills are a defining impairment in individuals with HFASDs and since peer victimization often focuses on a weakness of the victim, it is hypothesized that individuals with HFASDs will realize their inadequacies with social interaction, therefore contributing to their self-perceived social competence. This study will measure self-perceived social competence in particular as opposed to other domains that may contribute to self-esteem because it is hypothesized that peer victimization will not affect other domains as severely. For example, academic abilities or physical appearance will likely not be as affected since social impairments are a distinguishing feature of individuals with HFASD.

Hypothesis 12

It was hypothesized that global self-worth would partially mediate the effect of self-perceived social competence on depression in the overall sample.

Rationale. Low perceptions of social skills may be associated with higher levels of depressive symptoms, as research in neurotypical children (Chan, 1997) and children with HFASD (Vickerstaff et al., 2007) demonstrates that lower scores in self-perceived social competence are associated with significantly higher depressive symptoms.

Additionally, global self-worth has been shown to impact depressive symptoms (Sowislo & Orth, 2013). However, perceptions of one's social abilities are thought to be an aspect within one's global self-worth (Harter, 1985, 1998). It is therefore hypothesized that low perceptions of self-perceived social competence may contribute to both global self-worth and depressive symptoms, but that levels of global self-worth may serve as a mediator for the relationship between self-perceived social competence.

Hypothesis 13

It was hypothesized that global self-worth would partially mediate the effect of peer victimization on depression in the overall sample.

Rationale. Similar to the rationale for hypothesis 11, the rationale for this hypothesis stems from the theories of depression that posit the contribution of negative thoughts about the self, especially when the person encounters negative events (Abramson, Metalsky, & Alloy, 1989; Beck, 1964; Nolen-Hoeksema's 1991). Therefore, the negative event (peer victimization) may affect the individual's global self-worth, which in turn may affect depression levels. As mentioned previously, it is thought that experiencing

peer victimization itself isn't a direct influence on depression, but rather how peer victimization makes the person feel about themselves, both socially and globally, which subsequently contributes to symptoms of depression. Furthermore, research has shown that global self-worth mediates the effect between peer victimization and anxiety in girls (Grills & Ollendick, 2002).

Hypothesis 14

- a) It was expected that there would be no differences in group membership for self-perceived social competence predicting depression levels when controlling for IQ.
- b) It was expected that there would be no difference in peer victimization predicting depression between the two groups, when controlling for IQ.
- c) It was expected that peer victimization would better predict self-perceived social competence in the HFASD compared with controls.
- d) It was expected that there would be no differences in group membership for global self-worth predicting depression levels when controlling for peer victimization and IQ.
- e) It was expected that there would be no differences in group membership for peer victimization predicting global self-worth when controlling for IQ.

Rationale

- a) While there are research studies that have examined the association of self-perceived social competence and depression, there have been few that compare this relationship for young adults with HFASD compared with controls. It is

expected that there will be no differences because the sample for this study includes young adults who are high-functioning. Perceptions of self-perceived social competence and the impact on depression have been established in both individuals with HFASD (Vickerstaff, 2006) and without HFASD (Whitton, Larson, & Hauser, 2008).

- b) There is little research that compares young adults with HFASD and controls with regard to peer victimization predicting levels of depression. It is expected that there will be no difference between the two groups as it is expected that individuals who are higher functioning and in young adulthood will be equally able to remember events of peer victimization. Furthermore, it is expected that peer victimization will equally predict levels of depression for both individuals with HFASD and controls. Individuals with autism often experience high levels of bullying and are more likely to experience depression compared to the normal population. The relationship with peer victimization and depression has been well established in individuals without autism.
- c) The reasons for victimization can be many, including targeting an individual because of a perceived weakness or a way in which they stand out from others (Frisen, Homqvist & Oscarsson, 2008). It is expected that peer victimization will better predict the individuals with HFASDs' perceptions of their social competence, since social abilities and ways of interacting with others may be an area of weakness that others perceive. It is expected that control participants who

are bullied may be bullied for a variety of reasons, and the target of the bullying may be more varied (i.e. physical appearance, academic performance, or standing out in some way, etc.). Therefore, it is expected that peer victimization may predict self-perceptions in other areas, depending on the intent of the victimization and the internalization of the victimization by the victim.

Additionally, it is hypothesized that control participants may be more likely to have friendships that serve as a protective factor for internalizing peer victimization.

- d) Global self-worth has been shown to impact depressive symptoms (Sowislo & Orth, 2013). Research has demonstrated that higher levels of global self-worth are associated with less severe depressive symptomatology (King, Naylor, Segal, Evans, & Shain, 1993; Harter, 1989). No known research has demonstrated differences between individuals with and without HFASD with regard to how global self-worth affects depressive symptoms, but it is hypothesized that low levels of overall self-worth will predict higher levels of depressive symptoms.
- e) Researchers have hypothesized that children's tendency to develop negative self-evaluations from social experiences may influence their overall self-schemas and self-worth (Crick & Dodge, 1994). Victims may also blame themselves for their harassment and think that it is because of internal characteristics that are unchangeable, resulting in feelings of hopelessness (Graham, & Bellmore, 2007). Harter et al (1998) also demonstrated that among adolescents, domains that

topped the list of importance included Close Friendship, even among varying groups of students including normally achieving students, students with learning disabilities, and students with behavior disorders. The association of peer victimization affecting global self-worth in typically developing individuals has been established, but little if any research has examined the effect of peer victimization on global self-worth for individuals with HFASD. Since individuals with autism experience high levels of peer victimization and high levels of depression (which is influenced by global self-worth), it is hypothesized that the effect of peer victimization and global self-worth will be similar between individuals with HFASD and controls.

CHAPTER 3

Method

Participants

Participants were recruited from an existing study at The University of Texas at Austin that is examining brain structure and function in young adult males with high-functioning autism spectrum disorders. The study participants consist of males, 18-26 years of age, who met diagnostic confirmation of an autism spectrum disorder. Control participants consisted of males, age 18-26, who had not been diagnosed with an autism spectrum disorder.

Participants were not enrolled in the study if they had a current or past history of notable alcohol use, drug use, or neurological problems. Control participants were not admitted into the study if they had psychiatric diagnoses or a history of significant learning difficulties. ASD participants were excluded if they received diagnoses of bipolar disorder or schizophrenia. Additionally, information regarding MRI safety was also used to determine eligibility for the larger research study that is examining brain functioning. Lastly, any participant who was found to have significantly below average intelligence, which was defined by a Full Scale IQ < 85 (one standard deviation below the mean), was excluded from the study.

The sample for this study consists of 40 individuals; 19 with an autism spectrum disorder diagnosis, and 21 control participants. This sample is composed of individuals

who were admitted into the study and completed all appointments. There were no missing data for any of these participants; therefore, all of their scores were included in the analyses. The sample originally consisted of 21 individuals with an autism spectrum disorder; however, 2 individuals were omitted because they did not complete the questionnaires pertaining to this study.

Demographic Descriptions of Participants

The race/ethnicity of the entire sample is presented below. No participant identified himself as Native Hawaiian or Other Pacific Islander, or as American Indian or Alaskan Native; therefore, these racial categories are not included in the table below.

Table 1.

Ethnicity and Race of Participants		
Ethnicity/Race	Frequency	Percent
Non-Hispanic or Latino/White	27	67.5
Hispanic or Latino/White	10	25
Non-Hispanic or Latino/African American or Black	1	2.5
Non-Hispanic or Latino/Asian	2	5
Total	40	100

Procedure

Approval by Human Subjects Committee

This study was conducted in compliance with the ethical standards authorized by the American Psychological Association, in addition to the standards approved by The University of Texas at Austin. Approval was attained by the Institutional Review Board at The University of Texas at Austin, and by the Educational Psychology Departmental Review Committee.

Interview/Screening Phrase

The initial screening of all participants was a brief phone screening relevant to their participation in the overarching study of brain structure and function in order to assure that they could safely participate in the MRI procedures. This screening also confirmed qualification for the study based on exclusionary criteria mentioned previously. In addition, the demographic data were gathered. After the initial health and MRI safety screening was completed, the HFASD individuals completed further screening. The initial step of the screening phase for the HFASD participants was for the individual's parent(s) to complete the Social Communication Questionnaire in order to confirm the likelihood of an autism spectrum disorder diagnosis. Subsequently, both the participant and the participant's parent(s) attended an appointment in which the study's designated psychologist administered the ADI-R and ADOS. Upon receiving the official diagnosis confirmation, the participant was enrolled in the study.

Data Collection Phase

Upon receiving the signed consent for participation in the study, participants came to the Imaging Research Center at The University of Texas at Austin for their first appointment. The initial step was to administer the Wechsler Abbreviated Scale of Intelligence. Upon receiving an IQ score greater than 85, the participants continued with further assessment. The questionnaires assessing the individual's recalled experience with peer victimization, depression, and self-perceived social competence were collected at a subsequent appointment as a part of a larger neuropsychological test battery. The participants were given the questionnaires in random order.

