An Investigation of Quality of Mixed-Neurodevelopmental Intimate Adult Relationships With an Emphasis on the Typically Developing Partner Perspective

An Investigation of Quality of Mixed-Neurodevelopmental Intimate Adult Relationships with an Emphasis on the Typically Developing Partner Perspective

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Abstract

The concepts of *mixed-neurodevelopmental* and *same-neurodevelopmental* intimate adult relationships are introduced and the quality of mixed relationships is investigated with an emphasis on the typically developing partner perspective. 173 participants, including 25 couples, completed the Subthreshold Autism Trait Questionnaire (SATQ) (Kanne, Wang, & Christ, 2012), the Quality of Relationships Inventory (QRI) (Pierce, 1994; Pierce et al., 1997), a short demographics questionnaire and intimate partnership pairing questions through an online survey tool. Typically developing individuals in mixed-neurodevelopmental intimate relationships, or relationships with individuals with autism spectrum disorders (ASD), report lower quality of intimate relationship than typically developing individuals in same-neurodevelopmental relationships, or relationships with other typically developing individuals. Typically developing individuals who report they believe their partners have undiagnosed ASD report no significant difference in intimate relationship quality than typically developing individuals who report their partners have diagnosed ASD. Typically developing individuals who report to be in mixed-neurodevelopmental relationships are shown to have lower levels of subthreshold autism traits than typically developing individuals who report to be in same-neurodevelopmental relationships. Among mixed and same-neurodevelopmental partnerships, no association between differences in partners' levels of autism traits and individual partners' perceptions of intimate relationship quality is found. No conclusive difference between typically

developing partners' and ASD partners' reports of relationship quality in mixed-neurodevelopmental intimate relationships is found, but mean QRI scores are in the predictive direction of establishing that typically developing individuals experience lower intimate relationship quality than their ASD partners. A larger sample size is necessary. Recommendations for future research are made.

Dedication

To my children for their love, strength, wisdom, frustrations and desires

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Table of Contents

List of Tables

List of Figures

Chapter I

Introduction

Humans are social animals and have an intrinsic need to engage in social transactions with other humans. Multidisciplinary research has demonstrated that supportive social transactions are associated with better physical and mental health in the population in general and among individuals coping with particular life stressors (Berkman, Glass, Brissette, & Seeman, 2000; Cohen, Gottlieb, & Underwood, 2000). Individuals tend to engage in a higher quantity of social transactions with spouses and intimate partners than with others and spouses and intimate partners are generally considered important sources of frequent social support. Accordingly, social support from spouses is associated with positive relationship outcome (Bradbury, Fincham & Beach, 2000; Verhofstadt, Buysse, & Rosseel, 2005) and greater physical and mental health (Miller, Hollist, Olsen, & Law, 2013).

Characteristics of Autism Spectrum Disorders

Autism spectrum disorders (ASD) are characterized by impairment in social interaction, verbal and nonverbal reciprocal communication, repetitive motor behaviors, insistence on routines, restricted interests of abnormal intensity and focus, and hyper or hyposensitivity to environmental stimuli (American Psychiatric Association, 2013). Many people with ASD have mild to moderate intellectual disability. However, individuals with *high-cognitive autism* (formally known as high-functioning autism) do

not suffer from intellectual impairment and may not have the same language delays during early childhood. Even so, deficits in reciprocal verbal and nonverbal communication and in the ability to understand, develop and maintain relationships remain present (American Psychiatric Association, 2013). Verbal deficits include presenting messages in a manner or order that is confusing for recipients and nonverbal deficits include impairment in employing and understanding nonverbal social cues such as facial expressions, body language and gestures. Integration of verbal and nonverbal expression is abnormal and may "give the impression of odd, wooden, or exaggerated 'body language'" (American Psychiatric Association, 2013, p. 54).

Individuals with high-cognitive autism may not intuitively understand others' actions and may suffer from confusion about others' intentions, limiting their interpersonal relationship capacity (Gallese, Rochat, Cossu & Sinigaglia, 2009). They may experience poor emotional control and amplified emotional responses (Mazefsky et al., 2013). Many individuals with ASD have other symptoms that do not fall within the diagnostic criteria of ASD and may qualify for concurrent diagnoses of attention deficit and hyperactivity disorder (ADHD), anxiety disorders or depressive disorders. Approximately 40% of individuals with ASD have two comorbid mental disorders and 70% have at least one (American Psychiatric Association, 2013).

Adults with high-cognitive autism often develop *compensatory strategies* that allow them to overcome the most recognizable appearances of their disorder. Compensatory strategies rely on thought rather than more immediate mechanisms of empathy to predict others' behaviors and intentions (Gallese, Keysers, & Rizzolatti, 2004) and require great deliberate effort to perpetually cognitively calculate what would be

socially intuitive to typically developing individuals (American Psychiatric Association, 2013). These adults may suppress repetitive behaviors in public and strain to maintain a socially acceptable facade. Many continue to struggle throughout their lifetimes to maintain employment commensurate with their strengths and abilities. Those that are able to find employment in niche professions that align with their interests and skills can experience professional success (American Psychiatric Association, 2013). Many will marry and have children although no research to date has investigated what percentage pursue this option.

ASD Diagnoses and Autism Traits in the General Population

Diagnosis of autism is more common today than in the past (Volkmar, Reichow, & McPartland, 2014). Symptoms of autism are most easily identified in children (Farley & McMahon, 2014) and many adults, especially older adults, were likely not diagnosed as children. High-cognitive autism may be especially difficult to recognize in adults as compensatory strategies and the inhibition of repetitive motor behaviors further mask the disorder. As autism has a genetic component, individuals who have a family member with autism are more likely to have autism than are members of the general population (Rutter, Bailey, Simonoff, & Pickles, 1997) and many adults with high-cognitive autism are diagnosed only after a child or other family member has been diagnosed (American Psychiatric Association, 2013). Individuals may not be aware that the social, communication and interpersonal difficulties they face are related to autism, especially if never diagnosed.

Autism traits exist in the general population and are distributed from normal levels through clinical extremes (Constantino & Todd, 2003; Hoekstra, Bartels, Cath, & Boomsma, 2008) with individuals on the high end of the distribution qualifying for formal diagnoses of autism. Other members of the population have subthreshold levels of autism traits, ranging from very low levels to higher levels that do not allow for full diagnosis. Intimate partnerships between typically developing individuals and individuals with ASD are termed *mixed-neurodevelopmental relationships* and intimate relationships between two typically developing partners or two individuals with ASD are termed *same-neurodevelopmental relationships*.

ASD and Intimate Relationships

In recent years, autism in children has received increased public attention. It is now widely recognized that parents of children with autism face particularly difficult parenting challenges and more resources and support are available to parents now than in previous years (Cohen, Dickerson & Forbes, 2013). It is less widely recognized, however, that typically developing intimate partners of adults with high-cognitive autism may face significant, unrecognized relationship challenges. As high-cognitive autism in adults is not always diagnosed, many typically developing adult partners may face the challenges of autism without awareness that their intimate partners are displaying high levels of autism traits.

Due to the nature of the social impairments of the disorder, individuals with high-cognitive autism presumably do not engage in social transactions with their spouses in the same manner as would typically developing spouses. Likewise, the difficulties

individuals with autism have perceiving others' emotional and social needs could assumedly affect their capacity to provide intimate partners the social support associated with positive relationship outcomes. At the same time, it can be assumed that typically developing intimate partners in mixed-neurodevelopmental intimate relationships, or relationships with individuals with ASD, are in a position to provide partners the accommodation and support that may have once been provided by schools and parents.

Adult-adult intimate partnerships are qualitatively different, however, than parent-child relationships, teacher-student relationships or other caregiving relationships in which one person is considered the primary caregiver and generally has some level of authority over the individual who is said to be receiving care. Social support and social transactions are generally expected to be reciprocal within adult-adult intimate partnerships, yet it can be assumed that intimate partners who have high-cognitive autism are impaired in their capacity to provide reciprocal social care. Typically developing intimate partners in mixed-neurodevelopmental relationships may consequently be abandoned to the care of their partners with autism without the beneficial receipt of the reciprocal care that would be expected in many intimate partnerships between two typically developing individuals. It may be unsuitable to expect typically developing adults to care for their intimate partners who have high-cognitive autism in the same manner as a parent, teacher or other adult caregiver.

Parents of children with autism report more life stressors and greater distress associated with their children's disabilities (Konstantareas & Homatidis, 1989; Yamada et al., 2012), are under more stress than parents of children with other intellectual disorders (Dumas, Wolf, Fisman, & Culligan, 1991), and experience deleterious psychological

effects related to their children's autism (Wolf, Noh, Firman, & Speechley, 1989). Autism has a genetic component (Ronald & Hoekstra, 2011) and some typically developing parents of children with autism may also have intimate partners with ASD and may simultaneously face challenges related to both their children's autism and their partners' autism, finding themselves caring for autism in both children and spouses. Parents' perceptions of social support from their partners have been shown to predict relationship satisfaction (Ekas, Timmons, Pruitt, Ghilain, & Alessandri, 2015) and social support within intimate partnerships in general is associated with greater physical and mental health and better relationship outcome (Miller et al., 2013). Typically developing partners who are struggling to raise children with autism spectrum disorders may be doing so without the intimate relationship support that would offer them such benefits.

Based on the symptoms of autism, it can be assumed that difficulties experienced by typically developing partners in mixed-neurodevelopmental intimate relationships may include but not be limited to difficulties engaging in reciprocal verbal and non-verbal communication and social interactions with their primary intimate partners, difficulties engaging in nonverbal communication with their intimate partners during sexual relations, difficulties associated with lack of social support from their intimate partners, difficulties engaging in typical social interactions as a couple with other social contacts including loss of potential social network, difficulties related to managing any emotional excitability common to autism as well as any comorbid anxiety and depression their intimate partners may experience, and difficulties related to raising children with autism spectrum disorders. Further, as individuals with autism have a diminished capacity to perceive others' perspectives and may misunderstand their intimate partners'

actions and intentions, typically developing intimate partners may consequently feel misunderstood and that they must defend themselves from their autistic partners' misperceptions.

Non-Diagnosed ASD in Mixed-Neurodevelopmental Relationships

High-cognitive autism in adults may remain undiagnosed; many adults with high-cognitive autism have developed compensatory strategies that mask observable symptoms of the disorder. Intimate partners interact on a personal and regular basis and some typically developing partners in mixed-neurodevelopmental relationships may be alone in the perception that their intimate partners have ASD. Without diagnostic confirmation, typically developing partners who report to families, colleagues, communities and professionals that they believe their partners have ASD may face disbelief. Other contacts who do not engage a similar quantity or quality of social transactions with the ASD partners may remain unaware of the effects of the disorder and may call into question typically developing partners' reports.

It may be helpful to briefly compare high-cognitive autism to color blindness. Someone who does not see color would not know that color existed without feedback from the environment making its existence, and therefore the color blind person's inability to perceive the color, obvious. Once the color blind person is convinced through social transactions of the existence of colors that cannot be seen, the color blind person will likely accept the reality of his or her disability. In a similar manner, individuals with high-cognitive autism are "blind" to certain aspects of social transactions. Without environmental feedback to convince them that the aspects of social transactions they

can't perceive actually do exist, they may not accept that they are missing important perceptual information or feel any need to pursue diagnosis. While a ubiquitous understanding of color is ever-present in a color blind person's social environment and the color blind person cannot long maintain rational belief that unseen colors don't exist, there is little to no comprehension of high-cognitive autism in adults among the general population. On the contrary, relatively few typically developing adults are qualified to recognize high-cognitive autism, even among professionals. Individuals with undiagnosed high-cognitive autism therefore have little external social feedback to convince them of the reality of social information they do not personally perceive. If an intimate partner is the first and only person to come to an awareness of the possible yet undiagnosed high-cognitive autism, the partner with the undiagnosed ASD may not accept an intimate partner's feedback as adequate evidence of the existence of social cues to which he or she is "blind."

Whether or not a partner with undiagnosed ASD accepts the possibility of the disorder and seeks diagnosis and support, the ASD will still affect the social transactions within the intimate relationship and typically developing partners will still experience the difficulties associated with mixed-neurodevelopmental intimate relationships. In addition, since no diagnosis has been made, typically developing partners may face intimate partners' resistance and denial of the possibility of ASD without the credibility to convince other potential support people that the ASD may exist. Mental health professionals can only diagnose those who come for treatment and in some cases, only typically developing intimate partners will ever seek support related to ASD.

