SELF-COMPLEXITY AND DEPRESSION OUTCOMES IN ADOLESCENT SIBLINGS OF INDIVIDUALS WITH ASD

By

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Self-concept can be defined as a collection of ideas about the self. The structure of self-concept, as measured by self-complexity, can be broken into two factors: the number of roles one identifies as being important to the self, and the distinctness of these roles. Research has suggested that high total self-complexity, and high positive complexity, is seen as a protective factor. Conversely, high negative complexity is considered a risk factor. These self-attributions originate at a young age, and are formed through social mechanisms, such as social feedback and social comparison. In this way, significant relationships, including family, have an important role in shaping an individual’s self-concept. While much of the literature has focused on the influence of parents, research also suggests that siblings are significant figures. However, when an individual with autism is introduced into the family unit, the sibling relationship is significantly changed. This results from decreased social feedback and increased family stress, which may influence the formation of self-concept. The present study looked at the self-concept of 15 adolescent siblings of individuals with autism (ASD group) and compared this to the self-concept of 18 adolescents with a neurotypical sibling (Control group). Study
participants were also asked to fill out questionnaires related to their overall well-being, including measures of depression symptoms, social support, negative life events, and the sibling relationship. Overall, results suggested that siblings in the ASD group fared as well as siblings in the Control group. They did not significantly differ on depression scores, social support, negative life events, or general self-complexity. There was some differentiation in sibling self-concept, with the ASD group showing more distinct sibling roles. Further, the findings of the present study supported the hypothesis that high negative self-complexity is positively related to depression scores. Lastly, it was found that distinctness among roles had a positive relationship with depression in the clinical group. This study yielded important information about siblings of individuals with autism, and adolescent self-concept more generally. The implications of the present findings, limitations, and future directions are also discussed.
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<tr>
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Introduction

Self-concept has a significant influence on a child’s development and psychological outcomes. Research broadly defines self-concept as a collection of ideas and evaluations about the self that contain information about important roles, goals, and relationships in one’s life (McConnell, Shoda, & Skulborstad, 2012). Self-concept can therefore be defined as both the way an individual thinks about the self, in terms of structure, but also how individuals feel about the self, in terms of positive or negative evaluation (Leflot, Onghena, & Colpin, 2010). The literature suggests that a sense of self begins at a young age (Harter, 1998; 2006), and is influenced by several factors, including broad-based social comparison (Suls & Wheeler, 2000; Trautwein, Ludtke, Marsh, & Nagy, 2009) and more specifically, influential social and family contexts (Leflot et al., 2010).

With regard to social comparison, research has suggested that children use social feedback and social comparison to understand the self (Suls & Wheeler, 2000; Trautwein et al., 2009). These theorists also suggest that individuals pursue information from those around them to be integrated into the self-concept (Suls & Wheeler, 2000; Trautwein et al., 2009). Specifically, by noting how individuals respond to us, and how we are similar and different than others, we begin to form roles and attributes about our self. Further, those children who experience positive interactions with significant others will be set up for a positive view of the self, while those who experience negative feedback from others will gain a more negative view (Harter, 1996; Leflot et al., 2010). These variables have been shown to have significant implications for a child’s well-being and adjustment in the future. Specifically, self-concept has been shown to influence important variables
such as academic achievement (Guay, Marsh Boivin, 2003), and psychological outcomes (Dubois & Tevendale, 1999)

**Self-Complexity**

One approach to studying self-concept, particularly as it relates to depression, is self-complexity. First introduced into the literature by Linville (1985, 1987), it puts forth the premise that individuals have distinct differences in the way that they represent themselves cognitively. According to Linville, the cognitive representation of one’s self (i.e., their self-complexity) is broken into two components: self-aspects and the differentiation among these aspects (Linville, 1985, 1987). Self-aspects can be defined as the aspect of one’s self, or the ways in which one defines him or herself in roles or activities (Linville, 1985, 1987). For example, someone may define herself as a student, a sister, a friend, and a hockey player; all individual aspects of the self. Each of these roles is then posited to have its own set of traits and positive and negative evaluations attributed to it (Linville, 1985, 1987). For example, when considering oneself as a friend, they may define themselves positively as caring and patient, while thinking of herself as a hockey player brings about negative evaluation as sloppy or careless. The differentiation among these attributes is the degree to which these roles are distinct, or conversely the amount of overlap among the traits or affects of self in those roles (Linville, 1985, 1987). An individual’s self-complexity can then be individually defined as “high” or “low” depending on these two factors (Linville, 1985, 1987). For example, those high in self-complexity define their self-concept into many self-aspects that are highly differentiated (Abela & Veronneau-McArdle, 2002; Linville, 1987). Conversely, those low in self-
complexity, define the self in fewer self-aspects that have a larger degree of overlap (Linville, 1985, 1987).

From this model, Linville (1987) posits that high self-complexity will serve as a protective factor when encountering negative life events and may serve to buffer the depressive symptoms resulting from this exposure. Specifically, after experiencing a negative event, relevant self-aspects are thought to be stimulated, and the negative thoughts and feelings associated with the negative event will then become connected to that relevant self-aspect (Abela & Veronneau-McArdle, 2002). This association will not only remain in those self-aspects that are immediately activated, but will also spread to related self-aspects (Abela & Veronneau-McArdle, 2002). Therefore, the fewer self-aspects one uses to define him/herself, and the less distinct they are, the more of the self becomes associated with these negative thoughts (Abela & Veronneau-McArdle, 2002), leaving one at greater risk for depression (Linville 1987). However, those high in self-complexity will have a greater number of aspects that will remain unharmed by a negative event, and will therefore leave them less susceptible to depression (Abela & Veronneau-McArdle, 2002; Linville, 1987). In Linville’s (1987) seminal study, support for this theory was found, as those low in self-complexity were more likely to endorse depressive symptoms following negative events.

Since this foundational study, researchers have extended the model of self-complexity to include the concepts of “positive” and “negative” self-complexity. Specifically, high positive self-complexity appears as high numbers of self-aspects with highly differentiated positive self-attributes (Morgan & Janoff-Bulman, 1994), while high negative self-complexity contains highly differentiated negative self-attributes (Morgan
& Janoff-Bulman, 1994). It has then been posited that it is not beneficial to merely be highly complex overall, but one must have high positive self-complexity (Morgan & Janoff-Bulman, 1994). Despite the initial research supporting the benefits of these factors (Linville, 1987), it has been largely unsupported in subsequent literature. Instead, much more emphasis has been placed on the risk factors incurred from high negative self-complexity. Specifically, those who are highly negative in self-complexity are at particular risk for developing psychological distress (Morgan & Janoff-Bulman, 1994).

While these studies primarily address adult populations, research has also looked at self-concept in children and adolescents. Looking at younger age groups has yielded information about the general influence of self-concept in children, and how this important construct is created. First, research has suggested that self-complexity affects children and adolescents in the same way as adults (Abela & Veronneau-McArdle, 2002). In looking at psychological outcomes in children, findings suggest that high total self-complexity, and positive self-complexity, do not serve as a buffer against depressive symptoms following negative life events (Abela & Veronneau-McArdle, 2002). Instead, as with adults, high levels of negative self-complexity in conjunction with negative events were found to predict the endorsement of depressive symptoms (Abela & Veronneau-McArdle, 2002).

To address the formation of the self-concept, as measured by self-complexity, researchers have extended the self-complexity model to children and adolescents (Abela & Veronneau-McArdle, 2002; Jordan & Cole, 1996). Research has suggested that the formation of self-concept increases dramatically in middle childhood, as a result of increasing cognitive abilities and social perception (Abela & Veronneau-McArdle, 2002;
Harter, 1983). Looking developmentally, even as self-complexity increases in middle childhood, pre-adolescent children have been found to have a largely positive sense of the self with little attention to imperfections or flaws (Harter, 1988). In this way, self-complexity in young children reveals a self-concept that is largely positive. This is not to say that children do not have a somewhat negative sense of self, with children as young as nine being able to differentiate their self-concept in terms of positive and negative aspects as older individuals do (Abela & Veronneau-McArdle, 2002). However, as cognitive abilities increase, and the view of self becomes more realistic, children in early adolescence begin to more easily incorporate both positive and negative information about the self (Harter & Monsour, 1992). At this time, negative self-complexity is found to increase.

As negative self-complexity begins to emerge in early adolescence, exposure to negative feedback and negative life events becomes crucial. Specifically, as research suggests that feedback from significant others can influence the sense of self; this may indicate that negative self-complexity can form and change as a result of negative relationships or life events (Jordan & Cole, 1996). From these studies, one can then say that children also experience the individuating effects of self-complexity when encountering negative life events. As negative self-complexity has the best predictive value for psychological outcomes, it becomes crucial to study the factors contributing to the formation of these self-perceptions in childhood, and the populations most at risk for a stressful family context.

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1 See Footnote attachment
It can then be said that the kind of feedback that individuals experience as children have important implications for future functioning. The quality of the feedback, however, is highly dependent on the target of these social inquiries. Crucial information about the self in childhood is primarily gained within the context of significant relationships, such as family members and significant peers (Leflot et al., 2010). At young ages, parents and family relationships are the most salient, as children spend the most time in interactions with family members (Leflot et al., 2010). Peers become introduced later in life, as play and social relationships take on an important role (Leflot et al., 2010).

It can then be said that the family context is extremely important for both the formation of the self-concept, as well as a child’s psychological outcomes (Leflot et al., 2010). Specifically, families can influence several aspects of a child’s self-concept, including his or her physical, social, and emotional identities. Much of the literature on family context, and more specifically familial relationships and self-concept, has focused on the role of parents in a child’s life (Doyle & Markiewics, 2005; Schek; 2007). Research in this area has addressed the long-term effects of topics such as attachment, learning, and social and emotional functioning on self-concept. While it is evident that the parent-child relationship is vital, other crucial relationships in a child’s life may subsequently get overlooked. For example, little research attention has been paid to the sibling relationship and its effects on self-concept. However, the limited research that has been conducted has shown this relationship to have a significant influence on one’s life.

**The Sibling Relationship**

The sibling relationship is distinct from all other relationships in a person’s life, familial and non-familial alike. Within the broader context, the sibling relationship is
typically the longest lasting relationship of one’s life (Cicirelli, 1995). This relationship often originates in infancy or early childhood and persists throughout most of the lifespan. This distinction sets it apart from other social relationships, including parents, grandparents, spouses and friends, where the longevity of the relationship is typically more limited. Siblings are also unique within the family unit itself. Siblings are considered to be of equivalent status within a family (Cicirelli, 1995), while relative status may be unbalanced in other family bonds, such as in parent-child relationship. Accompanying the equivalent status, siblings are unique as they typically share many influential environmental contexts. These contexts extend beyond the confines of physical space, as siblings are often being exposed to the same limited number of physical and emotional resources (Cicirelli, 1995). This may include monetary resources, as well as valuable parent time and attention. Outside of the family context, the sibling relationship is distinct as it is imposed; determined by outside factors such as birth or adoption, and not chosen as other relationships may be (Cicirelli, 1995). Therefore, while siblings may have some choice in the level of involvement they have with their brother or sister, particularly as they get older, they are never without their sibling status (Cicirelli, 1995).

While all of these factors set the sibling relationship apart from other important bonds in one’s life, this relationship is particularly significant with regard to social development and broader social awareness. From a developmental perspective, siblings provide the first opportunity for peer interactions and social relationships (Dunn, 1988). Siblings are often a child’s first peer partners and through these interactions a child will learn social norms and the social rules that accompany them (Dunn, 1988). Play is a very
important way that children begin to understand these rules. Through play, children learn how to engage in reciprocal social interactions, and will be given feedback with regard to any unacceptable behaviors. For example, a child engaged in pretend play with her sibling will quickly be rejected by her partner for stealing toys, or being aggressive with the other child. Children then learn from this pattern of reinforcement, and future interactions will be shaped by the feedback. These rules help a child navigate through the social world, and help to inform future relationships extending from childhood through adulthood (Dunn, 1988). These relationships are integral to one’s social development, and therefore to the development of one’s social self-concept (Dunn, 1988).

**Autism and the family**

Family dynamics and sibling relationships can change significantly when there is a sibling with autism, and research indicates that there is a pervasive family impact. Defined by early onset, typically before age three, Autism Spectrum Disorders (ASDs) are defined by three characteristic symptom domains: impairments in communication, social functioning, and the presence of restricted and repetitive behaviors. While not among the core domains, ASDs are often characterized by many other behaviors that may be challenging for the family. Some of these include impairments in intellectual functioning, seizures, and the presence of maladaptive behavior, such as aggression and self-injurious behaviors (Harris & Glasberg, 2003).

In reaction to a child’s diagnosis with autism, parents often experience a “loss of a perfect child,” (Harris & Glasberg, 2003) and mourn the loss of an idealized image of their son or daughter. When thinking about becoming a parent, individuals are typically flooded with images of an idealized life. Parents often imagine bringing their child to
school, attending baseball games and school plays, or even attending their child’s wedding. There are also idealized notions of the relationship that parents will have with their child, and the emotional bond that accompanies it. However, with the diagnosis of an ASD, parents begin to realize that these romanticized visions of their child’s future may never be realized. Similarly, the parent-child relationship may be significantly altered; they may never have the profound reciprocal emotional bond experienced by other typically developing parent-child dyads. This feeling of loss, or of being robbed of the typical parenting experience, can cause significant stress for parents, and may leave them with feelings of sadness. Siblings, as they become aware of the challenges in their brother or sister’s life, may also long for an idealized sibling partner. These feelings of loss, disappointment, and grief are common among families with children having acute medical and psychiatric diagnoses. However, research indicates that the impact of an ASD on the family unit is distinct from other chronic illnesses (Bouma & Schweitzer, 1990), and even from other developmental disabilities (Donovan, 1988).