Instruments

Social Communication Questionnaire (Autism Symptomatology)

The Social Communication Questionnaire (SCQ) is a parent-report screening tool that assesses symptomatology associated with autism spectrum disorders. Parents of the HFASD group completed the Social Communication Questionnaire over the phone during the initial screening phase of the study. The SCQ has two forms; Current and Lifetime (Rutter, Bailey, M.D., & Lord, 2003). For the purposes of this study, the Lifetime form was used to assess autism symptomatology across the young adult's development. The Lifetime form assesses behaviors across the individual's entire developmental history. Half of the questions require the parent to focus on a specific time period during the individual's early development. There are 40 yes-or-no questions that are based on the Autism Diagnostic Interview-Revised. Administration time is estimated to be 10 minutes. Initial studies of its psychometric properties consisted of 200

individuals; 160 individuals with PDD and 40 individuals with non-PDD diagnoses, with an age range of 4-32 (Berument et al, 1999). The results indicated that the SCQ (at this time, called the Autism Screening Questionnaire), is an effective screening for PDD. Factor analysis suggested a four-factor model, including Social Interaction, Communication, Abnormal Language, and Stereotyped Behavior. The alpha coefficient of the total score was .90. The alpha index of internal consistency ranged from acceptable to good (.84-.93) (Rutter, Bailey, & Lord, 2003). The overall correlation with the ADI was high (.712). The SCQ yields a total score cutoff score that indicates the likelihood of an individual having an autism spectrum disorder. Specifically, a score of 15 or greater indicates that an individual should be referred for a more comprehensive assessment.

Autism Diagnostic Interview-Revised (Autism Diagnosis Confirmation)

The Autism Diagnostic Interview – Revised (ADI-R) is a clinical interview for the diagnosis of autism. This interview can last up to 2.5 hours and is conducted by a trained ADI-R interviewer who questions a parent or caregiver regarding the client’s developmental history; the client is not present for the interview. The age range is two years and older. The ADI-R consists of 93 items and is scored using an algorithm. The interview focuses on specific areas of development affected in autism, including language, social interactions, and repetitive or stereotyped behavior and interests.

The ADI was originally published in 1989 and proved high in interrater reliability. The ADI-R was published in 1994. Interrater reliability studies have shown

that the majority of items have kappa values of .70 or above. Test-retest reliability was good, as studies have found coefficients of .82 or above (Lord, Rutler, & Le Couteur, 1994; Rutter, Le Couteur, & Lord, 2005).

Autism Diagnostic Observation Schedule (Autism Diagnosis Confirmation continued)

The Autism Diagnostic Observation Schedule (ADOS) is a semi-structured interview designed to diagnose autism spectrum disorders in individuals. The interview includes assessment of communication, social skills, play, and repetitive interests or stereotypic behavior. It is designed to assess these domains through creating opportunities for the individual to interact with the examiner and the environment. The age range for ADOS administration is 2-year to adults. The ADOS administration time is approximately 30-45 minutes. There is a toddler module and four modules to choose from when administering the ADOS; the patient's age and communication level is taken into consideration when choosing a module. For this study, module 4 was used, as it is intended for verbally fluent older adolescents and adults. The examiner makes qualitative notes of observations during the assessment, and then assigns quantitative ratings to the domains assessed after the completion of the interview. (Lord, Rutter, DiLavore, & Risi, 2003).

The current form of the ADOS was published in 2003. Interrater reliability was acceptable for all three modules (kappa value > .80). The modules of the ADOS showed high accuracy in differentiating diagnostic groups (Lord et al., 2003).

Wechsler Abbreviated Scale of Intelligence (IQ)

The Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler, 1999) was administered to participants in order to confirm an IQ of 85 or higher. The WASI is intended to provide a brief measure of intelligence. There are four subtests that produce a Full Scale IQ, Verbal IQ, and Performance IQ. The Verbal IQ score is derived from the Vocabulary and Similarities subtests, and the Performance IQ is derived from the Matrix Reasoning and Block Design subtests. The Full Scale IQ includes all four subtests. The WASI was nationally standardized on 2,245 males and females. The psychometric properties of the WASI are adequate. In the standardization sample, split-half reliabilities ranged from .81 to .98 for subtests and .92 to .98 for IQs. Test-retest reliability estimates ranged from .83 to .95 for subtests. Correlations between same-named subtests and scales on the WISC-III were moderate to high: $r = .66$ to $.88$ for subtests and $.76$ to $.92$ for IQs (Wechsler, 1999).

Relational Victimization Questionnaire (Peer Victimization)

Participants completed the Relational Victimization Questionnaire (RVQ) to assess for recalled experience with relational victimization. The RVQ is an instrument developed by Dempsey and Storch (2008), which aims to assess participants' recollection of experience with relational victimization in adolescence. The questionnaire is a 7-item self-report measure with a 5-point rating scale from 1 (Never) to 5 (Always). Higher scores indicate higher rates of recalled relational victimization. In its initial use with 210 undergraduate students from various socioeconomic and cultural backgrounds, the RVQ

showed adequate internal consistency (Chronbach's $\alpha = 0.79$) and was determined to have a single factor structure (Dempsey & Storch, 2008).

Adult Self-Perception Profile (Self-Perceived Social Competence and Global Self-Worth)

The Adult Self-Perception Profile (ASPP) (Messer & Harter, 1986) assesses a variety of domains regarding an individual's self-perceived competence among various abilities: Sociability, Job Competence, Nurturance, Athletics, Appearance, Provider, Morality, Household Management, Intimate Relationships, Intelligence, Humor, and Global Self-Worth. The ASPP is a self-report measure that requires the individual to respond how true a statement is for his opinion of his abilities. The ASPP contains 50 items and the estimated administration time is 30 minutes. The actual questionnaire is entitled "What I am Like". Responses are categorized on a forced-choice format on a four-point scale. Lower scores indicate poorer self-perceptions of the indicated domain. The structured alternatives of the choices were designed to offset the tendency to give socially desirable responses.

For the purposes of this study, the Sociability scale was used to measure self-perceived social competence. This scale is composed of four questions that are averaged together for a composite score. Subscale reliabilities are acceptable. Chronbach's α reliabilities for the Sociability ranged from .63-.82 among various populations.

Global self-worth was also measured using the Adult Self-Perception Profile. The Global Self-Worth is a scale that is composed of six items that are averaged together; moreover, these items do not go into any other separate scales of the ASPP as they are

meant to measure an overall sense of self worth apart from the other individual scales. As mentioned previously, the respondent rates their self-worth using a forced-choice format with a four-point scale (higher scores indicating higher self-perceptions).

Beck Depression Inventory (Depression)

Participants completed the Beck Depression Inventory- Second Edition (BDI-II) (Beck, Steer, & Brown). The BDI-II is a 21-item self-report measure that assesses the severity of depression in adolescents and adults (age 13 and older). The questions correspond to DSM-IV (American Psychiatric Association, 1994) symptoms of depressive disorder. The respondent answers the questions based on how he has been feeling during the past two weeks. Higher scores indicate greater levels of depressive symptoms. Internal consistency measured .93 for 120 college students. Test-retest stability demonstrated a correlation of .93.

CHAPTER 4

Statistical Analysis

The primary purpose of this study was to examine the possible effects of peer victimization, self-perceived social competence, and global self-worth on depression symptoms in young adults with HFASDs and control participants. Data included scores from the Relational Victimization Questionnaire (peer victimization), the Beck Depression Inventory (depression), the Adult Self-Perception Profile (self-perceived social competence and global self-worth), and the Wechsler Abbreviated Scale of Intelligence (IQ), which were analyzed using multiple regression analyses and bootstrapping tests of mediation. First, preliminary analyses will be described, followed by descriptive statistics, and finally, multiple regression analyses and bootstrapping tests of mediation for the main hypotheses are examined.

Preliminary Analysis

In the initial stage of the study's recruitment for participants, a power analysis was conducted using GPOWER software, version 3.1.3 to determine the sufficient number of participants to achieve adequate statistical power. While this study used four independent variables (self-perceived social competence, global self-worth, peer victimization, and IQ), analyses with all four variables simultaneously predicting depression was not conducted, as it was presumed that global self-worth encompassed self-perceived social competence. In order to prevent confounding overlap between these two variables, analyses were conducted separately in order to examine their effects on

depression. Therefore, a maximum of three independent variables was used to examine their effects on depression. With three independent variables, it was determined that 53 participants would be needed in order to obtain a moderate to large effect size ($f^2=.25$) at the level of power of .80 and an alpha of .05. Unfortunately, the study ultimately obtained a total sample size of only 40. Therefore, the end-result sample size was unable to meet the suggested number of participants determined by the power analysis at the start of the study. However, it is hoped that the analyses will still be informative to the hypotheses of this study.

Data were analyzed to determine if there were any outliers. Examination of histograms and stem-leaf diagrams revealed three outliers for high scores on depression and one for high scores on peer victimization. All of these individuals were HFASD participants. One of these individual's scores had an influence on the data; his scores were so extreme that they significantly affected mean differences and the curvilinearity of the regression of depression on peer victimization. This individual's scores were commensurate with the hypotheses of this study; the individual was an HFASD participant who had reported extremely high levels of peer victimization and depression, and low levels of self-perceived social competence. However, his scores were so extreme that they had an effect on the data that may have been misleading. Therefore, his scores were Winsorized in order to correct for the influence (i.e., his scores were changed to the closest scores of another individual that were not determined to have an effect on the data).