ASD Research and Professional Resources

Most autism research focuses on individuals who have been diagnosed. Even within the diagnosis, relatively little information is available regarding the distress of intimate partners of adults with high-cognitive autism as there is scant acknowledgment of the difficulties of mixed-neurodevelopmental intimate partnerships. Further, professionals' tendency to focus on explaining and understanding the perspectives of individuals with the disorder rather than the perspectives of their typically developing intimate partners may have a deleterious impact on typical partners. Based on the symptoms of autism, it can be assumed that the perspectives of typically developing intimate partners may, in general, be relatively unrecognized by partners who have autism creating a situation in which typically developing partners' wants and needs remain unmet within relationships. Professionals' primary focus on the needs of the partner with autism may bolster the perspective of the ASD partner within relationships and may inadvertently further suppress the perspectives of typical partners contributing to the many difficulties typically developing partners may already be facing.

Professionals working with children with autism should be aware that in some cases, at least one of the children's parents may also have autism and that the typically developing parent may be in need of assistance and support not only to manage children's symptoms, but in managing the relationship between the intimate partners and related stressors within the family system. Likewise, professionals seeking to assist adults within difficult intimate partnerships may unknowingly be treating individuals or couples in mixed-neurodevelopmental relationships with little understanding of the relationship dynamics that occur as a result of one partner's autism. The specific effects of autism on

typically developing intimate partners are in further need of research considering the gravity of the family and relationship situation both partners may face without enough information or support.

Common Conjectures

Due to the paucity of research, fairly little is known about mixed-neurodevelopmental intimate relationships (i.e., relationships between typically-developing individuals and individuals who have autism spectrum disorders) and same-neurodevelopmental relationships (i.e., intimate relationships between two typically developing people or two people with autism spectrum disorders). In addition to concerns regarding mixed-neurodevelopmental intimate relationship difficulties, common conjectures include the suppositions that 1) typically developing individuals with lower than average levels of autism traits are more likely than other typically developing individuals to self-select intimate partners with high-cognitive autism, 2) individuals with high-cognitive autism are more satisfied in intimate relationships when they choose a relationship with another person who also has high-cognitive autism, 3) all partners experience higher quality of relationship when their own levels of autism traits more closely match their intimate partners' levels, regardless of level of autism traits or diagnosis, and 4) typically developing partners experience more distress related to mixed-neurodevelopmental intimate partnerships than do their partners with ASD. .

Measuring Quality of Intimate Relationships

The Quality of Relationships Inventory (QRI) is a widely used relationship-specific measure of perceived social support that assesses three distinct features of relationships: 1) *support*, defined as the perceived availability of support from a relationship with a specific individual, 2) *conflict*, defined as the perception of the extent to which a relationship with a specific individual is a source of conflict, and 3) *depth*, defined as the extent to which the specific relationship is perceived as positive, secure and important. Participants are asked to consider a specific important relationship such as a romantic partnership or a relationship with a parental figure or a friend and to score their perceptions of the relationship on a 4-point Likert-like scale (Pierce, 1994; Pierce, Sarason, Sarason, Solky-Butzel, & Nagle, 1997).

Research has demonstrated that the QRI predicts individuals' loneliness, anxiety, self-esteem, depression, etc. (Pierce, Sarason, Sarason, Solky-Butzel & Nagle, 1997; Ptacek, Pierce, Eberhart, & Dodge, 1999) and scores have been demonstrated to be consistent and strong predictors of current social behaviors towards the specific individual about whom the measure was used (Gurung, Sarason, & Sarason, 1997; Verhofstadt, Rosseels, & Peene, 2006). The QRI's psychometric properties have been examined in cross-sectional, longitudinal and experimental research designs and have been demonstrated to be reliable and to have predictive and discriminate validity and test-retest stability (Nakano et al., 2002; Pierce, 1994; Pierce et al., 1991; Verhofstadt et al., 2006).

The QRI was developed in response to the need for a valid, psychometrically sound instrument that measures support inherent in specific individual relationships that

can be used in clinical, research and other applied settings (Pierce, 1994). Earlier social support constructs had defined support in terms of quality or quantifiable aspects of a social network such as size, density and proportion of family networks and friends (Stokes, 1985; Vaux & Harrison, 1985). In contrast, the QRI measures individuals' perceived support related to the contribution of particular relationships such as marital relationships, parent-child relationships, caregiver-recipient relationships, and older parents-adult child caregiver relationships (Pierce, 1994).

Study participants were asked to respond to the QRI only regarding their relationships with their intimate partners. Relationships are interdependent and quality of secondary relationships does affect the overall quality of any individual's total support system; the impact of what are generally considered to be more secondary relationships on the primary intimate adult relationship were not measured, however. It is unknown if secondary relationships, such as parent-child relationships and peer relationships become more important to typically developing individuals in mixed-neurodevelopmental intimate partnerships due to perceived lack of support from partners with autism spectrum disorders. Such an investigation is outside the scope of this preliminary study.

Measuring Level of Autism Traits

Autism traits are continuously distributed within the general population (Constantino & Todd, 2003) and occur more often in family members of individuals diagnosed with autism spectrum disorders than among others. Individuals diagnosed with ASD assumedly have the highest levels of autism traits and their non-autism relatives who have a high-trait phenotypic expression but do not meet full ASD diagnostic criteria

belong to the *broader autism phenotype* (Hurley et al., 2007). Lowest expression of autism traits exists in the general population (Constantino & Todd, 2003, 2005).

The Subthreshold Autism Trait Questionnaire (SATQ) is a short five-factor self-report measure that was developed to measure level of autism traits in all members of the population. The SATQ was administered to 1,709 students and scores were continuously distributed in a normal bell curve. It has five subscales: social interaction and enjoyment, oddness, reading facial expressions, expressive language, and rigidity. These subscales have demonstrated convergent validity with other self-report ASD measures (Kanne, Wang, & Christ, 2012) including the Autism-Spectrum Quotient (AQ) (Baron-Cohen et al., 2001) and the Broader Autism Phenotype Questionnaire (BAPQ) (Hurley et al, 2007). Likewise, the measure accurately distinguished between students who had and had not been diagnosed with ASD, with diagnosed individuals having higher mean scores. Structural validity was established and internal consistency was adequate with a test-retest of r = .79 and Cronbach's Alpha of .73 (Kanne et al., 2012).

Study Aims and Hypotheses

This study introduces the concept of mixed-neurodevelopmental intimate relationships (i.e., relationships between typically-developing individuals and individuals who have autism spectrum disorders), sheds light on the experiences of typically developing individuals in mixed-neurodevelopmental relationships, and conducts an initial investigation of common conjectures regarding mixed-neurodevelopmental and same-neurodevelopmental intimate relationships (i.e., relationships between two typically developing people or two people with autism spectrum disorders).

Aim 1: Comparison of Typically Developing Partners' QRI, Mixed-Neurodevelopmental Relationships vs. Same-Neurodevelopmental Relationships

This aim investigated whether typically developing individuals who report they are in mixed-neurodevelopmental relationships report lower quality of intimate relationships than typically developing individuals who report they are in same-neurodevelopmental intimate relationships.

It was hypothesized that typically developing individuals who report that their intimate partners have been diagnosed with ASD report lower quality of intimate relationship on all three subscales (support, conflict, and depth) of the Quality of Relationship Inventory (QRI) (Pierce, 1994; Pierce, Sarason, Sarason, Solky-Butzel, and Nagle, 1997) than typically developing individuals who report they are in same-neurodevelopmental relationships.

Aim 2: Comparison of Typically Developing Partners' QRI, Reported Diagnosed ASD Partners vs. Reported Undiagnosed ASD Partners

This aim sought to call attention to the fact that some typically developing individuals within the autism community believe their partners have ASD without a confirmed diagnosis. It intentionally focuses on typically developing partners' reports of undiagnosed ASD. There is a certain level of necessary doubt that must be applied anytime an individual reports that an intimate partner qualifies for a particular diagnosis. Doubt may be even more appropriate when an intimate partner reports belief in a diagnosis that has not been made by a trained professional. Due to the symptoms of high-cognitive autism, however, it is possible that many typically developing intimate partners really are in relationships with individuals who have undiagnosed ASD and that in

addition to facing challenges related to their partners' disorders, they are facing challenges related to not being believed that their partners' ASD actually exists.

It was hypothesized that typically developing individuals who believe their partners have undiagnosed ASD, will report *similar* quality of intimate relationships on all three subscales (support, conflict and depth) of the Quality of Relationships Inventory (QRI) (Pierce, 1994; Pierce et al., 1997) as typically developing individuals who report that their partners have been diagnosed, and *lower* quality of intimate relationship than typically developing individuals in same-neurodevelopmental intimate relationships.

Aim 3: Comparison of Typically Developing Partners' SATQ, Mixed-Neurodevelopmental Relationships vs. Same-Neurodevelopmental Relationships

This aim investigated the possibility that typically developing individuals who self-select into mixed-neurodevelopmental intimate partnerships have lower levels of autism traits than typically developing individuals who choose intimate partnerships with other typically developing individuals.

It was hypothesized that typically developing individuals who report that their partners have been diagnosed with autism will have significantly lower Subthreshold Autism Trait Questionnaire (SATQ) scores (Kanne et al., 2012) than typically developing individuals who report that they are not in mixed-neurodevelopmental relationships.

Aim 4: Investigation of Difference in Partners' SATQ Scores and Quality of Intimate Relationships

This aim explored the possibility that intimate partnerships between two individuals with similar levels of autism traits are of a higher quality than intimate relationships between two individuals who have dissimilar levels of autism traits.

It was hypothesized that a lower difference between intimate partners' Subthreshold Autism Trait Questionnaire (SATQ) scores (Kanne et al., 2012) is associated with a higher level of quality of intimate relationship as measured by the Quality of Relationships Inventory (QRI) (Pierce, 1994; Pierce et al., 1997) and as reported by both members of the intimate partnerships.

Aim 5: Comparison of QRI of Typically Developing and ASD Partners in Mixed-Neurodevelopmental Relationships

This aim explored the possibility that typically developing members of mixed-neurodevelopmental intimate relationships experience lower quality of intimate relationship than their ASD partners.

It was hypothesized that typically developing partners in mixed-neurodevelopmental intimate relationships would report lower mean Quality of Relationships Inventory (QRI) scores (Pierce, 1994; Pierce et al., 1997) than their intimate partners who self-report to have been diagnosed with ASD and who have Subthreshold Autism Trait Questionnaire (SATQ) scores above 40.8 (Kanne et al., 2012).

Significance of Study

This study introduces the concepts of mixed-neurodevelopmental and same-neurodevelopmental intimate adult partnerships, emphasizes the perspective of the typically developing partner and stresses the need for further research. Despite the many unique difficulties typically developing partners may face as a result of their intimate partners' ASD, typical partners' perspectives often remain relatively unrecognized or unnoticed by mental health professionals. This study draws attention to the typically developing partner perspective and investigates their perceptions of the quality of mixed-neurodevelopmental intimate relationships.

Chapter II

Method

The study was conducted online using a survey tool, Survey Monkey, and was promoted from the website www.relationshipqualitystudy.com. Participants were asked to complete two formal self-report measures, the Quality of Relationships Inventory (QRI) (Pierce, 1994; Pierce et al., 1997), and the Subthreshold Autism Trait Questionnaire (SATQ) (Kanne et al., 2012), a short demographics questionnaire, and a set of intimate partner pairing questions. Participants filled out the QRI first, the SATQ second, the short demographics questionnaire third, and the pairing questions last.

Participants

A total of 218 individuals participated in the study. Advertisements recruiting individuals over the age of 18 who had been in intimate partnerships for at least one year were placed online. All respondents who reported they were at least 18 years of age, accepted the adult consent form, and reported they had been in an intimate relationship for at least one year were allowed to participate in the study. Individuals who did not make these statements were directed to an online disqualification page. The study and all promotions were written in English and it is assumed all participants were fluent English speakers who had Internet access. No study participants were paid. Participants spent an average of 7 minutes and 18 seconds completing the study.