In addition to the emotional ramifications of an autism diagnosis, families also experience many practical challenges as a result. This may include becoming an advocate for the child with autism, finding appropriate educational placements, identifying and implementing therapeutic programs, as well as a greater commitment to overall childcare responsibilities. Specifically, families of children with autism are faced with an increased time commitment dedicated to caring for their child with a disability. For example, due to limitations in adaptive skills, parents and siblings alike often need to help the child with autism with daily skills far longer than families of typical children, or children with other disabilities. In addition, parents and families of children with autism will often spend
time implementing therapeutic programs in the home, as well as taking their child to different appointments. These additional demands involve a major investment of emotional, temporal and economic resources.

**Autism and Siblings**

It is evident that autism has a significant impact on the family unit, and can alter the family structure. Many of these changes are placed on the shoulders of the parents, and much research attention has been paid to the psychological and emotional impact of autism on parents (Benson, 2006; 2010; Bromley, Hare, Davison, & Emerson, 2004). However, these significant changes in family life and structure are not limited to parents, but rather are a change for the entire family unit. Therefore, one must acknowledge that other family members may also experience relationship changes and stress as a result of an autism diagnosis. For example, many of the above-mentioned factors have a significant impact on siblings. Relatively little research has been conducted on siblings of children with autism spectrum disorders specifically, and the research that has been conducted has yielded mixed results. However, it has largely been agreed upon those sibling relationships that include a child with a disability, particularly autism, have several qualitative differences than a typical sibling pair (Celiberti & Harris, 1993). Much of the research in this area has focused on the differences in social interactions between siblings, as well as differences in relationship quality, as compared to typical controls.

Because impairments in social functioning are one of the hallmark symptom categories in autism spectrum disorders, it is reasonable to assume that this area would be one of the most salient challenges experienced within the sibling relationship. Additionally, as previously mentioned, social exchanges through play are one of the
primary learning opportunities for typical and atypical children alike. Any alterations in this dynamic therefore have significant implications for future social learning. Researchers have specifically focused on the social initiations of typical siblings within the sibling dyad. As children with autism are often unaware or unresponsive to social initiation and gesture, typical siblings may interpret this unawareness as social rejection, and subsequently feel discouraged or rejected (Celiberti & Harris, 1993; El-Ghoroury & Romanczyk, 1999). This may have significant emotional ramifications for a sibling who is looking for a play partner and receiving little in return.

In studies looking at interactions between sibling pairs when one child has an ASD, results have shown that there are differences in patterns of social interactions, specifically in social initiations (El-Ghoroury & Romanczyk, 1999). In social interaction between typical sibling pairs, there is often significant reciprocal social initiation taking place between two playmates, independent of an adult presence. This shared interaction is present in children from a very early age, with children often taking turns suggesting games or contributing to a story. However, in looking at dyads that include a sibling on the autism spectrum, parents are more likely to step in and initiate social interactions with the child with ASD. Therefore, social initiations are less likely to come from the typical sibling (El-Ghoroury & Romanczyk, 1999).

Additionally, these sibling relationships often include less prosocial behavior overall than those involving typical siblings (Kaminsky & Dewey, 2001). This may include fewer behaviors such as helping or sharing with a partner. In looking further at relationship quality, studies have shown that sibling relationships involving a child with an ASD are characterized by less intimacy and less nurturance than is true for those
including a child with Downs Syndrome or those without a disability (Kaminsky & Dewey, 2001). Some studies also report that relationships between siblings when one child has an autism spectrum disorder are characterized by lower levels of positive affect than sibling dyads including a child with Down syndrome (Orsmond & Seltzer, 2007).

Sibling relationships including a child with autism also take on a different quality with regard to family status. While typical siblings are considered to have an equivalent status, sharing a pool of resources, this balance may be significantly altered when introducing a child with autism. As parents’ resources are spread thin, an unequal distribution of resources is then available for the rest of the family. When parents are required to invest time in finding appropriate placements, implementing treatments, and caretaking of the affected child, typical children requiring less assistance may receive less individualized attention, and may be expected to be more self-sufficient (Stoneman, Brody, Davis, & Crapps, 1988). This anticipation can significantly alter the family environment for the typical siblings, who are now placed with a distinct set of expectations requiring them to be more functionally independent (Stoneman et al., 1988).

Also impacting status, some studies have indicated that siblings of children with autism may take on increased caretaking and household responsibilities as a result of their brother or sister’s disability (Stoneman et al., 1988). While parents characteristically assume these responsibilities with typical children, decreased parent availability may necessitate the sibling stepping in and assuming some basic responsibilities for their brother or sister (Stoneman et al., 1988), or even chores around the house (Randall & Parker, 1999). This may include watching their brother or sister when the parent is
occupied, helping with school work, preparing meals, or even assisting with daily hygiene routines.

**Psychological outcome of siblings: Positive and negative**

Given these significant alterations within the household, as well as within the sibling relationships itself, several studies have focused on the psychological outcomes of typical siblings, and whether they experience any negative repercussions as a result of these distinct relationship differences. Results have been mixed with regard to whether siblings of children with autism experience more psychological distress or poorer outcomes than those with typical siblings. Some researchers find marked differences (Fisman, Wolf, Ellison, Freeman & Szatmari, 1996; Gold, 1993; Hastings, 2007; Verte, Roeveres, & Buvsse, 2003) and others find none at all (Mates, 1990; McConachie & Domb, 1990; McHale & Gamble, 1989). However, the overall research has generally agreed that siblings of children with autism are at greater risk of developing difficulties with adaptation than are typical peers.

With regard to negative impacts, research has shown that neurotypical (i.e., typically developing) siblings can sometimes feel resentful or have negative feelings toward their sibling on the spectrum as a result of changes to the family environment. In a study examining typical sibling’s reactions to early behavioral intervention, it was reported that some siblings experienced distress as a result of the decrease in their physical and emotional resources (Grindle, Kovshoff, Hastings, & Remington, 2009). Children said that they felt that had been receiving less attention than their brother or sister with ASD. Other studies have indicated significant ramifications resulting from this
decreased attention. Specifically, it has been recorded that siblings experience feelings of loneliness or isolation resulting from this change in family status (Grindle et al., 2009).

Siblings have also said that they had been restricted from certain places in their home (Grindle et al., 2009). These restrictions have also been reported to extend to family activities, or time spent with parents (Gray, 1998). Specifically, as some children with autism exhibit disruptive or maladaptive behavior, group activities may be limited to those that can accommodate the child with autism and his/her behavior (Gray, 1998). This can limit the scope of activities for the typical sibling, and may result in anger and frustration. In addition to restrictions being placed on the typical child, they may also experience anger as a result of the increased responsibilities placed on them by their family. Typical siblings often experience frustration at increased childcare and household responsibilities, and report that they are treated unfairly by their parents (Howlin, 1988). As previously mentioned, typical siblings are often held to a higher behavioral standard than their sibling with autism, and this expectation may become a source of stress (Howlin, 1988). Additionally, typical siblings may become jealous of their autistic sibling, noting that they are treated differently. For example, siblings report that their brother or sister is permitted to have a tantrum when upset, but they, themselves, are held to a different standard. It is also often reported that siblings can experience social stress as a result of their brother or sister’s behavior (Gray, 1998). Children engaging in unusual motor stereotypy or stereotyped speech may be a source of embarrassment for their sibling, particularly in a public space (Gray, 1998). Similarly, typical siblings may be hesitant to bring peers into the home for fear of their sibling’s misbehavior, and having to explain this to a peer (Gray, 1998). This can be a significant source of stress for a sibling,
and may place additional social pressure on them. This is especially true for siblings heading into the adolescent years, as the role of peers becomes more salient.

Focusing on these feelings of anger, loneliness, and frustration, a good portion of the research literature has been dedicated to the psychological well-being of siblings, and specifically how siblings cope with these difficulties. Much of this literature has relied on parent ratings and parent report to unveil any difficulties experienced, and those studies have found both differences in psychological adjustment and in outcome, and specifically more negative experiences than those of neurotypical comparison children. In looking at psychological outcomes, research has typically focused on the types of disorders that siblings of children with autism may experience; dividing these disorders into externalizing and internalizing disorders. When experiencing psychological distress, those with externalizing disorders express this distress outward on their surrounding environment. This may include acting out behaviors, aggression, and conflict with others. However, those with internalizing disorders often experience psychological distress through turning inward. This results in feelings of sadness, anxiety, and in some children, physical complaints. Although the research on siblings of children with autism has been mixed with regard to these patterns, there are some reports that typical siblings may experience higher rates of both externalizing and internalizing disorders (Fisman et al., 1996). Some studies have shown increased reports of problem behavior in siblings of children with an autism spectrum disorder as compared to those with typical siblings (Hastings, 2007; Verte et al., 2003). However, when the studies are based on the child’s report, it has been seen that siblings may report more symptoms of anxiety and depression than age-matched controls (Hastings, 2007; Gold, 1993). Notably, these same
studies have identified no significant problems with social adjustment in the neurotypical sibling.

Additionally, the research on coping strategies reveals that siblings of children with autism are at risk for both externalizing and internalizing reactions to stress. Specifically, in studies of coping, mothers report aggression from the typical sibling as the most commonly reported problem occurring within sibling interactions (Ross & Cuskelly, 2006). High levels of anger were also reported, in addition to an increased risk of developing internalizing behaviors for the typical siblings (Ross & Cuskelly, 2006).

Despite research revealing these potential risks, other research has indicated that typical siblings were not adversely affected by their relationship with their disabled sibling (McConachie & Domb, 2009), and do not differ from those with non-handicapped siblings on self-report measures (McHale, 1986). Specifically, studies looking at academic performance and behavioral outcomes have noted that sibling behavior was within normal limits, and did not require special intervention (Mates, 1990). Self-report studies reveal that neurotypical siblings describe their relationship with their brother or sister positively (Bagenholm & Gillberg, 1991). Very few studies show that siblings of children with ASD hold negative feelings about their sibling with autism, although at times they are reported as being a “burden” (Bagenholm & Gillberg, 1991). Rather, the majority of studies show that despite their sibling’s spectrum disorder, siblings rate their brother or sister highly on positive behavioral and emotional descriptors in an interview (Pillowksy, Yirmiya, Doppelt, Gross-Tsur, & Shaley, 2004).

In addition to these positive feelings, research has also suggested that having a sibling with autism may have significant influences on a sibling’s life outside of the
family. Some studies have even suggested that having a sibling with autism may offer positive social and emotional benefits to one’s self-concept (Macks & Reeve, 2007). Specifically, studies controlling for other risk factors have found that development in the areas of social and emotional development are enhanced in siblings of children with autism (Macks & Reeve, 2007). Additionally, sisters of children with autism rate themselves to have higher social competence, and both male and female siblings in general had higher self-confidence than siblings of children without a disorder (Verte et al., 2003). It should be noted that some of the positive qualities found in these relationships were from studies that relied on self-report from the siblings themselves. Notably, these positive feelings and altered social and emotional development also extend beyond the immediate, and may have a life-long impact on the sibling’s academic and career pursuits (Harris & Glasberg, 2003). Specifically, having a sibling with a disability has been found to translate into adult career paths, with researchers finding that siblings of children with autism often enter the helping professions (Harris & Glasberg, 2003).

Coping and protective factors

The literature suggests that there are both positive and negative factors involved in having a sibling with autism and that this sibling relationship has a profound influence on one’s life and one’s sense of self. It has been reported that some siblings experience increased feelings of loneliness or isolation, while others report an enhancement in self-concept, and positive feelings about the self (Lobato, 2003). It has even been reported that having a sibling with autism shape career choices (Harris & Glasberg, 2003). While it is clear that having a sibling with autism may have an impact on one’s self-concept, very little research has been done to address the factors that may contribute to a
neurotypical sibling’s outcome, or specific ways in which this particular sibling label changes the way one defines oneself.

In beginning to decipher the variability in these findings, some potential risk and protective factors have been discovered to moderate the hardships in this relationship. These factors include outside support, economic status, and family variables. One of the largest predictors of positive experience is the presence and engagement in outside means of support. Social support can be defined as a person’s perception of the level of emotional support provided by members of one’s social network, including friends, teachers, etc. Research indicates that the increased presence of social support buffers stress in the sibling relationship (Rivers & Stoneman, 2003). In addition to measures of social support, participation in sibling support groups has been shown to reduce difficulties in a sibling’s life (Giallo & Gavidia-Payne, 2006). This suggests that the opportunity to meet others going through similar circumstances, and to share positive and negative experiences, may benefit these siblings. Economic factors are also a large predictive factor of psychological adjustment and outcomes. Specifically, lower socioeconomic status is a specific risk factor for siblings of children with autism (Giallo & Gavidia-Payne, 2006).

Family factors are also a significant predictor of sibling outcomes. First, a significant predictor of sibling outcomes is parent stress, and specifically stress in the marital relationships (Giallo & Gavidia-Payne, 2006; Rivers & Stoneman, 2003). Increased stress experienced by parents, and in the marital relationship, may compromise the sibling relationship (Rivers & Stoneman, 2003). This is a common risk factor that many children experience. As previously noted, parenting a child with autism is a big
emotional and economic investment, requiring tremendous resources from the parents. If parents are not receiving adequate support handling these hardships, and subsequently are under substantial stress, this may spill over to negatively affect the sibling relationship. The harm in the sibling relationship may be a result of several events such as decreased time spent with the parent and increased sibling responsibilities. In addition to the influence of parents, the overall family environment also has an impact on sibling adjustment. Research has pointed to increased family time and routines (Giallo & Gavidia-Payne, 2006) as buffers against poor siblings outcomes in families with a child with autism. Similarly, one study found that overall level of family risk, as well as familial resiliency factors, were accurate predictors of adjustment (Giallo & Gavidia-Payne, 2006).

While it is apparent that there are some factors that serve to buffer the stress of having a sibling with autism, there has been little to no research attention paid to possible individual factors that may contribute to a sibling’s adjustment and outcome. Knowledge regarding these individual characteristics, such as self-concept, can shed significant light onto the direct impact of autism on a sibling’s idea of the self, and the psychological outcomes of this influence.