The skewness and kurtosis for each variable were examined and although the values were slightly abnormal, they are adequate for multiple regression analyses. Results are shown below.

Table 2.

Skewness and Kurtosis of Main Analysis Variables					
	SPSC	Depression	Vict.	GSW	IQ
Skewness	.027	1.374	.932	-.338	-.475
Std. Error of Skewness	.374	.374	.374	.378	.374
Kurtosis	-1.268	1.257	.142	-.870	-.601
Std. Error of Kurtosis	.733	.733	.733	.741	.733

Note: SPSC= self-perceived social competence

Linearity was checked by inspecting scatterplots of the data. The relationship between independent and dependent variables appeared linear. Additional confirmation was performed with a sequential regression with the addition of the squared independent variable to the regression. This was performed for peer victimization, self-perceived social competence, and global self-worth. Results were non-significant, indicating that there were no curvilinear effects in the regressions. Homoscedasticity was adequately demonstrated by the scatterplots of the standardized predicted dependent variable (depression) by the standardized residuals demonstrated for the independent variables (peer victimization and self-perceived social competence). A plot of the residuals against the predicted values was examined to confirm the presence of normally distributed residuals. Lastly, the histogram of standardized residuals for each regression demonstrated close to a normal curve, indicating that the error was normally distributed.

Descriptive Statistics

Descriptive statistics were examined for each variable in the total sample, including means, standard deviations, and minimum and maximum values. Means and standard deviations were also examined separately for each group (controls and HFASD) and are presented below, followed by Pearson product-moment correlations for the main analysis variables for the total sample.

Table 3. Descriptive Statistics for Main Analysis Variables in the Total Sample

	Minimum	Maximum	Mean	Std. Deviation
IQ	97	138	121.03	11.324
SPSC	1.25	4	2.6937	25
Depression	0	34	9.68	2.5
Victimization	7	25	13.63	4.802
Global Self-Worth	1	4	2.7572	.82863

Table 4. Means and Standard Deviations for Control and HFASD Groups

		Depression	SPSC	Vict.	GSW	IQ
Control	Mean	6.71	3.1190	12.24	3.0962	122.38
	Std. Dev	6.270	.73152	2.468	.64835	11.303
HFASD	Mean	12.95	2.2237	15.16	2.3617	119.53
	Std. Dev	11.621	.78570	6.203	.85597	11.462

Table 5.

Pearson Product Correlations for Main Analysis Variables (N=40)

		SPSC	Depression	Victimization	GSW	IQ
SPSC	Pearson Correlation	-	-.539**	-.451**	.792**	-.046
	Sig. (2-tailed)		.000	.003	.000	.779
Depression	Pearson Correlation	-.539**	-	.627**	-.776**	-.230
	Sig. (2-tailed)	.000		.000	.000	.154
Victimization	Pearson Correlation	-.451**	.627**	-	-.600**	-.079
	Sig. (2-tailed)	.003	.000		.000	.630
IQ	Pearson Correlation	-.046	-.230	-.079	.022	-
	Sig. (2-tailed)	.779	.154	.630	.894	
GSW	Pearson Correlation	.792***	-.776***	-.600**	-	.022
	Sig. (2-tailed)	.000	.000	.000		.894

Note. ** Correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05 level (2-tailed).

Pearson correlations show that four of the main variables (self-perceived social competence, global self-worth, peer victimization, and depression), are all significantly correlated with one another at the 0.01 level. Effect sizes range from medium to large for the significant correlations. IQ was not significantly correlated with any of the main variables. It is also important to note that a regression of IQ on group membership was

not significant $F(1, 38) = .628, p = .433$, revealing that there were no significant differences in IQ between the two groups.

Main Analyses

The following hypotheses were analyzed with multiple regression analyses and will be described for each hypothesis. An alpha of .05 was used to determine statistical significance; alphas of .01 and .001 are also reported when relevant.

Hypothesis 1

It was hypothesized that the HFASD group, when compared with controls, would display significantly lower levels of self-perceived social competence. Mean differences, as reported by Table 4, show that the HFASD group reported lower levels of self-perceived social competence. To test the significance of this mean difference, Hypothesis 1 was tested by regressing self-perceived social competence on group membership. Results indicate the overall model was significant $F(1, 38) = 13.930, p < .001$. These results confirm the hypothesis that the HFASD group reported significantly lower levels of self-perceived social competence compared with controls.

Hypothesis 2

It was hypothesized that the HFASD group, when compared with controls, would display significantly lower levels of global self-worth. Mean differences, as reported by Table, show that the HFASD group reported lower levels of global self-worth. To the significance of this mean difference, Hypothesis 2 was tested by regressing global self-worth on group membership. Results indicate the overall model was significant $F(1, 37) = 9.274, p < .01$. These results confirm the hypothesis that the HFASD group reported significantly lower levels of global self-worth compared with controls.

Hypothesis 3

It was hypothesized that the HFASD group, when compared with controls, would display significantly higher levels of depression. Mean differences, as reported by Table 4, show that the HFASD group reported higher levels of depression. Depression was regressed on group membership to examine if this difference was significant. Results indicate the overall model was significant $F(1, 38) = 4.577, p < .05$. These results confirm the hypothesis that the HFASD group reported significantly higher levels of depression compared with controls.

Hypothesis 4

It was hypothesized that the HFASD group, when compared with controls, will display significantly higher rates of recalled experience with peer victimization. Mean differences, as reported by Table 4, show that the HFASD group reported higher levels of peer victimization. Peer victimization was regressed on group membership to examine if this difference was significant. Results indicate the overall model was approaching significance $F(1, 38) = 3.968, p = .054$. These results indicate that, while there was a trend towards individuals with HFASD reporting higher levels of peer victimization, the HFASD group did not report statistically significant higher levels of peer victimization compared with controls.

Hypotheses 5 and 6

Hypotheses 5 and 6 were tested with a single regression; therefore, both hypotheses will be discussed together. Hypothesis 5 posited that self-perceived social

competence would explain a significant amount of the variability in depressive symptoms in young adults with HFASD and controls, after controlling for peer victimization and IQ. Hypothesis 6 posited that peer victimization would explain a significant amount of the variability in depressive symptoms in young adults with HFASDs and controls, after controlling for self-perceived social competence and IQ. Using simultaneous regression, the participant's scores on depressive symptoms were regressed on the participant's scores on self-perceived social competence, peer victimization, and IQ. Results indicate the overall model was significant $F(3, 36) = 12.951, p < .001$ and accounted for 52% of the variance in depression scores ($R^2 = .519$). Coefficients showed that IQ, the control variable, was not significant in predicting levels of self-perceived social competence ($b = -.178, \beta = -.210, p = .080$). However both peer victimization ($b = 9.13, \beta = .456, p < .001$) and self-perceived social competence ($b = -3.773, \beta = -.343, p < .05$) significantly explained depression levels. Therefore, both hypotheses 5 and 6 were confirmed. Both peer victimization and self-perceived social competence explained a significant amount of variability of depression scores when controlling for IQ. Standardized coefficients suggest that peer victimization has a greater influence on depression scores compared to self-perceived social competence. Additionally, the positive and negative signs of the beta are commensurate with the hypotheses that higher levels of peer victimization explain higher levels of depression, and lower levels of self-perceived social competence explain higher levels of depression.

Hypothesis 7

It was hypothesized that peer victimization would explain a significant amount of the variability in self-perceived social competence, after controlling for IQ. In a separate regression, the participant's scores on self-perceived social competence, as measured by the ASPP, were regressed on the participant's scores on peer victimization, as measured by the RVQ. Results indicate the overall model was significant $F(2, 37) = 4.918, p < .05$ and accounted for 21% of the variance in self-perceived social competence scores ($R^2 = .210$). Coefficients showed that IQ, the control variable, was not significant in predicting levels of self-perceived social competence ($b = -.006, \beta = -.082, p = .580$), but peer victimization ($b = -.083, \beta = -.457, p < .05$) significantly predicted self-perceived social competence. Therefore, the hypothesis was confirmed that peer victimization predicted a significant amount of variance in self-perceived social competence. Additionally, the negative sign of the beta is commensurate with the hypothesis that higher levels of peer victimization explain lower levels of self-perceived social competence.

Hypothesis 8

It was hypothesized that peer victimization would explain a significant amount of variability in global self-worth, after controlling for IQ. In a separate regression, the participants' scores on global self-worth, as measured by the ASPP, were regressed on the participants' scores on peer victimization, as measured by the RVQ. A regression of global self-worth on peer victimization, while controlling for IQ, revealed significant findings for the overall model; $F(2, 36) = 10.150, p < .001$; peer victimization significantly predicted levels of global self-worth ($b = -.107, \beta = -.600, p < .001$). Beta

coefficients show that higher levels of peer victimization are associated with lower levels of global self-worth. Beta coefficients show that higher levels of peer victimization are associated with lower levels of global self-worth.

