# EVALUATING THE BENEFITS OF MULTIPLE SIBLING RELATIONSHIPS IN FAMILIES OF INDIVIDUALS ON THE AUTISM SPECTRUM

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## Abstract

Previous research has suggested that having a sibling on the autism spectrum impacts the quality of the sibling relationship as well as the psychological functioning of neurotypical siblings. It is important to examine the extent to which having a typically developing (TD) sibling in addition to a sibling on the autism spectrum may help promote more positive sibling relationships and serve as a protective factor against psychological distress. The present study asked 11 young adults who have a sibling diagnosed with autism spectrum disorder (ASD) as well as a TD sibling and 11 young adults who only have a sibling with ASD to complete measures relevant to the overall functioning of a young adult. These included assessments of the sibling relationship, psychological distress, and career development. Respondents were asked about their perceptions of the impact of their siblings on these variables during childhood and at the present time. Overall, the findings of the present study did not support the hypothesis that individuals who have a neurotypical sibling in addition to a sibling with ASD differ from individuals who only have a sibling with ASD in areas of career development and quality of the sibling relationship. However, results provided some support for the hypothesis that the two groups differ on measures of psychological functioning. Specifically, individuals who have a neurotypical sibling in addition to a sibling with ASD are more likely to report higher levels of anxiety than individuals who only have a sibling with ASD. The implications of the present study, along with recommendations and directions for future research on adult siblings of individuals with ASD are also discussed.

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## Introduction

Sibling relationships are among the most unique and long-lasting relationships in an individual's life. Dunn and McGuire (1992) suggest that this relationship has a significant impact on an individual's psychological functioning, as it is one of the most enduring relationships an individual will have in his or her lifetime. Sibling relationships in adulthood are especially important, as brothers and sisters may provide significant sources of social and emotional support (Cicirelli, 2013). Several different factors can impact the quality of the sibling relationship, including if one sibling is impacted by a chronic illness or disability. Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by functional impairment in social skills, communication skills, and daily living skills. Research suggests that having a sibling with ASD may have a negative impact on the psychosocial functioning of typically developing (TD) siblings as well as the sibling relationship into adulthood (Harris & Glassberg, 2012).

However, the impact of ASD on the adult sibling may be mitigated by the presence of another, neurotypical, sibling in the family. No research has addressed this area of study to date. The following review of the literature will explore the TD sibling relationship in childhood, adolescence, and adulthood and how it is impacted when one sibling has a chronic illness or disability or, of particular interest here, ASD. The psychological impact of ASD on a neurotypical sibling will also be examined. Finally, I will review the literature on the benefits of a healthy sibling relationship in adulthood, and how a neurotypical sibling relationship may help mitigate the lifelong impact of the presence of ASD in the family on siblings.

**The Sibling Relationship**

Several characteristics distinguish the sibling from other interpersonal connections across the lifespan. Cicirelli (2013) asserts that sibling relationships begin when one sibling first becomes aware of the other's existence. For younger siblings, this begins at the moment of birth, but for older siblings, this may occur prior to the birth of the child when the parents prepare the sibling for the arrival of their new brother or sister.

These sibling relationships last throughout an individual's life. Even when siblings choose not to maintain close contact, it is impossible to entirely give up the sibling identity (Cicirelli, 2013). Siblings have the unique experience of sharing both a genetic and an environmental history with one another, and often have intimate, daily contact throughout their childhood and adolescence (McHale et al., 2012). In their review of the literature on sibling relationships in childhood and adolescence, McHale et al. (2012) found that siblings' constant companionship throughout the important stages of childhood allows for innumerable opportunities for them to shape each other's behavior, beliefs about the self, social development, and emotional development.

In his book on sibling relationships throughout the lifespan, Cicirelli (2013) discussed how the sibling relationship evolves throughout the lifespan, and concluded that research is just beginning to uncover the factors that most influence change in the sibling relationship during childhood, adolescence, and into adulthood. Conflict between siblings may foster the development of perspective taking, empathy, and problem-solving, all of which are important skills involved in establishing and maintaining relationships into adulthood (McHale et al., 2012). However, when the majority of conflict is handled poorly, it can also result in children becoming aggressive, experiencing problems in school, and developing both internalizing and

externalizing problems. Patterson and Stouthamer-Loeber's (1984) coercion theory has been used to describe how siblings may both model and reinforce negative behaviors in one another (e.g., aggression, undermining authority, bullying, substance use). Research has shown that these behaviors may extend to a child's or adolescent's relationship with his or her peers (e.g., Bank et al., 2004; Compton et al., 2003).

Siblings may also exert indirect influences on one another. Each child shapes parenting behavior in a different way, which in turn influences how parents choose to treat the other children in the family (McHale et al., 2012). Children generally notice the way that they are treated relative to their siblings, and when siblings are treated in a significantly different way from one another, it often has a negative impact (McHale et al., 2012). A number of studies suggest that differential treatment such as more privileges, greater discipline, and stronger parent-child relationships for one sibling over another is linked to poorer sibling relationships and an increase in adjustment problems for siblings who perceive that their parents are favoring the other sibling (e.g., Coldwell, Pike, & Dunn, 2008; Shanahan et al., 2008).

Given the extent to which siblings may influence one another, it is important to examine how these influences change over the course of the life cycle. Cicirelli (2013) notes that when researchers choose to study the sibling relationship, they rely on data primarily from self-report measures, interviews, and systematic observation. The data collected often address variables such as the frequency of interactions between siblings, the quality of the interactions, and the duration of the interactions, as well as attitudes siblings have about one another. Teti (1992) observed that older siblings typically initiate interactions with younger siblings in early childhood. He posited that both older and younger siblings learn important social skills through these early interactions. Dunn and Kendrick (1982) observed 2- and 3-year-old children

interacting with their 14-month-old siblings and noted that the majority of the initiations and interactions tended to be positive, and that the older siblings were often eager to help the younger siblings. Bank (1992) hypothesized that siblings at a very young age form their own attachments to one another outside of their attachments to their parents, and will look to one another for support when their parents are absent. Just as in parental attachment, these bonds can be disrupted if siblings do not reciprocate or respond to their brother or sister's bids for attention.

Cicirelli (2013) states that as the younger siblings move into preschool and early elementary school, they may take more of an active role in participating in and initiating interactions with their siblings. As the younger child grows, he or she may become more attractive as a playmate for the other sibling, and they may engage in more reciprocal, collaborative play. These interactions expose children to concepts such as turn taking, fairness, and sharing, all of which generalize to later interactions with peers (Feiges & Weiss, 2004). Conflict and rivalry may begin to increase in elementary school, due to both an increase in interaction between siblings and younger siblings asserting themselves more in play and in their relationships with their parents (Dunn, 1992).

Cicirelli (2013) also discusses how, in late childhood or early adolescence, older siblings may begin to spend more time outside of the home and with their peers. As a result, the siblings may interact less frequently than they did during early childhood. Older siblings often serve as role models during this time, and help their younger siblings with some of the issues they may encounter when transitioning from elementary school to middle school, as well as through middle and high school. Older siblings model for younger siblings how to tackle certain challenges unique to adolescence, such as conflict with parents and romantic encounters. Younger siblings may seek advice from their older siblings, particularly about issues that they do

not feel comfortable discussing with their parents. These interactions are important both in terms of social development and in strengthening the bonds between siblings (Cicirelli, 2013).

Generally speaking, over the course of adolescence, the sibling relationship becomes more egalitarian (Cicirelli, 2013). In early adolescence (e.g., ages 11-12), the amount of nurturance given to the younger sibling by the older sibling decreases and the younger sibling begins to care more for the older sibling (Cicirelli, 2013). Rivalry and conflict are observed most frequently early adolescence, but drop off by late adolescence and early adulthood. One study found that, overall, qualities such as love, trust, understanding, and enjoyment in a sibling relationship tend to decline during adolescence and then peak in adulthood (Cicirelli, 1994). Vandell, Minnett, and Santrock (1987) observed that companionship and the use of a positive emotional tone between siblings increases with age. Boer, Goedhart and Treffers (1992) found that adolescent siblings tend to be closer when the parents allow the siblings to interact freely with one another and do not involve themselves in sibling interactions. The authors conjecture that this finding may be due to sibling sensitivity to any sort of differential treatment from their parents. When parents involve themselves in the sibling interactions, siblings may be more likely to notice these differences, which may lead to increaseX in hostility and conflict between siblings (Boer, Goedhart & Treffers, 1992).

As siblings transition into adulthood, the nature of the relationship fundamentally changes as they are no longer required to live in the same home and interact with one another as frequently. Siblings in adulthood choose how often, for how long, and when they would like to see each other. Thus, the sibling relationship tends to vary throughout the course of adulthood (Stocker, Lanthier, & Furman, 1997). Generally speaking, adult siblings endorse a higher degree of closeness and intimacy in their relationships than do younger sibling dyads (Cicirelli, 2013).

Sibling relationships in adulthood tend to vary in terms of warmth, conflict, and rivalry; which are all associated with family structure, amount of contact between siblings, and siblings' mental health (Stocker, Lanthier, & Furman, 1997). Stocker, Lanthier, and Furman (1997) examined sibling relationships in undergraduate students at large universities using the Adult Sibling Relationship Questionnaire (ASRQ) as an evaluation tool. They found that siblings of the same gender reported a higher amount of conflict than did siblings of different genders and that more frequent contact was associated with a greater amount of warmth in the relationship. Conversely, siblings who choose to remain distant from one another and do not interact frequently are more likely to endorse feelings of conflict and rivalry in their relationships. These authors also observed that adults who endorsed higher levels of psychological functioning had better overall relationships with their siblings than did those who reported lower levels of psychological functioning. It is possible that this is because close sibling relationships in adulthood are important forms of social support in difficult times such as divorce, loss of employment, and/or deaths in the family (Cicirelli, 2013).

The nature of the sibling relationship fundamentally changes when one sibling is impacted by a chronic illness or disability. A body of literature suggests that having a sibling with a pervasive and chronic illness or disability has an important impact on an individual (Sharpe & Rossiter, 2002). Depending on the extent to which an individual's daily functioning and communication skills are impaired, siblings may have difficulty interacting with one another in a typical way, and may experience differences in their roles in the family as well as their relationships with their parents.

**Living with a Sibling with Chronic Illness or Disability**

Cicirelli (2013) suggests that the presence of a child with a chronic illness or disability in the family often diverts parental attention away from the TD or healthy children. The healthy children, especially females, are often given caretaking responsibilities early on in their lives, leaving less time for them to engage in activities of their choosing. In many families, caretaking responsibilities extend throughout the lifetime, with the healthy sibling taking full responsibility for their chronically ill or cognitively impaired sibling once their parents pass away (Cicirelli, 2013). Lobato, Barbour, Hall, and Miller (1987) examined psychosocial characteristics of 24 preschool aged siblings of handicapped children as compared to 22 siblings of nonhandicapped children. They found that even preschool aged siblings assumed child-care responsibilities for their handicapped brothers or sisters. These findings are consistent with those of McHale and Gamble (1989), who found that siblings of children with disabilities were more likely to have both caretaking and household chore responsibilities than those siblings who did not have a brother or sister with a disability.

A study by Stoneman et al. (1988) showed that childcare responsibilities in siblings of handicapped children differ depending on the gender. They interviewed siblings of children with and without an intellectual disability to gain information about household chores, their social lives, and childcare responsibilities. They observed that sisters of children with intellectual disabilities were more likely to be directly involved in childcare than brothers of children with intellectual disabilities. Greater childcare responsibilities were associated with fewer out of home activities, fewer interactions with peers, and greater instances of sibling conflict. However, some authors posit that increased childcare responsibilities promote increased opportunities to develop important social skills that generalize to better relationships in adulthood (Lobato et al., 1987).

Sharpe and Rossiter (2002) conducted a meta-analysis of 51 published studies examining the psychosocial outcomes of siblings of children with a chronic medical condition. They found a statistically significant overall negative effect for having a sibling with a chronic illness. Siblings of children with a chronic illness had overall higher scores on measures of anxiety and depression, as well as greater difficulties with their peers. Lobato, Faust, and Spirito (1988) conducted a similar meta-analysis and also found that the large majority of research on siblings of individuals with chronic illness indicates that these individuals are at greater risk for psychological problems, aggressive behavior, and poor peer relations.