**Rationale for the Present Study**

The current study sought to investigate the developmental model of self-concept formation, and to examine the self-complexity of a population with known environmental stress in significant family contexts: typical adolescent siblings of children with an autism spectrum disorder. Specifically, research suggests that growing up with a brother or sister on the autism spectrum introduces pervasive stress into the family unit, which may affect
the level and content of self-relevant feedback received by children. Specifically, with decreased parental resources available, and increased roles and responsibilities introduced, neurotypical siblings may be sent different evaluative messages about the self than their same-aged counterparts with only typical siblings (Grindle et al., 2009). These messages may serve to influence the self-concept and thus influence outcomes.

In this framework, it was predicted that children experiencing the stress of growing up with a brother or sister on the autism spectrum may in fact come to have a higher self-complexity than other teens. Specifically, as adolescence is a time when self-complexity, and particularly negative self-complexity, is increasing, this population may be more prone to incorporate negative attributions into the self-concept. This may result in this group having a high self-complexity that is at-risk for being highly negative.

Adolescent neurotypical siblings also offer a unique perspective with regard to self-complexity. As noted by Abela et al. (2002), children undergo significant increases in self-complexity during middle childhood, and these increases should be consolidated in adolescence. Adolescents are also at a developmental stage that is particularly relevant to this question. This age group is able to understand autism as a diagnosis, and has only begun to think about the way autism may impact their sibling’s future (Harris & Glasberg, 2003). Adolescents also will be thinking about their own potential future caretaking responsibilities. Additionally, most teens are less immersed in family structure, than when they were younger and rely more readily on peer relationships. This allows them to gain perspective on family structure, and particularly their place in it.
Hypothyes

1. Neurotypical adolescent siblings of children with an autism spectrum disorder will have more self-aspects (general and sibling) than those teens with typically developing siblings.

2. ASD siblings will have lower overlap among roles (general and sibling) than peers with typically developing siblings.

3. Those adolescents from both groups with higher negative self-complexity (general and sibling) will have higher depression scores than those who are less negatively complex (general and sibling), and those with higher positive self-complexity (general and sibling).

Method

Participants

This study investigated self-complexity in female and male adolescent siblings between the ages of 12 and 17 years. All participants were a first-degree sibling of at least one other child, and were neurotypical in their development. Participants belonged to one of two study groups: 15 neurotypical siblings with a brother or sister carrying a current diagnosis of an Autism Spectrum Disorder, and 18 neurotypical siblings with a neurotypical brother or sister. Participants were matched on gender, age, and race/ethnicity.

All participants in this study were categorized as neurotypical by parental report. Parents were asked to indicate if the participants had any developmental delays, language or learning impairments, or any past or present psychiatric diagnoses. In both groups, participants’ siblings were at least five years of age.
For the ASD group, it was required that the sibling had a diagnosis of an Autism Spectrum Disorder. This included Autistic Disorder, Asperger’s Disorder, or Pervasive Developmental Disorder- Not Otherwise Specified (PDD-NOS). The ASD diagnosis of affected siblings was confirmed by parental report. Participants in the ASD condition were not restricted by severity of condition, however it was required that the siblings have shared a residence with their brother or sister for at least five years.

**Recruitment.**

Participants were recruited through several referral sources. Participants in the ASD group were recruited through the Douglass Developmental Disabilities Center (DDDC) at Rutgers University. The DDDC has consistently provided resources to siblings of children on the autism spectrum, and these families will be contacted regarding possible participation in this study. Recruitment was also conducted through a resource list provided by Autism New Jersey, an agency that provides services and resources to families living in New Jersey, and local school programs for individuals with ASD. Advertisements for the neurotypical group were sent to local school districts, community organizations, and DDDC staff.

The study was approved by the Institutional Review Board of Rutgers, the State University of New Jersey. Written consent (Appendix A) was obtained from a parent of all the enrolled adolescents, and assent (Appendix B) was granted by the participant.

**Setting**

Information about participation in the study was sent to the home, and interested families were provided contact information for the study investigator. Once people indicated their interest in continuing on to study participation, they were asked to
complete an initial phone screening to ensure that the neurotypical siblings met the study criteria, and to confirm a diagnosis of ASD for children in the affected group. If initial screening was met, the principal investigator also spoke with the teenager to explain the study procedures and confirm their interest in participating. Once this has been established, parents were mailed the packet of study questionnaires to complete. Packets included two sealed envelopes: one with questionnaires for the parents to complete, and one for study participants to complete. Each packet also contained an additional self-addressed envelope to allow families to return the forms to the investigator. To facilitate privacy there were two plain envelopes available, one for the teen and one for the parents to enclose in the single envelope with postage and the PI’s address.

**Measures**

**Demographics questionnaire.**

Participants were asked about basic demographic information, including age, date of birth, race, and ethnicity.

**Family Profile.**

Parents were asked to provide information about basic family structure, such as the marital status of the parents, family size, and the age, birth order, and residential status of siblings. They also answered demographic questions about themselves, including their level of education and current occupation.

Parents provided information about the mental health history of both the participant and the sibling(s). With regard to neurotypical siblings in both groups, parents reported if he/she has ever been under the care of a therapist, or ever received a psychiatric diagnosis. Parents were also asked to provide information about their child’s
academic performance. This specifically looked at how well participants performed in school, whether they receive extra help, or had ever been in need of support services. For the sibling with an Autism Spectrum Disorder, parents were asked to provide specific information about the diagnostic history of that sibling. This included age of first diagnosis, as well as information about functioning level with specific regard to adaptive, communication, educational, and social skills.

**Psychological Profile.**

Teenagers filled out several standardized self-report questionnaires to assess depression, life events, social support, the sibling relationship and self-complexity:

*Adolescent Life Events Questionnaire (ALEQ) (Hankin & Abramson, 2002).* The ALEQ is a 70 item self-report scale measuring negative life events that typically occur among the adolescent population. Negative life events are separated into four categories; Family and Parents (“You had an argument with a close family member (parent, brother, sister”), Romantic Relationships (“Girlfriend/Boyfriend criticizes you”), School and Classes (“Did poorly on, or failed, a test or class project”), and Friends and Social Activities (“Don’t get invited to parties.”) Participants are asked to indicate “Yes” or “No” to whether each of the events has occurred in the last three months. Total scores for each domain are calculated, with each Yes indicating a positive response.

*Center for Epidemiologic Studies Depression Scale for Children (CES-DC) (Weissman, Orvaschel, & Padian, 1980).* This self-report scale measures symptoms of depression in children. The scale has 20 self-report items covering feelings or actions that may have been experienced, for example, “I felt like I was just as good as other kids” and “I felt down and unhappy.” Children are asked to rate how much something has been felt
in the last week. Ratings are made on a scale of 0-3, with a score of 0 indicating that something was felt “Not At All,” 1 indicating “A Little,” 2 indicating “Some,” and 3 being felt “A Lot.” Total scores on this measure range from 0 to 60 with higher scores indicating greater levels of depressive symptoms. Weissman et al., (1980) indicate that scores of 15 or above are clinically significant.

*Self-Complexity Tasks (Method adapted from: Abela & Veronneau-McArdle-McArde, 2002).* Self-Complexity was broken into two tasks. One addressed general self-complexity, and one addressed self-complexity specifically related to their role as a sibling.

*General self-complexity.* Participants were instructed to make a list of up to 10 roles or activities in their life that are important to them (Abela & Veronneau-McArdle, 2000). After this list was generated, participants used an individual worksheet for each of the self-aspects. In their packet of questionnaires, children were provided 10 sheets and asked to write one self-aspect on the top of each sheet. Each sheet also contained a list of adjectives. Children were asked to think of themselves in each role, and circle which adjectives describe themselves in that role (Abela & Veronneau-McArdle, 2000). The sheets listed total 20 total adjectives, 10 positive words, and 10 negative words (Adapted from Abela & Veronneau-McArdle, 2000). Positive words were: happy, funny, nice, smart, kind, helpful, brave, responsible, confident, calm. Negative words were: bad, angry, sad, lonely, scared, ugly, lazy, careless, confused, shy.

*Sibling self-complexity.* Participants were instructed to make a list of up to 10 roles or activities that were important to them as a sibling. Participants then followed the same procedure as the general self-complexity task.
Self-complexity is measured both as number of self-aspects and distinctness of these aspects as measured by the adjective descriptors. Traditionally, the two aspects of self-complexity had been analyzed together using the H statistic (H=\log_2x- (\xi \log_2\xi)/x)), a measure that creates a response matrix measuring both the number of roles and the dispersion of traits among these roles. However, recent research has criticized the H statistic for being inconsistent, and for showing significant positive correlations with both the number of self-aspects or roles (NASPECTs), and the amount of dispersion between the traits that describe them (overlap) (Rafaeli-Mor et al., 1999; Rafaeli-Mor & Steinberg, 2002; Luo & Watkins, 2008). To address these concerns, the two facets of self-complexity are now broken apart and analyzed separately. NASPECTs are the number of the roles identified by participants. Overlap is measured as the average of pairwise comparisons among adjective endorsement in each role: OL=(\sum_i(\sum_j C_{ij}/T_i)/n*(n-1). In this case, C is the commonality in two different roles, T equals the number of adjectives endorsed in a particular role, and n equals the number of roles identified by the participant (Rafaeli-Mor et al., 1999). Higher overlap equates to more spillover between traits, and lower overall complexity.

Self-complexity (NASPECT and overlap) was be calculated three ways: total self-complexity score (20 total adjectives), negative self-complexity (10 adjectives, NASPECTs including those adjectives, and overlap among traits), and positive self-complexity (10 adjectives, NASPECTs including those adjectives, and overlap among traits).

_Sibling Inventory of Behavior (SIB) (Schaefer & Edgerton, 1981; Hetherington, 1999)._ This measure was originally developed by Schaefer & Edgerton (1981) and
modified by Hetherington et al (1999) to address several behavioral categories that can define the sibling relationship. Participants filled out the 32-question survey, asking how often the statements happen to him/her and their sibling. Participant’s responses are scored on a 5-point Likert scale, ranging from 1=Never to 5=Always.

The survey specifically focuses on six behavioral domains: rivalry to sibling (“Are jealous of your brother or sister”), aggression to sibling (“Tease or annoy your brother or sister”), avoidance of sibling (“Stay away from your brother or sister if possible”), involvement with sibling (“Get ideas for things to do together”), empathy toward sibling (“Are concerned for your brother or sister’s welfare and happiness”), and teaching (“Try to teach your brother or sister how to behave.”) Each domain contains a normed cut-off score.

Internal validity for this measure is acceptable for each subscale, ranging from alpha of .67 to .99. Additionally, high measures of test-retest reliability were reported.

Social Support Scale for Children and Adolescents (SSSCA) (Harter, 1985). This self-report measure, created by Harter (1985) addresses children and adolescent’s perceptions of their social support from sources including teachers, classmates, parents and friends. This measure consists of 24-items rated on a 1 to 4 scale for each item. Higher scores on this measure indicated greater levels of perceived social support. Each item is force-choice, with two statements such as “Some kids don’t have a close friend who cares about their feelings” and “Other kids do have a close friend who cares about their feelings.” Respondents are asked to choose the statement that is most like them, and then rate how true it is for them. This measure has high internal consistency with Cronbach’s alpha ranging from 0.72 to 0.82.
Procedure

The teenagers were asked to complete a series of tasks designed to address self-complexity, as well as depression, social support, and negative life events. They were asked to complete the tasks independent of help or guidance from family members. The parents separately completed questionnaires addressing the psychological history of the participant and the sibling. Parents also filled out and put in their envelope a family profile (Appendix C), outlining information about demographics, as well as diagnosis and mental health history. Teenagers filled out a demographics questionnaire designed by the investigator (Appendix D). Siblings also filled out the Center for Epidemiological Studies Depression Scale for Children (CES-DC) (Weissman, Orvaschel, & Padian, 1980) in order to address symptoms of depression (Appendix E). They will also complete the Adolescent Life Events Questionnaire (Hankin & Abramson, 2002) (Appendix F), Sibling Inventory of Behavior (Schaefer & Edgerton, 1981; Hetherington, 1999) (Appendix G), and Social Support Scale for Children and Adolescents (Harter, 1985) (Appendix H). Lastly, the teenagers completed the Self-Complexity Tasks (Method adapted from: Abela & Veronneau-McArdle-McArde, 2002) (Appendix I).

Data Analysis

Hypothesis #1: Neurotypical adolescent siblings of children with an autism spectrum disorder were predicted to have more self-aspects (general and sibling) than those adolescents with typically developing siblings

1. Means and standard deviation scores were calculated on the number of self-aspects (NASPECTs) for both groups and means were compared using t-tests.
Hypothesis #2: ASD siblings were predicted to have less overlap (OL) between traits (general and sibling) than peers with typically developing siblings

1. Overlap scores were be calculated for each participant using the pairwise comparisons described above, and means and standard deviations were be calculated for each group and compared using independent samples t-tests.

Hypothesis #3: Those adolescents from both groups with higher positive self-complexity (more NASPECTs and less OL) were predicted to have lower depression total scores on the CES-DC than those who were less complex, and those with higher negative self-complexity.

1. Correlations were calculated between group self-complexity scores (NASPECTs and OL) and scores on the CES-DC.

2. A regression analysis looked at self-complexity scores as independent predictors of CES-DC scores.

3. A multiple linear regression analysis was completed to look at interaction effects between self-concept (NASPECTs and OL) and group as it predicts CES-DC scores.

General analyses: Mean and standard deviation scores were obtained for all primary measures. Between group analyses, using t-tests, were obtained for all measures.

Results

Participant Demographics

Of the 33 participants who completed the study, 15 belonged to the ASD group and 18 belonged to the Control Group. No participants who returned questionnaires were excluded based on study criteria. Looking at the full sample, adolescent participants were
predominantly female (75.8%), White (90.9%), and Non-Hispanic (93.9%) (See Table 1). The average age of participants was 14.45 (range: 12-17) years, with an average academic grade of 9.30 (range: 6-12) (Table 1). Parents reported that the largest number of participants received “Mostly A’s” in school (36.4%) (Table 1).