Hypothesis 9

It was hypothesized that global self-worth would explain a significant amount of variability in the level of depressive symptoms, after controlling for IQ and peer victimization. A separate regression of depression on global self-worth, while controlling for IQ and peer victimization, revealed a significant result as well for the overall model; $F(2, 36) = 24.741, p < .001$; global self-worth predicted a significant amount of depressive symptoms. Beta coefficients ($b = -7.268, \beta = -.622$) indicate that lower levels of global self-worth are associated with higher levels of depressive symptoms.

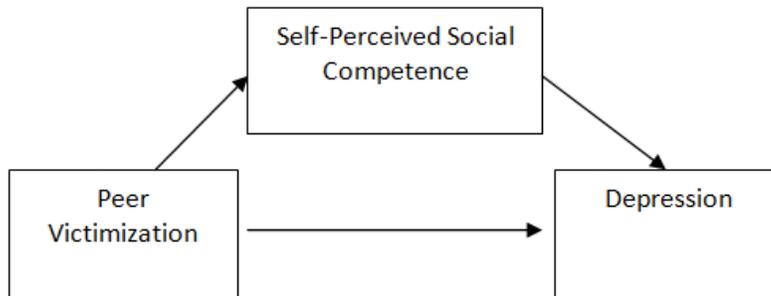
Hypothesis 10

It was hypothesized that self-perceived social competence would explain a significant amount of variability in the level of global self-worth, after controlling for IQ and peer victimization. A regression of global self-worth on self-perceived social competence, while controlling for IQ and peer victimization, revealed a significant result for the overall model; $F(3, 35) = 26.582, p < .000$. This indicates that self-perceived social competence predicted a significant amount of global self-worth, even after controlling for IQ and peer victimization. Beta coefficients ($b = .615, \beta = .658$) indicate that higher levels of self-perceived social competence are associated with higher levels of global self-worth.

Hypothesis 11

It was hypothesized that self-perceived social competence would serve as a mediator for the relationship between peer victimization and depression.

Figure 1. Proposed Mediation Model: 1



Until recently, research on mediation analysis has focused on the examination of the relationship between the independent and dependent variable as an indicator of potential mediation and also as a means to determine partial or full mediation (Baron and Kenny, 1986). However, current recommendations for mediation analysis suggest that mediation consideration should instead focus on the magnitude and significance of indirect effects, due to problematic evidence related to the focus on the relationship of the independent and dependent variable (Rucker, Preacher, Tormala, and Petty, 2011). The Sobel test has been frequently used to test mediation after meeting the suggested requirements suggested by Baron and Kenny, but according to Preacher and Hayes (2008), bootstrap confidence intervals are preferred over the Sobel test. The authors suggest that Sobel test makes unrealistic assumptions about the shape of the sampling distribution of the indirect effect.

Preacher and Hayes (2008) describe bootstrapping:

Bootstrapping, a nonparametric resampling procedure, is an additional method advocated for testing mediation that does not impose the assumption of normality in the sampling distribution. Bootstrapping is a computationally intensive method that involves repeatedly sampling from the data set and estimating the indirect effect in each resampled data set. By repeating this process thousands of times, an empirical approximation of the sampling distribution of ab is built and used to construct confidence intervals for the indirect effect (p. 880).

Preacher and Hayes developed a macro for SPSS to conduct bootstrapping for examining mediation, which is available for download at www.quantpsy.org. This macro was used in conducting the subsequent mediation analyses. The bootstrap results of peer victimization on depression, through the proposed mediator of self-perceived social competence are presented below.

Table 6. Bootstrap Results for Self-Perceived Social Competence Mediating Effect of Peer Victimization on Depression

BOOTSTRAP RESULTS FOR INDIRECT EFFECTS

Indirect Effects of IV (Peer Victimization) on DV (Depression) through Proposed Mediator (Self-Perceived Social Competence) (ab paths)

IV to Mediators (a paths)				
	Coeff	se	t	p
SPSC	-.0833	.0267	-3.1207	.0035
Direct Effects of Mediators on DV (b paths)				
	Coeff	se	t	p
SPSC	-3.7734	1.4300	-2.6387	.0122
Total Effect of IV on DV (c path)				
	Coeff	se	t	p
Victimiz	1.2269	.2501	4.9051	.0000
Direct Effect of IV on DV (c' path)				
	Coeff	se	t	p
Victimiz	.9127	.2609	3.4983	.0013
	Data	Boot	Bias	SE
Total	.3142	.3028	-.0114	.1237
SPSC	.3142	.73152	-.0114	.1237
Bias Corrected and Accelerated Confidence Intervals				
	Lower	Upper		
Total	.1335	.7171		
SPSC	.1335	.7171		

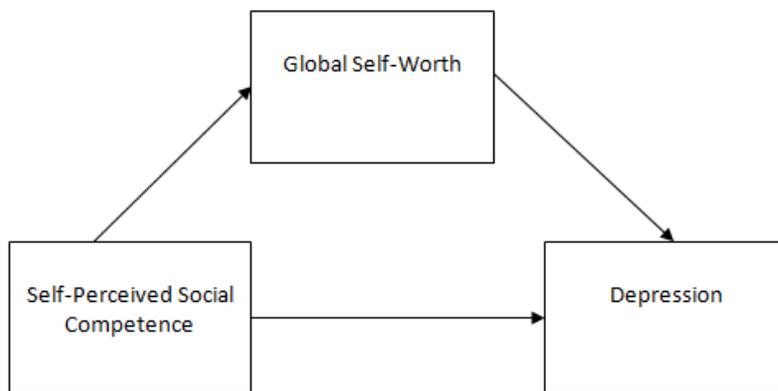
The results of the bootstrap confidence intervals for self-perceived social competence showed significant results, as the confidence interval did not span 0. Therefore,

hypothesis 11 was confirmed; self-perceived social competence mediated the relationship between peer victimization and depression. Rucker et al. (2011) stated that instead of proposing a partial or full mediation, an effect size is more appropriate; $a * b$ is the amount by which the dependent variable is expected to change as a function of a change of size a in the mediator variable, which is the expected change in the mediator per a change in one unit of the independent variable. Therefore, depression is expected to increase by .313 with a change of -.083 in self-perceived social competence, per a change in one unit of peer victimization.

Hypothesis 12

It was hypothesized that global self-worth mediated the relationship between self-perceived social competence and depression.

Figure 2. Proposed Mediation Model 2



Therefore, a separate bootstrap analysis was conducted to examine the proposed mediation model of global self-worth (proposed mediator) between the relationship of

self-perceived social competence (independent variable) on depression (dependent variable), while controlling for IQ and peer victimization.

Table 7. Bootstrap Results for Global Self-Worth Mediating Effect of Self-Perceived Social Competence on Depression

BOOTSTRAP RESULTS FOR INDIRECT EFFECTS

Indirect Effects of IV (Self-Perceived Social Competence) on DV (Depression) through Proposed Mediators (Global Self-Worth) (ab paths)

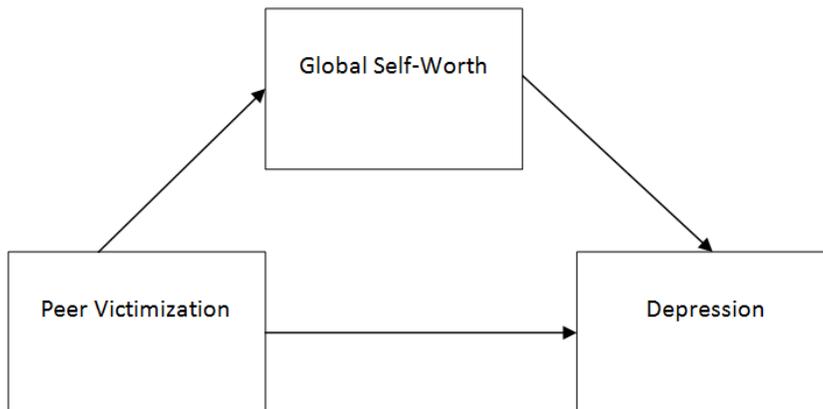
IV to Mediators (a paths)				
	Coeff	se	t	p
GlobalSW	.6153	.0993	6.1946	.0000
Direct Effects of Mediators on DV (b paths)				
	Coeff	se	t	p
GlobalSW	-8.7372	2.0246	-4.3155	.0001
Total Effect of IV on DV (c path)				
	Coeff	se	t	p
SPSC	-3.6477	1.4589	-2.5004	.0172
Direct Effect of IV on DV (c' path)				
	Coeff	se	t	p
SPSC	1.7285	1.7226	1.0034	.3228
BIAS ACCELERATED CONFIDENCE INTERVALS				
	Data	Boot	Bias	SE
Total	-5.3762	-5.3844	-.0082	1.7300
Global SW	-5.3762	-5.3844	-.0082	1.7300
Bias Corrected and Accelerated Confidence Intervals				
	Lower	Upper		
Total	-10.14127	-2.7973		
Global SW	-10.1427	-2.7973		

When controlling for IQ, the results of the bootstrap confidence intervals for Global Self-Worth showed significant results, as the confidence interval did not span 0. Therefore, hypothesis 12 was confirmed; global self-worth mediated the relationship between self-perceived social competence and depression. Depression levels are expected to decrease by -8.12 with a change of .615 in global self-worth, per one unit change of self-perceived social competence.