LaVigne and Routman (1992) assert that the impact of a sibling with a chronic illness or disability largely depends on the extent to which the illness or disability impairs the daily functioning of the individual. They found that siblings of children who are dependent upon others to perform activities of daily living are more negatively impacted by their sibling than those who had siblings who are able to function more independently. The authors hypothesized that this is because in cases where the ill or disabled child is more dependent, a larger amount of parental attention is directed towards that sibling. Rossiter and Sharpe (2001) specifically examined the impact of having a sibling with an intellectual disability on TD individuals. They found a small, but overall negative impact of having a sibling with a cognitive or intellectual disability. These authors use family systems theory (Minuchin, 1988) to explain this negative impact, asserting that when one family member is experiencing significant difficulty, the difficulties extend to other family members.

Several variables appear to have a mitigating effect on the negative impact of ill or disabled siblings on the family (Rossiter & Sharpe, 2001). Factors both within and outside the family may provide the support necessary to make the impact of a sibling with a chronic and

pervasive illness or disability less detrimental to the TD child's development. For example, having other TD siblings in the household may allow the siblings to share a more typical sibling relationship (Rossiter & Sharpe, 2001), reducing the impact of disability on the individual neurotypical siblings. However, no studies to date have examined the effect of having a TD or healthy sibling in addition to an ill or disabled sibling, as compared to individuals who only have an ill or disabled sibling. Research has shown that close and positive sibling relationships improve psychological functioning and serve as important sources of support during difficult times (e.g., Stocker, Lanthier, & Furman, 1997; White, 2001). Given the benefits of having a positive sibling relationship, it may be important to consider this question.

**The Impact of ASD on Siblings**

It is particularly interesting to examine the impact on the sibling relationship when one of the siblings has ASD because of its unique symptoms and their known impact on social relationships between siblings. ASD is a chronic and pervasive neurodevelopmental disorder characterized by deficits in language development and social skills, as well as a pattern of restricted and repetitive behaviors (APA, 2013). The range of impairment of individuals diagnosed with ASD varies greatly. Most individuals show symptoms of ASD within 12 to 24 months of age, but symptoms may appear evident earlier than 12 months in lower functioning individuals and later than 24 months in higher functioning individuals. Care providers often first notice ASD in children who seem less interested in engaging socially with others, do not make appropriate eye contact, fail to develop language at an age appropriate level, and exhibit atypical patterns of play. Behavioral symptoms of ASD may also be present at an early age, most often characterized by an insistence on routine and sameness, which when violated, causes the child to become upset and dysregulated (APA, 2013).

Young children with ASD often lack the skills necessary to begin to form interpersonal relationships. They tend to have difficulty with skills such as joint attention, social reciprocity in communication and play, perspective-taking, and pretend play. Children with ASD may prefer to play on their own rather than with others, and often use toys in a nonfunctional way (e.g., spinning the wheels on a toy car instead of driving it). They may also communicate in nonfunctional ways such as grabbing others by the hand to lead them where they want to go, or engaging in self-injurious, disruptive, or aggressive behavior to gain the attention of others. Often, individuals with ASD display strong, idiosyncratic interests and preferences. For example, they may only like to eat certain foods, use toys of a certain color, or watch the same videos (APA, 2013).

ASD is not a degenerative disorder, but there is no known cure and it typically impacts an individual's ability to function in their daily life throughout their life span. There are treatments that help individuals on the spectrum to learn functional communication and social skills, as well as help them to decrease maladaptive and stigmatizing behaviors. Lower functioning individuals often require care and support throughout their lives to complete activities of daily living such as bathing, toileting, and feeding. In addition, these individuals may never learn functional communication skills and continue to exhibit challenging behaviors into adulthood. Higher functioning individuals may grow to live independently as adults, but may require additional social support due to difficulties making and maintaining relationships, as well as vulnerability to anxiety and depression. These individuals may also require additional financial support, as they may have difficulty sustaining employment due to impairments in social skills (APA, 2013).

Given the impairments associated with ASD, having a child on the spectrum can pose a particular challenge for families. Siblings of individuals on the spectrum, in particular, are faced

with unique difficulties associated with growing up with a brother or sister who does not have the same capacity to communicate and build relationships with them as do TD siblings. Deficits in social skills, play skills, and communication skills characteristic of individuals on the spectrum impact the development of a typical sibling relationship. For example, TD siblings may make attempts to play and interact with their sibling with ASD, who may respond in a punishing manner (Harris & Glassberg, 2012). A sibling with ASD may demonstrate disinterest in his or her TD siblings and the TD sibling may become frustrated by the seeming rejection by his or her sibling with ASD. As a result, the TD sibling may give up on trying to form a relationship with his or her ASD sibling (Harris & Glassberg, 2012). Siblings of individuals on the spectrum may also be impacted by the behavioral challenges associated with ASD. For example, if a child with ASD destroys the property of his or her TD sibling or behaves aggressively towards him or her, parental attention may immediately turn to the child with ASD to address the behavior (Harris & Glassberg, 2012). Though parents' behavior may serve to ultimately protect the TD sibling, he or she may feel dismissed by the parents and upset that they not attempted to comfort him or her after harm has been done to his or her property. It may be difficult for neurotypical siblings to share their feelings and concerns with their parents about these issues.

Much of the research on the sibling relationship and ASD focuses on the nature of the sibling relationship as well as the psychosocial functioning of the TD sibling. Overall, the literature suggests that having a sibling with ASD both negatively impacts the sibling relationship and negatively impacts psychosocial functioning of TD siblings. However, some of the research indicates that there may be some positive effects of having a sibling on the spectrum.

**Attitudes about the sibling relationship**. The majority of research published on TD siblings' attitudes about their relationships with their sibling with ASD focuses on the relationship in childhood and adolescence (Orsmond & Seltzer, 2007). Several authors have relied on interview and questionnaire data to assess the quality of the sibling relationship in individuals with developmentally disabled or cognitively impaired siblings and have found mixed results (Mascha & Boucher, 2006; McHale et al, 1986; Pilowsky, 2004). McHale et al. (1986) conducted a study of 90 individuals between 6 and 15 years old, 30 of which had a TD sibling, 30 of which had a sibling with an intellectual disability, and 30 of which had a sibling with ASD. Children were asked in a semi-structured interview about their attitudes toward their sibling and their relationship with their sibling, their perception of their sibling's role in the family, and their perception of the role their sibling plays in the context of the child's friendships outside the home. Parents were also given a questionnaire in which they rated the positive and negative aspects of their children's behavior towards their sibling. Results showed that, on average, all siblings felt positively about their brothers and sisters and that the way siblings speak about their brothers and sisters did not significantly differ among groups. This finding is consistent with Rivers and Stoneman's (2003) study using self-reports from siblings of children with ASD. They observed that siblings of children with ASD aged 7 to 12 years felt generally positively about their relationships with their siblings.

However, McHale et al. (1986) also observed significant variability in responses in the groups of siblings of brothers and sisters with intellectual disabilities and ASD. Siblings of individuals with ASD or an intellectual disability reported greater satisfaction in their sibling relationships when they had a better understanding of their sibling's disability. Siblings tended to feel more negatively about their relationships with their disabled siblings when they were

worried about their sibling's future and ability to function independently, when they perceived parental favoritism towards the handicapped child, and when they felt rejected by the handicapped sibling. These results indicate that although having a sibling with ASD can impact the sibling relationship negatively, the impact can be mitigated by helping siblings understand their brother or sister's disability (Harris & Glassberg, 2012). Pilowsky et al. (2004) found that older siblings of children with ASD were more likely to endorse positive attitudes about the sibling relationship than younger siblings, possibly due to greater understanding of the disorder. It is possible that having a TD sibling with whom to discuss their sibling's disability may help siblings to develop a better understanding of ASD.

Mascha and Boucher (2006) further evaluated TD siblings' attitudes towards their sibling with ASD using a semi-structured interview aimed at eliciting both the positive and negative aspects of having a sibling on the spectrum. They found that most TD siblings expressed concern for their sibling's future and often felt embarrassed by their sibling's behavior. In addition, all but two of the participants in their study cited "bad temper," "aggression," and "excessive anger" as characteristics in their sibling with ASD that greatly impacted their lives. However, despite the negative effects cited by the siblings in this study, many of them reported that they enjoyed interacting with their sibling on the spectrum when watching TV or playing outside.

**Closeness and sibling interaction**. Aside from examining attitudes in the sibling relationship, the literature also focuses on closeness and quality of interaction between and among siblings. Kaminsky and Dewey (2001) examined the sibling relationships of children with ASD compared to siblings of children with Down syndrome and siblings of TD children. They surveyed 90 siblings between the ages of 8 and 18, with 30 participants in each group. Siblings completed the Sibling Relationship Questionnaire – Revised (SRQ). Parents of the children with

ASD and the children with Down syndrome completed an Adaptive Behavior Questionnaire to gain information about their child's level of functioning and the parents of the children with ASD completed the Gilliam Autism Rating Scale as a measure of severity of autism. Overall, the siblings of children with ASD reported fewer instances of prosocial behavior in their sibling relationships than the siblings of children with Down syndrome and the siblings of TD children. The siblings of children with ASD also reported less intimacy in their sibling relationships, as well as less nurturance in their sibling relationships compared to the other two groups. These findings likely result from the social and communication impairments common in individuals on the spectrum. However, the siblings of children on the spectrum also reported that they experienced less sibling rivalry with their siblings on the spectrum than did siblings of individuals with Down syndrome, and reported that they felt a higher degree of admiration for their siblings.

Other authors have relied on observational methods to study the sibling relationship (El-Ghorouy & Romanczyk, 1999; Knott, Lewis, & Williams, 1995). Knott, Lewis, and Williams (1995) studied 15 sibling dyads in which one sibling had ASD and 15 sibling dyads in which one sibling had Down syndrome. They observed each sibling dyad interact and coded the frequency of initiations, who initiated each interaction, and whether the initiation was prosocial or antagonistic. The authors observed that the siblings of children with Down syndrome made a greater number of both prosocial and antagonistic bids for interaction than the siblings of children with ASD. They also noted that the siblings with Down syndrome responded more positively to their sibling's bids for interaction than did the siblings with ASD. El-Ghorouy and Romanczyk (1999) observed families with a child with ASD interacting with one another. They noticed that parents of children with ASD were more likely to play with their children than the

siblings were. This may reflect the extent to which siblings are punished by their attempts to interact with their siblings on the spectrum, and that they are likely to give up after a period of time (Harris & Glassberg, 2012). It is reasonable to hypothesize that siblings of an individual with ASD who also have a TD sibling may benefit from the ability to engage in typical sibling play and develop a more traditionally intimate sibling relationship. These relationships are important to the development of important social skills, and are significant sources of social and emotional support during difficult times.

Similar to siblings of individuals with a chronic illness or disability, Harris and Glassberg (2012) suggest that it is common for siblings of individuals on the ASD spectrum to assume caretaking roles for their sibling with ASD. They conclude that both sisters and brothers are likely to assume additional caretaking responsibilities, although it is more common for girls to serve as ancillary caretakers for their sibling with ASD. Even in cases where the sibling with ASD is older than his or her brother or sister, it is likely that younger siblings will help care for their older sibling with ASD. These caretaking responsibilities may begin in childhood. For example, neurotypical siblings may help their brother or sister with ASD to eat, bathe, and/or get dressed, and may be assigned additional household chores to compensate for those that the sibling with ASD cannot do (Harris & Glassberg, 2012).

Very little research examines siblings of individuals with ASD in adulthood. Orsmond and Seltzer (2007b) conducted a study examining the quality of the sibling relationship in adults who have siblings with ASD and adults who have siblings with Down syndrome. Adult siblings of individuals with ASD had significantly less contact with their siblings than did adult siblings of individuals with Down syndrome. In addition, the adult siblings of individuals with ASD reported lower levels of positive affect in the relationship, felt more pessimistic about their

sibling's future, and reported that their relationships with their parents had been more significantly impacted by their brother or sister's disability. Consistent with previous literature suggesting that the sibling relationship is more positive when the sibling with ASD is able to function more independently (e.g. LaVigne & Routman, 1992), Orsmond and Seltzer (2007b) also found that sibling pairs who spent more time engaging in activities with one another were ones in which the sibling with ASD had a higher level of independence. A higher degree of positive affect in the sibling relationship as well as a greater level of contact between siblings were observed in sibling pairs that lived in close proximity to one another, and in those siblings who were able to utilize problem-focused coping strategies to address issues related to their sibling with ASD. It is possible that having a neurotypical sibling would help individuals to more effectively use problem-focused coping strategies.