Table 1:
Participant Demographics

<table>
<thead>
<tr>
<th>Participant Demographics</th>
<th>Full Sample</th>
<th>ASD Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex of participant: n (% female)</td>
<td>25 (75.8%)</td>
<td>12 (80.0%)</td>
<td>13 (72.2%)</td>
</tr>
<tr>
<td>Race: n (% White)</td>
<td>30 (90.9%)</td>
<td>15 (100%)</td>
<td>15 (83.3%)</td>
</tr>
<tr>
<td>Ethnicity: n (% Non-Hispanic)</td>
<td>31 (93.9%)</td>
<td>14 (93.3%)</td>
<td>17 (94.4%)</td>
</tr>
<tr>
<td>Age (average)</td>
<td>14.45</td>
<td>13.80</td>
<td>15.00</td>
</tr>
<tr>
<td>Grade (average)</td>
<td>9.30</td>
<td>8.67</td>
<td>9.83</td>
</tr>
<tr>
<td>Number of children in family (average)</td>
<td>2.58</td>
<td>2.53</td>
<td>2.61</td>
</tr>
<tr>
<td>Sex of target sib: n (% male)</td>
<td>19 (57.6%)</td>
<td>13 (86.7%)</td>
<td>6 (33.3%)</td>
</tr>
<tr>
<td>Participant older or younger than target sib: n (% older)</td>
<td>19 (57.6%)</td>
<td>9 (60.0%)</td>
<td>10 (55.6%)</td>
</tr>
<tr>
<td>Birth order of participant: n (% 1st)</td>
<td>16 (48.5%)</td>
<td>8 (53.3%)</td>
<td>8 (44.4%)</td>
</tr>
<tr>
<td>Participant diagnosis: n (% none)</td>
<td>25 (75.8%)</td>
<td>9 (60.0%)</td>
<td>16 (88.9%)</td>
</tr>
<tr>
<td>Typical Performance in School: n (% Mostly A’s)</td>
<td>12 (36.4%)</td>
<td>6 (40.0%)</td>
<td>6 (33.3%)</td>
</tr>
</tbody>
</table>

Regarding parent demographics, 72.7% of parents were reported as married, and had some college education (27.3%) (See Table 2). Participants came from families with 2.58 (range: 2-4) children on average, and nearly half were first in the birth order (48.5%) (Table 2).
Table 2:
*Parent Demographics*

<table>
<thead>
<tr>
<th>Parent Demographics</th>
<th>Full Sample</th>
<th>ASD Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responder: n (% mothers)</td>
<td>30 (90.9%)</td>
<td>13 (86.7%)</td>
<td>17 (94.4%)</td>
</tr>
<tr>
<td>Marital Status: n (% married)</td>
<td>24 (72.7%)</td>
<td>11 (73.3%)</td>
<td>13 (72.2%)</td>
</tr>
<tr>
<td>Highest education level achieved: average (descriptor)</td>
<td>Bachelor’s Degree</td>
<td>Bachelor’s Degree</td>
<td>Associate’s Degree</td>
</tr>
</tbody>
</table>

Between groups, participants did not differ significantly on gender, race, ethnicity, or parent marital status. Individuals in the control group were significantly older (M=15.00), and belonged to higher grades (9.83), than those in the ASD group (Mage= 13.80, Mgrade=8.67) (t(31)= 2.186, p<.05). The gender of the target sibling also different significantly between groups, with the ASD group reporting more males (86.7%) than the control group (33.3%) (t(31)= -3.547, p=.001). Additionally, parents of participants in the ASD group reported significantly higher levels of education than those in the control group (t(31)=2.066, p<.05).

Looking specifically at the ASD group, the majority of target siblings carried a diagnosis of Autistic Disorder (86.7%) with the average age of first diagnosis at 3.33 years (See Table 3). The majority of target siblings attended school in a special education setting (53.3%), and lived in the home (93.3%) (Table 3). Regarding functioning level, the majority of siblings was reported to communicate using vocal phrases (53.3%) and was rarely independent with daily activities (60.0%) (Table 3).
Table 3: 
*ASD Demographics*

<table>
<thead>
<tr>
<th>ASD Demographics</th>
<th>n= 15</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASD Diagnosis: n (% Autistic Disorder)</td>
<td>13 (86.7%)</td>
</tr>
<tr>
<td>Age of First Diagnosis (average)</td>
<td>3.33</td>
</tr>
<tr>
<td>Educational Placement: n (% Special Education Setting)</td>
<td>8 (53.3%)</td>
</tr>
<tr>
<td>Current Living Arrangement: n (% in the home)</td>
<td>14 (93.3%)</td>
</tr>
<tr>
<td>Primary Communication: n (% vocal phrases)</td>
<td>8 (53.3%)</td>
</tr>
<tr>
<td>Independence with daily activities: n (% rarely independent)</td>
<td>9 (60.0%)</td>
</tr>
</tbody>
</table>

**Primary Measures**

**Social Support Scale for Children and Adolescents (SSSCA).**

Social support was broken down into four aspects: parents, classmates, teachers, and close friends. Social support was rated highly by participants in all four domains (range 3.3-3.53) (Refer to Table 4). All four of the domain scores were slightly above the reported norms, but were not significantly different. The ASD group and the control group did not differ significantly on any measure of social support.

**Adolescent Life Events Questionnaire (ALEQ).**

The life events measure was broken down into four aspects: family and parents, romantic relationships, school and classes, and friends and social activities. Overall, participants rated the most life events in the Family and Parents domain (M=6.06, SD=4.35), and the least life events in the Romantic Relationships domain (M=0.72, SD=0.94) (Table 4). The two groups did not differ significantly on any aspect of negative life events.
**Sibling Inventory of Behavior (SIB).**

Responses on this measure were rated on six factors relevant to the sibling relationship: rivalry, aggression, avoidance, involvement, empathy, and teaching. Overall, highest domain scores were found on the involvement (M=19.03, SD=6.41) and empathy (M=19.83 factors, SD=4.16). Lowest domain scores were found in the avoidance factor (M=9.42, SD=3.92) (Table 4).

ASD and control groups differed significantly on measures of aggression, avoidance, involvement, and empathy. The control group (M=15.0) endorsed higher levels of aggression toward their sibling than the ASD group (M=11.79), (t(28)=2.443, p<.05). Higher levels of involvement with their sibling was also reported by the control group (M=21.94, ASD M=15.71), (t(28)=2.993, p<.01), as well as higher levels of empathy (M=21.31, ASD M=18.14) toward their sibling (t(28)=2.217, p<.05). The ASD group showed significantly higher levels of avoidance (11.39) of their sibling than the control group (M=7.69), (t(28)=2.993, p<0.1).

**Self-Complexity General and Sibling.**

Looking at general self-complexity across groups, average NASPECTS generated by participants was 7.76 for total, 7.55 for positive, and 2.82 for negative. Overlap for general complexity averaged at 0.50, 0.52 for positive, and 0.29 for negative, across groups. For sibling self-complexity across groups, average NASPECTS generated by participants was 5.85 for general, 5.67 for positive, and 1.88 for negative. Overlap for sibling self-complexity across groups averaged at 0.53 for general, 0.56 for positive, and 0.45 for negative.
The two groups did not differ significantly on the number of aspects generated, both in general complexity (ASD M=7.53, Control M=7.78) and sibling complexity (ASD M=5.8, Control M=5.89). The two groups differed significantly on two aspects of self-complexity. First, the groups differed significantly on the amount of overlap in total sibling self-complexity, with the ASD group showing significantly less overlap (M=0.44) than the control group (M=0.60), (t(30)= 2.211, p<.05). The groups also differed significantly on positive overlap in sibling self-complexity, with the ASD group again showing less overlap (M= 0.46) than the control group (M=0.64), (t(30)=1.301, p<.05). These two factors had a significant positive correlation, (r=0.962, p<.001). (Table 4)

Center for Epidemiological Studies Depression Scale for Children (CES-DC). Across groups, participants received an average depression score of 14.18 (SD=10.30), which was below the clinical cutoff of 15. Scores ranged from 1-46 out of a possible score of 60. Broken apart, 15 of 33 participants met the clinical cutoff for depression (45.5%), and 18 of 33 were sub-threshold (54.5%). Groups did not differ significantly on this measure. (ASD M= 13.33, Control M= 14.89). (Table 4)

There was evidence of a Group by Older/Younger interaction for depression scores. Results suggest that older siblings of individuals with ASD had higher depression scores than their younger counterparts, while younger siblings of neurotypical individuals had higher depression scores than older individuals. This interaction effect approached significance (F(1,33)=3.623, p=.067) while not finding significance in the main effects.

2 See Footnote attachment
Table 4: Means and Standard Deviations in Primary Measures

<table>
<thead>
<tr>
<th></th>
<th>ASD</th>
<th>Control</th>
<th>Total</th>
</tr>
</thead>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parents <strong>SSCCA</strong></td>
<td>3.40 (0.53)</td>
<td>3.63 (0.48)</td>
<td>3.53 (0.51)</td>
</tr>
<tr>
<td>Classmates</td>
<td>3.13 (0.47)</td>
<td>3.24 (0.55)</td>
<td>3.19 (0.51)</td>
</tr>
<tr>
<td>Teachers</td>
<td>3.39 (0.53)</td>
<td>3.34 (0.43)</td>
<td>3.30 (0.38)</td>
</tr>
<tr>
<td>Close Friends</td>
<td>3.26 (0.69)</td>
<td>3.59 (0.49)</td>
<td>3.44 (0.60)</td>
</tr>
<tr>
<td><strong>ALEQ</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family and Parents</td>
<td>5.73 (3.83)</td>
<td>6.33 (4.84)</td>
<td>6.06 (4.35)</td>
</tr>
<tr>
<td>Romantic Relationships</td>
<td>0.53 (0.64)</td>
<td>0.89 (1.13)</td>
<td>0.72 (0.94)</td>
</tr>
<tr>
<td>School and Classes</td>
<td>3.07 (2.22)</td>
<td>3.11 (2.11)</td>
<td>3.09 (2.13)</td>
</tr>
<tr>
<td>Friends and Social Activities</td>
<td>4.47 (3.76)</td>
<td>2.83 (3.19)</td>
<td>3.58 (3.50)</td>
</tr>
<tr>
<td><strong>Sibling Inventory of Behavior</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rivalry</td>
<td>13.86 (4.07)</td>
<td>14.94 (2.32)</td>
<td>14.43 (3.24)</td>
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<tr>
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<td>11.79 (3.42)</td>
<td>15.00 (3.74)</td>
<td>13.50 (3.89)</td>
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<tr>
<td>Avoidance</td>
<td>11.39 (4.29)</td>
<td>7.69 (2.63)</td>
<td>9.42 (3.92)</td>
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<tr>
<td>Involvement</td>
<td>15.71 (5.57)</td>
<td>21.94 (5.78)</td>
<td>19.04 (6.41)</td>
</tr>
<tr>
<td>Empathy</td>
<td>18.14 (4.62)</td>
<td>21.31 (3.16)</td>
<td>19.83 (4.16)</td>
</tr>
<tr>
<td>Teaching</td>
<td>12.14 (4.59)</td>
<td>11.69 (4.54)</td>
<td>11.90 (4.49)</td>
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<tr>
<td><strong>CES-DC</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Score</td>
<td>13.33 (8.44)</td>
<td>14.89 (11.83)</td>
<td>14.18 (10.30)</td>
</tr>
<tr>
<td><strong>Self-Complexity General</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NASPECTGT</td>
<td>7.53 (2.20)</td>
<td>7.78 (2.46)</td>
<td>7.76 (2.31)</td>
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<tr>
<td>OLG1</td>
<td>0.46 (0.19)</td>
<td>0.53 (0.19)</td>
<td>0.50 (0.19)</td>
</tr>
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<td>NASPECTGP</td>
<td>7.52 (2.20)</td>
<td>7.56 (2.36)</td>
<td>7.55 (2.25)</td>
</tr>
<tr>
<td>OLG1</td>
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<td>0.50 (0.17)</td>
<td>0.52 (0.19)</td>
</tr>
<tr>
<td>NASPECTGN</td>
<td>3.13 (2.70)</td>
<td>2.56 (3.07)</td>
<td>2.82 (2.88)</td>
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<tr>
<td>OLG1</td>
<td>0.36 (0.30)</td>
<td>0.44 (0.30)</td>
<td>0.29 (0.30)</td>
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<tr>
<td><strong>Self-Complexity Sibling</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>NASPECTST</td>
<td>5.80 (2.98)</td>
<td>5.89 (3.16)</td>
<td>5.85 (3.03)</td>
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<td>OLST</td>
<td>0.44 (0.23)</td>
<td>0.60 (0.19)</td>
<td>0.53 (0.22)</td>
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<tr>
<td>NASPECTSP</td>
<td>5.47 (2.80)</td>
<td>5.83 (3.17)</td>
<td>5.67 (2.97)</td>
</tr>
<tr>
<td>OLSP</td>
<td>0.46 (0.23)</td>
<td>0.64 (0.20)</td>
<td>0.56 (0.23)</td>
</tr>
<tr>
<td>NASPECTSN</td>
<td>2.47 (2.92)</td>
<td>1.39 (1.79)</td>
<td>1.88 (2.39)</td>
</tr>
<tr>
<td>OLSN</td>
<td>0.51 (0.27)</td>
<td>0.37 (0.35)</td>
<td>0.45 (0.30)</td>
</tr>
</tbody>
</table>
Relationship to Depression

Social Support and Depression.

To look at the relationship between social support and depression scores (Table 5), a series of correlations were conducted between these variables. Significant negative relationships were found between classmate (r = .639, p = .000) and depression total scores, and parent social support and depression total scores (r = .452, p = .011).

Table 5: Pearson Correlations with SSCA and CES-DC Scores

<table>
<thead>
<tr>
<th></th>
<th>Parent</th>
<th>Classmate</th>
<th>Teacher</th>
<th>Close Friend</th>
<th>CES-DC Total Score</th>
</tr>
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<tbody>
<tr>
<td>SSCA</td>
<td>--</td>
<td>0.546**</td>
<td>0.569**</td>
<td>0.744*</td>
<td>-0.452*</td>
</tr>
<tr>
<td>Parent</td>
<td>--</td>
<td>--</td>
<td>0.300</td>
<td>0.353</td>
<td>-0.639*</td>
</tr>
<tr>
<td>Classmate</td>
<td>0.546**</td>
<td>--</td>
<td>--</td>
<td>0.363*</td>
<td>-0.301</td>
</tr>
<tr>
<td>Teacher</td>
<td>0.569**</td>
<td>0.300</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Close Friend</td>
<td>0.744*</td>
<td>0.353</td>
<td>0.363*</td>
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<td></td>
</tr>
<tr>
<td>CES-DC Total Score</td>
<td>-0.452*</td>
<td>-0.639*</td>
<td>-0.301</td>
<td>-0.228</td>
<td></td>
</tr>
</tbody>
</table>

*p<0.05, **p<.01

Life Events and Depression.