Hypothesis 13

It was also hypothesized that global self-worth would mediate the relationship between peer victimization and depression.

Figure 3. Proposed Mediation Model 3



Therefore, a separate bootstrap analysis was conducted to examine the proposed mediation model of Global Self-Worth (proposed mediator) between the relationship of peer victimization (independent variable) on depression (dependent variable), while controlling for IQ.

Table 10. Bootstrap Results for Global Self-Worth Mediating Effect of Peer Victimization on Depression

BOOTSTRAP RESULTS FOR INDIRECT EFFECTS

Indirect Effects of IV (Peer Victimization) on DV (Depression) through Proposed Mediator (Global Self-Worth) (ab paths)

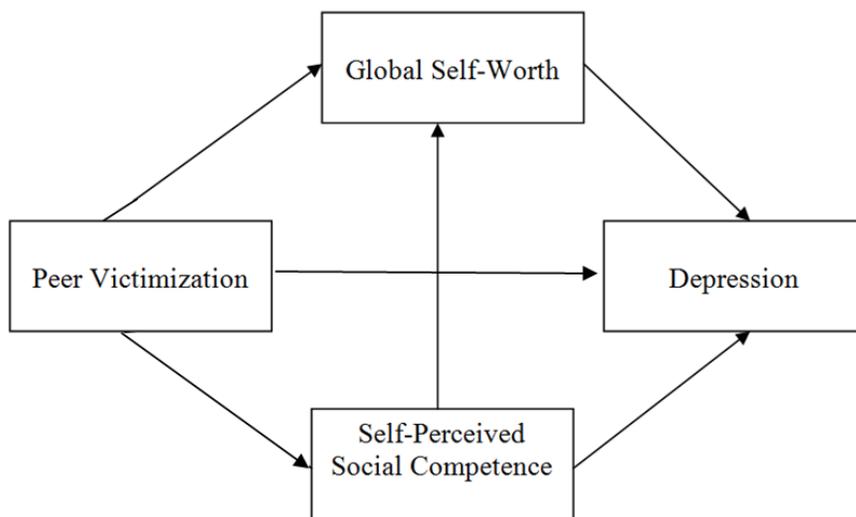
IV to Mediators (a paths)				
	Coeff	se	t	p
GlobalSW	-.1066	.0237	-4.5025	.0001
Direct Effects of Mediators on DV (b paths)				
	Coeff	se	t	p
GlobalSW	-7.2681	1.3984	-5.1973	.0000
Total Effect of IV on DV (c path)				
	Coeff	se	t	p
Victimiz	1.2910	.2607	4.9528	.0000
Direct Effect of IV on DV (c' path)				
	Coeff	se	t	p
Victimiz	.5164	.2483	2.0798	.0449
	Data	Boot	Bias	SE
Total	.7746	.7811	.0065	.2475
Global SW	.7746	.7811	.0065	.2475
Bias Corrected and Accelerated Confidence Intervals				
	Lower	Upper		
Total	.3006	1.2894		
Global SW	.3006	1.2894		

When controlling for IQ, the results of the bootstrap confidence intervals for Global Self-Worth showed significant results, as the confidence interval did not span 0.

Therefore, hypothesis 13 was confirmed; global self-worth mediated the relationship between peer victimization and depression. Depression is expected to increase by .775 with a change of -.107 in global self-worth, per a change in one unit of peer victimization.

The model of mediation between peer victimization, self-perceived social competence, global self-worth, and depression may be better described by the figure below.

Figure 4. Proposed Integrated Mediation Model



Hypothesis 14

Interaction effects were tested for hypotheses 5,6,7,8, and 9 to determine if group membership (HFASD or controls) affects the relationship between the relationships of peer victimization, self-perceived social competence, global self-worth, and depression. Each independent variable was multiplied by the group membership variable. The

variables were first centered to avoid multicollinearity. These interaction terms were used when running the regressions described in hypotheses 5-9.

a) It was expected that there would be no differences in group membership for self-perceived social competence explaining depression levels, when controlling for IQ. With depression as the dependent variable, the centered self-perceived social competence and IQ variables were entered in the first step of the regression, followed by the interaction term of centered self-perceived social competence*group membership. The interaction was not statistically significant, ($\Delta R^2 = .022$, $F(2, 37) = 1.254$, $p = .270$), which confirms hypothesis 8a, indicating that self-perceived social competence has the same effect on depression scores for both control and HFASD participants.

b) It was expected that group membership would not moderate the relationship of peer victimization predicting depression, when controlling for IQ. With depression as the dependent variable, the centered peer victimization variable and the IQ variable were entered in the first step of the regression, followed by the interaction term of centered peer victimization*group membership. The interaction was not statistically significant, ($\Delta R^2 = .000$, $F(2, 37) = .027$, $p = .870$), supporting hypothesis 8b, indicating that peer victimization has the same effect on depression scores for both control and HFASD participants.

c) It was expected that group membership would not moderate the *direction* of the relationship of peer victimization predicting depression, when controlling for IQ; however, it was expected that there would be a difference in the *strength* of peer

victimization predicting self-perceived social competence levels in the HFASD compared with controls. It was expected that peer victimization levels would explain more variance in self-perceived social competence in HFASD participants compared with controls. The interaction was not statistically significant, ($\Delta R^2 = .034$, $F(2, 37) = 1.644$, $p = .208$), failing to support hypothesis 14c, indicating that peer victimization has the same effect on self-perceived social competence for both control and HFASD participants.

d) It was hypothesized that there would be no differences in group membership for global self-worth predicting depression levels when controlling for peer victimization and IQ. The interaction was not significant for global self-worth predicting depression, while controlling for peer victimization and IQ ($\Delta R^2 = .686$, $F(3, 35) = .487$, $p = .490$). Therefore, hypothesis 14d was confirmed; global self-worth had the same effect on depression for HFASD individuals and controls.

e) It was expected that there would be no differences in group membership for peer victimization predicting global self-worth when controlling for IQ. The interaction was not significant for peer victimization predicting global self-worth ($\Delta R^2 = .013$, $F(2, 36) = .761$, $p = .389$). Therefore, hypothesis 14e was confirmed; peer victimization had the same effect on global self-worth for HFASD individuals and controls.

Exploratory Analyses

Additional goals of this study aimed to enhance the understanding of the contributing and predicting factors of depression. One goal was to conduct exploratory analyses to examine how parental report of autistic symptomatology predicted levels of depression, peer victimization, and self-perceived social competence. Autism symptomatology was measured with the Social Communication Questionnaire (SCQ), which was completed by the HFASD individuals' parent. The variable representing autism symptomatology will be hereafter called SCQ.

This analysis was examined in light of inconclusive research that debates whether autistic symptomatology affects HFASD individuals' self-report of depressive symptoms, peer victimization, and social competence. While research has shown that higher levels of autistic symptomatology predict depression, other research suggests that individuals with autism may not possess the necessary insight into their emotions. Furthermore, it is unclear how autistic symptomatology affects self-perception and recollection of peer victimization, particularly in individuals with high cognitive abilities. Therefore, the variables of self-perceived social competence, global self-worth, peer victimization, and depression were examined within the context of parent reported levels of autism symptomatology, as measured by the Social Communication Questionnaire (SCQ). Descriptive statistics for SCQ are presented below.

Table 12.

Descriptive Statistics for SCQ (N=16)				
	Minimum	Maximum	Mean	Std. Deviation
SCQ	16	36	21.75	5.916

It is of note that there are only 16 individuals with SCQ scores. Only HFASD individual's parents were given the SCQ. Additionally, two individuals from out of town participated in the study, but had already received diagnostic confirmation as a part of the existing study before the PI moved to the university where this data was collected. Therefore, screening was unnecessary and these two individuals' parents were not given the SCQ.

Due to the significantly reduced sample size, the relationship between SCQ scores and the main analyses variables could not be conducted through regression analyses. Instead, to examine the relationship, a correlation was conducted between SCQ and peer victimization, IQ, self-perceived social competence, global self-worth, and depression. Pearson correlation coefficients for SCQ are presented below.

Table 13.

Pearson Product Correlations for SCQ (N=16)						
		SPSC	Depression	Global SW	Victimization	IQ
SCQ	Pearson Correlation	.210	-.234	.293	-.454	.022
	Sig. (2-tailed)	.436	.382	.290	.078	.653

**. Correlation is significant at the 0.01 level (2-tailed).

Autism symptomatology severity, as measured by the SCQ, was not significantly correlated with any of the main variables or global self-worth. While these results are not significant, it will be important for future research with an adequate sample size to determine if autism symptomatology predicts levels of self-report for various self-introspection variables, while controlling for cognitive abilities.

Qualitative Responses

Another goal of this study was to explore qualitative responses provided by a select number of the HFASD participants regarding their experiences with bullying. A particular interest in these qualitative responses stemmed from research that debates children and adolescents with HFASDs' ability to accurately perceive bullying. There is little, if any research that examines perceptions of bullying or recalled experience with bullying in young adults with HFASD.