Caretaking responsibilities for siblings on the spectrum often continue throughout adulthood, sometimes serving as a source of stress for older siblings who are hoping to move away from home and begin independent lives (Harris & Glassberg, 2012). Harris and Glassberg (2012) also posit that in cases where the younger sibling is responsible for caring for his or her older sibling, he or she may resent or even fear having to care for someone who is older. Siblings with ASD may rely entirely on their neurotypical siblings for support in completing activities of daily living, as well as financial and emotional support once their parents pass away.

**Sibling psychosocial functioning**. Findings are mixed regarding the extent to which having a sibling on the ASD spectrum impacts the psychosocial functioning of TD siblings (Orsmond & Seltzer, 2007a). Studies examining sibling adjustment have mostly focused on siblings in late childhood and adolescence, while very few have evaluated sibling adjustment in early childhood and adulthood (Orsmond & Seltzer, 2007a). Some research has suggested that

siblings of children with ASD and other developmental disabilities are not at an increased risk for psychosocial difficulties (Gold, 1993; Pilowsky et al., 2004; Rodrigue et al., 1993). Rodrigue et al. (1993) compared the psychological and social functioning of siblings of children with ASD, with Down syndrome, and with no developmental delays. They found that scores on measures of psychological well-being of siblings of children with ASD were within normal limits and did not reflect a higher level of psychopathology. In addition, their data showed that siblings of children with ASD did not differ significantly from the other groups on measures of self-esteem. Similarly, Gold (1993) compared the psychological well-being of siblings of children with ASD to siblings of TD children. She found no statistically significant differences on measures of social functioning between the two groups. These findings are consistent with those of Pilowsky et al. (2004), who observed that siblings of children with ASD did not differ significantly on measures of social-emotional adjustment, behavior problems, and social skills from siblings of children with intellectual disabilities and siblings of children with developmental language disorders.

However, there is some literature suggesting that siblings of children with ASD may be at an increased risk for psychological, social, and behavioral problems. A study by Smith and Perry (2005) indicated that 36% of siblings aged 6 to16 of children with ASD have borderline to clinically significant internalizing problems, and 20% have externalizing problems. Similarly, Verte, Roeyers, and Buysse (2003) examined psychological adjustment in siblings ages 6 to 11, of children with high functioning ASD and found that siblings of children with ASD reported higher rates of internalizing and externalizing problems than did siblings of TD children. These findings are consistent with those of Fisman et al. (2006), who conducted a three-year longitudinal study evaluating the psychological adjustment of siblings of children with pervasive

developmental disorder (PDD), Down syndrome, or no developmental delays. Parents reported significantly higher rates of externalizing and internalizing disorders in siblings of children with PDD than in either of the other groups.

Factors such as parental stress, functioning level of the disabled sibling, and availability of outside social support have also been used to explain the high rate of adjustment problems in siblings of individuals with ASD. Lobato et al. (1987) found that parents' ratings of sibling distress were higher than the siblings' self-reported levels of depression and aggressive behaviors. This effect was especially pronounced when the parents themselves were experiencing significant levels of psychological distress, suggesting that parents' perception of their child's difficulties may be skewed by their own experience. Hastings (2003) observed that siblings of children with ASD reported lower levels of psychological distress when their sibling was higher functioning and when they reported higher scores on a measure of social support (e.g., helpfulness of friends, family, professionals, etc).

Some research has sought to isolate the factors that predict psychological well-being in siblings of children with ASD. Gold (1993) and Rodrigue et al. (1993) observed age related differences in psychological functioning of siblings of children with ASD. Both studies noted that younger sibling cohorts (ages 7-12) reported significantly fewer internalizing and externalizing problems than older siblings (ages 13-17). It is possible that the increase in psychological difficulties in adolescence stems from the unique challenges associated with that stage in the lifespan. Harris and Glassberg (2012) suggest that the cognitive changes associated with adolescence are likely to lead to an increase in concerns about the future. In siblings of children with ASD, it is possible that adolescents are becoming more aware of their future roles and responsibilities in the lives of their siblings with ASD. Relatedly, Eisenberg, Baker, and

Blacher (1988) found that adolescent siblings of individuals with an intellectual disability worried more about where their brother or sister would live in the future, the extent to which they would be involved in their brother or sister's care, and the extent to which their sibling would impact their decisions about the future (e.g., family, where to live, career) than did siblings of TD individuals.

One study looked at psychological functioning of adult siblings of individuals with ASD using family history methods and found that 15% of TD siblings had received treatment for depression or mania, which is higher than rates reported in epidemiological studies (Piven et al., 1990). A similar study by Piven et al. (1997) found that adult siblings of individuals with ASD have higher rates of social impairments than adult siblings of individuals with Down syndrome.

**Potential Benefits of Having a Neurotypical Sibling When One Sibling Has ASD**

Having a sibling with ASD in young adulthood is likely to have a significant impact on the sibling relationship and the psychological functioning of siblings of individuals with ASD. Young adulthood is often a time of transition and change, when individuals are making decisions about careers, families, children, and where they will live. All of these decisions are likely to be complicated by having a sibling on the spectrum. In addition, difficult life events (e.g., loss of a family member, divorce) may be more challenging when a sibling does not have a brother or sister who is able to provide the emotional support that siblings typically provide. In order to best understand the impact of having a sibling with ASD in adulthood, it is also important to also explore the benefits of having a healthy adult relationship with a neurotypical sibling.

TD siblings may provide each other with important opportunities for early childhood interactions important to the development of social skills that they may miss with a brother or sister with ASD. These interactions often foster the development of appropriate social skills,

such as play, conflict resolution, turn taking, and perspective taking (Cicirelli, 2013). In adolescence, having a TD sibling in addition to an ASD sibling may provide an individual with a resource to discuss issues he or she is uncomfortable discussing with a parent. Neurotypical siblings may also help one another to put in perspective or understand any differential treatment given to the sibling with ASD, potentially mitigating the negative impact of greater parental resources directed towards the ASD sibling (Boer, Goedhart & Treffers, 1992). Throughout childhood and adolescence, TD siblings would likely talk with one another about ASD and how it impacts their brother or sister, perhaps helping them to develop a greater understanding of the disorder and providing support to one another when they feel frustrated by their sibling's behaviors. Harris and Glassberg (2012) suggest that a better understanding of ASD increases the quality of sibling relationships between neurotypical siblings and siblings with ASD.

In adulthood, having a neurotypical sibling along with an ASD sibling would likely have a significantly positive impact. Positive sibling relationships in adulthood are associated with better psychosocial functioning in all adults (Cicirelli, 2013). Cicirelli (2013) notes that siblings who maintain close contact and subscribe to similar values often have a higher internal locus of control, and therefore may be more capable of managing psychological stressors. A study of sibling relationships in undergraduates at a large university revealed that those who maintained harmonious relationships with their siblings (high warmth, low conflict) endorsed closer friendships with peers, higher levels of self-esteem, and lower levels of loneliness (Sherman, Lansford, & Volling, 2006). Milevsky (2005) noted a similar pattern, observing that individuals receiving high levels of emotional and social support from their siblings in adulthood scored significantly lower on measures of loneliness and depression and significantly higher on measures of self-esteem. It is possible that the intimacy of the relationship between neurotypical

siblings may help to compensate for the lack of closeness in adult sibling relationships where one sibling has ASD, and result in overall better psychological functioning.

TD siblings are in a unique position in that they truly understand each other's experience in having a sibling with ASD, and therefore can offer an important form of support to one another that would be difficult to find elsewhere. Neurotypical siblings may help one another manage some of the difficulties associated with having a brother or sister on the spectrum by sharing their feelings about their sibling with ASD and problem-solving challenges together as they arise. Furman and Buhrmester (1985) hypothesized that when a relationship is not providing an individual with the support that he or she needs, that the individual may seek that support in other relationships. In the case of individuals who may have a sibling with ASD as well as a TD sibling, it is likely that they will be able to find some sibling support missing from their relationship with their sibling with ASD in their relationship with their TD sibling(s).

White (2001) discusses how, in later adulthood, receiving help and support from siblings can help to provide a sense of community and family when loved ones pass away. They may also provide other important forms of support to one another, such as financial support and providing a space where an individual may reflect on his or her early life experiences (Cicirelli, 2013). In the event of circumstances such as death of family members, divorce, and becoming parents, neurotypical siblings may be able to help one another emotionally, logistically, and financially in a way that an individual with ASD may not be able to do.

Research also suggests that siblings play an important role in helping each other to cope during difficult and stressful times, and helping each other to better understand how their past experiences have shaped their lives (e.g., Butler, 1963; White, 2001). Reminiscing allows individuals to better understand their past experiences and integrate them into their present lives

(Butler, 1963). Analyzing and evaluating past events often leads to better psychosocial functioning in old age, and helps individuals to feel more satisfied with their lives (Butler, 1963). Cicirelli (2013) suggests that because siblings share a common family history with one another, they are important to the process of reminiscence. Siblings with ASD may be unable to provide this kind of support and this type of reflective experience. However, having a neurotypical sibling may increase the likelihood that adults are able to have these interactions with a sibling, leading to a better understanding of an individual's experience and improved psychological functioning.

Neurotypical siblings may also help adults who have a sibling on the spectrum with some of the responsibilities that accompany caring for a sibling with ASD in adulthood. Some adults become financially responsible for their brother or sister with ASD, and responsible for ensuring that he or she is well cared for. Harris and Glassberg (2012) observed that adult siblings of individuals with ASD vary widely in terms of their relationships and level of involvement with their sibling. While some siblings desire a life far away from their sibling on the spectrum, other adult siblings have made lifestyle choices greatly influenced by their sibling with ASD and choose careers in helping professions (e.g., teaching, medicine, psychology), elect to remain close by to their sibling when choosing where to live, and decide to include their sibling in their social lives. Having a TD sibling with whom to share caretaking responsibilities may alleviate some of the burden. Neurotypical siblings may also help one another to care for their sibling with ASD on a social and emotional level, and provide support to one another when they feel anxiety about their sibling's future and their role in their sibling's future.

## Rationale for Present Study

Given the positive impact of typical sibling relationships in adulthood, exploring the impact of having a TD sibling as well as a sibling on the spectrum in young adulthood is important. To date, no studies have directly compared the potential benefits of having a TD sibling when an individual also has a sibling on the spectrum. If sibling adjustment can be improved by having a TD sibling, this has important implication for clinicians and researchers. The potential benefits of having a close relationship with another young adult who shares a similar upbringing and similar experiences may inform potential interventions for this population.

## Hypotheses

The aim of the present study is to compare the psychosocial functioning of siblings who have a brother or sister with ASD to those siblings who have a brother or sister with ASD as well as a TD sibling. In particular, this study will examine measures of the psychological functioning, sibling relationship, and career choice among these sibling groups.

**Psychological functioning.** When compared to siblings without a neurotypical sibling, it is expected that siblings who have both a brother or sister with ASD as well as a TD sibling will experience more positive overall psychological functioning. Based on previous research highlighting the positive impact of a typical sibling relationship (e.g, Eisenberg, Baker, & Blacher, 1988; Orsmond & Seltzer, 2007b; Rodrigue et al., 1993), it is hypothesized that individuals who have a TD sibling as well as a sibling on the spectrum will report fewer symptoms of depression and anxiety than those individuals who only have a sibling on the spectrum.

**Sibling Relationship.** Siblings who have a TD brother or sister in addition to a sibling with ASD are expected to report more positive relationships with their sibling with ASD in their young adult lives, and more feelings of warmth towards their sibling with ASD. A TD sibling may reduce the impact that a sibling with ASD has on social and emotional development, as these individuals were able to form more typical sibling bonds and relationships. In addition, having another individual with whom to discuss the difficulties and share the experience of having a sibling on the spectrum may help to decrease the negative emotions directed towards the sibling on the spectrum. When an individual has a TD sibling with whom to share some of the caretaking responsibilities in adulthood, he or she may feel less resentful towards their sibling with ASD and will be more likely to focus on the positive aspects of the sibling relationship. The knowledge that an individual has someone to help with some of the emotional and financial burdens of caring for an adult sibling with ASD may also help reduce some of the anxiety experienced by neurotypical siblings about their brother or sister's future.

**Career choice.** Finally, it is predicted that siblings who also have a TD brother or sister will perceive their sibling with ASD to have had a lower impact on their career choice, and therefore be less likely to pursue a career in the human service industry. Having a TD sibling may reduce the extent to which a neurotypical sibling was required to provide a caretaking role in his or her ASD sibling's life, or even interact with his or her sibling with ASD. Therefore, it is possible that these individuals had less exposure to caretaking roles and responsibilities, which may impact their desire to pursue a career in which they are able to use these skills.