Correlations were conducted between different areas of negative life events and CES-DC total scores (Table 6). Negative life events in the areas of Family and Parents (r = .612, p = .000), Romantic Relationships (r = .484, p < .01), and Friends and Social Activities (r = .783, p = .000) were positively correlated with higher depression scores. No significant correlations were found in the domain of School and Classes.

Table 6: Pearson Correlations with ALEQ and CES-DC Scores

<table>
<thead>
<tr>
<th></th>
<th>ALEQ</th>
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<th></th>
<th></th>
<th>CES-DC Total Score</th>
</tr>
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<td>ALEQ</td>
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<td>--</td>
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<td>--</td>
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<tr>
<td>Family and Parents</td>
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<tr>
<td>Romantic Relationships</td>
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<tr>
<td>School and Classes</td>
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<td>--</td>
<td></td>
</tr>
<tr>
<td>Friends and Social Activities</td>
<td>0.621**</td>
<td>0.427*</td>
<td>0.282</td>
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<td></td>
</tr>
<tr>
<td>CES-DC Total Score</td>
<td>0.612**</td>
<td>0.484**</td>
<td>0.306</td>
<td>0.783**</td>
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*p<0.05, **p<.01
Sibling Relationship and Depression.

No aspects of the sibling relationship were significantly related to depression scores (Table 7).

Table 7:

<table>
<thead>
<tr>
<th>SIB</th>
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</thead>
<tbody>
<tr>
<td>Rivalry</td>
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</tr>
<tr>
<td>Aggression</td>
<td>0.602**</td>
</tr>
<tr>
<td>Avoidance</td>
<td>0.620**</td>
</tr>
<tr>
<td>Involvement</td>
<td>-0.319</td>
</tr>
<tr>
<td>Empathy</td>
<td>-0.513**</td>
</tr>
<tr>
<td>Teaching</td>
<td>-0.456*</td>
</tr>
<tr>
<td>CES-DC Total Score</td>
<td>0.161</td>
</tr>
</tbody>
</table>

*p<0.05, **p<.01

Self-Complexity and Depression Scores.

To examine the relationship between self-complexity and the occurrence of depression, a series of correlations were conducted between both NASPECTS (general and sibling) and overlap scores (general and sibling), with scores on the CES-DC (Table 8). Looking at general complexity NASPECTs with the entire sample, a significant positive correlation was also found between the number of general negative self-aspects generated and depression outcomes, r=.688, p=.00. Looking at this result by group, the significant relationship was found only in the ASD group, (r=.632, p<.05).

For general complexity overlap, results were broken into clinical vs. nonclinical groups as measured by scores on the CES-DC. When looking at the clinical sample only, significant negative correlations were found between general overlap and depression scores, r=-.619, p<.05, and positive overlap and depression scores, r=.518,
p<.05.\textsuperscript{5} Significant correlations were not found between general overlap and positive overlap when assessing nonclinical groups.

Finally, looking at sibling self-concept, there was a significant positive correlation between the number of negative sibling self-aspects generated and depression outcomes, $r=.510$, $p<.01$. Looking at these results by group, the significant correlation was found only in the control group ($r=.626$, $p<.01$).

To look at the interaction effects between sibling status and complexity scores, as they predict depression scores, a multiple regression linear model was created. General negative NASPECTs, sibling negative NASPECTs, and general overlap were entered with depression total scores as the dependent variable. All factors were found to be nonsignificant across the sample.\textsuperscript{6}

\textsuperscript{5} See Footnote attachment
\textsuperscript{6} See Footnote attachment
Table 8: Pearson Correlations with Self-Complexity (General and Sibling) and CES-DC Scores

<table>
<thead>
<tr>
<th>Self-Complexity</th>
<th>r</th>
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</thead>
<tbody>
<tr>
<td>NASPECTGT</td>
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</tr>
<tr>
<td>OLGT</td>
<td>0.88</td>
</tr>
<tr>
<td>NASPECTGP</td>
<td>0.972**</td>
</tr>
<tr>
<td>OLGP</td>
<td>0.157</td>
</tr>
<tr>
<td>NASPECTGN</td>
<td>0.563**</td>
</tr>
<tr>
<td>OLGN</td>
<td>-0.359</td>
</tr>
<tr>
<td>NASPECTST</td>
<td>0.670**</td>
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<tr>
<td>OLST</td>
<td>0.135</td>
</tr>
<tr>
<td>NASPECTSP</td>
<td>0.657**</td>
</tr>
<tr>
<td>OLSP</td>
<td>0.169</td>
</tr>
<tr>
<td>NASPECTSN</td>
<td>0.602</td>
</tr>
<tr>
<td>OLSN</td>
<td>0.165</td>
</tr>
<tr>
<td>CES-DC Total Score</td>
<td>0.366*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>r</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>NASPECTGT</td>
<td>--</td>
</tr>
<tr>
<td>OLGT</td>
<td>0.88</td>
</tr>
<tr>
<td>NASPECTGP</td>
<td>0.972**</td>
</tr>
<tr>
<td>OLGP</td>
<td>0.157</td>
</tr>
<tr>
<td>NASPECTGN</td>
<td>0.563**</td>
</tr>
<tr>
<td>OLGN</td>
<td>-0.359</td>
</tr>
<tr>
<td>NASPECTST</td>
<td>0.670**</td>
</tr>
<tr>
<td>OLST</td>
<td>0.135</td>
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<tr>
<td>NASPECTSP</td>
<td>0.657**</td>
</tr>
<tr>
<td>OLSP</td>
<td>0.169</td>
</tr>
<tr>
<td>NASPECTSN</td>
<td>0.602</td>
</tr>
<tr>
<td>OLSN</td>
<td>0.165</td>
</tr>
<tr>
<td>CES-DC Total Score</td>
<td>0.366*</td>
</tr>
</tbody>
</table>

* p < 0.05; ** p < 0.01
Table 8 (continued):
*Pearson Correlations with Self-Complexity (General and Sibling) and CES-DC Scores*

<table>
<thead>
<tr>
<th>Self-Complexity</th>
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</tr>
</thead>
<tbody>
<tr>
<td>NASPECTGT</td>
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</tr>
<tr>
<td>OLGT</td>
<td>--</td>
</tr>
<tr>
<td>NASPECTGP</td>
<td>--</td>
</tr>
<tr>
<td>OLGP</td>
<td>--</td>
</tr>
<tr>
<td>NASPECTGN</td>
<td>--</td>
</tr>
<tr>
<td>OLGN</td>
<td>--</td>
</tr>
<tr>
<td>NASPECTST</td>
<td>--</td>
</tr>
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<td>OLST</td>
<td>--</td>
</tr>
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<td>OLSN</td>
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<td>CES-DC Total Score</td>
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</table>
Discussion

The present study identified important findings relevant to both siblings of individuals with Autism Spectrum Disorders, and adolescents more broadly. First, this study suggests that adolescent siblings of individual with ASD generally fair as well as adolescent siblings of typical individuals (McConachie & Domb, 1990; McHale & Gamble, 1989; Mates, 1990).

Social Support and Life Events

The two groups did not differ significantly on measures of social support, negative life events, or depression scores. First, the means for social support in the domains of parents, classmates, teachers, and friends were slightly above the reported norms across groups. This suggests a higher than average perception of social support in these domains. As groups did not differ on this measure, it can be said that siblings of individuals with ASD reported high levels of social support that were, on average, similar to the social support to their peers.

Looking next at negative life events, again the two groups did not differ significantly on this measure. Overall, most negative events were reported in the family domain, which includes items about disruptions in family relationships (divorce, separation of parents), external factors affecting the family (losing a job, illness), and conflicts within the family unit (not being able to please parents, getting grounded). It should be noted that this domain contained the most items (29) of all of the domains, yet it is significant that it received the most selections. Looking at the endorsement patterns of specific items in this domain, the most commonly reported item was “You had an
argument with a close family member (parent, brother, sister).” This was true across groups, and appears to be a true indicator of adolescence. This is the time that individuals are forming their sense of self, and sense of independence, which often leads to conflicts with other family members (Cicirelli, 1995). Results then suggest that this facet of adolescence is relevant regardless of sibling diagnosis. The domain that received the fewest selections was the romantic relationships domain. This included items such as “Girlfriend/boyfriend criticizes you” and “Found out that boyfriend/girlfriend has been cheating on you.” With such a wide age range included in this sample, it is possible that many of the participants had not yet entered into romantic relationships, or were not experiencing these more intricate relationship conflicts. Overall, these results again suggest that siblings of children with ASD do not fair differently than those with typical siblings.

**Depression Scores**

Lastly, with regard to depression scores, the two groups did not differ significantly on depression symptoms as measured by the total score, or by the amount of individuals reaching the clinical cutoff in each group. It should be noted that nearly half of the total sample met clinical cutoffs for depression on the CES-DC. This was unexpected as the prevalence rates for adolescent depression ranges from 8% point prevalence to up to 25% lifetime prevalence (Kessler, Avenevoli, & Merikangas, 2001). These elevated scores are particularly surprising given the high levels of social support and relatively few negative life events reported by participants. As several of the items in the measure are reverse-scored, a separate analysis was conducted to assess whether total scores were artificially inflated due to inattention to these items. To look at this, the
reverses scored items for the entire sample was pulled out and the mean of these items were compared to the mean of the remaining items. The comparison of means revealed that they were not significantly different. Given these results, it can be said that this sample contained elevated rates of depression symptoms as compared to the general population. As the groups did not differ on this measure, it appears again that siblings of children with ASD were not worse off than the control group, however both groups had elevated symptoms.

While the groups did not differ on CES-DC scores, there was some evidence of an interaction between group and whether participants were older or younger than their target sibling. While the interaction only approached significance, it appeared that older siblings of individuals with ASD had higher scores than their younger counterpart. Conversely, younger siblings in the control group had higher scores than control siblings who were older than their target sibling. Mean scores for younger siblings in the control group were most elevated. In thinking about these patterns, the differentiation seen in the ASD group may be consistent with the loss felt by the first child when a sibling is introduced to a family, but to a stronger degree (Cicirelli, 1995). Typically, when the child is first in the family, they experience a certain amount of time where all resources, physical and emotional, are devoted to them and only them. However, with the introduction of a sibling, these resources then need to be divided and shared (Cicirelli, 1995). As such, siblings who are first in the birth order may feel some brief ill will toward their new brother or sister (Cicirelli, 1995). While these feelings of loss are common in the neurotypical sibling relationship, it may be more pronounced when introducing a child with a disability. Research suggests that families endure a great
amount of stress in the early years when a child is diagnosed with ASD, concerned with obtaining a diagnosis, getting appropriate services, and adjusting emotionally to this turmoil (Buoma & Schweitzer, 1990; Donovan, 1988). It can be speculated that a higher portion of resources needs to be allocated to the child with an ASD as compared to the neurotypical sibling. The feelings of loss experienced by the older child may then be heightened and extended for a longer period of time, resulting in increased risk for depression symptomology. This is a hypothesis that should be further explored.

Regarding the control group, depression patterns are consistent with the evidence that children later in the birth order experience higher depression scores than those first in the birth order (Gates, Lineberger, Crockett, & Hubbard, 1988). While results in this area of study have been conflicting, results of this study support these findings.

The Sibling Relationship

There was also evidence indicating that siblings of individuals with ASD reported significant differences in the sibling relationship than those in the control group. Specifically, the two groups differed on measures of avoidance, aggression, involvement and empathy. The ASD group scored higher on measures of avoidance while the control group scored higher on measures of aggression, involvement, and empathy. Looking first at avoidance, this domain includes items about shame and embarrassment of the sibling. These results fall in line with the research suggesting siblings of individuals with ASD can be very sensitive to their sibling’s behavior, particularly for those who have public problem behavior (Harris & Glasberg, 2003. This is especially salient during adolescence, when peers and peer judgment is of utmost importance (Harris & Glasberg, 2003). Given this sensitivity to embarrassment, it is not surprising that siblings of
individuals with ASD would rate this factor higher than the level of embarrassment experienced by typical siblings.

The aggression domain included items about getting into arguments and conflicts with your sibling. While problem behaviors associated with ASD may lead to frustration among siblings, aggression as defined by the Sibling Inventory of Behavior may be too high order of a construct. For example, it may not be possible for siblings to have verbal arguments if one child has limited ability to communicate. Therefore, while there may be conflicts, the way that the measure defines aggression does not capture these behaviors. This can also be supported by the increased avoidance reported by siblings of those with ASD. If the sibling has problem behavior that made lead to conflict, siblings may instead avoid their brother or sister. The involvement domain includes joint activities (play, making plans together) and the regarding the sibling as a friend. Again, higher scores in the control group may indicate that this construct is too high order for the ASD sample given limitations with play and social interaction. This is also supported by the avoidance endorsed by the ASD group. Lastly, the control group scored higher on measures of empathy, which included items about wanting your sibling to succeed, or comforting them when upset. This finding was initially perplexing, given the positive ratings that individuals often give their siblings with ASD (Pilowsky et al., 2004). However, in light of increased avoidance, individuals may spend less time with their brothers and sisters and therefore have less empathy. Looking at it a different way, this may again be an example of a construct that is too high order. Specifically, for a typical sibling, it is possible to more fully understand the experience of another typical child. However, with those with ASD, it may be possible for their typical siblings to feel badly
for them and for their struggles, but it becomes increasingly difficult to truly understand their experience. It can then be said that siblings of those with ASD may be more apt at sympathy, while siblings of typical siblings may be able to better empathize. Finally, groups did not differ on rivalry (jealous, competitive) or teaching (helping them with new skills). This can also be looked at through the lens of avoidance on the part of siblings in the ASD group.