The study was promoted as a "study for intimate partners" and its public stated purpose was to "explore the impact of high levels of autism traits on the quality of intimate adult relationships." Institutions supporting autism, bloggers, psychotherapists who work with children and adults with autism, and others within the autism community were asked to share the study with their contacts and clients and, in some cases, their clients' parents. It is assumed that individuals who self-selected to participate in the study were more likely than the general population to be interested in the impact of autism on intimate relationships and more likely than the general population to be in a mixed-neurodevelopmental relationships or to have considered the impact of ASD on intimate relationships in the past.

Measures

The study protocol employed two formal self-report measures, the Quality of Relationships Inventory (QRI) (Pierce, 1994; Pierce et al., 1997), and the Subthreshold Autism Trait Questionnaire (SATQ) (Kanne et al., 2012), as well as a short demographics questionnaire and a set of intimate partner pairing questions.

Quality of Relationships Inventory (QRI)

The Quality of Relationships Inventory (QRI) (Pierce, 1994; Pierce et al., 1997) is 25-item self-report index that measures the quality of a specified potentially supportive interpersonal relationship on a 4-point Likert-like scale. Respondents were asked to, "Please use the scale below to answer the following questions regarding your relationship

with your intimate partner," and were then provided with the scale of "1-Not at all, 2-A little, 3-Quite a bit, and 4-Very much."

The QRI support scale consists of 7 items (e.g. "To what extent could you count on this person for help with a problem?" and "To what extent can you count on this person to listen to you when you are very angry at someone else?") and measures the extent to which a respondent believes the other individual to be someone who can be relied upon regardless of circumstances. The conflict scale has 12 items (e.g. "How much does this person make you feel guilty?" "How much do you argue with this person?" "How often does this person try to control or influence your life?" and "How much more do you give than you get from this relationship?") and measures the degree to which a respondent anticipates conflict from a potential support provider. It is necessary to measure support and conflict separately because supportive relationships are not necessarily free of conflict and supportive as well as unsupportive relationships can be sources of anger, distress and ambivalence (Hirsch, 1979; Pierce et al., 1991). The depth scale consists of 6 items (e.g. "How significant is this relationship in your life?" and "How much would you miss this person if the two of you could not see and talk with each other for a month?") and refers to the relationship's importance to the respondent and the significance it plays in the respondent's life regardless of perceived levels of conflict or social support (Pierce, 1994). See Appendix 1.

In general, higher scores on each of the QRI's three subscales indicates a higher manifestation of that feature within the specified relationship. For example, a higher score on the QRI support scale indicates a higher level of support within the relationship and a higher score on the conflict scale indicates a higher level of conflict within the

relationship (Pierce, 1994; Pierce et al., 1997). For the purposes of this study, the scores on the conflict scale were inverted so that a higher score on the conflict scale indicated a lower level of conflict within the relationship and a higher quality of relationship. This change was made to simplify reporting, reduce confusion and so that mean QRI scores (means of individuals' scores on the support, conflict and depth subscales) could be also be used.

QRI was used as the dependent variable throughout the study.

Subthreshold Autism Trait Questionnaire (SATQ)

The Subthreshold Autism Trait Questionnaire (SATQ) (Kanne et al., 2012) is a 24-item five-factor self-report instrument that measures levels of autism traits in all members of the population on a 4-point Likert-like scale. High scores indicate higher level of autism traits and item totals are added together to determine a participant's score. The SATQ does not and cannot diagnose ASD. Participants' SATQ scores offer a numerical value that represents participants' levels of autism traits.

Study respondents were told, "For each item, please use the scale below to rate the extent to which it describes you on most days. There are no right or wrong answers. Please answer all of the items the best that you can" and were provided the scale of "0 - false, not at all true, 1 - slightly true, 2 - mainly true, 3 - Very true." They then rated themselves on eight items in the social interaction and enjoyment factor (e.g. Others consider me warm, caring and/or friendly), five items in the oddness factor (e.g. I have some behaviors that others consider strange or odd), three items in the reading facial expressions factor (e.g. I can sense that someone is not interested I what I'm saying by reading their facial expressions), three items in the expressive language factor (e.g. I am

good at using words to express my thoughts and ideas), and five items in the rigidity factor (e.g. I tend to stick to routines in my day to day life, preferring to do things the same way). Items were not sorted by factor and all participants responded to the items in the same order. See Appendix 2.

The SATQ was used for two purposes. Firstly, it was used to corroborate reports of participants' ASD diagnosis. Kanne et al. (2012) administered the SATQ to 17 students who had been diagnosed with an autism spectrum disorder. The students with ASD diagnoses had SATQ scores that ranged from 7 to 57 with a mean of 40.8 and a standard deviation of 13.6. Participants of the current study who reported that they had been diagnosed with ASD and who had an SATQ score above the mean found by Kanne et al. (2012), 40.8, were considered, for the purposes of this study, to have *corroborated* ASD. While it is impossible to confirm the validity of any report made during an anonymous online study, the corroboration of an SATQ score adds a higher level of certainty that reports of ASD diagnoses are indeed accurate.

Secondly, the SATQ (Kanne et al., 2012) was used to determine the difference in levels of autism traits between individuals and their intimate partners when their intimate partners also participated in the study. When both members participated, the absolute value of the difference between their SATQ scores was calculated to represent the difference between the partners' levels of autism traits. In study Aim 4, the absolute value of the difference between intimate partners' SATQ scores was used as the independent variable.

Short Demographics Questionnaire

Some items on the short demographics questionnaire ("What is your gender?" "What is your age?" "What is your highest level of education in years?" "How many years have you been in your relationship with your intimate partner?" and "Do you live with a child who has been diagnosed with an autism spectrum disorder?") were used to investigate other possible predictive variables.

The independent variable *report of intimate partner's diagnosis* was determined by participants' answers to the items "Have you ever been diagnosed with an autism spectrum disorder?" "Do you believe you might have an autism spectrum disorder?" "Has your intimate partner ever been diagnosed with an autism spectrum disorder?" and "Do you believe your intimate partner may have an autism spectrum disorder?" as well as SATQ scores (Kanne et al., 2012). See Appendix 3.

Pairing Questions

Both members of a total of 25 intimate couples (made up of 50 participants) completed the study. 40 participants, or 20 couples, were paired to their intimate partners through the use of an optional matching password both partners provided at the end of the study. 10 participants, or 5 couples, were paired to their intimate partners through their responses to items asking for the month and day of their own births, the month and day of their partners' births, and the names of the cities where they first met their intimate partners. Respondents were told the information would be used to "help us create the right study groups." See Appendix 3.

Procedures

This study employed four protocols: participant recruitment, data collection, study protocol, and participant exclusion. The study was promoted on the website www.relationshipqualitystudy.com and data was gathered using an online survey tool, Survey Monkey. Participants responses were used to explore study aims as explained in the Data Analysis section below.

Participant Recruitment

A website, www.relationshipqualitystudy.com, was purchased and designed to promote the study. The website stated that the purpose of the study was to "explore the impact of high levels of autism traits on intimate adult relationships" and that "anyone who has been in an intimate relationship for at least one year and is over the age of 18 is welcome to participate." As paired intimate partners were necessary to address study aims three and four, the website also read, "Please ask your intimate partner to fill out the study, too. We need both of you."

Participants were told that they would "be asked approximately 70 questions," that "50 questions will ask you to select the best of four possible options," and that "other questions are multiple choice, short answer or selections from a dropdown menu." Participants were told it would take "approximately 10 to 20 minutes to complete the study."

Participants were informed that their answers would "be completely anonymous" and "kept confidential." They were informed they would be "asked to provide first initials, months and days of birth and the name of the city where you first met your

intimate partner so researchers can match your answers to your intimate partner's answers." They were provided a link to an online and printable consent form.

Recruitment texts linking to the website were posted to approximately 25 autism-related Facebook groups. Emails including a website link, recruitment text, and printable flyer were sent to approximately 150 metal health and human services professionals who regularly work with members of the autism community requesting they share the study with their clients or their clients' parents. Online forms or emails were sent to multiple chapters of various autism-related organizations with the website link, recruitment text and, when possible, flyer. A small number of prominent members of the online autism community were requested to share the study with their audiences. All contacts were encouraged to share the website link.

Data Collection

Data were collected using the online survey tool, Survey Monkey. Survey Monkey is a web-based survey software that allows users to input survey questions into an online form, compiles surveys into a user-friendly format and allows users to share the surveys with their audiences through web links and other means.

Qualification questions, the QRI (Pierce, 1994; Pierce et al., 1997), the SATQ (Kanne et al., 2012), the short demographics questionnaire and the intimate partner pairing questions were input into Survey Monkey. A selection in the online software to prevent collection of IP addresses was made in order to protect participant privacy and confidentiality. No attempts were made to connect Facebook posts or recruitment emails with study responses. A Survey Monkey web link collector was created to distribute the survey. The web link was posted to the www.relationshipqualitystudy.com website.

Study Protocol

Individuals who clicked on the web link were forwarded to the Survey Monkey data collector. They were first required to answer whether or not they were at least 18 years of age, whether they had been in an intimate partnership for at least one year, whether or not their intimate partner would also complete the study and whether or not they had read and accepted the Relationship Quality Study consent form.

Individuals who reported they were at least 18, that they had been in an intimate relationship for at least one year, and that they accepted the consent form were forwarded to the study. All others were sent to a disqualification page that simply said, "That's the end of the preview!"

Individuals were allowed to choose between three options when asked whether or not their intimate partners would also participate: "1) My intimate partner has already filled out this study, 2) My intimate partner will fill out this study in the near future, and 3) My intimate partner will not be filling out the study at any time." None of the three options excluded any individual from participation in the study. The purpose of the question was only to remind individuals of the request that their partners also participate.

218 individuals qualified for participation in the study and proceeded beyond the qualification questions. Those who qualified were next asked to fill out the QRI (Pierce, 1994; Pierce et al., 1997) and then the SATQ (Kanne et al., 2012) followed by the short demographics questionnaire and the additional pairing questions.

It is assumed that individuals who self-selected to participate were more likely than the general population to be in mixed-neurodevelopmental intimate relationships because the study was promoted as a study investigating autism in intimate relationships.

Participant Exclusion

42 (19%) of the 218 total participants completed none or only some of the first inventory, the QRI (Pierce, 1994; Pierce et al., 1997), before discontinuing participation. Their scores were removed from the dataset. All of the 176 subjects who proceeded beyond the QRI also completed the SATQ (Kanne et al., 2012). Three individuals who completed both the QRI and the SATQ did not complete any of the short demographics questionnaire and their data was removed from the dataset. A total of 173 participants completed the study.

94 (54%) of the 173 remaining participants believed themselves to be typically developing, had never been diagnosed with autism and had SATQ scores below 40.8, the mean among 17 students having ASD found by Kanne et al. (2012). For the purposes of this study, these participants were considered to be typically developing and were eligible for inclusion in study Aims 1 through 3. 46 typically developing participants reported they were in diagnosed mixed-neurodevelopmental partnerships, 35 reported they were in undiagnosed mixed partnerships, and 13 reported they were same-neurodevelopmental intimate relationships or relationships with other typically developing individuals. The remaining 79 (46%) participants had either been diagnosed with ASD, believed themselves to have ASD or had SATQ scores above 40.8 (Kanne et al., 2012) and were not eligible for study inclusion unless their intimate partners also completed the study.

50 (29%) of the 173 participants who completed the study were paired to their intimate partners using the intimate partner pairing questions for a total of 25 couples. All individuals whose intimate partners also participated in the study were included in study Aim 4. Participants whose partners also completed the study and who were determined to

be in corroborated mixed-neurodevelopmental intimate partnerships based on both partners' self-reports of diagnoses and both partners' SATQ scores were included in study Aim 5. Nine of the 25 participating couples (18 individuals) qualified for inclusion in Aim 5.

One SATQ-corroborated and reportedly diagnosed ASD-ASD couple, and one couple with both members having SATQ scores above 40.8 (Kanne et al., 2012) and both believing themselves to have ASD despite the fact that only one self-reported formal diagnosis, completed the study. For the purpose of this study, both of these couples will be considered ASD-ASD same-neurodevelopmental couples and their QRI (Pierce, 1994; Pierce et al., 1997) scores will be noted and discussed the discussion section below.