# Methods

## Participants

TD siblings of individuals with ASD were recruited by contacting well-known autism treatment and advocacy centers, as well community mental health centers and asking administrators to distribute the recruitment flyer (see Appendix A) to staff and to clients. Participants were also recruited through university graduate and undergraduate programs, as well as relevant online communities. Inclusion criteria for participation were that the typical sibling had to be at least 18 years of age and spoke English as his or her primary language. No criteria for the age of participants' siblings was specified, though participants were required to have a sibling with ASD born within 7 years of their own birth so that the participant was more likely to have lived with their sibling during their childhood.

A total of 45 individuals responded to the recruitment materials disseminated by the principal investigator. Of those, 37 siblings returned consent forms to the examiner once they indicated they were willing to participate. Once participants returned the consent form, the principal investigator scheduled a phone interview with each individual in order to administer the BDI and BAI and mailed a packet with the remaining questionnaires. All 37 participants completed the phone interview with the principal investigator; however only 22 returned the packets with the remaining questionnaires. As a result, only 22 individuals were included in the data analysis. The sample included 11 siblings of individuals diagnosed with ASD, and 11 individuals who have a neurotypical sibling in addition to a sibling with ASD. Due to difficulties with recruitment, the sample size is only large enough to detect large differences between the groups. Results of the study should be interpreted with caution, as the small nature of the sample prevents conclusions from being generalized to the general population of siblings.

## Procedure

After expressing interest in participation (e.g., replying to a recruitment flyer by contacting the primary investigator by email), a potential participant was mailed a packet of study materials. The packet included a letter to participants describing the study (see Appendix B), consent forms (see Appendix B), a demographic data form, study questionnaires, and a stamped return envelope addressed to the primary investigator. Two study questionnaires (Beck Depression Inventory and Beck Anxiety Inventory) were not included in the mailed packet and completed over the phone with the principal investigator by the request of the IRB to ensure that issues related to suicidality and severe psychopathology were addressed immediately. Demographic information collected from each participant included the participant's age, ethnicity, gender, number of siblings, age of siblings, and marital status. Participants were provided with specific instructions detailing how to complete the questionnaires and return them to the primary investigator through mail. The questionnaires took participants about one hour to complete.

## Measures

**Demographic Questionnaire**. A demographic questionnaire (see Appendix C) was administered to gain information about the participant's age, ethnicity, gender, number of siblings, age of siblings, and marital status.

**Beck Depression Inventory-Second Edition & Beck Anxiety Inventory** (Beck, Steer, & Brown, 1996; Beck & Steer, 1990). The Beck Depression Inventory – Second Edition (BDI-II) and the Beck Anxiety Inventory – Second Edition (BAI-II) are commonly used self-report tools measuring symptoms of depression and anxiety in clinical and nonclinical populations (see Appendix C). The BDI-II consists of 21 items each designed to measure the extent to which a

variety of depressive symptoms are impacting an individual's life. Participants are asked to rate each item on a 4-point scale indicating the severity of the symptom, with summed items yielding a score of 0-63. A higher total score indicates greater severity of depression. The BDI-II has been reported to have an internal consistency coefficient (Chronbach's alpha) around 0.9 and test-retest reliability raging from 0.73 to 0.96 (Wang & Gorenstein, 2013). The BAI contains 21 items that describe a symptom of anxiety and ask the participant to rate on a 4-point scale how much they feel impacted by the symptom. A higher total score indicates greater severity of anxiety. The BAI has been reported to have an internal consistency coefficient (Chronbach's alpha) around 0.92 and test-retest reliability of 0.75 (Beck et al., 1988).

**Lifespan Sibling Relationship Scale** (Riggio, 2000). The Lifespan Sibling Relationship Scale (LSRS) is a 48-item questionnaire designed to examine the quality of the sibling relationship throughout the lifespan (see Appendix C). Different aspects of the sibling relationship are addressed on six subscales consisting of eight items each: Child Affect (CA), Adult Affect (AA), Child Cognitions (CC), Adult Cognitions (AC), Child Behavior (CB), and Adult Behavior (AB). Respondents rate each item on a five-point Likert scale indicating the extent to which they agree or disagree with the statement. A total LSRS score may be interpreted to reflect overall attitudes about the adult sibling relationship and individual satisfaction with the relationship. Participants were instructed to complete this questionnaire with their sibling with ASD in mind. The LSRS has an internal consistency coefficient (Chronbach's alpha) of 0.96 and test-retest reliability of 0.91 (Riggio, 2000).

Sample items from each subscale include: "My sibling's feelings are very important to me" (Adult Affect), "My sibling and I do a lot of things together" (Adult Behavior), "My sibling and I have a lot in common" (Adult Cognitions), "I enjoyed spending time with my sibling as a

child" (Child Affect), "My sibling and I often played together as children" (Child Behavior), and "My sibling and I were very important to one another when we were children" (Child Cognitions).

**Education and Career Information** (Martins, 2007). An education and career information form was administered in order to gain information about the participant's stage in and type of career path they have chosen (see Appendix C). Participants were asked to provide information about the nature of their career goals and whether they have considered or will be considering a "service career" or a "non-service career." Service careers were defined based upon whether the participant believes the occupation involves "helping others in need on a daily basis." Additional questions are included to address the participant's perception of the influence of his/her parents and siblings upon making a career decision. The scale is not standardized.

**Subjective Sibling Experience** (Martins, 2007). A 15-item subjective sibling experience questionnaire was administered to gain information about each participant's experience of being a sibling (see Appendix C). Each item was rated on a 5-point Likert scale and participants were instructed to complete the questionnaire with their sibling with ASD in mind. The scale is not standardized. Sample questions include: "To what extent to you worry about your sibling's future?" and "Compared with your peers, do you think you spent more time in caretaking roles with your sibling as a child?"

**Data Analysis**

Differences between the groups on the scores of the BDI-II and the BAI were compared using the *t*-test for two population means. Differences between the groups on subscales of the LSRS were also compared using *t*-tests for two population means.

The education and career information questionnaire and subjective sibling experience questionnaire are not standardized, and do not yield summary scores that can be compared. Rather, the questionnaires contain a number of Likert scale questions that provide information about career development. *T*-tests for two population means were run on individual items to identify differences between groups on responses.

## Results

### Demographic Information

Demographic information as reported by participants is presented in Table 1. Participants were on average 26.05 years of age (range 19 to 30 years), more likely to be female (77.30% female, 22.70% male), and largely identified themselves as Caucasian (86.40%), with 9.10% Asian/Pacific Islander and 4.50% Other. The majority of participants reported that they were single. The respondents, on average, had 5.16 years of education after high school. Using *t*-tests to compare means, no group differences were found when comparing individuals who had TD siblings to individuals who did not have TD siblings when comparing participant age, participant gender, ethnicity, marital status, and number of years of education after college (Table 1). All individuals who participated in the study indicated that their sibling impacted by a developmental disability was diagnosed with ASD.

Table 1

*Demographic Information*

| | All Participants | Individuals with No TD siblings (*n* = 11) | Individuals with TD Siblings (*n* = 11) | *t*(22) | *p* |
|---|---|---|---|---|---|
| Age | *M*: 26.05<br>Range: 19-30<br>*SD*: 3.4 | *M*: 25.81<br>Range: 19-30 years<br>*SD*: 3.22 | *M*: 26.27<br>Range: 19-30 years<br>*SD*: 3.70 | -0.305 | 0.46 (NS) |
| Gender | 77.30% female, 22.70% male | 72.72% female, 27.27% male | 90.90% female, 9.09% male | 0.49 | 0.63 (NS) |
| Ethnicity | 86.40% White/Caucasian, 9.10% Asian/Pacific Islander, 4.50% Other | 72.72% White/Caucasian, 18.18% Asian/Pacific Islander, 9.09% Other | 100% White/Caucasian | 1.92 | 0.07 (NS) |
| Marital Status | 95.50% single, 4.50% married | 100% single | 90.09% single, 9.09% married | -1.0 | 0.33 (NS) |
| Years Education after HS | *M*: 5.16<br>Range: 1-8<br>*SD*: 1.84 | *M*: 5.27<br>Range: 1-8 years<br>*SD*: 1.90 | *M*: 5.05<br>Range: 1-8 years<br>*SD*: 1.00 | 0.28 | 0.78 (NS) |
| Total Number of Siblings | *M*: 1.90<br>Range: 1-6<br>*SD*: 1.34 | *M*: 1<br>Range: 1<br>*SD*: 0 | *M*: 2.82<br>Range: 2-6<br>*SD*: 1.40 | | |
| Diagnosis of Sibling with Developmental Disability | 100% ASD | 100% ASD | 100% ASD | | |

**Sibling Experience Questionnaire**

Mean responses for each item on the Subjective Sibling Experience Questionnaire (SSEQ) were calculated for all participants (Table 2). On average, all individuals who participated in the study felt strongly that their sibling with ASD has helped formed who he or she is as a person ($M = 4.64$, $SD = 0.85$) and that they will be very involved in the future with their sibling on the spectrum ($M = 4.45$, $SD = 0.74$). Siblings who participated also reported that

their sibling on the spectrum has had a significant influence on their decisions about career and family (M = 4.27, SD = 0.70); that, during childhood, their families focused more on the needs of their sibling on the spectrum relative to their own needs (*M* = 4.36, *SD* = 0.73); that they spent more time in a caretaker role for their sibling as a child than did other children their age (*M* = 3.95, *SD* = 1.05); and that, currently, their families focus more on the needs of their sibling on the spectrum than on their own needs (*M* = 4.00, *SD* = 0.82). Participants also reported having few negative experiences with peers due to their sibling (*M* = 2.64, *SD* = 1.26).

Table 2

*Subjective Sibling Experience Questionnaire, Descriptive Statistics Including All Participants*

| | *M* | *SD* |
|---|---|---|
| 1.During childhood, to what extent did you have negative experiences with your peers due to your sibling? | 2.64 | 1.26 |
| 2.Compared with your peers, do you think you spent more time in caretaking roles with your sibling as a child? | 3.95 | 1.05 |
| 3.During childhood, how much of a focus within the family was your brother or sister's needs relative to your own? | 4.36 | 0.73 |
| 4.To what extent do you think you have overcompensated for your sibling's failure to achieve goals? | 3.45 | 1.44 |
| 5.Do you feel pressure from your parents to be involved with your sibling as an adult? | 2.95 | 1.36 |
| 6.To what extent do you worry about your sibling on a daily basis right now? | 3.45 | 1.14 |

| Table 2 - Continued | | |
|---|---|---|
| 7.How much of a focus within the family is your brother or sister (relative to you) right now? | 4.00 | 0.82 |
| 8.To what extent do you feel guilty about having abilities your sibling lacks? | 3.27 | 1.39 |
| 9.To what extent do you worry about your sibling's future? | 4.41 | 0.85 |
| 10.What level of involvement do you expect to have with your sibling in the future? | 4.45 | 0.74 |
| 11.Do you worry about having a child with autism? | 3.73 | 1.16 |
| 12.To what extent does your sibling influence your decisions about career and family? | 4.27 | 0.70 |
| 13.To what extent does your sibling impact upon your decision of where to live? | 3.73 | 1.28 |

To compare siblings in each group on responses to questions about their experience as a sibling, a series of t-tests to compare means were utilized (Table 3). No statistically significant differences were found between the two groups on responses to these questions. The most robust difference between the groups was observed on the item: "To what extent do you think you have overcompensated for your sibling's failure to achieve goals?" Individuals without a TD sibling reported that they felt they had overcompensated more for their sibling's failures compared to individuals who have a TD sibling (No TD sibling $M = 4.00$, $SD = 1.00$; TD sibling $M = 2.91$, $SD = 1.64$; $t(22) = 1.88$, $p = 0.07$). Participants without a TD sibling reported feeling somewhat less pressure from their parents to be involved with their sibling on the spectrum as an adult, though this finding did not reach significance (No TD sibling $M = 2.55$, $SD = 1.13$; TD Sibling $M = 3.35$, $SD = 1.50$, $t(22) = -1.45$, $p = 0.16$). Notably, no difference between groups was

observed on an item comparing the extent to which participants' sibling on the spectrum influences their decisions about career and family (No TD sibling $M = 4.27$, $SD = 0.79$; TD Sibling $M = 4.27$, $SD = 0.65$, $t(22) = 0.00$, $p = 1.00$) and on an item comparing the level of involvement participants believe they will have with their sibling in the future (No TD sibling $M = 4.45$, $SD = 0.69$; TD Sibling $M = 4.45$, $SD = 0.82$, $t(22) = 0.00$, $p = 1.00$).