**The Adolescent Self-Concept**

Finally, this study revealed general information about the self-concept of adolescents broadly, as well as differences between groups. For general complexity, which measures general self-concept, the average number of NASPECTS across groups was 7.76, slightly less for aspects that contained positive attributes, at 7.55, and significantly less for aspects that contained negative attributes, at 2.82. Looking at this across groups, these findings suggest participants generally identified a large number of roles or activities that were important to them in their lives. Further, the majority of these roles were assigned positive descriptors while very few of the roles endorsed by participants contained negative descriptors. This implies a generally more positive role definition for these individuals. However, with regard to the dispersion of descriptors, the average amount of overlap for adjectives in general roles was 50%, 52% for positive, and 29% for negative. This indicates that while many roles were identified with positive attributes to define them, there was a significant amount of overlap amount in the role definitions. More concretely, while participants could identify many roles for themselves, they described themselves very similarly in each role. Therefore, while one aspect of self-complexity led to higher positive complexity trends, the other factor was significantly
less distinct and therefore less complex. Less overlap was found among roles with negative descriptors, however these corresponded with less NASPECTS, which again moderated the complexity effects.

The hypotheses of the present study proposed that the participants in the ASD group would generate more self-aspects than the control group, and further lead to higher complexity scores. Comparisons between groups on the NASPECTS and overlap measurements revealed that groups did not differ significantly on any measure of general self-complexity. The lack of differentiation between groups on this measure suggests that sibling type, and concurrent family stress, does not significantly alter one’s general self-concept or sense of self. Further, this suggests that having a sibling with ASD does not necessarily result in an increase in negative feedback about the self that becomes incorporated into the self-concept (Abela & Veronneau-McArdle, 2002). This may suggest that having a sibling with ASD does not translate into a negative life experience for these participants, or that other positive attributes (e.g. social support, low negative life events) serve to buffer the negative effects. Future research should investigate this attribution further.

However, results showed some differentiation when targeting one particular aspect of participants’ self-concept: being a sibling. When prompting participants to think about themselves as a sibling, several aspects of self-complexity shifted. The average NASPECTS was less than general at 5.85, slightly less for roles than contained positive at 5.67, and a low 1.88 for roles than contained negative attributes. This suggests that, overall, participants ascribed less roles to themselves as a sibling than when directed to think about their general self-concept. Looking at overlap, average for general sibling
complexity was 53%, 56% for positive, and 45% for negative. This reveals similar patterns with regard to the relationship between general and positive roles when looking at total NASPECTS and overlap. This again reveals that very few of the sibling roles endorsed by participants contained negative adjectives, which reveals a general positive self-concept as a sibling. Looking more broadly at self-complexity, patterns between NASPECTS and overlap suggests that participants had a relatively low number of NASPECTS, with a significant amount of overlap among descriptors. This indicates generally low levels of complexity on both aspects of self-concept.

**Between Group Self-Concept Differences**

The groups differed on two aspects of sibling self-complexity. The ASD group had significantly less overlap in both general sibling attributes and positive sibling attributes. While the number of roles did not significantly differ between groups, this differentiation in dispersion suggests that sibling roles for the ASD group were more distinct than those in the control group. This is also true for roles that only contained positive adjectives. This therefore indicates that having a sibling with autism is associated with a sibling self-concept that is more complex than those with typical siblings. This provides some support for Hypothesis #2. A brief qualitative analysis was also conducted on the types of sibling roles endorsed by the ASD group versus the control group. This analysis revealed that siblings of neurotypical children more commonly generated roles related to peer relationships, such as roles of confidant (keeping secrets, keeping each other out of trouble), playmate, and general helper (very simply listing “helper”). In this way, these siblings had roles that were not greatly differentiated. While the ASD group also endorsed helping roles, these roles covered a broader range of responsibilities.
Specifically, the ASD group endorsed roles more specific to teaching and to caretaking (feeding, bathing, etc). It can then be said that not only did the ASD group endorse roles that were qualitatively different from the roles endorsed by the neurotypical group, but that they were also more distinct. It can then be said that the lack of overlap among roles may come from the presence of more distinct responsibilities with greater role differentiation.

In addition to general information about self-concept, these results also yielded valuable information about the relationship between these variables and psychological outcomes. Looking at the primary measures, several yielded significant relationships to depression scores across participant groups. Research has consistently supported the relationship between social support and depression, and the protective factors this variable has demonstrated. For the general sample, these findings were again supported, with classmate and parent social support showing significant negative relationships with depression total scores. This also demonstrates the importance of family and peers in an adolescent’s life, which is also consistent with the developmental literature. In addition, research has supported the influence of negative life events on the occurrence of depression in adolescents (Abela & Veronneau-McArdle, 2002). Results of the present study again supported the literature, demonstrating significant positive relationships between negative life events occurring within the family, romantic, and friend contexts and total depression scores. An analysis of these factors, in comparison to the nonsignificant relationship found between negative events in school and class, reveal again the priorities in the life of the adolescent. Specifically, any disturbance in the family, friend, and romantic context is significantly related to psychological well-being at
this age. Interestingly, despite several significant differences between groups with regard
to the sibling relationship, no significant relationships were found between these
variables and depression outcomes. This suggests that specific relationship conflict or
positive bonding did not reveal a risk or protective factor when looking at depression
scores for these individuals.

Looking at the relationship between self-concept and depression scores yielded
very interesting results when looking across adolescents as a group. The literature
generally suggests that total high-self complexity, as measured by high NASPECT and
low overlap, yields lower depression scores (Linville, 1987). Further, differential results
should be found between positive and negative self-complexity, as high positive
complexity will yield lower depression scores, while high negative complexity can be
considered a risk factor for depression. In line with these findings, results suggest that as
NASPECTS that contain negative attributes increase, depression scores also increases.
This was true both in general self-concept as well as sibling self-concept. These results
fall within the literature that high negative self-complexity can be related to negative
outcomes.

There was, however, a split in group effects between these two variables.
Specifically, the significant relationship between general negative NASPECTs was only
found in the ASD group. This suggests that siblings of individuals with ASD were more
negatively affected by roles that contained negative attributes than those in the control
group. This differential sensitivity could relate to the environment of the siblings in the
ASD group. Specifically, as family context is already stressful for these siblings, coping
resources may be low, both internally and externally. Therefore, a more negative general
self-concept can be more damaging than for those who have a more supportive and available environment to fall back on. It was also found that the control group reacted more negatively to having sibling roles that contained negative attributes. This may be related to the importance of peer relationships in adolescence. As siblings of individuals with ASD did not endorse many sibling roles related to friendship, or playmates, it can be said that the neurotypical siblings had a more peer-like relationship with their brother or sister. Therefore, to associate negative attributes with being a sibling may mimic negative peer relationships, leading to negative psychological outcomes. This is similar to the findings that negative life events in the realm of friends, relates to more negative outcomes. Further, the ASD group may not be as affected by these more negative roles, as their identity as a sibling is qualitatively tied to being a caregiver or teacher. Therefore, a negative attribute may be more inherent in the roles they have assumed, and may not as negatively impact feelings of social support.

However, other aspects of self-complexity generated more mixed results. Several analyses were done to assess the effects self-concept on different study groups. No significant differences were found to suggest that sibling status interacted with self-concept to uniquely predict depression scores. However, significant relationships were found in the effects of self-concept in clinical vs. non-clinical groups. The participants were first broken down into clinical versus nonclinical groups, as defined by reaching the threshold on the CES-DC depression measure. When looking only at the clinical sample, the more distinctly general roles were defined, the higher the depression scores. This was also true of roles that contained positive attributes. While the research is minimal on assessing self-complexity in clinical samples, it appears that high self-complexity, as it
related to role distinctness, does not have a buffering effect for this group. This speaks to a significant portion of the self-complexity literature that questions the buffering effects of low overlap among roles (Abela & Veronneau-McArdle, 2002; Rafaeli & Steinberg, 2002). While the literature has certainly been mixed with regard to high complexity as a protective factor, there is very little evidence to suggest that this in fact may work against the individual. Preliminarily, this sets up a very interesting dichotomy between positive and negative aspects of self-concept as they relate to depression for clinical samples. Specifically, these results suggest that having high negative complexity lends itself to higher rates of depression for some individuals. However, the converse of these results is not true, high positive complexity does not yield lower rates of depression, rather high complexity in general self-concept, and positive self-concept also yield higher depression scores. This therefore suggests that less overlap among roles may in fact be a risk factor for these depressed adolescents. As there is little literature looking at self-concept in clinical samples, it may be useful to investigate these factors more thoroughly in future studies.

**Limitations**

While the present study revealed many important findings with regard to outcomes of siblings and general self-concept, there are some limitations. First, the study involved a small sample size, with a total group size of 33 participants. A sample of this number may limit the generalizability of study findings. Future studies can expand the sample size to look at these groups more broadly and improve power. Similarly, both samples were extremely difficult to recruit, leading to some specific, targeted sampling procedures. As siblings of individuals with ASD are a very specific population, there
were very limited means of accessing these individuals. While I attempted to utilize more
global recruiting techniques (i.e. autism recruitment websites, general Rutgers
community), low yield in these areas led to more targeted recruitment through local
autism school programs and autism resources. Similarly, with the control group, general
recruitment procedures through the Rutgers community were also low yield, which led to
more specific recruitment through the Rutgers psychology program and faculty and staff
at the Douglass Developmental Disabilities Center. These procedures may have limited
the generalizability of findings, as these individuals were specific to the University
community, for controls, and or families who sought specific autism services, in the
target group. This again led to the sample to be largely homogenous with regard to sex
and race. Participants in the study were largely female and Caucasian. This may be a
result of sampling procedures, but also poses difficulties with generalization to the larger
adolescent and ASD communities. Future studies should investigate individuals from
families with more diverse racial and ethnic backgrounds, and should include more male
participants.

It should be noted that information about target siblings in both groups was made
by parent report only. For the ASD group, this includes factors such as diagnostic
information, functioning level, and speech capabilities for target siblings. Using parent
report to collect these measures introduces questions about the validity of parent
assessment and reporting. However, for ease of family participation, it was decided to
have all family correspondence via mail, thus leaving these factors unconfirmed by
school or physician report.
Finally, while the study assessed the structure of self-concept through role number and dispersion, this leaves the content of self-concept largely unexplored. Assessing factors such as attributional style, which assesses cognitive style, would provide important information about the way that these individuals categorize information more broadly. For example, the self-complexity literature is hinged on the protective or risk factors provided by the structure of self-concept in light of negative events (Linville, 1987). However, the broader psychology literature notes that the magnitude and perception of negative events can be perceived vastly differently across individuals (Peterson et al., 1982). Including a measure of cognitive style would help to further examine individual differences between self-concept and outcomes.

Even further, while the number of roles and the attributes that describe them were analyzed for each individual, the content of these roles has largely been left unexamined, with the exception of the preliminary analysis of sibling roles. Specifically, it may be informative to look at patterns of role endorsement both across and between groups to help inform what specific roles become incorporated into the self-concept in the adolescent period. This may also help to lend some insight into the content of the self-concept above and beyond the structure.

Lastly, as siblings in the ASD group did not endorse a more negative self-concept than siblings in the control group, further investigation should be conducted on factors that may influence the negative impact of having a disabled sibling. First, a cross-sectional analysis of negative self-complexity between younger and older adolescents may reveal developmental differences in self-concept. This could help further elucidate the impact of age and cognitive level on self-complexity. Another area to explore is the
rating of the sibling relationship. Specifically, it may be beneficial to look at the positive or negative evaluation of the sibling relationship, and whether this relates to negative self-attributions. Specifically, do individuals who rate the sibling relationship more negatively have a higher negative self-concept? Additionally, further research should be conducted on the effects of multiple-sibling families. For example, for siblings in the ASD group, does having an additional neurotypical sibling help to buffer the effects of the sibling with ASD? One can speculate that having an additional neurotypical sibling may provide the benefits of the sibling bond, and that this again may soften the impact of ASD.

**Summary**

Overall, the present provides important information about siblings of individuals with ASD, as well as siblings in general. In general, siblings of individuals with ASD fair as well as individuals with a typical sibling on measures of social support, negative life events, and depression. Further, general self-complexity remains comparable while higher positive self-complexity is shown among sibling roles in the ASD group. This suggests that siblings in the ASD group had more distinct sibling roles than those in the group. Looking at psychological outcomes, it was shown that higher negative self-complexity was positively related to depression scores with some between group differences. This provides support for negative self-complexity as a risk factor. Further, for clinical samples, greater role differentiation, and therefore greater self-complexity, was related to higher depression scores. This provides important information about the self-concept of adolescents, with and without a sibling with ASD, and helps to inform clinical treatments for these groups in the future.
References
Unpublished questionnaire.


Footnotes

1. Research has suggested that self-complexity increases throughout childhood and can be affected and changed by social mechanisms (Abela & Veronneau-McArdle-McArdle, 2002). However, research has suggested that self-complexity remains relatively stable over the short-term (Linville, 1987).

2. When conducting multiple comparisons, it is typical to use groupwise alpha, corrected by the Q statistic, to adjust the threshold for significant values. In this case, twelve comparisons would limit p values to .004 as a measure of significance. However, given the extremely limited power of the current study (n=33), it is not reasonable to use corrected p values. Instead, by using a p value of .05, these analyses may be considered exploratory rather than confirmatory. In addition, significant values were found with this limited power, which is significant for such a small sample.

3. Initial analysis revealed a significant positive correlation between the total number of general aspects and CES-DC scores, r=0.366, p<.05. Further analysis of the correlation revealed that two significant outliers were present in the control group, with elevated CES-DC scores of 46 and 34, more than two standard deviations above the mean. When correcting for these outliers, the significant relationship with general NASPECTs dropped out, while the relationship with general negative NASPECTs was maintained.

Initial Scatterplot:
Corrected Scatterplot:

\[ \text{Total} \]

\[ \text{NASPECTGT} \]
4. For this analysis, the entire clinical sample was included (n=15). This allowed us to assess patterns for all individuals who reached the clinical cutoff.