The questions asked to a select number of participants are listed below:

- 1) What does it mean to be bullied or made fun of?
- 2) Can you describe a situation in which this happened to you?
- 3) Why do you think you were bullied or made fun of by this person?
- 4) Can you describe a time when you saw someone else being bullied or made fun of?
- 5) What is the difference between gentle teasing and bullying?
- 6) If you were bullied, did you notice if it was worse in elementary, middle, or high school?

These questions were asked to selected individuals with HFASD. Individuals with both low and high scores on recalled peer victimization were selected from each group.

Scores on the Relational Victimization Questionnaire (peer victimization) for individuals

in this study ranged from 7 to 25 (25 representing higher incident reports of peer victimization in high school). Participants' responses will be described below.

HFASD Respondent 1: RVQ Score: 7

- 1) *What does it mean to be bullied or made fun of?* “I mean it would hurt – do you mean how would I respond or how would I feel? (repeated the question and clarified) Well it is to be singled out and to be verbally or physically abused or teased.”
- 2) *Can you describe a situation in which this happened to you?* “Several years ago, there was this kid who would take my books and once and threw them in the street. I don't know if I did something to single myself out.” (When was this?) “It was in high school.”
- 3) *Why do you think you were bullied or made fun of by this person?* “I might have done something that made myself seem different and then he would of stuck on that or maybe I made him angry.”
- 4) *Can you describe a time when you saw someone else being bullied or made fun of?* “I don't know about anybody else- I always kept to myself.”
- 5) *What is the difference between gentle teasing and bullying?* “Gentle teasing I guess would be with someone who is a friend. I had a friend several years ago and when we would get together we would talk about politics or movies- the majority of time he was nice but if he were to make a joke at my expense I would be

alright. Bullying is when every interaction with that person is either a verbal or physical attack.”

- 6) *If you were bullied, did you notice if it was worse in elementary, middle, or high school?* “I think high school would be worse because the capability was there, middle school just some disputes between me and other students, in high school there was the physical attack (referring to book incident).”

HFASD Respondent 2: RVQ Score: 9

- 1) *What does it mean to be bullied or made fun of?* “I’m not sure – never been bullied, however I can answer in principal; bullying is to be a victim of an individual or societal consideration that does not treat the person as an ends but merely as a point of gratification and it is not conducive to society as a whole. What it means- it hurts the individual but also the society for which he is a part.”
- 2) *Can you describe a situation in which this happened to you?* “No”
- 3) Not applicable
- 4) *Can you describe a time when you saw someone else being bullied or made fun of?* “Yeah, they are so numerous that I can’t remember any individual one that stands out in particular. When someone uses a derogatory term, referred to women, I would say that’s a good word to use with a female dog, but not with other people.”
- 5) *What is the difference between gentle teasing and bullying?* “Gentle teasing is where both people are on an equal footing of power- they are doing it to each

other and it is not meant to hurt either person or make them look worse in the group's or society's eyes, whereas with bullying, there is an imbalance of power and the other person is trying to make the other person denigrated in the society of which they are a part of."

- 6) *If you were bullied, did you notice if it was worse in elementary, middle, or high school?* "I noticed it was worse in school because older people can learn more hurtful things to say to people or more hurtful ways to say them. (*clarified question because he did not understand what time period during school*) I would say high school would be the worst using that line of reasoning."

HFASD Respondent 3: RVQ Score: 21

- 1) *What does it mean to be bullied or made fun of?* "It means to be singled out and have your weaknesses exposed."
- 2) *Can you describe a situation in which this happened to you?* "People used to poke me in middle and high school."
- 3) *Why do you think you were bullied or made fun of by this person?* "Because I gave a reaction to it."
- 4) *Can you describe a time when you saw someone else being bullied or made fun of?* "No"
- 5) *What is the difference between gentle teasing and bullying?* "Gentle teasing is done with people you know very well."

6) *If you were bullied, did you notice if it was worse in elementary, middle, or high school?* “Middle school.”

HFASD Respondent 4: RVQ Score 25

- 1) *What does it mean to be bullied or made fun of?* “To me it is to feel that you are not a part of the mainstream population; to be kind of made an outcast.”
- 2) *Can you describe a situation in which this happened to you?* “So many to think of... there’s just so many. One time in high school when I was waiting in line for the cafeteria for lunch and I got mad at a girl who cut in front of me in line and said something, so the guy behind me thought it would be funny to accuse me of cutting in line- that ended in kind of an incident.” *(like a fight?)* “Yes. *(the participant paused for several seconds)* “One thing that happens to me is that I don’t remember things when I get really emotional. One time in middle school- well, my dad is a pastor and there was this one guy who used to harp on me about that and spread jokes about it.”
- 3) *Why do you think you were bullied or made fun of by this person?* “I was socially awkward- I didn’t pick up on a lot of the norms, you know, most kind of people just pick up on automatically- I didn’t get that.”
- 4) *Can you describe a time when you saw someone else being bullied or made fun of?* “Yeah, I remember there were times that I got mad at people, because I was in the whole special ed group in high school, so I remember those times that I would hear people gossiping about this kid- and I happened to know he was in special

- ed. I would think- you guys have no idea- I would know a little about their life- kids don't really know. They don't know that this kid's parents had a divorce and what not and this kid gets angry.”
- 5) *What is the difference between gentle teasing and bullying?* “Um... that's a good question. For a lot of years I would not have recognized it. I would probably mistake a lot of teasing for bullying when I was younger. It is a subtle difference- it depends on the intent and the closeness of the person doing it. People who tease you are like friends- there is an unspoken permission that when you get close to someone, you can poke fun of them, and that is not allowed with other people. I mean it's a fine line. Even when you are in high school you are still learning those kinds of things.”
- 6) *If you were bullied, did you notice if it was worse in elementary, middle, or high school?* “High school because it gets more personal as you get older, and it's less excusable. When you are in elementary school especially, you are all really young, and when high school you really should know better.”

After thanking the participant for answering the questions, this participant indicated that this was something that he felt strongly about and said “I barely made it through high school in a lot of ways; it was not an easy part of my life. It took me years of therapy to get where I am today”.

Interpretation of Qualitative Responses

As shown by the main statistical analyses, the difference of recalled peer victimization for individuals with HFASD and controls was not significant; however, results were approaching significance for individuals with HFASD reporting higher levels of victimization. Peer victimization significantly predicted self-perceived social competence, global self-worth, and depression. These qualitative results help to expand upon the participants' experience with peer victimization, with an additional focus on eliciting the HFASD participants' understanding of bullying. The questions posed to these individuals were not specific to relational victimization, which allowed for more freedom in the participant's response.

The individuals with HFASD provided some quality responses that demonstrated their knowledge about bullying. In fact, the respondent's definitions of bullying contain elements that are very similar, if not exact, to definitions of bullying provided by research on peer victimization. "Being singled out for your weaknesses" and "with bullying, there is an imbalance of power vs. gentle teasing" and "physical and verbal bullying" are all aspects provided in the definition of bullying, and eloquently stated by these individuals. Of course, their definitions of the concepts of bullying do not mean that these individuals can accurately identify when they are being bullied or purposely excluded. The two individuals who did report high levels of bullying may have accurately been able to identify instances of victimization, but it is impossible to know from these interviews whether the individuals who reported low levels of victimization actually did not experience victimization, or rather if they were unable to accurately identify it when it

occurred. Nonetheless, individuals who aren't victimized or who aren't aware of it may be protected from the negative emotional effects.

Respondent 1, whose total RVQ score (peer victimization) was low, indicated that he wasn't bullied, and also, he did not notice anyone else being bullied because he mostly kept to himself. While his peer victimization score was low, his depression score was moderate (10) and his self-perceived social competence score was low (1.5). Perhaps further examination of the effects of a lack of friends, social anxiety, or social exclusion may be more relevant for some individuals related to the development of depression. Additionally, examination of extroversion and introversion, or social overture attempts of the individual with HFASD should also be examined related to the amount of experienced victimization.

One of the HFASD respondents (Respondent 4) was extremely insightful regarding his experience with victimization. He indicated that he thought he was bullied because he was "socially awkward and didn't pick up on a lot of the norms that most people pick up on automatically." This particular individual had a level of awareness regarding his diagnosis and how his behaviors may affect how others react to him. This particular individual also reported high levels of depression (34 on the BDI) and low levels of self-perceived social competence and global self-worth (both 1.5). Related to the prior research and the hypotheses of this study, this individual made attributions of the bullying to internal characteristics, which may have predisposed this individual to develop depression (Abramson, Metalsky, & Alloy, 1989). Additionally, similar to prior

research findings, the two HFASD participants who reported high levels of bullying specified self-blaming reasons for why they thought they were bullied (Graham, & Bellmore, 2007); being socially awkward or possibly doing something to make the other person mad were reasons used by these individuals. While these reasons may be logical, the internal blame may more likely predispose these individuals to developing depressive symptoms, rather than if these individuals attributed some of the blame to the bully or to external circumstances.

Chapter 5

Discussion

Overview of Findings

This study adds substantial findings to the current body of research dedicated to understanding the development of depression in individuals with high-functioning autism spectrum disorders. These findings also promote considerations for the prevention and treatment of depression for such individuals. Additionally, this research provides a greater understanding of the insight and self-reports of young adults with high-functioning autism spectrum disorders.

The primary goal of this study was to examine the role of peer victimization, global self-worth, and self-perceived social competence in predicting depressive symptoms in individuals with HFASD. Results from this study show that as a group, individuals with HFASD reported significantly higher levels of depression, lower levels of self-perceived social competence and lower levels of global self-worth than controls. Additionally, there was a trend towards greater levels of experience with peer victimization for individuals with HFASD. Peer victimization, global self-worth, and self-perceived social competence explained a significant amount of variance in depression, even while controlling for IQ. Additionally, peer victimization explained a significant amount of variance in self-perceived social competence and global self-worth, and self-perceived social competence explained a significant amount of variance in

global self-worth. Furthermore, self-perceived social competence and global self-worth mediated the presumed effect of peer victimization on depression, when controlling for IQ. Also, global self-worth mediated the presumed effect of self-perceived social competence on depression. Since global self-worth is an aspect of one's self-perception, albeit a more encompassing one, it was hypothesized to have a similar relationship with peer victimization and depression as did self-perceived social competence. The primary difference between global self-worth and self-perceived social competence is that global self-worth represents a more inclusive and overall self-worth of an individual, whereas self-perceived social competence is merely an aspect of an individual's overall self-worth. The finding of global self-worth mediating the effect of peer victimization on depression adds support to Abramson's theory that depression can result when the individual makes attributions to the causes of negative events, including global, stable, and internal causes, which predisposes him to develop depression (Abramson, Metalsky, & Alloy, 1989). To summarize, greater levels of peer victimization explained higher levels of depression; however, this relationship was not direct. Greater levels of peer victimization explained greater depressive symptoms, through lower levels of self-perceived social competence and lower levels of global self-worth, while controlling for IQ. In other words, peer victimization did not directly explain depression; peer victimization explained depression in part via its impact on self-perceived social competence and global self-worth. It is presumed that experience with peer victimization affects one's perception of social abilities, which in turn affects their perceptions of their

overall worth, and subsequently contributes to depression levels. Specifically, an individual who is subjected to greater amounts of victimization begins to internalize that the victimization is due to his own social inadequacies; these thoughts may then contribute to poor overall self-esteem, which can result in higher levels of depression. Exploratory analyses added further understanding to this conclusion, and will be explained later in depth. Lastly, while there were differences in levels of self-perceived social competence, depression, global self-worth, and peer victimization between the groups, there were no significant interactions in the regression analyses for the groups. In other words, the relationship of peer victimization, global self-worth, self-perceived social competence, and depression was the same for both individuals with HFASD and controls.

This study also had a secondary goal, which was to examine how levels of autism symptomatology may explain self-reported depressive symptoms, recalled peer victimization, and self-perceived social competence. Due to a limited sample size, this relationship could not be adequately assessed with multiple regression analyses. Instead, Pearson correlations were conducted between autism symptomatology and depression, peer victimization, global self-worth, and self-perceived social competence. No correlations were significant, indicating that autism symptomatology did not significantly correlate with any of the aforementioned self-report variables. There may have been no significant correlations due to a restricted range, since the study only enrolled individuals

with higher SCQ scores and average or above cognitive levels. Further analyses with a larger sample need to be conducted to examine the relationship between these variables.

Qualitative responses were also collected as a part of this study. A select number of participants from each group were chosen to answer questions about their experience with being victimized. Individuals were selected according to their scores on recalled experience with peer victimization in order to have a sample with a range of values (i.e. a range of experience with peer victimization).

Individuals with HFASD of both low and high peer victimization scores provided quality definitions of bullying, and were able to accurately distinguish the difference between gentle bullying and teasing. While providing a definition of bullying requires separate skills than identifying bullying when it is happening, the participants' responses of describing their own or others' experience with bullying demonstrated that these participants are able to understand bullying and apply the definition in the context of everyday life. Furthermore, one individual who did not report bullying and was unable to give an example of someone else being bullied indicated that he mostly kept to himself. This statement prompts further investigation into differences in bullying and exclusion, for instance, examining the degree or type of bullying related to attempted social overtures on the part of the individual with HFASD. A response by one individual with HFASD was that he felt strongly about bullying because he barely made it through high school and has been through many years of therapy to get to where he is today. This individual also indicated that he thought he was bullied because he was socially

awkward. Perhaps this individual developed a high level of self-awareness and insight though his experience with therapy. However, his current scores still reflected high levels of depression and low perceptions of his social abilities and global self-worth. These participants' responses, along with the quantitative analyses, demonstrate that there is a need to address victimization and self-perceptions of individuals with HFASD, both preventatively and throughout their lives.

Limitations

While the findings from this research will hopefully further the understanding of depression in young adults with HFASD, this study is not without limitations. While some of the limitations of this study concern methodology, others involve limitations of doing research with individuals with HFASD, due to the relative infancy of research with this population in many of the areas that impact the study's conclusions.

One such limitation concerns the lack of validated assessment instruments for accurately diagnosing depression in individuals with HFASD. Symptom presentation of depression in individuals with autism may be different than neurotypical individuals. Furthermore, some symptoms of depression may overlap with symptoms of autism. Therefore, screening tools or assessment instruments may need to be developed to be sensitive to such complexities. Furthermore, research results are mixed with regard to the accuracy of self-report instruments for individuals with HFASD. It is possible that individuals with HFASD may have inadequate insight into their own emotional states. It is likely that the most informative assessment for depression and other psychiatric

comorbidities should include multi-method and multi-rater assessments. Furthermore, the professional conducting the assessment should be conscious of other factors of the individual's symptom presentation (i.e. language ability, cognitive level, age, parent acceptance of their child's diagnosis, etc.) with regard to interpreting child and parent report questionnaires. However, it is hoped that the results from this study urge practitioners, parents, and other professionals to be aware of the high risk of emotional difficulties and poor self-concept within these individuals, and therefore monitor changes in the child's behavior or emotional state. Additionally, it is important to acknowledge the individual's report of their feelings and self-concept.

This study had some methodological limitations that may have impacted the findings of this study. First, the study only included male individuals, which was a valid requirement of the larger study of brain structure and function, due to analyses considerations of the high ratio of males to females with autism in the context of brain imaging. While research has shown that there are no gender differences of self-reported depression between males and females with autism, this finding needs to be replicated. Additionally there are no known studies of gender differences in self-reports of peer victimization or self-concept in young adults with HFASD. Therefore, these results can't be generalized to female neurotypical individuals or females with HFASD. Additionally, many of the individuals with autism and all of the controls included in this study were enrolled in college. It is possible that the variables in this study may be impacted differently in individuals who did not attend college, especially if the reason for not

attending college was due to depression or social anxiety reasons, or even poor self-concept in succeeding or being able to live away from parents.

Another limitation of this study was the sample size, which was less than power analyses indicated were necessary. The sample size of this study did not meet the needed requirement, given the number of variables used in the regression. Additionally, the exploratory analysis of autism symptomatology predicting the variables in this study was unable to be adequately examined due to the limited number of HFASD participants.

Another limitation of this study was that controls with psychiatric comorbidities of depression or anxiety were not enrolled in the study, due to requirements for the overarching study of brain structure and function. This may have affected the significant mean differences of the variables in this study. However, the primary goal of this study was not to show that there were mean differences between the two groups. The *relationships* between the variables were the main focus of this study; there were no interaction effects between the two groups, indicating that the relationships between the variables were the same for each group, despite mean differences of the variables. It is possible that there may have been interaction effects of group membership if the sample included controls with depression; however, literature for neurotypical individuals show similar results for the relationships between variables in this study, particularly that lower self-perceptions of social competence predict higher levels of depressive symptoms (Whitton, Larson, & Hauser, 2008) and that higher levels of peer victimization predict higher levels of depression (Flemming & Jacobsen, 2009).

Lastly, this study did not include parent reports for any of the main variables in the analyses. Parent reports may have been valuable information to further understand the variables in this study, understanding parental perspectives of their children, and in determining if reports differed between the parents and their children. As mentioned previously, it will be important for parental input to be included in the assessment of depression in individuals with HFASD. Teacher reports will also be important for assessing depressive symptoms in children and adolescents.

Clinical Implications

This study presents information that has clinical implications for understanding depression in individuals with high-functioning autism spectrum disorders. Previous research has shown that peer victimization contributes to depression in individuals with HFASDs (Shtayermman, 2007) and that self-perceived social competence predicts depression in individuals with HFASDs (Vickerstaff, 2006). However, no known research to date has included both variables in understanding their relationship with depression. Furthermore, research has shown that global self-worth mediates the effect between peer victimization and anxiety in girls (Grills & Ollendick, 2002), but no research examines the role of self-perceived social competence, global-self worth, and peer victimization in understanding depression, particularly with young adults with HFASDs.