Table 3

*Subjective Sibling Experience Questionnaire, T-Tests to Compare Means*

| | Individuals with no TD siblings | Individuals with TD siblings | *t*(22) | *p* |
|---|---|---|---|---|
| 1.During childhood, to what extent did you have negative experiences with your peers due to your sibling? | *M*: 2.36<br>Range: 1-5<br>*SD*: 1.03 | *M*: 2.91<br>Range: 1-5<br>*SD*: 1.45 | -1.02 | 0.32 (NS) |
| 2.Compared with your peers, do you think you spent more time in caretaking roles with your sibling as a child? | *M*: 4.18<br>Range: 1-5<br>*SD*: 0.75 | *M*: 3.73<br>Range: 1-5<br>*SD*: 1.27 | 1.02 | 0.32 (NS) |
| 3.During childhood, how much of a focus within the family was your brother or sister's needs relative to your own? | *M*: 4.27<br>Range: 1-5<br>*SD*: 0.79 | *M*: 4.45<br>Range: 1-5<br>*SD*: 0.69 | -0.58 | 0.57 (NS) |
| 4.To what extent do you think you have overcompensated for your sibling's failure to achieve goals? | *M*: 4.00<br>Range: 1-5<br>*SD*: 1.00 | *M*: 2.91<br>Range: 1-5<br>*SD*: 1.64 | 1.88 | 0.07 (NS) |
| 5.Do you feel pressure from your parents to be involved with your sibling as an adult? | *M*: 2.55<br>Range: 1-5<br>*SD*: 1.13 | *M*: 3.36<br>Range: 1-5<br>*SD*: 1.50 | -1.45 | 0.16 (NS) |

| Table 3 - Continued | | | | |
|---|---|---|---|---|
| 6.To what extent do you worry about your sibling on a daily basis right now? | *M*: 3.27<br>Range: 1-5<br>*SD*: 1.27 | *M*: 3.64<br>Range: 1-5<br>*SD*: 1.03 | -0.74 | 0.47 (NS) |
| 7.How much of a focus within the family is your brother or sister (relative to you) right now? | *M*: 3.91<br>Range: 1-5<br>*SD*: 0.83 | *M*: 4.09<br>Range: 1-5<br>*SD*: 0.83 | -0.51 | 0.61 (NS) |
| 8.To what extent do you feel guilty about having abilities your sibling lacks? | *M*: 2.91<br>Range: 1-5<br>*SD*: 1.51 | *M*: 3.64<br>Range: 1-5<br>*SD*: 1.21 | -1.25 | 0.23 (NS) |
| 9.To what extent do you worry about your sibling's future? | *M*: 4.27<br>Range: 1-5<br>*SD*: 0.91 | *M*: 4.55<br>Range: 1-5<br>*SD*: 0.82 | -0.74 | 0.47 (NS) |
| 10.What level of involvement do you expect to have with your sibling in the future? | *M*: 4.45<br>Range: 1-5<br>*SD*: 0.69 | *M*: 4.45<br>Range: 1-5<br>*SD*: 0.82 | 0.00 | 1.00 (NS) |
| 11.Do you worry about having a child with autism? | *M*: 3.64<br>Range: 1-5<br>*SD*: 1.12 | *M*: 3.82<br>Range: 1-5<br>*SD*: 1.25 | -0.36 | 0.72 (NS) |
| 12.To what extent does your sibling influence your decisions about career and family? | *M*: 4.27<br>Range: 1-5<br>*SD*: 0.79 | *M*: 4.27<br>Range: 1-5<br>*SD*: 0.65 | 0.00 | 1.00 (NS) |
| 13.To what extent does your sibling impact upon your decision of where to live? | *M*: 3.82<br>Range: 1-5<br>*SD*: 1.25 | *M*: 3.64<br>Range: 1-5<br>*SD*: 1.36 | 0.33 | 0.75 (NS) |
| 14.To what extent has your sibling helped form who you are? | *M*: 4.73<br>Range: 1-5<br>*SD*: 0.91 | *M*: 4.55<br>Range: 1-5<br>*SD*: 0.82 | 0.49 | 0.63 (NS) |
| 15.To what extent have you participated in support groups or therapy about being a sibling? | *M*: 2.00<br>Range: 1-5<br>*SD*: 1.27 | *M*: 2.36<br>Range: 1-5<br>*SD*: 1.12 | -0.71 | 0.48 (NS) |

**Beck Depression Inventory and Beck Anxiety Inventory**

The mean responses on the BAI-II and BDI-II for all participants were calculated (Table 4). Notably, there was a high degree of variability among participants' responses. Overall, participants reported subclinical levels of depression and anxiety (BAI $M = 9.27$, $SD = 8.87$; BDI $M = 9.09$, $SD = 7.97$).

Table 4

*BAI and BDI, Descriptive Statistics Including All Participants*

| | *M* | *SD* |
|---|---|---|
| BAI | 9.27 | 8.87 |
| BDI | 9.09 | 7.97 |

To compare responses between groups, a t-test to compare means was conducted (Table 5). No significant difference between groups was observed when comparing responses on the BDI (No TD sibling $M = 13.09$, $SD = 9.77$; TD Sibling $M = 11.27$, $SD = 9.36$, $t(22) = -1.31$, $p = 0.21$). However, a significant difference was observed between groups when comparing responses on the BAI such that individuals with a TD sibling reported higher levels of anxiety (No TD sibling $M = 5.45$, $SD = 6.13$; TD Sibling $M = 6.91$, $SD = 5.94$, $t(22) = -2.92$, $p < 0.05$).

Table 5

*BAI and BDI, T-Tests to Compare Means*

| | Individuals with no TD siblings | Individuals with TD siblings | *t*(22) | *p value* |
|---|---|---|---|---|
| BAI | Mean: 5.45<br>Range: 0-21<br>SD: 6.13 | Mean: 6.91<br>Range: 0-26<br>SD: 5.94 | -2.92 | 0.04 (S) |
| BDI | Mean: 13.09<br>Range: 0-19<br>SD: 9.77 | Mean: 11.27<br>Range: 0-34<br>SD:9.36 | -1.31 | 0.21 (NS) |

**Lifespan Sibling Relationship Scale**

Means were computed based on all participants' responses on the LSRS (Table 6). Affect items assessed affection for sibling and enjoyment of participants' relationship with his or her sibling on the spectrum, cognition items assessed beliefs about the closeness and importance of each participant's relationship with his or her sibling on the spectrum, and behavior items assessed the quality and quantity of interactions between each participant and his or her sibling on the spectrum. Higher scores indicate more positive feelings, beliefs, and behaviors.

Table 6

*Lifespan Sibling Relationship Scale, Descriptive Statistics Including All Participants*

| | *M* | *SD* |
|---|---|---|
| Adult Affect | 30.45 | 6.75 |
| Adult Behavior | 21.14 | 7.43 |
| Adult Cognitions | 26.68 | 6.45 |
| Child Affect | 25.95 | 3.06 |
| Child Behavior | 21.91 | 5.92 |
| Child Cognitions | 23.37 | 6.98 |
| LSRS Total | 147.91 | 29.00 |

To compare responses between each group, an independent *t*-test of means was conducted. No significant differences between groups were observed on any of the subscales (Table 7). A slight trend was observed indicating that, as adults, individuals without a TD sibling reported engaging in behaviors that indicate closeness in the sibling relationship somewhat more frequently (Adult Behavior, No TD sibling $M = 22.82$, $SD = 8.77$; TD Sibling $M = 19.45$, $SD = 5.72$, $t(22) = 1.07$, $p = 0.30$); and believing that they have a slightly closer relationship with their sibling on the spectrum compared to individuals with a TD sibling (Adult Cognitions, No TD sibling $M = 27.82$, $SD = 6.75$; TD Sibling $M = 25.55$, SD = 6.25, $t(22) = 0.82$, $p = 0.42$).

Table 7

*Lifespan Sibling Relationship Scale, T-Test to Compare Means*

| | Individuals with no TD siblings | Individuals with TD siblings | *t*(22) | *p* |
|---|---|---|---|---|
| Adult Affect | *M*: 31.91<br>Range: 8-40<br>*SD*: 5.67 | *M*: 29.00<br>Range: 8-40<br>SD: 7.68 | 1.01 | 0.32 (NS) |
| Adult Behavior | *M*: 22.82<br>Range: 8-40<br>*SD*: 8.77 | *M*: 19.45<br>Range: 8-40<br>*SD*: 5.72 | 1.07 | 0.30 (NS) |
| Adult Cognitions | *M*: 27.82<br>Range: 8-40<br>*SD*: 6.75 | *M*: 25.55<br>Range: 8-40<br>*SD*: 6.25 | 0.82 | 0.42 (NS) |
| Child Affect | *M*: 26.64<br>Range: 8-40<br>*SD*: 2.73 | *M*: 25.27<br>Range: 8-40<br>*SD*: 3.35 | 1.05 | 0.31 (NS) |
| Child Behavior | *M*: 22.64<br>Range: 8-40<br>*SD*: 6.41 | *M*: 21.18<br>Range: 8-40<br>*SD*: 5.60 | 0.57 | 0.58 (NS) |
| Child Cognitions | *M*: 24.00<br>Range: 8-40<br>*SD*: 7.59 | *M*: 22.55<br>Range: 8-40<br>*SD*: 6.59 | 0.48 | 0.64 (NS) |
| LSRS Total | *M*: 156.00<br>*SD*: 39.91 | *M*: 139.82<br>*SD*: 25.83 | 1.33 | 0.41 (NS) |
| Adult Affect | *M*: 31.91<br>Range: 8-40<br>*SD*: 5.67 | *M*: 29.00<br>Range: 8-40<br>SD: 7.68 | 1.01 | 0.32 (NS) |

**Education and Career Information Form**

Mean responses on the Education and Career Information Form for all participants were computed (Table 8). Overall, few participants reported that they had decided on a career path (*M* = 1.16, *SD* = 0.35), that they were confident in their career path (*M* = 2.77, *SD* = 1.88), and that they were satisfied with their career path (*M* = 2.09, *SD* = 1.34). Participants on average also reported that their parents and sibling on the spectrum had a moderate influence over their career decisions (Parent Influence, *M* = 4.00, *SD* = 1.69; Sibling Influence, *M* = 3.45, *SD* = 2.02). Most individuals reported that their chosen career path serves others (*M* = 1.22, *SD* = 0.53).

Table 8

*Education and Career Information, Descriptive Statistics Including All Participants*

| | *M* | *SD* |
|---|---|---|
| Decided on Career Path | 1.14 | 0.35 |
| Confidence in Career Path | 2.77 | 1.88 |
| Satisfied with Career Path | 2.09 | 1.34 |
| Parent Influence on Career | 4.00 | 1.69 |
| Sibling Influence on Career | 3.45 | 2.02 |
| Career in Service | 1.22 | 0.53 |

*T*-tests of independent means were used to compare responses on each item of the Career Information Form (Table 9). Individuals without a TD sibling reported that their parents had a significantly larger influence on their career decision than participants with a TD sibling (No TD sibling *M* = 5.00, *SD* = 1.48; TD Sibling *M* = 3.00, *SD* = 1.27, $t(22) = 3.40$, $p < 0.05$). No other statistically significant differences were observed between groups on items in the Career Information Form. Of note, no difference between groups was found on the item measuring the extent to which participants felt their sibling on the spectrum had influenced their career path (No TD sibling *M* = 3.45, *SD* = 2.12; TD Sibling *M* = 3.45, *SD* = 2.01, $t(22) = 0.00$, $p = 1.00$).