Data Analysis

The methods of data analysis for each aim are delineated below.

Aim 1: Comparison of Typically Developing Partners' QRI, Mixed-Neurodevelopmental Relationships vs. Same-Neurodevelopmental Relationships. Aim 1 sought to demonstrate that typically developing individuals who report that their intimate partners have been diagnosed with ASD report lower quality of intimate relationships than individuals who do not report or believe that their intimate partners have ASD.

The independent variable was *report of intimate partner's diagnosis* and the dependent variable was QRI scores on all three of the QRI subscales (i.e., support, conflict, depth) (Pierce, 1994; Pierce et al., 1997). The independent variable, report of intimate partner's diagnosis, was a nominal variable with four distinct categories: 1) reported diagnosed partners without corroboration, 2) reported believed without diagnosis

or corroboration, 3) corroborated and reported diagnosed partners and 4) reported typically-developing-typically-developing relationships with or without corroboration. For the purposes of this study, an intimate partner's ASD diagnosis was only considered to be "corroborated" if the intimate partner also completed the study, also self-reported ASD diagnosis and had an SATQ score above 40.8, the mean found by Kanne et al. (2012).

Only participants who self-reported they did not have ASD, did not believe they had ASD and had an SATQ score below 40.8, the mean found by Kanne et al. (2012), were considered to be typically developing and qualified for inclusion in this analysis. Participants who were grouped as "reported diagnosed partners without corroboration" reported that their partners were diagnosed, but had intimate partners who did not also complete the study. "Reported believed without diagnosis or corroboration" reported that they believed their partners had autism despite lack of formal diagnosis, but had intimate partners who did not also complete the study. "Corroborated and reported diagnosed partners" reported their intimate partners had been diagnosed, and had intimate partners who also completed the study, who also self-reported they had been diagnosed, and who had SATQ scores above 40.8 (Kanne et al., 2012). "Reported typically-typically-developing relationships with or without corroboration" were participants who did not report their partners had ASD, who did not believe their partners had ASD and who, if their partners also completed the study, had partners who also had an SATQ score below 40.8 and did not self-report themselves to be diagnosed or to believe they had ASD.

Three one-way analysis of variance (ANOVA) procedures were conducted to test this hypothesis and simple tests of contrasts comparing QRI scores (Pierce, 1994; Pierce

et al., 1997) of typically developing participants in same-neurodevelopmental relationships to typically developing individuals in reported diagnosed, reported undiagnosed, and corroborated mixed-neurodevelopmental relationships.

It was predicted that QRI scores on all three subscales (i.e., support, conflict, depth) would be higher for typically developing individuals in intimate relationships with other typically developing individuals than for any of the typically developing participants in mixed-neurodevelopmental relationships.

Aim 2: Comparison of Typically Developing Partners' QRI, Reported Diagnosed ASD Partners vs. Reported Undiagnosed ASD Partners. Aim 2 sought to demonstrate that typically developing individuals who believe their partners have ASD despite lack of formal diagnosis report similar quality of relationship as typically developing individuals who report their partners have been diagnosed.

Aim 2 used the same groups and same analysis of variance (ANOVA) procedure as Aim 1. Simple tests of contrasts comparing the QRI scores of typically developing individuals in reported diagnosed and reported undiagnosed mixed-neurodevelopmental relationships were performed.

Aim 3: Comparison of Typically Developing Partners' SATQ, Mixed-Neurodevelopmental Relationships vs. Same-Neurodevelopmental Relationships. Aim 3 sought to investigate the possibility that typically developing individuals in mixed-neurodevelopmental relationships have lower levels of autism traits than typically developing individuals in same-neurodevelopmental relationships.

A one-tailed t-test compared SATQ (Kanne et al., 2012) scores of typically developing individuals who reported their intimate partners had been diagnosed with ASD to typically developing individuals who reported their intimate partners had not been diagnosed with ASD and who did not believe their partners to have ASD. It was predicted that SATQ scores would be significantly lower for those who reported themselves to be in mixed-neurodevelopmental relationships.

Aim 4: Investigation of Difference in Partners' SATQ Scores and Quality of Intimate Relationships. Aim 4 investigated whether a greater difference in levels of autism traits between intimate partners is associated with a lower quality of intimate relationship for both members of the partnership.

The absolute value of the difference between the SATQ (Kanne et al., 2012) scores of each member of each partnership was calculated. A regression was performed using the this difference to establish whether a greater difference between SATQ scores would predict a lower mean QRI (Pierce, 1994; Pierce et al., 1997) for all participants whose partners also completed the study. Presence of a child with ASD in the home, gender and number of years in the intimate relationship were included as other possible predictive variables.

Aim 5: Comparison of QRI of Typically Developing and ASD Partners in Mixed-Neurodevelopmental Relationships. Aim 5 explored the possibility that typically developing members of corroborated mixed-neurodevelopmental intimate relationships experience lower quality of relationship than their intimate partners.

Nine of the 25 participating couples were determined to be in corroborated mixed-neurodevelopmental relationships because both partners agreed that the higher-autism-trait partner had been diagnosed with ASD, and because the higher-trait partner had an SATQ score above 40.8 and the lower-autism-trait partner had an SATQ score below 40.8. A paired t-test compared mean QRI scores between the ASD and the typically developing partners. It was predicted that mean QRI scores of the reported and corroborated typically developing partners would be significantly lower than mean QRI scores of the reported and corroborated ASD partners.

Chapter III

Results

The data supported the Aims 2 and 3 hypotheses, partially supported the Aim 1 hypothesis, and did not support the Aims 4 and 5 hypotheses. The results for each Aim are discussed separately below.

Aim 1: Comparison of Typically Developing Partners' QRI, Mixed-Neurodevelopmental vs. Same-Neurodevelopmental Relationships

Participants' responses to all three of the Quality of Relationship Inventory (QRI) subscales (i.e., support, conflict, depth) (Pierce, 1994; Pierce et al., 1997) were considered normally distributed. In accordance with Kline (2011), all had a skewness index below three and a kurtosis index below 20 (see Table 1). All histograms were bell shaped (see Appendix 4). Levine's test demonstrated that QRI variances were homogenous across groups for all three subscales: support ($p = .804$), conflict ($p = .283$) and depth ($p = .405$) and the assumption of homogeneity of variances was fulfilled.

It was hypothesized that typically developing individuals who report that their intimate partners have been diagnosed with autism spectrum disorder would report lower quality of intimate relationship on all three subscales (i.e., support, conflict, and depth) of the QRI than typically developing individuals who report they are in same-neurodevelopmental relationships. The independent variable was report of intimate partner's diagnosis and the dependent variable was QRI scores on all three of the QRI subscales (i.e., support, conflict, depth) (Pierce, 1994; Pierce et al., 1997).

Table 1. Skewness and Kurtosis Indices for QRI Subscales (N=94).

QRI Subscale	Skewness Statistic	Skewness Index	Kurtosis Statistic	Kurtosis Index
Support	.49	1.96	-.27	-.55
Conflict	.47	1.84	-.31	-.63
Depth	.05	.20	-.75	1.53

Note. SE for skewness statistic = .25. SE for kurtosis statistic = .49.

To test this hypothesis, three one-way analysis of variance (ANOVA) procedures were conducted comparing QRI scores (Pierce, 1994; Pierce et al., 1997) of typically developing individuals who reported themselves to be in same-neurodevelopmental intimate relationships to three groups: 1) typically developing individuals who self-reported that their intimate partners had been diagnosed with ASD, 2) typically developing individuals who self-reported that they believed their intimate partners had ASD but had not been diagnosed, and 3) typically developing individuals who reported their partners had been diagnosed with ASD and whose partners' ASD had been corroborated (ASD partners also filled out the study, had an SATQ score of above 40.8, (Kanne et al., 2012), and self-reported ASD diagnosis).

QRI Support

As shown in Table 2, QRI support scores (Pierce, 1994; Pierce et al., 1997) differed significantly across groups, $F(3, 90) = 15.45$, $p < .001$. The test of simple contrasts indicated that typically developing individuals who self-reported themselves to be intimate relationships with other typically developing individuals had significantly

higher mean QRI support scores (M = 3.21, SD = .47) than those who reported having a diagnosed partner without corroboration (M = 2.24, SD = .51; $p < .001$), those who reported they believed their partners had ASD without diagnosis or corroboration (M = 2.07, SD = .56; $p < .001$), and those whose intimate partners' ASD had been corroborated (M = 2.49, SD = .56; $p = .002$).

QRI Conflict

As shown in Table 2, QRI conflict scores (Pierce, 1994; Pierce et al., 1997) differed significantly across groups, $F(3, 90) = 10.81$, $p < .001$. The test of simple contrasts indicated that typically developing individuals who self-reported themselves to be intimate relationships with other typically developing individuals had significantly higher mean QRI conflict scores (M = 2.80, SD = .64) than those who reported having a diagnosed partner without corroboration (M = 1.91, SD = .48; $p < .001$), those who reported they believed their intimate partners had ASD without diagnosis or corroboration (M = 1.98, SD = .48; $p < .001$), and those whose intimate partners' ASD had been corroborated (M = 2.33, SD = .64; $p = .040$).

QRI Depth

As shown in Table 2, QRI depth scores (Pierce, 1994; Pierce et al., 1997) differed significantly across groups, $F(3, 90) = 9.14$, $p < .001$. The test of simple contrasts indicated that typically developing individuals who self-reported themselves to be intimate relationships with other typically developing individuals had significantly higher mean QRI scores (Pierce, 1994; Pierce et al., 1997) depth scores (M = 3.19, SD = .40) than those who reported having a diagnosed partner without corroboration (M = 2.57, SD

= .54; p < .001) and those who reported they believed their intimate partners had ASD without diagnosis or corroboration (M = 2.44, SD = .49; p < .001). The typically developing individuals who self-reported they were in same-neurodevelopmental intimate relationships did *not* have QRI depth scores that differed significantly from typically developing individuals in corroborated mixed-neurodevelopmental relationships, p = .416.

Table 2. Means, Standard Deviations, and ANOVA Results for QRI Scores Across Groups (N=94)

	Diagnosed without Corroboration (n = 37)		Believed without Diagnosis or Corroboration (n = 35)		Corroborated and Diagnosed (n = 9)		Typically Developing (n = 13)			
QRI Subscale	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*df*	*F*
Support	2.24	.51	2.07	.56	2.49	.56	3.21	.47	3,90	15.45 ***
Conflict	1.91	.48	1.98	.48	2.33	.62	2.80	.64	3, 90	10.81 ***
Depth	2.58	.54	2.44	.49	3.01	.46	3.12	.39	3, 90	9.14 ***

* $p < .05$. ** $p < .01$. *** $p < .001$.

Summary

With one exception, participants' QRI conflict, support and depth scores were significantly lower among typically developing adults in reported diagnosed, undiagnosed and corroborated mixed-neurodevelopmental relationships than they were among typically developing adults in same-neurodevelopmental relationships. There was no significant difference between QRI depth scores (Pierce, 1994; Pierce et al., 1997)

between typically developing individuals in same-neurodevelopmental relationships and those in *corroborated* mixed-neurodevelopmental relationships. As such, the Aim 1 hypothesis was partially supported.

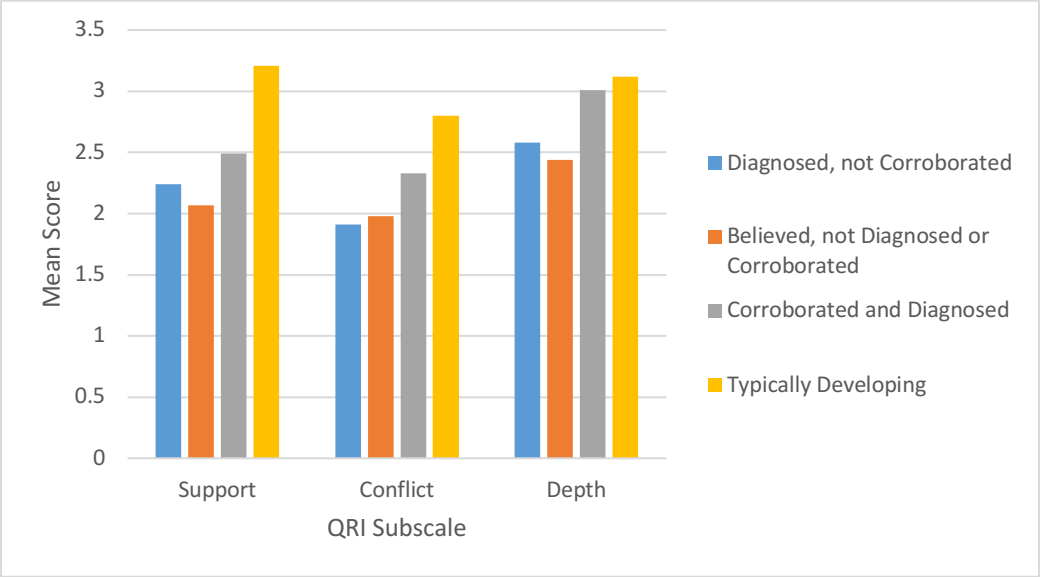


Figure 1. Mean QRI Subscale Scores.

Aim 2: Comparison of Typically Developing Partners' QRI, Reported Diagnosed ASD Partners vs. Reported Undiagnosed ASD Partners

The preliminary screening procedures used for Aim 1 were applied to Aim 2 because the same ANOVA procedures used for Aim 1 were also used for Aim 2.

Aim 2 hypothesized that typically developing individuals who believe their partners have undiagnosed ASD would report *similar* quality of intimate relationships on all three subscales (i.e., support, conflict and depth) of the Quality of Relationships

Inventory (QRI) (Pierce, 1994; Pierce et al., 1997) as typically developing individuals who report that their partners have been diagnosed.

To test this hypothesis, three one-way analysis of variance (ANOVA) procedures were conducted (i.e., the same ANOVA procedures for Aim 1). Test of simple contrast comparisons were made between typically developing partners in reported diagnosed and reported undiagnosed mixed-neurodevelopmental relationships.

QRI Support

The findings in Table 2 reveal that QRI support scores (Pierce, 1994; Pierce et al., 1997) differed significantly across groups, $F(3, 90) = 15.45$, $p < .001$. The test of simple contrasts indicated that those who reported believing their partner had an ASD without diagnosis ($M = 2.07$, $SD = .56$) did not differ significantly from those who reported having a diagnosed partner ($M = 2.24$, $SD = .51$; $p = .167$).

QRI Conflict

As shown in Table 2, QRI conflict scores (Pierce, 1994; Pierce et al., 1997) differed significantly across groups, $F(3, 90) = 10.81$, $p < .001$, but the simple contrasts results were not significant. Therefore, those who reported believed without diagnosis *($M = 1.98$, $SD = .48$)* did not differ significantly from those who reported their partners had been diagnosed *($M = 1.91$, $SD = .51$; $p = .582$).*

QRI Depth

The findings in Table 2 show that QRI depth scores (Pierce, 1994; Pierce et al., 1997) differed significantly across groups, $F(3, 90) = 9.14$, $p < .001$. The test of simple

contrasts indicated that those who reported believed without diagnosis (M = 2.44, SD = .49) did not differ significantly from those who reported their partners had been diagnosed (M = 2.58, SD = .54; p = .249).

Summary

The mean QRI scores (Pierce, 1994; Pierce et al., 1997) for those who reported they believed their partners had an undiagnosed autism spectrum disorder did not differ significantly from those who reported their intimate partners had been diagnosed. As such, the Aim 2 hypothesis was supported.

Aim 3: Comparison of Typically Developing Partners' SATQ, Mixed-Neurodevelopmental Relationships vs. Same-Neurodevelopmental Relationships

The SATQ variable was distributed normally. Its skewness index was 2.92 (i.e., .91/.33) and its kurtosis index was 1.63 (i.e., .99/.61). Further, as shown in Appendix 4, the histogram was bell-shaped.

It was hypothesized that typically developing individuals in mixed-neurodevelopmental relationships would have lower levels of autism traits than typically developing individuals in same-neurodevelopmental relationships. To test this hypothesis, an independent t-test procedure was conducted.

The findings in Table 3 reveal that SATQ scores differed significantly across groups, t(57) = -2.74, p = .004. Typically developing individuals in mixed-neurodevelopmental relationships had significantly lower SATQ scores (M = 14.07, SD =

6.81) than typically developing individuals in same-neurodevelopmental relationships (M = 20.38, SD = 9.08). Therefore, the Aim 3 hypothesis was supported.

Table 3. Means, Standard Deviations, and Independent t-test Results for SATQ Scores (N=59).

	Diagnosed ASD (n = 46)		Diagnosed TD (n = 13)			
Variable	*M*	*SD*	*M*	*SD*	*df*	*t*
SATQ	14.07	6.81	20.38	9.08	57	-2.74 **

Note. Per Levene's test, variances were equal, p = .113.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Aim 4: Investigation of Difference in Partners' SATQ Scores and Quality of Intimate Relationships

As shown in Table 4, all variables had a skewness index below three and a kurtosis index below 20. Further, as shown in Appendix 4, all histograms were bell-shaped. Therefore, all variables were distributed normally. Prior to conducting the regression procedures, the assumptions of multivariate normality, linearity, homoscedasticity, and the absence of multi-collinearity were assessed. Per Norusis (1994), the assumption of normality is met when the points in the normal probability plot are clustered towards the diagonal. As the points were clustered towards the diagonal in the normal probability plots, the assumption of normality was met. The assumptions of linearity and homoscedasticity are met when the plot of the studentized deleted residuals by the standardized predicted values yields a random scatter (Norusis, 1994). All plots

yielded a random scatter; thus, the assumptions of linearity and homoscedasticity were met. Multi-collinearity is problematic if Tolerance values are below .20 (Tabachnick & Fidell, 2012). Tolerance values ranged from .68 to .92; as such, multi-collinearity was not problematic. See Appendix 5.

Table 4. Skewness and Kurtosis Indices for the Aim 4 Variables (N = 25).

Variable	Skewness		Kurtosis	
	Statistic	Index	Statistic	Index
Difference in SATQ	-.21	-.46	-1.09	-1.21
Relationship years	.90	1.96	.93	1.03
QRI for partner 1	.16	.35	-.28	-.31
QRI for partner 2	.50	1.09	-.77	-.86

Note. SE for skewness statistic =.46. SE for kurtosis statistic = .90.

Table 5. Linear Regression for the QRI of ASD Partner (N = .25).

Variable	*B*	*SE*	β	*t*
Gender of ASD partner	.01	.34	.00	.02
Relationship years	-.13	.11	-.29	-1.20
No ASD child vs. has ASD child	.16	.17	.23	.95
Difference in SATQ scores	.00	.01	.08	.35

Note. Overall model F(4, 20) = .66, p = .624, R2 =.117

* $p < .05$. ** $p < .01$. *** $p < .001$.

It was hypothesized that a greater difference in levels of autism traits between intimate partners would significantly predict a lower quality of intimate relationship for

both members in the partnership. To test this hypothesis, two regression procedures were conducted (one for each partner in the relationship).

The findings in Table 5 reveal that the difference in levels of autism traits between intimate partners did not significantly predict mean QRI score (Pierce, 1994; Pierce et al., 1997) of the partner with ASD, β = .08, p = .732. Gender of partner with ASD, relationship length in years, and presence of a child with ASD in the home did not predict mean QRI score of the ASD partner.

Table 6. Linear Regression Results for QRI of Typically Developing Partner (N = 25).

Variable	*B*	*SE*	β	*t*
Gender of TD partner	1.01	.65	.39	1.55
Relationship years	.13	.15	.21	.89
No ASD child vs. has ASD child	.23	.21	.23	1.09
Difference in SATQ scores	-.00	.01	-.03	-.14

Note. Overall model F(4, 20) = 1.52, p = .235, R^2 =.233.

* $p < .05$. ** $p < .01$. *** $p < .001$.

The findings in Table 6 show that the difference in levels of autism traits between intimate partners also did not significantly predict mean QRI score (Pierce, 1994; Pierce et al., 1997) of the typically developing partner, β = -.03, p = .893. Gender of the typically developing partner, relationship length in years, and presence of a child with ASD did not predict mean QRI score of the typically developing partner.

Given both sets of findings, the Aim 4 hypothesis was not supported.

Aim 5: Comparison of QRI of Typically Developing and ASD Partners in Mixed-Neurodevelopmental Relationships

The findings in Table 7 show that all variables had a skewness index below three and a kurtosis index below 20. Further, as shown in Appendix 4, all histograms were bell-shaped. Therefore, all variables were distributed normally.

Table 7. Skewness and Kurtosis Indices for the Mean QRI Variables (N = 9).

Variable	Skewness Statistic	Skewness Index	Kurtosis Statistic	Kurtosis Index
Mean QRI of TD partner	.72	1.00	1.67	1.19
Mean QRI of ASD partner	-.20	.28	1.70	1.21

Note. SE for skewness statistic = .72. SE for kurtosis statistic = 1.40.

Table 8. Means, Standard Deviations and Paired t-test Results for QRI Scores of Typically Developing and ASD Partners in Mixed-Neurodevelopmental Relationships (N = 9).

	Typically Developing		Corroborated ASD			
Variable	*M*	*SD*	*M*	*SD*	*df*	*t*
QRI	2.62	.44	2.94	.30	9	-1.63

* $p < .05$. ** $p < .01$. *** $p < .001$

It was hypothesized that the typically developing members of corroborated mixed-neurodevelopmental intimate relationships would experience lower quality of

relationship than their intimate partners. A paired t-test was conducted to test this hypothesis. The findings in Table 8 indicate that mean QRI scores (Pierce, 1994; Pierce et al., 1997) did not differ across partners, $t(8) = -1.63$, $p = .071$. The Aim 5 hypothesis was not supported. Note, however, that the means were in the predicted direction; with a larger sample size, the hypothesis could have been supported.

Chapter IV

Discussion

Findings demonstrate that 1) typically developing individuals in mixed-neurodevelopmental intimate adult relationships (i.e., intimate relationships with individuals with ASD) report lower quality of intimate relationship than typically developing individuals in same-neurodevelopmental relationships (i.e., intimate relationships with other typically developing individuals), 2) typically developing individuals who report they believe their partners have *un*diagnosed ASD report no significant difference in relationship quality than typically developing individuals who report their partners have diagnosed ASD, 3) typically developing individuals who report to be in mixed-neurodevelopmental relationships have lower levels of subthreshold autism traits than typically developing individuals who report to be in same-neurodevelopmental relationships, 4) among mixed and same-neurodevelopmental partnerships, no association between differences in partners' levels of autism traits and partners' perceptions of intimate relationship quality is found, and 5) while no conclusive difference between typically developing partners' and ASD partners' reports of relationship quality is found, mean QRI scores are in the predictive direction of establishing that typically developing individuals experience lower quality of intimate relationship than their ASD partners. A greater sample size is necessary.

Each study Aim is discussed separately below.

Aim 1: Comparison of Typically Developing Partners' QRI, Mixed-Neurodevelopmental vs. Same-Neurodevelopmental Relationships

As hypothesized, the Aim 1 findings demonstrate that typically developing partners in mixed-neurodevelopmental relationships experience lower quality of intimate relationships than typically developing partners in intimate relationships with other typically developing individuals. With one exception, QRI scores of typically developing individuals in same-neurodevelopmental relationships were significantly higher on all three QRI subscales (i.e., support, conflict, depth) (Pierce, 1994; Pierce et al., 1997) than typically developing individuals in mixed-neurodevelopmental relationships regardless of whether or not the typically developing partner simply believed a partner had ASD without diagnosis, self-reported the partner's diagnosis, or whether a formal diagnosis had been made and corroborated by the partner with ASD and through the partner having an SATQ score above 40.8 (the mean among ASD students found by Kanne et al. (2012)). The one exception was that typically developing individuals in same-neurodevelopmental partnerships did not have significantly higher QRI depth scores than the typically developing participants whose partners also participated in the study and corroborated the ASD diagnosis.

This finding is significant and underscores the need for mental health professionals, families, and communities to recognize the relationship difficulties experienced by many typically developing individuals in mixed-neurodevelopmental partnerships. Self-report measures distributed online cannot fully be trusted, but corroboration through ASD partners' SATQ scores and their own self-reports of

diagnosis lends credibility to the findings comparing QRI support and QRI conflict (Pierce, 1994; Pierce et al., 1997).