5. When looking at the general sample, previously identified outliers were again removed. See above for exemplary scatterplots. In this analysis, a significant negative correlation was detected between the degree of overlap in general complexity and depression scores, \( r=-0.392, p<.05 \). There was also a negative relationship between the degree of overlap in positive general complexity and depression scores, \( r=-0.297, p=.094 \).

6. Prior to the removal of outliers, a marginally significant effect was found between the interaction of general overlap and sibling status, \( \beta=17.330, p=.06 \).

7. For the analysis of clinical status, overlap, and an interaction effect, the entire sample was included.

Appendix A

PARENTAL CONSENT FORM: ASD Group

Informed Consent for Research Participation                                         Initials: ________

Purpose of the Study

This form requests your consent for your child’s participation in a research study on the way that having a sibling with an autism spectrum disorder may affect the way a child thinks about and defines him or herself. The project is being conducted by Lauren Pepa; I am a doctoral student in clinical psychology at Rutgers University and a behavioral consultant at the Douglass Developmental Disabilities Center. I am doing this project for my Master’s thesis under the supervision of Dr. Sandra Harris.

Study Procedures

Your participation in this study is always completely voluntary. If you give your consent your child will be one of 60 total participants. Thirty participants in this study will be typically developing adolescent siblings of children with an autism spectrum disorder.
Another thirty will be typically developing adolescent siblings of children who are also typically developing. Your child will be asked to complete a set of questionnaires and do a task that will examine the way that your child defines him/herself. Prior to participation in this study, we will have an initial phone conversation to answer your questions and make sure your teenager meets the requirements for the study. Once this is completed, an envelope with two packets will be mailed to your home. The big envelope will contain two sealed envelopes: one containing forms for you to fill out, and the other containing forms for your teenagers to fill out. You will be asked to fill out information regarding your family history, as well as current information about your children. Your child will be asked to fill out questionnaires that address the way that he/she thinks about him/herself. These questionnaires will also address other related factors, including the sibling relationship, emotions, stressors, and current support. Once these questionnaires are completed, they will be mailed back to DDDC. These questionnaires should take approximately 40 minutes to complete.

**Risks/Benefits**

Dr. Harris and I believe that potential risks associated with the study are minimal; they may include mild frustration when filling out the questionnaires. To minimize any frustration, you and your child will be permitted to complete the questionnaires at your own pace, and can take breaks if necessary. While I am required to inform you that Rutgers University will not be responsible for compensation or treatment in the unlikely event of research-related adverse experiences, this research study poses no significant foreseeable risks to your children.

The benefits of taking part in this study will be a contribution to the greater knowledge about siblings of children with autism and the psychological outcomes they experience. This knowledge may inform future treatment goals that could benefit these siblings, and other siblings, in the future.

**Cost**

There is no cost to participate in this study.

**Voluntary Participation**

Your child’s participation in this study is completely voluntary. If you prefer not to grant consent or if you choose to withdraw your child at any time, you are free to do so with no adverse consequences. Participation or nonparticipation in this study will have NO effect on your child’s ongoing or future services at the Douglass Developmental Disabilities Center. Furthermore, if your child chooses to withdraw his or her assent, s/he may do so at any time.

**Confidentiality**
The data collected during this study will be used only in the research study, evaluating the self-concept of siblings of children with autism and will be viewed only by me (Lauren Pepa) and my advisor, Sandra Harris. If you have a child enrolled at the Douglass School, or in the Douglass Adult Program, this information will not be shared with any other Rutgers personnel. This information will not affect any future services rendered at the DDDC.

To preserve the confidentiality of data, any identifying information about you or your children (i.e., consent forms and contact information) will be kept separate from assessment and treatment data. To maintain security and confidentiality, I will store and maintain all information in a locked cabinet to which only I have access. When the material loses its scientific value, it will be destroyed (e.g., shredded, erased) to ensure no one else gains access to it.

By signing this document you assert that all your questions have been answered and that you are granting consent for your child to participate in this study. If you have any questions or concerns you can contact Lauren Pepa at 151 Ryders Lane, New Brunswick, NJ 08902, via phone (732-932-3017 x183) or at Lauren.pepa@gmail.com. Dr. Sandra Harris may be contacted at 732-932-3017 x155 or at sharris@rci.rutgers.edu.

Thank you for your time and consideration.

Sincerely,

____________________________________
(Principal Investigator) Lauren Pepa
Behavioral Consultant, Douglass Developmental Disabilities Center

Initials: ______

[ ] I/we understand the terms of this consent and agree for my/our children to participate in this study.

[ ] I/we decline to participate in this study.

____________________________________
Child’s name (participant)

____________________________________
Child’s name (sibling of participant)
PARENTAL CONSENT FORM: Comparison Group

Informed Consent for Research Participation

Purpose of the Study

This form requests your consent for your child’s participation in a research study on the way that having a sibling may affect the way a child thinks about and defines him or herself. The project is being conducted by Lauren Pepa; I am a doctoral student in clinical psychology at Rutgers University and a behavioral consultant at the Douglass Developmental Disabilities Center. I am doing this project for my Master’s thesis under the supervision of Dr. Sandra Harris.

Study Procedures

Your participation in this study is always completely voluntary. If you give your consent your child will be one of 60 total participants. Thirty participants in this study will be typically developing adolescent siblings of children with an autism spectrum disorder. Another thirty will be typically developing adolescent siblings of children who are also
typically developing. Your child will be asked to complete a set of questionnaires and do a task that will examine the way that your child defines him/herself. Prior to participation in this study, we will have an initial phone conversation to answer your questions and make sure your teenager meets the requirements for the study. Once this is completed, an envelope with two packets will be mailed to your home. The big envelope will contain two sealed envelopes: one containing forms for you to fill out, and the other containing forms for your teenagers to fill out. You will be asked to fill out information regarding your family history, as well as current information about your children. Your child will be asked to fill out questionnaires that address the way that he/she thinks about him/herself. These questionnaires will also address other related factors, including the sibling relationship, emotions, stressors, and current support. Once these questionnaires are completed, they will be mailed back to DDDC. These questionnaires should take approximately 40 minutes to complete.

Risks/Benefits

Dr. Harris and I believe that potential risks associated with the study are minimal; they may include mild frustration when filling out the questionnaires. To minimize any frustration, you and your child will be permitted to complete the questionnaires at your own pace, and can take breaks if necessary. While I am required to inform you that Rutgers University will not be responsible for compensation or treatment in the unlikely event of research-related adverse experiences, this research study poses no significant foreseeable risks to your children.

The benefits of taking part in this study will be a contribution to the greater knowledge about siblings and the psychological outcomes they experience. This knowledge may inform future treatment goals that could benefit these siblings, and other siblings, in the future.

Cost

There is no cost to participate in this study.

Voluntary Participation

Your child’s participation in this study is completely voluntary. If you prefer not to grant consent or if you choose to withdraw your child at any time, you are free to do so with no adverse consequences. Furthermore, if your child chooses to withdraw his or her assent, s/he may do so at any time.

Confidentiality
The data collected during this study will be used only in the research study, evaluating the self-concept of siblings of children with autism and will be viewed only by me (Lauren Pepa) and my advisor, Sandra Harris. If you have a child enrolled at the Douglass School, or in the Douglass Adult Program, this information will not be shared with any other Rutgers personnel. This information will not affect any future services rendered at the DDDC.

To preserve the confidentiality of data, any identifying information about you or your children (i.e., consent forms and contact information) will be kept separate from assessment and treatment data. To maintain security and confidentiality, I will store and maintain all information in a locked cabinet to which only I have access. When the material loses its scientific value, it will be destroyed (e.g., shredded, erased) to ensure no one else gains access to it.

By signing this document you assert that all your questions have been answered and that you are granting consent for your child to participate in this study. If you have any questions or concerns you can contact Lauren Pepa at 151 Ryders Lane, New Brunswick, NJ 08902, via phone (732-932-3017 x183) or at Lauren.pepa@gmail.com. Dr. Sandra Harris may be contacted at 732-932-3017 x155 or at sharris@rci.rutgers.edu.

Thank you for your time and consideration.

Sincerely,

____________________________________
(Principal Investigator) Lauren Pepa
Behavioral Consultant, Douglass Developmental Disabilities Center

Initials: ______

________ I/we understand the terms of this consent and agree for my/our children to participate in this study.

________ I/we decline to participate in this study.

____________________________________
Child’s name (participant)
Child’s name (sibling of participant)

____________________________________      ________________________________
Parent/Guardian signature                     Name (printed)

___________                                __________
Date signed                                  Date signed

Investigator’s signature

After the consent form has been returned to the DDDC, a copy will be sent to you.

Appendix B

SCRIPT FOR ORAL ASSENT

ASD group:

My name is Lauren Pepa. I am interested in learning about what it is like to be a brother or sister of someone with autism. I am very interested in learning about how you think about yourself, and how you think about your sibling. To learn about these things, I will ask you to fill out some questionnaires and complete some tasks. These will be mailed to your house and you can complete them at any time. Your parents have already said that it is O.K. for you to participate in this study. You can stop participating at any time and no one will be mad at you. Do you have any questions for me?

OR
Typical group:

My name is Lauren Pepa. I am interested in learning about what it is like to be a sibling. I am very interested in learning about how you think about yourself, and how you think about your sibling. To learn about these things, I will ask you to fill out some questionnaires and complete some tasks. These will be mailed to your house and you can complete them at any time. Your parents have already said that it is O.K. for you to participate in this study. You can stop participating at any time and no one will be mad at you. Do you have any questions for me?

Do you understand this study and are you willing to participate in it?

Child’s/Subject’s response: ☐ Yes ☐ No

_________________________________________________________________________
Investigator’s signature

Date signed

Appendix C

BACKGROUND INFORMATION: PARENT

I: Basic Information

Relationship to the participant (the adolescent child participating in this study) (Circle one):

  Mother
  Father
  Step mother
  Step father
  Legal Guardian

Marital Status (circle one):

  Never Married
  Married
Separated
Divorced
Widowed

**Race** (circle one):
- White
- Black or African American
- American Indian or Alaska Native
- Asian
- Native Hawaiian or Other Pacific Islander
- Two or more races
- Other (please indicate): ___________________

**Ethnicity** (circle one)
- Hispanic
- Non-Hispanic

**Highest Level of Education Achieved:**
- Some High School
- High School Graduate
- Some College
- Associates Degree
- Bachelor’s Degree
- Professional Degree (list): __________
- Some Graduate Education
- Advanced Degree (list): __________

**Current Occupation** (list): __________

**Current Occupation of Spouse (if applicable)** (list): __________
II: Family Profile

Number of Children in Family: _____ Total

(_____ sons _____ daughters)

Please list the birth order of your children (#1 oldest, up to #10 youngest). Please include their first name and age:

1. _________________
2. _________________
3. _________________
4. _________________
5. _________________
6. _________________
7. _________________
8. _________________
9. _________________
8. _________________

Are any of your children currently diagnosed with an Autism Spectrum Disorder (Autistic Disorder, Asperger’s Disorder, or Pervasive Developmental Disorder- Not Otherwise Specified)?    Yes    No

If YES, what is the current diagnosis? (Circle one)

Autistic Disorder    Asperger’s Disorder    PDD-NOS

At what age was he/she first diagnosed? __________
List any other current diagnoses: ______________________________

What is his/her current educational placement? (Circle one)
Mainstream placement
Special Education Setting
Private Placement (ABA or other)
Home-Based Services
Adult Day Program
Other (list): __________________________

What is his/her current living arrangement?
In the home
Group Residential Facility
Residential School
Other (list): __________________________

How long has he/she resided in this current placement? __________________

How does he/she primarily communicate? (Circle one)
No Communication
Gestures only
Sign Language
Some Sounds
Verbal Communication- Single Words
Verbal Communication- Phrases
Verbal Communication- Full sentences
Picture Exchange (PECS, etc)
Alternative Device
Other (list): __________________________

How often does he/she interact socially or play with others? (Circle one)
Very often
Sometimes
Rarely
Never

**How independent is he/she with daily activities (bathing, homework, etc)?** (Circle one)

Entirely Independent
Mostly Independent
Rarely Independent
Never Independent

Please answer the following questions about your adolescent child participating in this study):

**Has this child ever been diagnosed with:** (Circle all that apply)

- Autism Spectrum Disorder (Autistic Disorder, Asperger’s, PDD-NOS)
- Developmental Delay
- Language Delay
- Learning Disability
- Psychological Diagnosis (i.e. depression, anxiety)

If YES, please describe:

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Has this child ever been under the care of a therapist?   Yes   No

If YES, please describe:

______________________________________________________________________________
______________________________________________________________________________

______________________________________________________________________________
How does this child typically perform in school? (Circle one)

- Mostly A’s
- A’s and B’s
- Mostly B’s
- B’s and C’s
- Mostly C’s
- C’s and D’s
- Mostly D’s or F’s

Does this child typically require extra help in school?  Yes     No

Has this child ever received academic support services (i.e. extra time to complete exams, taking a test in a separate room)?  Yes     No

If YES, please describe:

__________________________________________________

Appendix D

BACKGROUND INFORMATION: YOUR TEENAGER

Gender (circle one)  Male  Female

Date of Birth: _____/_____/_____

Age: ______

Grade in school: ______

Race (circle one)

- White
- Black or African American
- American Indian or Alaska Native
- Asian
- Native Hawaiian or Other Pacific Islander
Two or more races
Other (please indicate): ___________________

Ethnicity (circle one)
Hispanic
Non-Hispanic

Appendix E
Center for Epidemiological Studies Depression Scale for Children (CES-DC)

INSTRUCTIONS:
Below is a list of the way you might have felt or acted. Please check how much you have felt this way during the past week.