Table 9

*Career Information, T-Test to Compare Means*

| | Individuals with no TD siblings | Individuals with TD siblings | *t(22)* | *p value* |
|---|---|---|---|---|
| Decided on Career Path | *M*: 1.18<br>*SD*: 0.41 | *M*: 1.09<br>*SD*: 0.30 | 0.60 | 0.56 (NS) |
| Confidence in Career Path | *M*: 3.09<br>Range: 1-5<br>*SD*: 2.21 | *M*: 2.45<br>Range: 1-5<br>*SD*: 1.51 | 0.79 | 0.44 (NS) |
| Satisfied with Career Path | *M*: 1.91<br>Range: 1-5<br>*SD*: 1.14 | *M*: 2.27<br>Range: 1-5<br>*SD*: 1.56 | -0.63 | 0.54 (NS) |
| Parent Influence on Career | *M*: 5.00<br>Range: 1-5<br>SD: 1.48 | *M*: 3.00<br>Range: 1-5<br>SD: 1.27 | 3.40 | 0.01 (S) |
| Sibling Influence on Career | *M*: 3.45<br>Range: 1-5<br>*SD*: 2.12 | *M*: 3.45<br>Range: 1-5<br>*SD*: 2.02 | 0.00 | 1.00 (NS) |
| Career in Service | *M*: 1.27<br>*SD*: 0.65 | *M*: 1.18<br>*SD*: 0.40 | 0.40 | 0.70 (NS) |

## Discussion

The present study is the first report to date to specifically examine the impact of having a TD sibling in addition to having a sibling on the autism spectrum in young adult siblings of individuals with ASD. Young adults who only have a sibling on the autism spectrum were compared to individuals who have a sibling on the spectrum in addition to a neurotypical sibling(s) on measures of psychological functioning, quality of the sibling relationship, and career development (both confidence in and satisfaction with career decisions). Given previous research highlighting the positive impact of a typical sibling relationship (e.g, Cicirelli, 2013; Sherman, Lansford, & Volling, 2006 ;White, 2001), it was predicted that individuals who also have TD siblings would likely show differences in some of these areas of functioning when

compared to young adults who only have a sibling on the spectrum. It was hypothesized that any differences in functioning would be largely due to the documented adverse impact associated with having a sibling on the autism spectrum and the positive impact associated with having a TD sibling (e.g., Harris & Glasserg, 2012; Orsmond & Seltzer, 2007b; Piven et al., 1997). Participants were asked about their perceptions of the impact of their siblings on their experience both during childhood and at the present time.

Because of the small sample size, the results of this study should be interpreted with caution. Overall, the findings in the present study did not support the hypothesis that individuals who have a TD sibling in addition to a sibling with ASD would differ from young adults who only have a sibling on the spectrum, particularly in areas of perception of the sibling relationship and career development. In the area of psychological functioning, study findings suggested some support for the hypothesis the individuals who have a TD sibling in addition to a sibling with ASD would differ from young adults who only have a sibling on the spectrum, but in a different direction than was expected. Each of these areas of functioning is discussed in greater detail below. The discussion also includes a critique of the methods used in the present study and how these methodological issues impact generalizations that can be made from study findings. Finally, recommendations and directions for future research on adult siblings with autism spectrum disorders are presented for each area examined in the study.

**Psychological Functioning**

Study findings did not support the hypothesis that individuals with a brother or sister with ASD as well as a neurotypical sibling would experience lower levels of depression as measured by the BDI-II. Similarly, the results of the present study did not support the hypothesis that individuals who have a TD sibling in addition to a sibling with ASD experience lower level of

anxiety than those who only have a sibling with ASD. On the contrary, results indicated that individuals who have a TD sibling in addition to a sibling with ASD have significantly higher levels of anxiety than individuals who only have a sibling with ASD, though anxiety levels for both groups were subclinical. This finding is surprising in the context of research that has demonstrated that close relationships between TD siblings are associated with better psychosocial functioning in adults (e.g., Cicirelli, 2013; Milevsky, 2005; Sherman, Lansford, & Volling, 2006). However, it suggests that having a TD sibling may not in fact serve as a protective factor against psychological distress associated with having a sibling on the spectrum, specifically with regards to reducing symptoms of anxiety. The present study did not explore the means through which having a TD sibling may increase symptoms of anxiety in young adults who have a sibling with ASD. It is possible that having more children in a family places greater stress on the family system in regards to sharing emotional and financial resources. Given the extent to which children with ASD often require a higher level of emotional and financial support than TD children, individuals in a family system that includes a child with ASD as well as other neurotypical children may receive less attentional and financial support from caregivers than those who only have one other sibling. Less financial and emotional support from caregivers in childhood and young adulthood may result in greater difficulty coping with stressful situations (Arnett, 2000).

On average, participants in both groups reported subclinical levels of depression and anxiety. This finding is consistent with some research discussed above suggesting that individuals who have a sibling on the autism spectrum are not at an increased risk for psychosocial difficulties (Gold, 1993; Pilowsky et al., 2004; Rodrigue et al., 1993). In addition, some studies have shown that having a TD sibling is not necessarily a protective factor against

psychological distress, especially when the quality of the relationship between neurotypical siblings is negative (Waldinger, Villiant, & Orav, 2007). Though the present study did not measure the quality of relationship between the participant and his or her TD sibling, much of the research indicates that sibling relationships between TD siblings are only protective against depression if they are experienced as positive relationships (e.g., Gass, Jenkins, & Dunn, 2007; Waldinger, Villiant, & Orav, 2007). It is possible that in the present study, the sample included individuals who have positive relationships with their TD sibling and do not experience any adverse psychological impact of having a sibling with ASD.

The finding that neither group reported clinical levels of depression and anxiety is reassuring for both families and clinicians working with this population. However, it is important to note that both the recruitment methods and the measurement tools used in the study impacted these results. It is possible that the recruitment strategies used in the present study introduced some sampling bias. Participants were required to voluntarily respond to a recruitment posting sent through the university or autism advocacy organization, and as a result participants may be siblings who are active and involved in their communities. It is well documented that higher levels of community engagement and social support have positive impacts on psychological functioning (e.g., Kawachi & Berkman, 2001; Lepore, 2002).

In addition, the present study only examined anxiety and depression in order to limit the number of measures the participant was required to complete. Relatedly, the BAI primarily asks about the physiological symptoms associated with anxiety disorders (e.g., dizzy/lightheadedness, heart pounding, feeling hot) and an individual with an anxiety disorder may in fact experience few physical symptoms. It is possible that the measures used in this study did not adequately capture certain anxiety disorders that have more behavioral symptoms (e.g., obsessive

compulsive disorder, social anxiety disorder) or did not capture other types of psychopathology that may impact individuals who have siblings with ASD. Future studies might ask siblings directly whether they have been diagnosed with a psychological disorder as well as asking them to complete standardized measures of depression and anxiety. In order to provide a more comprehensive picture of psychological functioning, future studies may also consider using the Structured Clinical Interview for DSM-5 (SCID-5) and/or the Anxiety and Related Disorders Interview Schedule for DSM 5 (ADIS-5; Barlow & Brown, 2014).

Another important limitation to this study is that it did not examine the level of functioning of the siblings on the spectrum. Individuals diagnosed with ASD present with a wide range of functional impairment. Lower functioning individuals often require care and support throughout their lives to complete activities of daily living such as bathing, toileting, and feeding. In addition, these individuals may never learn functional communication skills and continue to exhibit challenging behaviors into adulthood. Higher functioning individuals may grow to live independently as adults, but may require additional social support due to difficulties making and maintaining relationships, as well as vulnerability to anxiety and depression. It is likely that the level of functioning of the ASD sibling may have an impact on the extent to which individuals experience psychological distress. Research suggests that siblings of children with more severe symptoms of ASD are at greater risk for adjustment difficulties (Hastings, 2007; Meyer, Ingersoll, & Hambrick, 2011). Future research may consider including and controlling for a measure of autism symptom severity such as the Autism Behavior Checklist (ABC; Krug, Arick, & Almond, 1980) when examining the impact of having a TD sibling in addition to a sibling with ASD on psychological functioning.

Further, young adulthood is often the time when siblings are least likely to experience the direct impact of their sibling on their daily lives. Young adulthood is characterized by relative independence from family responsibilities as these individuals are no longer living in the home. In addition, young adults are often encouraged to focus mostly on their own career and personal development rather than the needs of others who are close to them (Arnett, 2000). As a result, young adults are less likely to be burdened by major caretaking responsibilities for parents and siblings, which often contribute to higher levels of psychological distress (Harris & Glassberg, 2012). Future research may examine the impact of having a TD sibling with whom to share the burden of caring for a sibling with ASD in older adults, who may be more likely to have assumed caretaking responsibilities. Having a TD sibling with whom to share the responsibility of providing emotional, social, and financial support to a sibling with ASD after the parents are no longer able to provide that support may alleviate some of the stress associated with those responsibilities.

**Sibling Relationship**

Study findings did not support the overall hypothesis that individuals who have a TD brother or sister in addition to a sibling with ASD would report more positive relationships with their sibling with ASD in their young adult lives, and more feelings of warmth towards their sibling with ASD. However, it is important to note that individuals without TD siblings reported that they have overcompensated more for their sibling's failure to achieve goals than did siblings who had a TD sibling in addition to a sibling with ASD. This finding is consistent with previous research on young adult siblings of individuals with ASD, suggesting that neurotypical siblings often feel the need to be successful because their sibling on the spectrum is limited in his or her ability to achieve success in adulthood (Harris & Glassberg, 2012). This finding has important

implications for providers working with families impacted by ASD. Clinicians should be mindful that in families with only one neurotypical child, he or she may feel undue pressure to perform and work with the family to alleviate some of that pressure.

Importantly, participants in both groups, on average, reported overall positive relationships with their sibling on the spectrum. This finding is encouraging, and consistent with research suggesting that individuals who have siblings with ASD are likely to endorse positive attitudes towards their sibling with ASD and their relationship with their sibling with ASD (e.g., Mascha & Boucher, 2006; Pilowsky, 2004). Researchers have put forth several hypotheses for why neurotypical siblings, on average, report positive relationships with the siblings with ASD, especially in young adulthood. One study concluded that young adult siblings are more likely to report having positive relationships with their sibling on the spectrum than are children or adolescent siblings because they have a greater understanding of ASD (McHale et al., 1986). As discussed above, it is also possible that greater distance and independence from siblings with ASD in young adulthood helps individuals to feel more positively towards their sibling on the spectrum because they are less burdened by caretaking responsibilities. Siblings who are younger and still living in the home might be more likely to be negatively impacted by their sibling on the spectrum due to behavioral challenges and deficits in adaptive living skills. Future research may examine the factors that help neurotypical siblings establish positive relationships with their siblings with ASD, in order to develop ways in which clinicians can support positive sibling relationships in families.

As discussed above, the present study did not include a measure of autism severity. It is possible that having a TD sibling has a greater impact on an individual's perception of the quality of their relationship with their sibling with ASD only in cases when the ASD sibling is

lower functioning. It is also likely that, given the age range, many individuals who participated in this study had a parent or parents who were still alive and able to provide the majority of care to their sibling on the spectrum. In contrast, older adults may be more likely to have lost a parent or parents and assume sole caretaking responsibilities for their ASD sibling. When the neurotypical sibling is required to provide a greater amount of support to their sibling with ASD, it is possible that having another TD sibling with whom to share the burden of care may reduce any resentment that is caused by having to provide that level of support. As a result, individuals who are older with lower functioning siblings may feel closer to their sibling with ASD if they have someone to help them with caretaking responsibilities. Future research may consider including a measure of autism symptom severity, as well as including older age cohorts, and controlling for those variables when evaluating the potential benefit of having a neurotypical sibling when a young adult also has a sibling on the autism spectrum.

**Career Choice**

The present study found no support for the hypothesis that siblings who also have a TD brother or sister will perceive their sibling with ASD to have had a lower impact on their career choice, and therefore be less likely to pursue a career in the human service industry. Participants in both groups reported that their sibling on the spectrum had a moderate influence over their career choice (No TD siblings M = 3.45, TD siblings M = 3.45). This finding stands in slight contrast to research suggesting that early childhood experiences with a disabled sibling have a significant impact on career aspirations (e.g., Heller & Arnold, 2010; Marks, Matson, & Barraza, 2005). However, Burton and Parks (1994) studied the extent to which having a sibling with any kind of disability impacts the career decisions of nondisabled siblings and found no support for the hypothesis that young adults who have a disabled sibling are more likely to report feeling that

their sibling with a disability influenced their career decision. In addition, participants in both groups reported that, on average, they were pursuing careers in the helping profession. This finding is consistent with research indicating that siblings of individuals with disabilities often pursue careers in helping professions related to their siblings' disability (e.g., Heller & Arnold, 2010; Marks, Matson, & Barraza, 2005).