The exception, QRI depth ($p = .416$), is also of significance. Depth, as defined by the QRI, is "the extent to which the specific relationship is perceived as positive, secure and important." It is unclear if typically developing individuals who have ASD partners willing to participate together in an online study (and provide corroboration) experience more intimate relationship depth as defined by the QRI (Pierce, 1994; Pierce et al., 1997) than typically developing individuals whose ASD partners will not participate or if there is another explanation. Future research is necessary.

Aim 2: Comparison of Typically Developing Partners' QRI, Reported Diagnosed ASD Partners vs. Reported Undiagnosed ASD Partners

As hypothesized, the Aim 2 findings demonstrate that typically developing individuals who believe their intimate partners have ASD but whose partners have not been formally diagnosed report no significant difference in quality of intimate relationship on all three QRI subscales (i.e., support, conflict, depth) (Pierce, 1994; Pierce et al., 1997) than typically developing individuals who report their partners have been diagnosed.

Some adults with high-cognitive autism do not accept the possibility they may have autism and do not seek diagnosis. Any resistance of diagnosis by a partner with ASD would ostensibly not improve any deleterious effect that ASD may have on a typically developing partner; in fact, the opposite may be true. While it cannot be denied that some typically developing individuals may mistakenly claim their partners have

ASD, high-cognitive autism in adults often goes unrecognized and the professional community knows very little about the dynamics of mixed-neurodevelopmental intimate adult relationships.

Aim 1 found that typically developing individuals who report being in mixed-neurodevelopmental relationships *without corroboration* experience significantly lower quality of relationship than those in same-neurodevelopmental relationships (there was no significant difference in QRI *depth* specifically between typically developing individuals in same-neurodevelopmental relationships and those in *corroborated* mixed-neurodevelopmental relationships), and Aim 2 found that typically developing partners who believe themselves to be in mixed-neurodevelopmental relationships without partners' formal diagnoses report no significant difference in relationship quality than those whose partners have formal diagnoses. It can therefore be understood that typically developing partners in mixed-neurodevelopmental relationships experience lower quality of intimate relationship regardless of formality of partners' ASD diagnoses.

This finding emphasizes the fact that typically developing individuals who believe their partners have an undiagnosed ASD may also be in need of support resources. When no formal diagnosis has been made, typically developing partners who label their intimate partners as having ASD may face disbelief from mental health professionals, family members and communities at a time when they are reaching out for solutions and support. While mental health professionals cannot diagnose ASD partners who will not seek treatment, a recognition that resisting diagnosis sometimes aligns with the characteristics of ASD can free professionals to offer support and resources suitable for typically developing individuals in mixed-neurodevelopmental intimate relationships

regardless of formality of ASD partners' diagnoses. Likewise, families and communities can seek to learn more rather than discredit typically developing partners' perceptions because no formal diagnosis has been made.

Aim 3: Comparison of Typically Developing Partners' SATQ, Mixed-Neurodevelopmental Relationships vs. Same-Neurodevelopmental Relationships

As hypothesized, the Aim 3 findings demonstrated that typically developing individuals who report that their partners have been diagnosed with ASD have significantly lower SATQ scores (Kanne et al., 2012) than typically developing individuals who report they are in same-neurodevelopmental relationships. This Aim investigated the possibility that typically developing individuals with lower than average levels of subthreshold autism traits (i.e. individuals who are on the opposite end of the spectrum from individuals with ASD) are more likely to self-select into mixed-neurodevelopmental relationships.

While the findings are not sufficient to fully make the claim of self-selection, the mean SATQ of study participants who self-reported a partners' ASD diagnosis was 14.7 (N = 46). The mean among typically developing students with no association to autism found by Kanne et al. (2012) was 22.7 (N = 196) and the mean among typically developing partners in same-neurodevelopmental relationships in the present study was 20.38 (N = 13). Further research investigating factors that may be associated with typically developing individuals' self-selection into mixed-neurodevelopmental relationships is necessary.

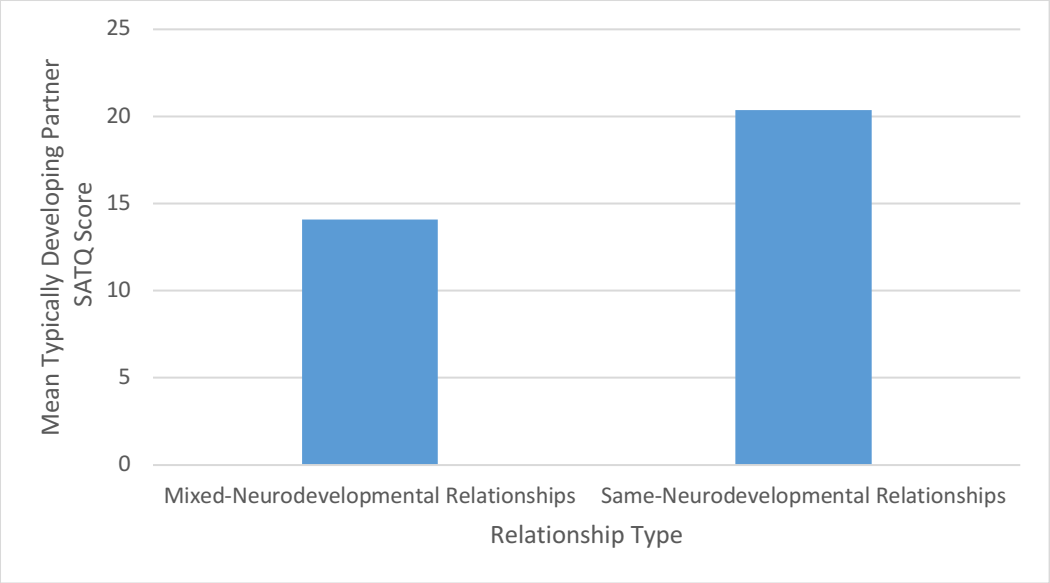


Figure 2. Mean SATQ Scores of Typically Developing Partners by Relationship Type

Aim 4: Investigation of Difference in Partners' SATQ Scores and Quality of Intimate Relationships

Findings did not support the Aim 4 hypothesis that a greater difference in levels of autism traits between intimate partners would significantly predict a lower quality of intimate relationship for both members in the partnership. Findings demonstrated that a difference in levels of autism traits between intimate partners as measured by the SATQ (Kanne et al., 2012) did not significantly predict mean QRI score (Pierce, 1994; Pierce et al., 1997) of the typically-developing partner or the partner with ASD. All 25 couples who participated in the study were included in this analysis, including all mixed-neurodevelopmental and same-neurodevelopmental partnerships. No assumptions can be made about similarity in levels of autism traits and relationship satisfaction.

Number of years in relationship, presence of a child with autism in the home and gender also did not have a predictive value in mean QRI.

That said, two ASD-ASD partnerships participated in the study. Members of both partnerships agreed that ASD diagnosis was accurate for themselves and their partners. SATQ scores of the four individuals were 48, 54, 54 and 39 with the score of 39 (the only score below the mean of 40.8 found by Kanne et al., 2012) belonging to a female who self-reported that she had been formally diagnosed. The SATQ score of 48 belonged to a male who had not been formally diagnosed, but, again, both he and his intimate partner believed him to have ASD. All four individuals' mean QRI scores were among the highest of the dataset: 3.52, 3.68, 3.6 and 3.52 (possible mean QRI scores range from 1 and 4). Future research investigating ASD same-neurodevelopmental relationships is in order.

Aim 5: Comparison of QRI of Typically Developing and ASD Partners in Mixed-Neurodevelopmental Relationships

Aim 5 hypothesized that the typically developing members of corroborated mixed-neurodevelopmental intimate relationships (or typically developing individuals whose intimate partners also filled out the study, had SATQ scores above 40.8 (Kanne et al., 2012) and also reported that they had been diagnosed with ASD), would experience lower quality of relationship than their ASD intimate partners. Nine couples fell into this category. The hypothesis was not supported, but the means were predicted in the right direction. A larger sample size would be necessary to fully investigate this hypothesis.

Future research is necessary.

General Discussion

This is a preliminary study investigating quality of mixed-neurodevelopmental intimate relationships (i.e., one partner is typically developing and one partner has ASD) with a focus on the perspective of the typically developing partner. Individuals with *high-cognitive* autism (formally known as high-functioning autism) do not intuitively understand others' actions and may suffer from confusion about others' intentions, limiting their interpersonal relationship capacity (Gallese et al., 2009). They may experience poor emotional control and amplified emotional responses (Mazefsky et al., 2013). Autism spectrum disorders are characterized by impairment in social interaction, verbal and nonverbal reciprocal communication, repetitive motor behaviors, insistence on routines, restricted interests of abnormal intensity and focus, and hyper or hyposensitivity to environmental stimuli (American Psychiatric Association, 2013). When adults with high-cognitive autism enter intimate relationships, these characteristics have potential to have a deleterious effect on their typically developing partners.

The study demonstrated that typically developing individuals in mixed-neurodevelopmental intimate relationships experience lower quality of relationships, as measured by the Quality of Relationships Inventory (QRI) (Pierce, 1994; Pierce et al., 1997) than those in same-neurodevelopmental relationships. The QRI measures three distinct relationship features: 1) the perceived availability of *support* 2) the perception of the extent to which the relationship is a source of *conflict*, and 3) *depth*, the extent to which the relationship is perceived as positive, secure and important. Typically

developing participants in mixed relationships reported less support, more conflict and less depth than the typically developing participants in same-neurodevelopmental relationships.

Of note, however, typically developing partners in corroborated mixed-neurodevelopmental partnerships did not report a significantly lower level of depth in their intimate relationships than those in same-neurodevelopmental relationships (although the difference in depth was significant when comparing non-corroborated mixed-neurodevelopmental to same-neurodevelopmental relationships) indicating that the relationships' security, importance and the positive roles the relationships play in typically developing individuals' lives is in need of further investigation. Additionally, two of the four QRI (Pierce, 1994; Pierce et al., 1997) questions regarding depth may be especially pertinent to typically developing individuals' experiences in mixed relationships. The first, 'How responsible do you feel for this person's well-being?' may indicate that typically developing partners sense the importance of their own role in the well-being of their ASD partners without establishing whether that sense has a positive impact on relationship quality or a more negative one as it could if the sense were more strictly one of obligation. The second, 'How much do you depend on this person?' does not specify whether it is referring to emotional dependence, physical dependence or financial dependence. Further investigation using measures more specific to the experiences of typically developing partners in mixed-neurodevelopmental relationships could clarify the positive or negative impact of matters measured by QRI depth (Pierce, 1994; Pierce et al., 1997) on quality of intimate relationship for the population.

The study also found that typically developing individuals who report they believe their partners have an undiagnosed ASD experience similar lower quality of relationship as those who report their partners have diagnosed ASD suggesting there is a similarity in relationship experience regardless of the formality of a partners' diagnoses. This is significant because some adults with likely ASD resist obtaining a formal diagnosis leaving their intimate partners without the ability to present their beliefs about their partners' ASD to professionals, family and community members with the credibility a formal diagnosis would offer.

The study demonstrated that typically developing individuals in mixed-neurodevelopmental relationships have lower levels of subthreshold autism traits than typically developing individuals in same-neurodevelopmental relationships suggesting that there are factors related to typically developing individuals' self-selection into mixed-neurodevelopmental partnerships that are in need of future research. Finally, although a sample size of nine was not large enough to establish significance, means were in the predictive direction to indicate that typically developing partners in mixed-neurodevelopmental relationship experience a lower quality of relationship than their ASD partners indicating that ASD individuals in mixed relationships may experience more support, less conflict and more depth than their typically developing partners. Future research is necessary.

The study findings and the characteristics of ASD underscore the importance of recognizing the typically developing partner's perspective and experience in research, clinical settings and in the development of individual, couple and family intervention methods. It is incumbent on professionals to specifically strive for awareness that the

typically developing partner perspective may be underrepresented in mixed-neurodevelopmental intimate adult relationships and to retain awareness that typically developing intimate partners have different roles in their mixed relationships than do parents, teachers, mental health professionals, and other ASD caregivers.