The findings of this study demonstrate that recalled peer victimization in high school significantly predicted depression, self-perceived social competence, and global

self-worth, when controlling for IQ. This information is important to consider for clinicians, teachers, and professionals who work with individuals with HFASD. While these findings concern young adults, there are many clinical implications for school-aged individuals with HFASD. Bullying, exclusion, and teasing begin when these individuals are school-age, so it is important for adults involved in the child's life to be aware of the high-rates of victimization and how it can affect these children. Victimization can occur in unstructured times during school, such as recess and lunch, and may go unnoticed by school professionals; therefore, checking in with the student periodically or monitoring such activities may prove to be useful in recognizing and addressing victimization. The school community should have policies for dealing with bullying and make such policies known to all students. Biggs, Simpson, and Gaur (2010) urge an interdisciplinary driven intervention to address the bullying of students with HFASDs.

Ostracism may be a more complex issue than overt victimization (such as physical aggression or teasing). Students may either purposely or passively exclude a child with HFASD. Conversely, the child with HFASD may be socially anxious, avoid others due to difficulty initiating interactions, or may prefer to be alone due to such difficulties. Therefore, there may be a cycle of peer exclusion and self-alienation for these children. School professionals should help facilitate positive interactions with mature peers when possible, which may be supported by providing the chosen peer with some education about the individual's challenges and strengths (with parental permission). Most importantly, individuals with autism will benefit from social skills

instruction, support groups, and practice implementing appropriate social skills with peers. Early intervention that is continued throughout school may help improve a child's self-concept through positive interactions with others.

These findings have important implications for clinicians as well. Since individuals with autism may be at a higher-risk for depression, clinicians should conduct early screenings for depression; additionally, clinicians should educate parents about signs of depression in their children and provide them with potential resources or treatment routes if they do notice such symptoms. Clinicians who are providing treatment to individuals with HFASD should consider therapy that addresses the child or adult's core beliefs and self-concept, due to this study's finding of the significance of self-concept in predicting depression. Cognitive-behavioral therapy may prove to be successful in treating depression in HFASD individuals, particularly with providing psychoeducation about the relationship between emotions, thoughts, and behavior; cognitive restructuring of negative beliefs; and providing tools for dealing with negative thoughts, feelings, and behaviors (Attwood, 2004).

Clinicians should also be aware of peer victimization in childhood, and other forms of victimization in adulthood (such as being taken advantage of or discriminated against). Consequently, the clinician should educate the child on dealing with bullying through assertiveness training, coping skills, and problem-solving. Problem-solving may include teaching children how to talk to an adult or parent when they are being bullied. It

may be important for adults to learn how to find the appropriate person or venue to file complaints for being mistreated or discriminated against in the workplace or community.

Future Directions

This study could benefit from expansion and further exploration in order to understand the complexity involved in the development of depression in individuals with autism, and in understanding the role of self-perceived social competence, global self-worth, and peer victimization.

Subsequent studies should include parent and teacher reports for children, or parent report for young adults, in exploring differences in self-report and others' report of depression and peer victimization. Furthermore, research should determine effective ways to gain a better understanding of the self-awareness of individuals with HFASD; a better understanding of how these individuals understand the nature of their diagnosis, self-awareness of their emotional states, ability to detect peer victimization, and their awareness of their strengths and weaknesses.

Further studies would also benefit by elaborating upon the model suggested in this study, and elaborating upon the complexities of the variables included in order to understand caveats, protective factors, and moderators for the relationship between peer victimization, self-perceived social competence, global self-worth, autism symptomatology, and depression. For example, it may be useful to examine how important social abilities are to the individual, in the sense of how influential it may be to their overall self-concept and self-worth. It may be reasonable to assume that the

importance one places on social abilities can impact global self-worth; if social abilities aren't important to an individual, and rather other aspects such as academic performance, artistic ability, etc. are more important, the individual may have different levels of global self-worth despite levels of self-perceived social competence. While this study showed that global self-worth can be negatively affected by an individual's experience with peer victimization and subsequent perception of their social abilities, it is also important to consider that their global self-worth may vary depending upon the context. Harter, Waters, and Whitesell (1998) showed that adolescents' perception of their worth as a person varied across interpersonal contexts, including with parents, teachers, male classmates, and female classmates. Examining differences in global self-worth across such contexts, with the addition of the self-worth in the context of other family relationships, romantic partners, or employee relationships when relevant, may be important in understanding self-perception in individuals with HFASD. Furthermore, awareness of variability in global self-worth may prove to be useful in treating depressive symptoms associated with poor global self-worth in specific contexts.

It may also be important to determine other protective factors for developing depressive symptoms, such as quality of current and past friendships, previous experience with treatment for depression (pharmacological or non-pharmacological) or skill-based interventions (such as social skill instruction, play, or speech/language therapy). Furthermore, examining the age at which the intervention(s) began as well as the duration may be useful in determining protective factors for depression in these individuals.

Further dissection of the nature of peer victimization in predicting depression and self-concept is warranted. Future research could determine if there are differential effects in the *type* of peer victimization (relational, ostracism, or physical) in predicting depression, self-perceived social competence, and global self-worth. Additionally, examining the difference in the amount and type of peer victimization across development may have important implications for school professionals and parents. In fact, understanding developmental changes in all of the variables in this study will be useful for understanding quality of life, long-term outcomes, and appropriate treatment depending on the age of the individual. Additionally, this study examines recalled experience with peer victimization. Future studies should examine if there are differences in recalled experience versus current experience while the individual is in school. Reporting current peer victimization while in school may prove to have a different impact on current report of self-perceptions or levels of depression.

This study focused on the development of depression in young adults with HFASD. However, it will be equally important for research to determine if the variables in this study predict other psychiatric comorbidities, such as social anxiety or generalized anxiety.

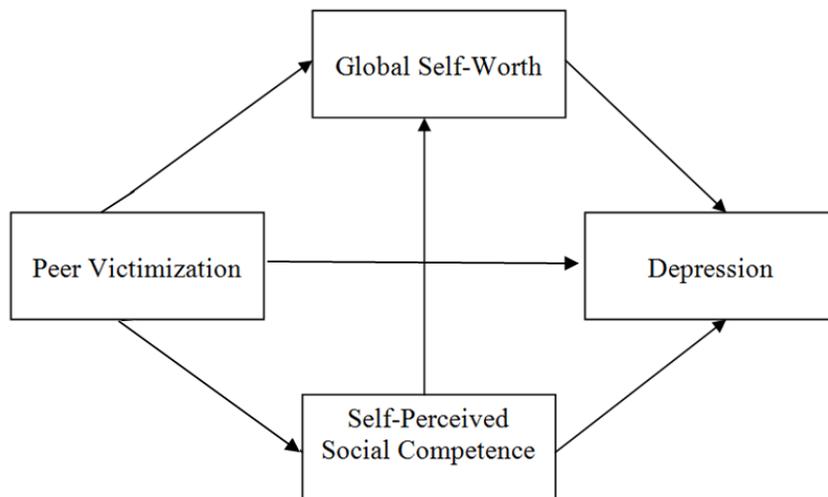
Lastly, it is critical that future research focus on developing treatment or determining the effectiveness of current treatment for addressing negative self-perceptions and depression for children, adolescents, and adults with HFASD.

Determining effective school-wide or community activity policies and programs to address bullying for both victims and perpetrators is also equally important.

Conclusions

This study demonstrated that higher levels of peer victimization were associated with lower levels of self-concept (both global self-worth and self-perceived social competence) and higher levels of depressive symptoms in young adult males with HFASD. Global self-worth and self-perceived social competence, in separate analyses, mediated relationship of peer victimization and depression. Global self-worth also mediated the relationship between self-perceived social competence and depression. The model that represents these findings is shown below.

Figure 4. Proposed Integrated Mediation Model



It is presumed that an individual with HFASD may internalize experience with peer victimization and begin to believe that he has inadequate social abilities and that he

is not a worthwhile person. These feelings may result in an increase of depressive symptoms.

Qualitative responses from selected individuals with HFASD provided meaningful expansions to the quantitative results of this study. The responses provided by the selected individuals demonstrated accurate definitions of bullying and teasing. Several individuals described meaningful accounts of their own experiences with victimization, and in several responses, a level of insight as to why they were bullied by others. The responses of these individuals indicated an awareness of the intentions of bullies, considerations of vulnerability and potential harm of the victim, and understanding important differences between being bullied or gently teased.

Despite limitations of this study and the need for further investigation, it is clear that there is a need to address victimization, poor self-concept, and depressive symptoms of individuals with HFASD. Hopefully, this study will prompt further research to understanding these concepts. Furthermore, it is hoped that future studies will focus on the development of interventions to address victimization, improve self-concept, and treat depressive symptoms, with the ultimate goal of improving the quality of life for individuals with HFASD throughout their development.

Appendix A

Qualitative Questions Regarding Recalled Peer Victimization

- 1) What does it mean to be bullied or made fun of?
- 2) Can you describe a situation in which this happened to you?
- 3) Why do you think you were bullied or made fun of by this person?
- 4) Can you describe a time when you saw someone else being bullied or made fun of?
- 5) What is the difference between gentle teasing and bullying?
- 6) If you were bullied, did you notice a change or difference in elementary, middle, or high school?

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