Notably, there was a significant difference between groups on the item measuring the extent to which participants felt their parent had influenced their career decision such that individuals without a TD sibling felt their parent had more influence over their career choice. This study did not collect information on the means through which participants felt their parent, or sibling, had influenced their decisions about their chosen career paths. However, it is possible that because individuals without a TD sibling come from families with only two children, they are more likely to attend to their parents' opinions and advice due to a lack of competing influences that may come from multiple siblings. Few studies examine the differential impact of parent influence over career in families with two children compared to families with more than two children. However, in his book on career development, Brown (2003) suggests that parents have a stronger influence over career choice for children relative to siblings and other adults in individuals' lives. He asserts that parents exert both direct and indirect influence over their children's career choices. Directly, parents may give opinions about what careers they think would be appropriate for their children. More indirectly, parents model different behaviors related to career choice and attitudes towards professions. Parents also help to shape the culture of the family and instill values in their children that ultimately may influence their chosen career.

The age of the participants in this study presents a limitation with regards to making generalization about sibling influence on chosen career path. Individuals in both groups indicated

that they had not yet decided on a career path, did not feel very confident overall in their career decisions, and were not entirely satisfied with their chosen career path. As a result, it is possible that any perception of influence over career direction, and decisions about career path are unclear and might change as these participants age. This finding is not surprising in the context of current research exploring emerging adulthood and how individuals in their late teens and early twenties approach decisions about their future (Arnett, 2000). Research is beginning to document the extent to which the period of time from the late teens through the twenties is a time of uncertainty for young adults, characterized by trying a number of different careers and jobs before individuals settle on their desired career path (Arnett, 2000). Future research might consider including older cohorts who may be more certain about their career paths to accurately measure the influence of siblings on career choice.

**Limitations and Future Directions**

As discussed above, the small sample size in the present study is perhaps the most significant limitation. The sample size did not allow for the detection of small to medium effects nor for the use of statistical methods to compare the influence of one variable on another (e.g., whether increased caretaking responsibilities contributed to increased levels of psychological distress, whether increased caretaking responsibilities impacted attitudes towards the sibling relationship). This limits conclusions about whether these results will generalize to the general population. In addition, the statistical methods used for analysis of the data pose a high risk for type I error, or finding a false positive. Future research should focus on recruiting a larger number of participants and conducting analyses that determine where certain variables mediate or moderate the impact of having a neurotypical sibling on the constructs measured in this study. Such findings would have important implications on how to work with and treat families

impacted by ASD and other developmental disabilities, especially given that the findings of this study are largely consistent with some of the research documenting that having a sibling with ASD does not necessarily have a negative impact on TD siblings.

Importantly, the sample was also homogenous. The large majority of participants in the present study identified as White/Caucasian and had attended some or completed college. In addition, it is likely that the recruitment methods used introduced some bias in the sample such that participants in this study are more altruistic and involved in their communities than individuals in the general population. In addition, siblings who have generally more positive relationships with their sibling may have been more likely to be willing to participate in the study. This bias should be assumed to be present because participants in both groups were willing to volunteer a significant amount of time to participate without compensation. While these limitations might not impact the extent to which differences between the groups were observed, they present a problem for generalizing to the population of siblings.

Future studies might also benefit from the inclusion of control groups. These control groups should include one group of siblings who do not have a brother or sister impacted by a disability and one group of siblings of individuals from a different clinical population (e.g., a language disorder, attention deficit/hyperactivity disorder, Down syndrome, or an intellectual disability). It is not known whether the findings in the present study are unique to autism or would apply to siblings of individuals with any significant childhood disorder. Such controls have been used in many studies with children who have a brother or sister with ASD and have sometimes found differences between these groups of siblings (Fisman et al., 1996; Knott, Lewis, & Williams, 1995). Further, it is not known whether the findings of the present study are unique to having TD siblings in general. Many studies of siblings of individuals with ASD have

included a control group of siblings of TD children and found important differences between these groups, as well (Gold, 1993; Kaminsky & Dewen, 2001; Verte, Roeyers, & Buysse, 2003).

**Conclusion**

Despite its limitations, this study is the first to explore the potential impact of having a TD sibling in addition to a sibling with ASD and this makes a meaningful contribution to the literature on families of individuals with autism. This study empirically demonstrates that having a TD sibling does not likely alter the impact of having a brother or sister on the autism spectrum with respect to how close individuals feel to their sibling on the spectrum, sibling influence over career choice, and levels of depression. Further, study results indicated that individuals who have siblings on the spectrum are not experiencing clinical levels of depression and anxiety, and endorse overall positive attitudes about their relationship with their sibling with ASD. Based on these findings, clinicians and families should not assume that young adults who have siblings with ASD are experiencing greater psychological distress and greater difficulty in their sibling relationships. However, given the extent to which the findings are mixed throughout the literature regarding the impact of having a sibling with ASD, it is important for caregivers and providers to perform a thorough assessment to determine how each individual is affected by his or her sibling on the spectrum.

Importantly, in this study, young adults who have a TD sibling reported that they experienced a significantly larger number of symptoms of anxiety when compared to young adults who only had a sibling on the spectrum. This finding was surprising in the context of previous research on families impacted by autism, so it is important that future research investigate how having a neurotypical sibling in addition to a sibling with ASD impacts symptoms of anxiety. In addition, individuals with only a sibling with ASD felt that they had

overcompensated for their sibling's disability more when compared to young adults who had an additional TD sibling. Providers should be aware of this unique stressor placed on young adults who are the only TD child in a family and work with both siblings and caregivers to reduce this burden. The findings of this study emphasize the need for more research in this area so that clinicians may better understand and serve the needs of families impacted by ASD.

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# Appendix A

## Do You Have a Sibling on the Autism Spectrum?

My name is Katelyn Selver and I am a fourth year doctoral candidate in the Clinical Psychology Psy.D. program at the Graduate School of Applied and Professional Psychology (GSAPP) at Rutgers University.

Sibling relationships are among the most unique and long-lasting relationships in an individual's life. Having a sibling with a chronic illness or disability may have a significant impact on an individual throughout his or her lifetime. I am conducting a study to explore the experience of individuals who have a sibling with Autism Spectrum Disorder (ASD). Are you between the ages of 18-30 and have a sibling with ASD within seven years of your age? If so, please consider participating.

Participants will be asked to complete six questionnaires, which should take a total of approximately 60-90 minutes, about their attitudes towards their sibling with autism, the ways in which their sibling has influenced them, their career goals, and their level of psychological distress.

If you are interested in participating or learning more about the study, please contact Katelyn Selver by the phone number or email below. In addition, if you know anyone who may be qualified and interested, please consider forwarding this message to them.

Thank you for your time and consideration.

Sincerely,

Katelyn Selver, Psy.M., BCBA
Douglass Developmental Disabilities Center, Rutgers University
151 Ryders Lane
New Brunswick, NJ 08902
Tel: (201)602-1897
Email: katelyn.selver@gmail.com

Appendix B

**Informed Consent for Research Participation**
**Siblings of Individuals with Autism**

This form requests your consent for your participation in a research study on the experiences of siblings of individuals with autism. The project is being conducted by Katelyn Selver; I am a doctoral student in clinical psychology at Rutgers University. I am doing this project for my doctoral dissertation under the supervision of Dr. Kate Fiske Massey, a clinical assistant faculty member at Rutgers University and the Associate Director of Behavioral and Research Services at the Douglass Developmental Disabilities Center (DDDC).

You are one of approximately 50 siblings I am inviting to participate. You will be asked to complete five questionnaires focusing on the ways in which autism has affected your relationship with your sibling, your career goals, and your general psychological wellbeing. The questionnaires should take a total of approximately one hour to complete. You will be provided with a stamped and addressed envelope with which to return completed questionnaires, or may scan the surveys and return them via email if that is easier for you. Steps will be taken to preserve the anonymity of your responses in the analysis of responses by using a unique identifying number for each participant. Your participation in this study is completely voluntary, and you may opt out of participation at any time without penalty.

Potential benefits of this study include the opportunity for you think about how your sibling with autism has influenced you throughout the course of your lifetime, facilitating a greater understanding of your experience. More broadly, sibling participation may contribute to a greater public understanding of the experiences of siblings of individuals with autism.

I am also required to inform you of the risks of this study. Dr. Fiske Massey and I believe the potential risks associated with this study are minimal. While I am required to inform you that Rutgers University will not be responsible for compensation or treatment in the event of research-related adverse experiences, the procedure for this research study poses no foreseeable risks to your sibling and minimal risk to you. Distress that you may experience in the completion of this study is not expected to exceed that experienced in daily life. Should you find yourself upset by the completion of these questionnaires, however, please do not hesitate to contact me using the contact information provided below so that I may help you find appropriate resources.

There is no cost to participate in this study. Your participation in this study is completely voluntary. If you prefer not to grant consent or wish to withdraw your consent at any time, you are free to do so with no adverse consequences.

To preserve the confidentiality of your responses, any identifying information about you or your sibling (i.e., consent forms and contact information) will be kept separate from your responses to questions. The only person who can link your responses to your identity will be me. Inclusion of your responses in published reports of findings will be anonymous; your name or the names of your family members or other identifying information will not be included in published findings.

To maintain security and confidentiality, I will store and maintain all returned and completed questionnaires in a locked cabinet to which only I will have access. When the material loses its scientific value, it will be destroyed (e.g., erased/shredded) to ensure no one else gains access to it.

The results of this study will be summarized in a manuscript on the experiences of siblings of individuals with autism, authored by me, Katelyn Selver.

If you have any questions regarding this information please feel free to contact Katelyn Selver at 151 Ryders Lane, New Brunswick, NJ 08902, via phone (201-602-1897), or at katelyn.selver@gmail.com. Dr. Kate Fiske Massey may be contacted at 848-932-4500, at kfiske@rutgers.edu, or at the Douglass Developmental Disabilities Center, 151 Ryders Lane, New Brunswick, NJ, 08901.

If you have any questions about your rights as a research subject, you may contact the IRB Administrator at Rutgers University at:

> Rutgers University Institutional Review Board for the Protection of Human Subjects
> Office of Research Regulatory Affairs
> 3 Rutgers Plaza New Brunswick, NJ 08901-8559
> Tel: 848-932-0150
> Email: humansubjects@orsp.rutgers.edu

Thank you for your time and consideration.

Sincerely,

_____.
(Principal Investigator) Katelyn Selver, PsyM
Doctoral Student in Clinical Psychology, Rutgers, The State University of New Jersey

---

**Consent for Participation**

_____I understand the terms of this consent and agree to participate in this study and for the responses I provide to be confidentially used for research purposes.

_____I decline to participate in this study

_____ _____

Participant Signature Participant Name (please print)

_____
Date

Please initial both pages if you give consent to participate.

# Instructions to Participants

Thank you so much for your interest in participating in this study!

Enclosed in this packet you will find a consent form, a demographic information form, and five questionnaires. Please read the consent for in full and, if you are interested in participating, sign your name and initial all pages. Once you have signed the consent form and initialed on all pages, you can complete the demographic form and questionnaires.

Please answer all survey questions as honestly as possible and with your experience with your sibling with autism in mind. If you have multiple siblings on the spectrum, complete the questionnaires according to your experience your sibling with autism who is closest in age to you. After you complete the surveys, please put them in the stamped envelope provided, along with the demographic information form and the signed consent form and place it in the mail.

Should you have any questions about the surveys, or any other aspects of the study, please contact me, Katelyn Selver, using the information provided on the consent form.

Thanks again!

# Appendix C

## Demographic Information Form

1. How old are you? _____.
2. How many siblings do you have? _____.
3. How many of your siblings are on the autism spectrum? _____.
4. How old are your siblings?