Limitations and Future Directions

Both the Subthreshold Autism Trait Questionnaire (SATQ) (Kanne et al., 2012) and the Quality of Relationships Inventory (QRI) (Pierce, 1994; Pierce et al., 1997) are self-report measures and participants filled out the study online leaving no method of ensuring participants represented their identities or experiences accurately. Findings with and without corroboration (as defined by the study) are limited by the nature of self-reports. The study was advertised to the autism community as "a study for intimate partners" investigating the "impact of autism on intimate relationships." As all participants were exposed to the advertisements either through online links, electronic flyers, emails or printed flyers that had originally been distributed by email, study participants were not randomly selected and individuals who self-selected to participate may not adequately represent the populations of interest. For example, the typically developing members of mixed partnerships who participated may have a lower quality of intimate mixed relationship than those who did not choose to respond or were not participating in activities related to the autism community that would expose them to study advertisements. Also, in the cases of Aims 1, 2, 3 and 5, no efforts were made to determine if gender, length of relationship or presence of a child with autism in the home had any impact on results.

Relationships are interdependent and the total quality of an individual's support systems cannot be reduced to the quality their intimate adult partnerships, regardless of level of their own or intimate partners' autism traits. The quality of secondary relationships such as relationships with children, parents, and close friends could affect the overall quality of typically developing partners' total support systems and therefore their perceptions of the quality of relationship with their ASD intimate partners. It is also unknown if secondary relationships are of more importance to typically developing individuals in mixed-neurodevelopmental intimate partnerships than they are to those in same-neurodevelopmental partnerships related to any ostensible lack of support which may exist in mixed-neurodevelopmental relationships. The QRI (Pierce, 1994; Pierce et al., 1997) is an interactional-cognitive social support model that allows multiple individual relationships to be measured simultaneously (Pierce et al., 1991). Future research could investigate any additional impact of non-primary relationships using the capacity of the QRI to simultaneously measure the quality of partners' intimate as well as close but non-intimate relationships.

The QRI (Pierce, 1994; Pierce et al., 1997) is a widely used relationship-specific measure of perceived social support and was not developed specifically for assessing relationship quality in mixed-neurodevelopmental relationships. Although ASD affects social relationships, little is known about intimate relationship dynamics between two individuals when at least one has ASD. Quality of relationship as measured by the QRI may only capture part of the challenge faced by either partner in mixed partnerships or same partnerships when both individuals have ASD. Qualitative analysis of open-ended verbal reports from individuals in such partnerships could offer researchers insight into

developing variables more appropriate for the populations. Variables such as emotion regulation within partnerships (Mazefsky et al., 2013), reciprocal facial, gestural (Gallesse, 2007) and verbal communication, and reciprocal sexual enjoyment (Koegel, Detar, Fox, Koegel, 2014) including the impact of motor differences on social, emotional and sexual responses are worth exploration.

Individuals with ASD may not intuitively understand others' actions and may suffer from confusion about others' intentions, limiting their interpersonal relationship capacity (Gallese, Rochat, Cossu, & Sinigaglia, 2009). It is likewise possible that typically developing individuals with lower than average levels of subthreshold autism traits may have a higher than average awareness of others' perspectives and intentions, a higher level of social awareness and a greater interpersonal relationship capacity than the general population. Future research could investigate whether these increased capacities exist and any relationship between these attributes and decisions to self-select into mixed-neurodevelopmental intimate adult relationships with or without prior knowledge of a partner's ASD.

Investigations of other factors in addition to low levels of subthreshold autism traits that may contribute to self-selection into mixed-neurodevelopmental relationships is necessary. Environmental factors such as receiving reinforcement for accepting care-giving roles in families of origin, cultural reinforcement for caregiving, cultural and family reinforcement for long term commitment to intimate relationships, gender expectations related to caregiving, and prior experiences with other developmental or personality disorders as they are related to typically developing individuals' self-selection

into mixed partnerships should be explored. Factors such as histories of childhood and domestic abuse should likewise be investigated.

As intimate partnerships are generally considered to be the primary relationship of adulthood, sources of support and well-being, and are even associated with greater physical health (Miller et al., 2013), tools that measure symptoms that may be related to environmental stress and the intimate relationship dynamics of mixed-neurodevelopmental relationships should be used to assess both partners. Rates and instances of mental disorders of typically developing partners could be considered as well as onset of disorders prior to relationships, during relationships, or after mixed intimate relationships end including any changes in typically developing partners' disorders and ASD partners' co-morbid disorders. Physical health of typically developing and ASD partners in mixed relationships in comparison to same-neurodevelopmental relationships is also worth investigation.

Possible physical and affect impacts of reduced reciprocal social stimulation including reciprocal facial and gestural communications on typically developing partners in mixed intimate relationships is in need of examination. Instances of infidelity among typically developing partners in mixed relationships in comparison to same-neurodevelopmental relationships and any possible association with reciprocal social and sexual deprivation and difficulties ending mixed relationships should be explored. Comparisons in levels of conflict during divorce between mixed and same-neurodevelopmental partners (Jennings, 2005), incidences of stalking (Stokes, Newton, & Kaur, 2007), and the impact of any differences in reciprocal sexual communication and enjoyment are worth investigation. Power differences related to gender, physical

capacity, earning capacity and social resources are in need of exploration as both members of mixed partnerships may be vulnerable to intimate partner conflicts and domestic violence, including verbal abuse, for disparate reasons. It is possible that low levels of subthreshold autism traits may be both a protective factor contributing to resiliency and the tendency to have compassion for ASD intimate partners, as well as a risk factor for vulnerability to abusive situations.

Future research could investigate whether or not ASD partners in same-neurodevelopmental relationships experience higher quality of relationship than ASD partners in mixed relationships. While intimate partners' differences in levels of autism traits, as measured by the SATQ (Kanne et al., 2012), did not have any predictive value upon individuals partners' mean QRI scores (Pierce, 1994; Pierce et al., 1997), the two ASD-ASD same-neurodevelopmental couples (with low differences in SATQ by definition) who participated in the study had mean QRI scores among the highest in the dataset. More investigation is necessary.

A larger sample size comparing the perception of relationship quality of typically developing partners to their own ASD partners in corroborated mixed-neurodevelopmental relationships is required to determine if, as the direction of the means predicted in this study, typically developing individuals experience a lower quality of relationship than their own ASD partners.

All of this study's typically developing partners in reported or corroborated mixed-neurodevelopmental relationships were female. Future exploration is necessary.

In some cases, typically developing partners in mixed-neurodevelopmental relationships may need interventions to help them develop self-care skills and the ability

to assert their own perspectives despite any resistance or lack of awareness of difference in perspective from their partners. Overall, mental health professionals should consider research that might determine if caution should be taken when advising typically developing partners in mixed-neurodevelopmental relationships to give care in a manner that would be suitable for a teacher, parent or professional and, if typically developing partners are to give care in a manner that may be more suitable for an intimate relationship, what that manner should be and how it could support the individual perspective and needs of the typically developing partner as well as the ASD partner.

Appendix 1.

Quality of Relationships Inventory (Pierce, 1994; Pierce et al., 1997)

Please use the scale below to answer the following questions regarding your relationship with your intimate partner.

1 – Not at all
2 – A little
3 – Quite a bit
4 – Very much

Items:

1. To what extent could you turn to this person for advice about problems? (Support)
2. How often do you need to work hard to avoid conflict with this person? (Conflict)
3. To what extent could you count on this person for help with a problem? (Support)
4. How upset does this person sometimes make you feel? (Conflict)
5. To what extent can you count on this person to give you honest feedback, even if you might not want to hear it? (Support)
6. How much does this person make you feel guilty? (Conflict)
7. How much do you have to "give in" in this relationship? (Conflict)
8. To what extent can you count on this person to help you if a family member very close to you died? (Support)
9. How much does this person want you to change? (Conflict)
10. How positive a role does this person play in your life? (Depth)
11. How significant is this relationship in your life? (Depth)

12. How close will your relationship with this person be in 10 years? (Depth)
13. How much would you miss this person if the two of you could not see and talk with each other for a month? (Depth)
14. How critical of you is this person? (Conflict)
15. If you wanted to go out and do something this evening, how confident are you that this person would be willing to do something with you? (Support)
16. How responsible do you feel for this person's well-being? (Depth)
17. How much do you depend on this person? (Depth)
18. To what extent can you count on this person to listen to you when you are very angry at someone else? (Support)
19. How much would you like this person to change? (Conflict)
20. How angry does this person make you feel? (Conflict)
21. How much do you argue with this person? (Conflict)
22. To what extent can you really count on this person to distract you from your worries when you feel under stress? (Support)
23. How often does this person make you feel angry? (Conflict)
24. How often does this person try to control or influence your life? (Conflict)
25. How much more do you give than you get from this relationship? (Conf

Appendix 2.

Subthreshold Autism Trait Questionnaire (Kanne et al., 2012)

26. I like being around other people (Social interaction and enjoyment)
27. I enjoy social situations where I can meet new people and chat (i.e. parties, dances, sports, games) (Social interaction and enjoyment)
28. I seek out and approach others for social interaction (Social interaction and enjoyment)
29. I like to share my enjoyment with others (Social interaction and enjoyment)
30. Others consider me warm, caring and/or friendly (Social interaction and enjoyment)
31. I respond appropriately to other people's emotions (for example, comforting someone who is upset) (Social interaction and enjoyment)
32. I can have a back and forth conversation (listen well and change topics appropriately) (Social interaction and enjoyment)
33. I use many gestures when talking with others such as shrugging, "talking with my hands," nodding my head, etc. (Social interaction and enjoyment)
34. Others think that I am strange or bizarre (Oddness)
35. I have some behaviors that others consider strange or odd (Oddness)
36. I sometimes say things that others tell me are rude or in appropriate (Oddness)
37. I use odd phrases or tend to repeat certain words or phrases over and over again (Oddness)

38. I am very interested in things related to numbers (i.e. dates, phone numbers, etc.) (Oddness)
39. I am good at knowing what others are feeling by watching their facial expressions or listening to the tone of their voice (Reading facial expressions)
40. I can sense that someone is not interested I what I'm saying by reading their facial expressions (Reading facial expressions)
41. I make eye contact when talking with others (Reading facial expressions)
42. I am good at using words to express my thoughts and ideas (Expressive language)
43. I have difficulty getting my ideas across to others in a conversation (Expressive language)
44. I have a good imagination (Expressive language)
45. I am comfortable with spontaneity, such as going to new places and trying new things (Expressive language)
46. I tend to stick to routines in my day to day life, preferring to do things the same way (Rigidity)
47. I am considered "laid back" and am able to "go with the flow" (Rigidity)
48. I sometimes take things too literally, such as missing the point of a joke or having trouble understanding sarcasm (Rigidity)
49. I tend to focus on individual parts and details more than the big picture (Rigidity)

Appendix 3.

Short Demographics Questionnaire and Pairing Questions

1. What is your gender? Open-ended
2. What is your age? .Open-ended numerical value
3. What is your highest level of education in years (e.g. 8 for completed grade 8, 12 for completed high school, 14 for completed associate's degree, 16 for completed bachelor's degree, etc.)? Open-ended numerical value
4. How many years have you been in your relationship with your intimate partner? Open-ended numerical value
5. Do you live with a child who has been diagnosed with an Autism Spectrum Disorder (e.g. Asperger's, high-cognitive autism or PDD-NOS)? Yes, No
6. Have you ever been diagnosed with an Autism Spectrum Disorder (e.g. Asperger's, high-cognitive, high-cognitive autism or PDD-NOS)? Yes, No
7. Do you believe you might have an Autism Spectrum Disorder (e.g. Asperger's, high-cognitive, high-cognitive autism or PDD-NOS)? Yes, No
8. Has your intimate partner ever been diagnosed with an Autism Spectrum Disorder (e.g. Asperger's, high-cognitive, high-cognitive autism or PDD-NOS)? Yes, No
9. Do you believe your intimate partner may have an Autism Spectrum Disorder (e.g. Asperger's, high-cognitive, high-cognitive autism or PDD-NOS)? Yes; Probably, I've been wondering; Probably, but I'd prefer not to talk about it; Maybe, I've been wondering; Maybe, but I'd prefer not to talk about it; No

10. In what city did you first meet your intimate partner? Open-ended

11. In what month were you born? Open-ended

12. On what day were you born? Open-ended

13. In what month was your intimate partner born? Open-ended

14. On what day was your intimate partner born? Open-ended

15. What is the first letter of your first name? Open-ended

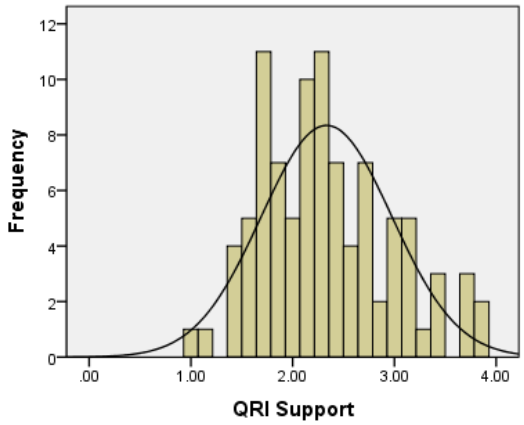
16. What is the first letter of your intimate partner's first name? Open-ended

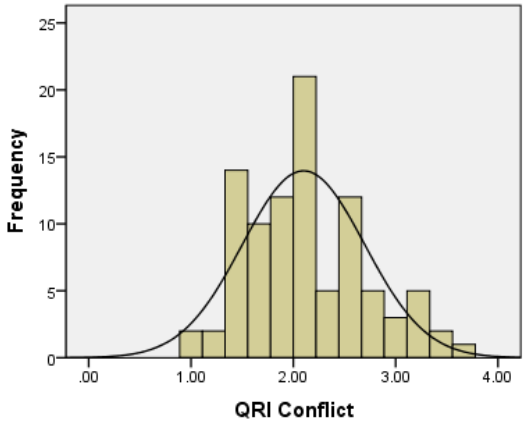
17. In what city did you first meet your intimate partner? Open-ended

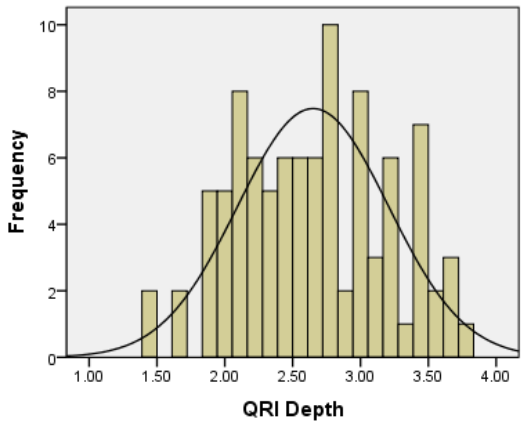
18. Optional password: If you would like, you and your intimate partner may agree on a password to help ensure we're able to match your answers to your intimate partner's answers. If you and your partner have chosen a password, please put that word here. Thank you for your help! Open-ended

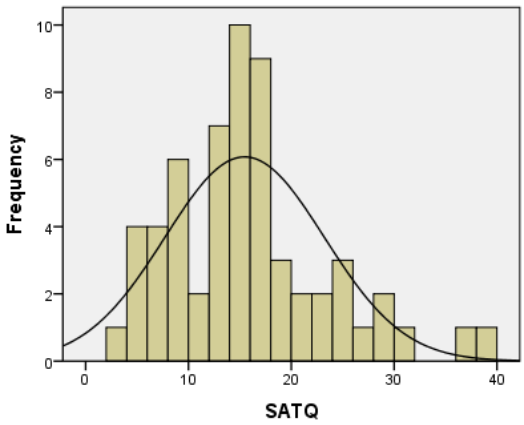
Appendix 4.

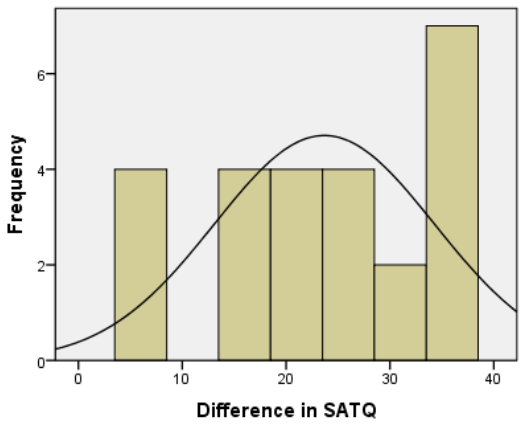
Histograms of the Study Variables

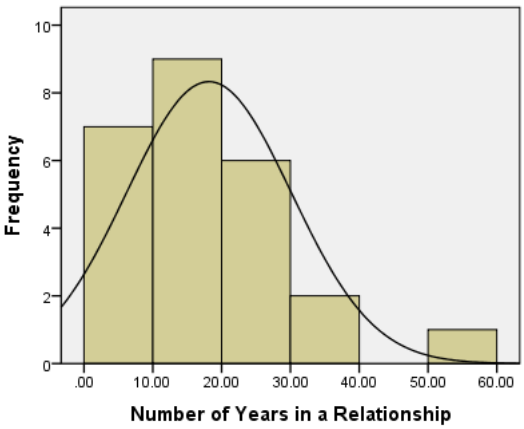


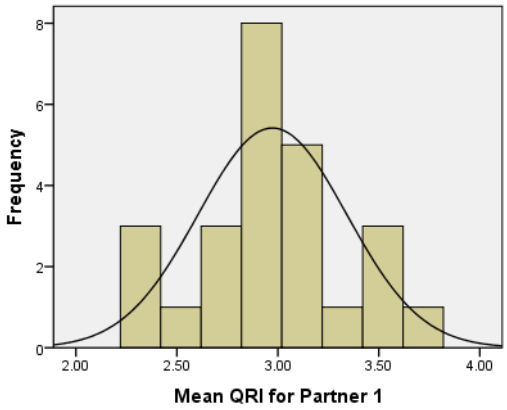











Frequency
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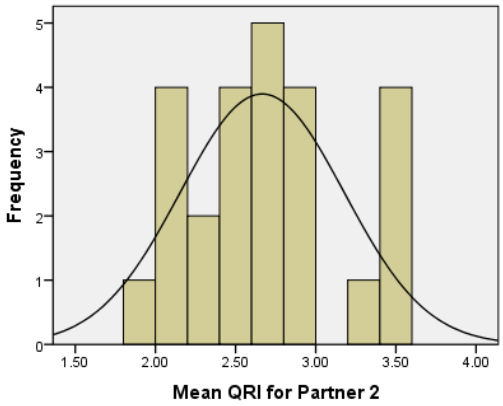
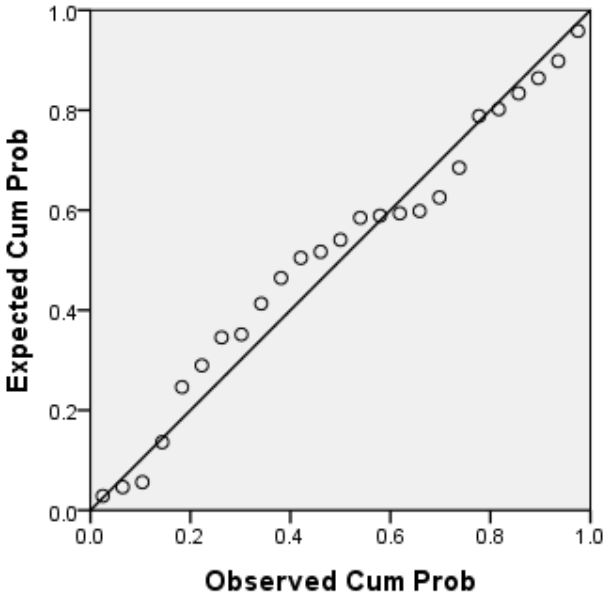
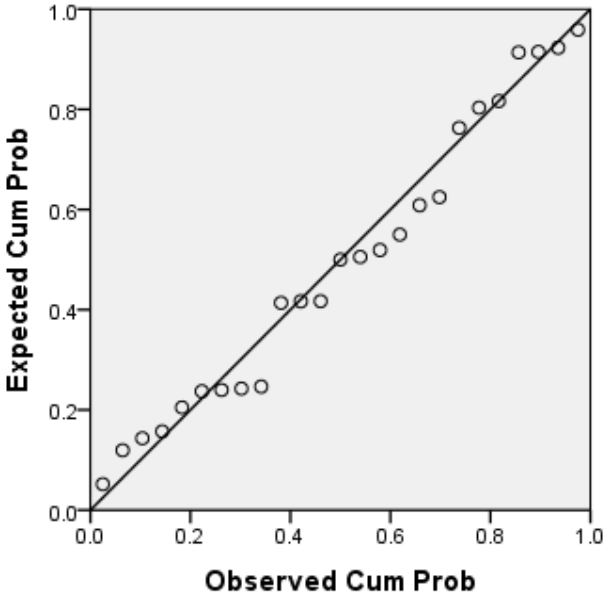
6
4
2
0
2.00
2.50
3.00
3.50
4.00
Mean QRI for Partner 1

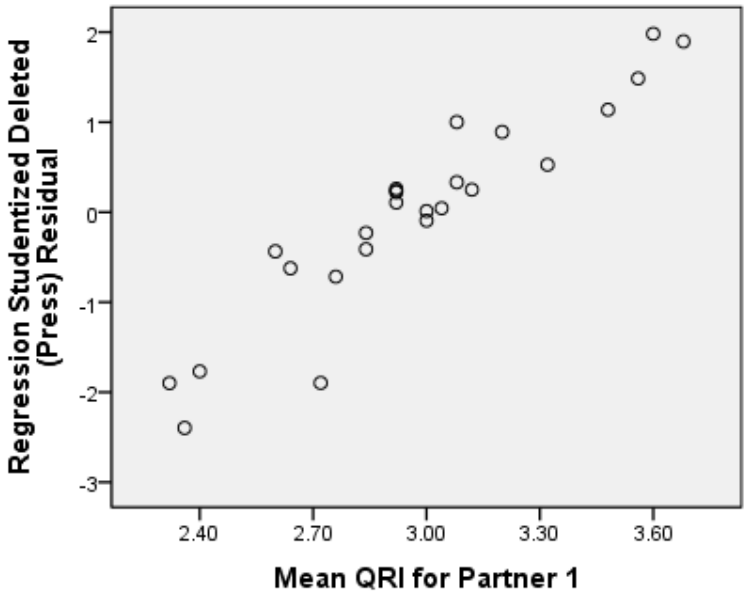

Frequency
5
4
3
2
1
0
1.50
2.00
2.50
3.00
3.50
4.00
Mean QRI for Partner 2

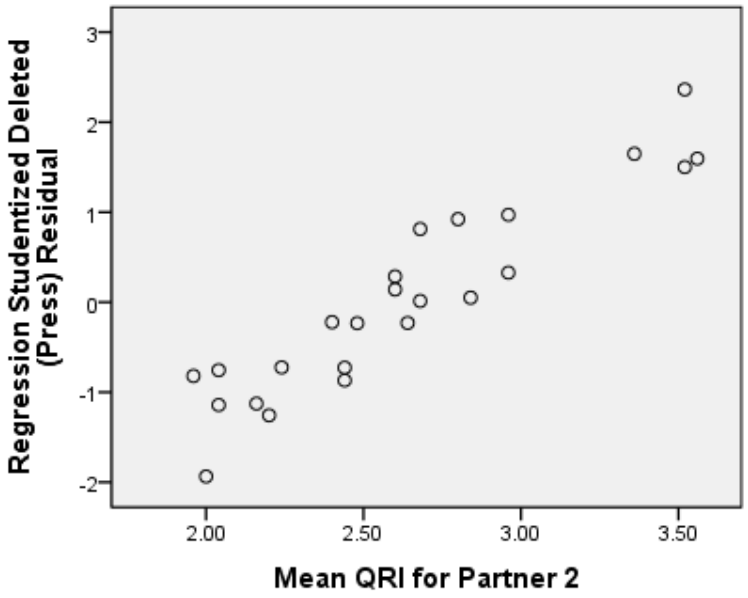
Appendix 5.

Regression Plots for Aim 4






Regression Studentized Deleted (Press) Residual
2
1
0
-1
-2
-3
2.40
2.70
3.00
3.30
3.60
Mean QRI for Partner 1


Regression Studentized Deleted (Press) Residual
3
2
1
0
-1
-2
2.00
2.50
3.00
3.50
Mean QRI for Partner 2

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