<table>
<thead>
<tr>
<th>DURING THE PAST WEEK</th>
<th>Not At All</th>
<th>A Little</th>
<th>Some</th>
<th>A Lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I was bothered by things that don’t usually bother me.</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>2. I did not feel like eating, I wasn’t very hungry.</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>3. I wasn’t able to feel happy, even when my family or friends tried to help me feel better.</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>4. I felt like I was just as good as other kids.</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>5. I felt like I couldn’t pay attention to what I was doing.</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td></td>
<td>During the past week</td>
<td>Not at all</td>
<td>A little</td>
<td>Some</td>
</tr>
<tr>
<td>---</td>
<td>----------------------</td>
<td>------------</td>
<td>---------</td>
<td>------</td>
</tr>
<tr>
<td>6.</td>
<td>I felt down and unhappy.</td>
<td>____</td>
<td>____</td>
<td>____</td>
</tr>
<tr>
<td>7.</td>
<td>I felt like I was too tired to do things.</td>
<td>____</td>
<td>____</td>
<td>____</td>
</tr>
<tr>
<td>8.</td>
<td>I felt like something good was going to happen</td>
<td>____</td>
<td>____</td>
<td>____</td>
</tr>
<tr>
<td>9.</td>
<td>I felt like things I did before didn’t work out right.</td>
<td>____</td>
<td>____</td>
<td>____</td>
</tr>
<tr>
<td>10.</td>
<td>I felt scared.</td>
<td>____</td>
<td>____</td>
<td>____</td>
</tr>
<tr>
<td></td>
<td>During the past week</td>
<td>Not at all</td>
<td>A little</td>
<td>Some</td>
</tr>
<tr>
<td>11.</td>
<td>I didn’t sleep as well as I usually sleep.</td>
<td>____</td>
<td>____</td>
<td>____</td>
</tr>
<tr>
<td>12.</td>
<td>I was happy.</td>
<td>____</td>
<td>____</td>
<td>____</td>
</tr>
<tr>
<td>13.</td>
<td>I was more quiet than usual.</td>
<td>____</td>
<td>____</td>
<td>____</td>
</tr>
<tr>
<td>14.</td>
<td>I felt lonely, like I didn’t have any friends.</td>
<td>____</td>
<td>____</td>
<td>____</td>
</tr>
<tr>
<td>15.</td>
<td>I felt like kids I know were not friendly or that they didn’t want to be with me.</td>
<td>____</td>
<td>____</td>
<td>____</td>
</tr>
<tr>
<td></td>
<td>During the past week</td>
<td>Not at all</td>
<td>A little</td>
<td>Some</td>
</tr>
<tr>
<td>16.</td>
<td>I had a good time</td>
<td>____</td>
<td>____</td>
<td>____</td>
</tr>
<tr>
<td>17.</td>
<td>I felt like crying</td>
<td>____</td>
<td>____</td>
<td>____</td>
</tr>
<tr>
<td>18.</td>
<td>I felt sad.</td>
<td>____</td>
<td>____</td>
<td>____</td>
</tr>
<tr>
<td>19.</td>
<td>I felt people didn’t like me.</td>
<td>____</td>
<td>____</td>
<td>____</td>
</tr>
<tr>
<td>20.</td>
<td>It was hard to get started doing things.</td>
<td>____</td>
<td>____</td>
<td>____</td>
</tr>
</tbody>
</table>
Appendix F
Adolescent Life Events Questionnaire

INSTRUCTIONS: In this questionnaire we are interested in whether certain events have happened to you in the past 3 months. Please answer yes to the following events have happened to you in the past 3 months using this scale:

FAMILY AND PARENTS
1. Your parents divorced. ______
2. Your parents separated. ______
3. A close family member (parent, brother, sister) hospitalized for serious injury/illness. ______
4. A close family member (parent, brother, sister) had an unwanted, unplanned pregnancy. ______
5. A close family member (parent, brother, sister) died. ______
6. A close family member (parent, brother, sister) was arrested. ______
7. You and your family moved to a new town, but you didn’t want to move. ______
8. You had an argument with a close family member (parent, brother, sister). ______
9. A close family member (parent, brother, sister) lost their job. ______
10. A close family member (parent, brother, sister) can’t work due to injury/illness. ______
11. Have to do chores/ work you don’t want to do. ______
12. Have to take care of brothers/ sisters when you don’t want to. ______
13. Don’t spend as much time with close family members as you want to.  
14. Parents are upset because you haven’t lived up to their standards.  
15. You can’t seem to please your parents.  
16. You can’t seem to get close to one or more family members.  
17. Did something you didn’t want to do to please a close family member.  
18. Found out that close family member has been criticizing you behind your back.  
19. Parents put you down.  
20. Seems like your parent are disappointed with you.  
21. Close family member has significant medical or emotional problems (examples: heart disease, cancer, depression, etc.).  
22. Don’t receive the love, respect, or interest from parents that you wanted (example: parents didn’t notice or compliment you on a good job).  
23. Fight with parents over personal goals, desires, or choice of friends.  
24. Your parents force you to achieve things you don’t want to do.  
25. Close family members withdraws love or affection from you.  
26. Parents criticized you or yelled at you for not doing well in school.  
27. Your parents grounded you.  
28. Your parents won’t let you go out with your friends.  
29. You get in a fight with your parents over friends/boyfriend/girlfriend.  

RELATIONSHIPS  
30. A boyfriend/girlfriend breaks up with you, but you still want to go out with them.  
31. Became pregnant/made someone pregnant when you didn’t want to.  
32. Had a baby that you didn’t plan or want.  
33. Don’t have a boyfriend/girlfriend when you want one.  
34. Got in a fight/argument with a boyfriend/girlfriend.  
35. Can’t seem to please boyfriend/girlfriend when you want to.  
36. Girlfriend/boyfriend criticizes you.  
37. Can’t seem to get close to your boyfriend/girlfriend when you want to.  
38. Found out that boyfriend/girlfriend has been criticizing you behind your back.  
39. Found out that boyfriend/girlfriend has been cheating on you.  
40. Did something to please your boyfriend/girlfriend that you didn’t want to do.  

SCHOOL AND CLASSES  
41. Did poorly on, or failed, a test or class project.  
42. Do not have time to do well in school (example, working too many hours at work).  
43. Got a bad report card.  
44. Didn’t get to take a class you wanted to take.  
45. Didn’t make the honor roll when you wanted to.  
46. Had a bad teacher.  
47. Didn’t understand the material the teacher was teaching you.  
48. Have to attend a class that you don’t like.  
49. Didn’t complete required homework assignment for class.  
50. Got in trouble with the teacher or principal.  
51. Didn’t get accepted for an extracurricular activity you wanted to be a part of.
FRIENDS AND SOCIAL ACTIVITIES
52. Don’t have as many friends as you would like to. ______
53. Aren’t friends with the people you want to be friends with. ______
54. Don’t get invited to parties. ______
55. Don’t get invited to dances when you want to go. ______
56. Didn’t have anyone to go out with on the weekends when you wanted to go out. ______
57. You had an argument with a close friend. ______
58. Your friends don’t seem to understand you. ______
59. People don’t call you when they are going out. ______
60. Don’t have time to spend with your friends when you want to be with them. ______
61. Don’t talk or share feelings with your friends. ______
62. Got in a fight/argument with your friends. ______
63. Friends pressure you to do things you don’t want to do. ______
64. A close friend was arrested. ______
65. A close friend had an unwanted, unplanned pregnancy. ______
66. A close friend was hospitalized for a serious injury/illness. ______
67. A close friend died. ______
68. A close friend moved away. ______
69. You can’t seem to get close to one of your friends. ______
70. Close friends withdraw their affection from you. ______

Please list any other stressful, negative events that you can remember happening to you since school started:

Appendix G
Sibling Inventory of Behavior

I. Your Feelings About Your Brother or Sister

For each item, circle the number that shows how often these things happen to you and your brother or sister. If you have a brother or sister with Autism Spectrum Disorder, please answer these questions about that sibling.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>Seldom</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
<td></td>
</tr>
</tbody>
</table>

How often you……..

1. Are pleased by the progress your brother or sister makes 1 2 3 4 5
2. Tease or annoy your brother or sister 1 2 3 4 5
3. Gets angry with your brother or sister 1 2 3 4 5
4. Accept your brother or sister as a playmate 1 2 3 4 5
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Are embarrassed to be with your brother or sister in public</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Want your brother or sister to succeed.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>Stay away from your brother or sister if possible</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>Get ideas for things to do together</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9</td>
<td>Fusses and argue with your brother or sister</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10</td>
<td>Have fun at home with your brother or sister</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11</td>
<td>Act ashamed of your brother or sister</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12</td>
<td>Show sympathy when things are hard for your brother or sister</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13</td>
<td>Frown or pout when your brother or sister has be with you</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14</td>
<td>Teach your brother or sister new skills</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15</td>
<td>Help your brother or sister adjust to a new situation</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>16</td>
<td>Treat your brother or sister as a good friend</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>17</td>
<td>Try to avoid being seen with your brother or sister</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>18</td>
<td>Are concerned for your brother or sister's welfare and happiness</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>19</td>
<td>Make plans that include your brother or sister</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20</td>
<td>Hurt your brother or sister's feelings</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>21</td>
<td>Try to comfort your brother or sister when s/he is unhappy or upset</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>22</td>
<td>Share secrets with your brother or sister</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>23</td>
<td>Baby-sit and care for your brother or sister</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>24</td>
<td>Tattle on your brother or sister</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>25</td>
<td>Are jealous of your brother or sister</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>26</td>
<td>Have physical fights with your brother or sister (not just for fun)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>27</td>
<td>Are nosy and need to know everything about your brother or sister</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
28. Try to teach your brother or sister how to behave
   1 2 3 4 5
29. Take advantage of your brother or sister
   1 2 3 4 5
30. Blame your brother or sister when something goes wrong
    2 3 4 5
31. Are very competitive against your brother or sister
    1 2 3 4 5
32. Resent your brother or sister
    1 2 3 4 5

Appendix H
<table>
<thead>
<tr>
<th>Really True for Me</th>
<th>Sort of True for Me</th>
<th>Sample Item</th>
<th>Other kids like to do fun things with just a few people.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>BUT</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td>Some kids have parents who don't really understand them</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BUT</td>
<td>Other kids have parents who really do understand them.</td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td>BUT</td>
<td>Some kids have classmates who like them the way they are</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BUT</td>
<td>Other kids have classmates who wish they were different.</td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td>BUT</td>
<td>Some kids have a teacher who helps them if they are upset and have a problem</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BUT</td>
<td>Other kids don't have a teacher who helps them if they are upset and have a problem.</td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td>BUT</td>
<td>Some kids have a close friend who can tell problems to</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BUT</td>
<td>Other kids don't have a close friend who they can tell problems to.</td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td>BUT</td>
<td>Some kids have parents who don't seem to want to learn about their children's problems</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BUT</td>
<td>Other kids have parents who do want to listen to their children's problems.</td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td>BUT</td>
<td>Some kids have classmates that they can become friends with</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BUT</td>
<td>Other kids don't have classmates that they can become friends with.</td>
</tr>
<tr>
<td>7.</td>
<td></td>
<td>BUT</td>
<td>Some kids don't have a teacher who helps them to do their very best</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BUT</td>
<td>Other kids do have a teacher who helps them to do their very best.</td>
</tr>
<tr>
<td>8.</td>
<td></td>
<td>BUT</td>
<td>Some kids have a close friend who really understands them</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BUT</td>
<td>Other kids don't have a close friend who understands them.</td>
</tr>
<tr>
<td>9.</td>
<td></td>
<td>BUT</td>
<td>Some kids have parents who care about their feelings</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BUT</td>
<td>Other kids have parents who don't seem to care very much about their children's feelings.</td>
</tr>
<tr>
<td>10.</td>
<td></td>
<td>BUT</td>
<td>Some kids have classmates who sometimes make fun of them</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BUT</td>
<td>Other kids don't have classmates who make fun of them.</td>
</tr>
<tr>
<td>11.</td>
<td></td>
<td>BUT</td>
<td>Some kids do have a teacher who cares about them</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BUT</td>
<td>Other kids don't have a teacher who cares about them.</td>
</tr>
</tbody>
</table>

(Over)
<table>
<thead>
<tr>
<th></th>
<th>Really True for Me</th>
<th>Sort of True for Me</th>
<th>Really True for Me</th>
<th>Sort of True for Me</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>13.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
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<tr>
<td>14.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>15.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
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<tr>
<td>16.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
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<tr>
<td>17.</td>
<td>□</td>
<td>□</td>
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<tr>
<td>18.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>19.</td>
<td>□</td>
<td>□</td>
<td>□</td>
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</tr>
<tr>
<td>20.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>21.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>22.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>23.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>24.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>
Appendix I

**Self-Complexity Scale: General**

Please list up to 10 roles or activities in your life that are important to you:

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________
5. ______________________________
6. ______________________________
7. ______________________________
8. ______________________________
9. ______________________________
10. ______________________________

*Once you have completed this list, please list each role or activity on the following pages. You will put only one role or activity on each page.*
**Role/Activity #1 (List):**

Think of yourself in this role/activity. Circle which of the following adjectives describe you in this role:

<table>
<thead>
<tr>
<th>Happy</th>
<th>Angry</th>
<th>Responsible</th>
<th>Ugly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smart</td>
<td>Lonely</td>
<td>Confident</td>
<td>Sad</td>
</tr>
<tr>
<td>Brave</td>
<td>Lazy</td>
<td>Kind</td>
<td>Shy</td>
</tr>
<tr>
<td>Helpful</td>
<td>Bad</td>
<td>Calm</td>
<td>Confused</td>
</tr>
<tr>
<td>Nice</td>
<td>Scared</td>
<td>Funny</td>
<td>Careless</td>
</tr>
</tbody>
</table>
Self-Complexity Scale: Sibling

Please list up to 10 roles or activities that are important to you as a sibling:

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________
5. ______________________________
6. ______________________________
7. ______________________________
8. ______________________________
9. ______________________________
10. ______________________________

*Once you have completed this list, please list each role or activity on the following pages. You will put only one role or activity on each page.*
Role/Activity #1 (List):

Think of yourself in this role/activity. Circle which of the following adjectives describe you in this role:

Happy
Smart
Brave
Helpful
Nice

Angry
Lonely
Lazy
Bad
Scared

Responsible
Confident
Kind
Calm
Funny

Ugly
Sad
Shy
Confused
Careless