5. Marital Status:
   Single Married Widowed Divorced
6. Gender (circle one): Male Female
7. Ethnicity

| Caucasian/White | Hispanic or Latino | Black or African American | Native American or American Indian | Asian/Pacific Islander | Other |
|---|---|---|---|---|---|

Beck Anxiety Inventory

Below is a list of common symptoms of anxiety. Please carefully read each item in the list. Indicate how much you have been bothered by that symptom during the past week, including today, by circling the number in the corresponding space in the column next to each symptom.

| | Not At All | Mildly, but it didn't bother me much | Moderately, it wasn't pleasant at times | Severely, it bothered me a lot |
|---|---|---|---|---|
| Numbness or tingling | 0 | 1 | 2 | 3 |
| Feeling hot | 0 | 1 | 2 | 3 |
| Wobbliness in legs | 0 | 1 | 2 | 3 |
| Unable to relax | 0 | 1 | 2 | 3 |
| Fear of worst happening | 0 | 1 | 2 | 3 |
| Dizzy or lightheaded | 0 | 1 | 2 | 3 |
| Heart pounding/racing | 0 | 1 | 2 | 3 |
| Unsteady | 0 | 1 | 2 | 3 |
| Terrified or afraid | 0 | 1 | 2 | 3 |
| Nervous | 0 | 1 | 2 | 3 |
| Feeling of choking | 0 | 1 | 2 | 3 |
| Hands trembling | 0 | 1 | 2 | 3 |
| Shaky/unsteady | 0 | 1 | 2 | 3 |
| Fear of losing control | 0 | 1 | 2 | 3 |
| Difficulty in breathing | 0 | 1 | 2 | 3 |
| Fear of dying | 0 | 1 | 2 | 3 |
| Scared | 0 | 1 | 2 | 3 |
| Hot/cold sweats | 0 | 1 | 2 | 3 |
| Indigestion | 0 | 1 | 2 | 3 |
| Faint/lightheaded | 0 | 1 | 2 | 3 |
| Face flushed | 0 | 1 | 2 | 3 |

Subjective Sibling Experience Questionnaire

Please answer all questions as honestly as possible and with your sibling with autism in mind. If you have multiple siblings with autism, please answer these questions thinking about the sibling closest in age to you diagnosed with ASD.

1. During childhood, to what extent did you have negative experiences with your peers due to your sibling?

| Not at all | A little bit | Sometimes | Quite a bit | Very often |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

2. Compared with your peers, do you think you spent more time in caretaking roles with your sibling as a child?

| Not at all | A little bit | Sometimes | Quite a bit | Very often |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

3. During childhood, how much of a focus within the family was your brother or sister's needs relative to your own?

| Less of a focus | A little less | About the same | A little more | Much more of a focus |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

4. To what extent do you think you have overcompensated for your sibling's failure to achieve goals?

| Not at all | A little bit | Neutral amount | Quite a bit | Very much |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

5. Do you feel pressure from your parents to be involved with your sibling as an adult?

| Not at all | A little bit | Sometimes | Quite a bit | Very much |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

6. To what extent do you worry about your sibling on a daily basis right now?

| Not at all | A little bit | Sometimes | Quite a bit | Very often |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

7. How much of a focus within the family is your brother or sister (relative to you) right now?

| Less of a focus | A little less | About the same | A little more | Much more of a focus |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

8. To what extent do you feel guilty about having abilities your sibling lacks?

| Not at all | A little bit | Sometimes | Quite a bit | Very much |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

9. To what extent do you worry about your sibling's future?

| Not at all | A little bit | Sometimes | Quite a bit | Very often |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

10. What level of involvement do you expect to have with your sibling in the future?

| None | A little bit | Sometimes | Quite a bit | Very frequent |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

11. Do you worry about having a child with autism?

| Not at all | A little bit | Sometimes | Quite a bit | Very often |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

12. To what extent does your sibling influence your decisions about career and family?

| Not at all | A little bit | Sometimes | Quite a bit | Very often |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

13. To what extent does your sibling impact upon your decision of where to live?

| Not at all | A little bit | Sometimes | Quite a bit | A lot of impact |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

14. To what extent has your sibling helped form who you are?

| Not at all | A little bit | Sometimes | Quite a bit | A lot of impact |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

15. To what extent have you participated in support groups or therapy about being a sibling?

| Not at all | A little bit | Sometimes | Quite a bit | Very often |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

Beck Depression Inventory – II

Instructions: This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the one statement in each group that best describes the way you have been feeling during the past two weeks, including today. Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including Item 16 (Changes in Sleeping Pattern) or Item 18 (Changes in Appetite).

1. Sadness
   0 I do not feel sad
   1 I feel sad much of the time
   2 I am sad all the time
   3 I am so sad or unhappy that I can't stand it

2. Pessimism
   0 I am not discouraged by my future
   1 I feel more discouraged by my future than I used to be
   2 I do not expect things to work out for me
   3 I feel my future is hopeless and will only get worse

3. Past Failure
   0 I do not feel like a failure
   1 I have failed more than I should have
   2 As I look back, I see a lot of failures
   3 I feel I am a total failure as a person

4. Loss of Pleasure
   0 I get as much pleasure as I ever did from the things I enjoy
   1 I don't enjoy things as much as I used to
   2 I get very little pleasure from the things I used to enjoy
   3 I can't get any pleasure from the things I used to enjoy

5. Guilty Feelings
   0 I don't feel particularly guilty
   1 I feel guilty over many things I have done or should have done
   2 I feel quite guilty most of the time
   3 I feel guilty all of the time

6. Punishment Feelings
   0 I don't feel I am being punished
   1 I feel I may be punished
   2 I expect to be punished
   3 I feel I am being punished

7. Self-Dislike
   0 I feel the same about myself as ever
   1 I have lost confidence in myself
   2 I am disappointed in myself
   3 I dislike myself

8. Self-Criticalness
   0 I don't criticize or blame myself more than usual
   1 I am more critical of myself than I used to be
   2 I criticize myself for all my faults
   3 I blame myself for everything bad that happens

9. Suicidal Thoughts or Wishes
   0 I don't have thoughts of killing myself
   1 I have thoughts of killing myself, but would not carry them out
   2 I would like to kill myself
   3 I would kill myself if I had the chance

10. Crying
    0 I don't cry any more than I used to
    1 I cry more than I used to
    2 I cry over every little thing
    3 I feel like crying, but I can't

11. Agitation
    0 I am no more restless or wound up than usual
    1 I feel more restless or wound up than usual
    2 I am so restless and agitated that it is hard to stay still
    3 I am so restless or agitated that I have to keep moving or doing something

12. Loss of Interest
    0 I have not lost interest in other people or activities
    1 I am less interested in other people or things than before
    2 I have lost my interest in other people or things
    3 It's hard to get interested in anything

13. Indecisiveness
    0 I make decisions about as well as ever
    1 I find it more difficult to make decisions than usual
    2 I have much greater difficulty in making decisions than I used to
    3 I have trouble making any decisions

14. Worthlessness
    0 I do not feel I am worthless
    1 I don't consider myself as worthwhile and useful as I used to

2 I feel more worthless as compared to other people
3 I feel utterly worthless

15. Loss of Energy
    0 I have as much energy as ever
    1 I have less energy than I used to have
    2 I don't have enough energy to do very much
    3 I don't have enough energy to do anything

16. Changes in Sleeping Pattern
    0 I have not experienced any change in my sleeping pattern
    1a I sleep somewhat more than usual
    1b I sleep somewhat less than usual
    2a I sleep a lot more than usual
    2b I sleep a lot less than usual
    3a I sleep most of the day
    3b I wake up 1-2 hours early and can't get back to sleep

17. Irritability
    0 I am no more irritable than usual
    1 I am more irritable than usual
    2 I am much more irritable than usual
    3 I am irritable all the time

18. Changes in Appetite
    0 I have not experienced any change in my appetite
    1a My appetite is somewhat less than usual
    1b My appetite is somewhat greater than usual
    2a My appetite is much less than before
    2b My appetite is much greater than usual
    3a I have no appetite at all
    3b I crave food all the time

19. Concentration Difficulty
    0 I can concentrate as well as ever
    1 I can't concentrate as well as usual
    2 It's hard to keep my mine on anything for very long
    3 I find I can't concentrate on anything

20. Tiredness or Fatigue
    0 I am no more fatigued than usual
    1 I get tired and fatigued more easily than usual
    2 I am too tired or fatigued to do a lot of the things I used to do
    3 I am too tired or fatigued to do most of the things I used to do

21. Loss of Interest in Sex

0 I have not noticed any recent change in my interest in sex
1 I am less interested in sex than I used to be
2 I am much less interested in sex now
3 I have lost interest in sex completely

Career Information Form

1. Number of Years of Education Following High School Completed Thus Far: _____

2. Have you decided upon a desired career path? Yes / No

3. How confident are you that you will be working in this career path in the next 5 years?

| Very Confident | | | Confident | | Not Confident | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

4. How satisfied are you with the career path or major you have chosen?

| Very Satisfied | | | Satisfied | | Not Satisfied | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

5. Which of the following fields is your career found in?
   _____ Arts, Design, Entertainment, Media
   _____ Accounting/Financial
   _____ Community, Psychology, Social Services
   _____ Computer, Mathematical
   _____ Education, Teaching, Training, Library Services
   _____ Science
   _____ Engineering, Architecture
   _____ Farming, Fishing, Forestry
   _____ Food Preparation, Chef, Food Server
   _____ Healthcare, Doctor, Nursing, Pediatrics
   _____ Construction, Installation, Maintenance, Repair
   _____ Legal, Lawyer
   _____ Environmental, Physical Sciences
   _____ Management, Business, Real Estate
   _____ Biotech, Pharmaceutical, Laboratory Medical
   _____ Office, Administrative Support
   _____ Protective Service
   _____ Sales, Marketing
   _____ Transportation, Moving
   _____ Military Service
   _____ Other: _____

6. Please further describe the career you have chosen. Be as specific as possible.
   _____

   _____

7. Do you think others would consider this career one that serves others? Yes /No If yes, please describe the nature of the service.
   _____

---

8. How much influence do you believe your parent(s) had upon choosing your career path?

| A lot of Influence | | | Some Influence | | Not Influence | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

9. How much influence did your sibling have upon choosing your career path?

| A lot of Influence | | | Some Influence | | Not Influence | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Lifespan Sibling Relationship Scale

Please answer all questions as honestly as possible and with your sibling with autism in mind. If you have multiple siblings with autism, please answer these questions thinking about the sibling closest in age to you diagnosed with ASD.

1. My sibling makes me happy

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

2. My sibling's feelings are very important to me

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

3. I enjoy my relationship with my sibling

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

4. I am proud of my sibling

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

5. My sibling and I have a lot of fun together

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

6. My sibling frequently makes me angry

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

7. I admire my sibling

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

8. I like to spend time with my sibling

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

9. I presently spend a lot of time with my sibling

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

10. I call my sibling on the telephone frequently

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

11. My sibling and I share secrets

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

12. My sibling and I do a lot of things together

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

13. I never talk about my problems with my sibling

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

14. My sibling and I borrow things from each other

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

15. My sibling and I hang out together

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

16. My sibling talks to me about personal problems

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

17. My sibling is a good friend

| | | | | |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
| 1 | 2 | 3 | 4 | 5 |

18. My sibling is very important in my life

| | | | | |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
| 1 | 2 | 3 | 4 | 5 |

19. My sibling and I are not very close

| | | | | |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
| 1 | 2 | 3 | 4 | 5 |

20. My sibling is one of my best friends

| | | | | |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
| 1 | 2 | 3 | 4 | 5 |

21. My sibling and I have a lot in common

| | | | | |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
| 1 | 2 | 3 | 4 | 5 |

22. I believe I am very important to my sibling

| | | | | |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
| 1 | 2 | 3 | 4 | 5 |

23. I know I am one of my sibling's best friends

| | | | | |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
| 1 | 2 | 3 | 4 | 5 |

24. My sibling is proud of me

| | | | | |
|---|---|---|---|---|
| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
| 1 | 2 | 3 | 4 | 5 |

25. My sibling bothered me a lot when we were children

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

26. I remember loving my sibling very much when I was a child

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

27. My sibling made me miserable when we were children

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

28. I was frequently angry at my sibling when we were children

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

29. I was proud of my sibling when I was a child

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

30. I enjoyed spending time with my sibling as a child

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

31. I remember feeling very close to my sibling when we were children

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

32. I remember having a lot of fun with my sibling when we were children

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

33. My sibling and I often had the same friends as children

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

34. My sibling and I shared secrets as children

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

35. My sibling and I often helped each other as children

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

36. My sibling looked after me (OR I looked after my sibling) when we were children

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

37. My sibling and I often played together as children

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

38. My sibling and I did not spend a lot of time together when we were children

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

39. My sibling and I spent time together after school when we were children

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

40. I talked to my sibling about my problems when we were children

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

41. My sibling and I were ‘buddies’ as children

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

42. My sibling did not like to play with me when we were children

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

43. My sibling and I were very close when we were children

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

44. My sibling and I were important to each other when we were children

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

45. My sibling had an important positive effect on my childhood

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

46. My sibling knew everything about me when we were children

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

47. My sibling and I liked all the same things when we were children

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

48. My sibling and I had a lot in common as children

| Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |