Spring 2017

Sexuality and the Autism Spectrum: Implications for Individuals with the Broad Autism Phenotype

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SEXUALITY AND THE AUTISM SPECTRUM: IMPLICATIONS FOR INDIVIDUALS WITH THE BROAD AUTISM PHENOTYPE

by

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B. A. May 2013, Vanderbilt University

A Thesis Submitted to the Faculty of
Old Dominion University in Partial Fulfillment of the
Requirements for the Degree of

MASTER OF SCIENCE

PSYCHOLOGY

OLD DOMINION UNIVERSITY
May 2017

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ABSTRACT

SEXUALITY AND THE AUTISM SPECTRUM: IMPLICATIONS FOR INDIVIDUALS WITH THE BROAD AUTISM PHENOTYPE

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Many people who are not diagnosed with Autism Spectrum Disorder (ASD) nevertheless have some symptoms of the disorder. These people are classified as having the Broad Autism Phenotype (BAP) and have some of the same difficulties as people with ASD. People with greater levels of the BAP may have difficulty in expressing their sexuality and may experience more same-sex attraction, as is commonly found in individuals with ASD. Previously, differences between individuals with higher vs. lower BAP traits have been measured categorically. In this study, my goal was to use continuous measures of BAP traits, sexual experiences, and sexual orientation in a typically developing (TD) population to see if those who have more characteristics of the BAP show similar patterns of sexual behavior and sexual orientation to those of people with ASD, as reported in the literature. I hypothesized that measures of the BAP would account for a significant amount of the variance in partnered sexual behavior, with people who have more BAP traits engaging in fewer partnered sexual behaviors. In addition, measures of the BAP were expected to account for a significant amount of the variance in sexual orientation, with people who have more BAP traits endorsing more same-sex attraction. Although BAP characteristics are not predictive of partnered sexual behaviors, one measure of BAP traits was a significant predictor of sexual orientation, $\beta = 0.22$, $t = 2.72$, $p = .007$, above and beyond the demographic variables, R^2 change = .04, $F = 7.41$, $p = .007$. This

finding supports my hypothesis that individuals with more BAP characteristics resemble people with ASD in that they are more likely than TD individuals to experience same-sex attraction.

This thesis is dedicated to my parents, Chris and Ruth Qualls, for fostering my imagination, love of discovery, and interest in psychology.

ACKNOLWEDGEMENTS

First and foremost, I would like to thank my thesis committee, Dr. James Paulson, Dr. Kathrin Hartmann, and Dr. Michelle Kelly, for their excellent and constructive feedback on this project. Special thanks to Dr. James Paulson, for being my committee chair and working through personal adversity to provide his support on this project. Much thanks also to Dr. Kathrin Hartmann for being an excellent mentor, for letting me choose my own direction on this project, and for providing continuous support throughout this process.

Finally, I want to thank my cohort, Lindsay Howard, Rachel MacIntyre, Peter Preonas, and Bilgé Yilmaz for encouraging me in my work when I needed it, and encouraging me not to work when I needed that, too. They have made my time in graduate school so far memorable and meaningful, and I am very grateful to them for that.

TABLE OF CONTENTS

Page

LIST OF TABLES

CHAPTER I

INTRODUCTION

Autism Spectrum Disorders (ASDs) are a category of developmental disorders that have been steadily increasing in the population, with incidence rates rising from an estimated 1 out of every 166 children in the year 2000 (Centers for Disease Control and Prevention [CDC], 2007) to an estimated 1 in 68 children as of 2014 (Zablotsky, Black, Maenner, Schieve, & Blumberg, 2015). The increase in ASD diagnoses means that there is a growing population of people who may need special services or help in certain areas. The fifth edition of the Diagnostic and Statistical Manual (DSM-5) of the American Psychological Association (APA) states that ASDs are characterized by deficits in the areas of social interaction/communication and restricted, repetitive behaviors or interests. Specifically, people with ASD have social difficulties that include social-emotional reciprocity; non-verbal communication behavior; and deficits in developing, understanding, and maintaining relationships. In addition to social deficits, people diagnosed with ASD also have restricted interests and repetitive behaviors (which may take the form of repetitive speech or motor movement) an oversensitivity and aversion to certain sensory stimuli, insistence on performing specific routines, and restricted interests in a few areas while other developmentally typical activities are often absent (APA, 2013).

Many people who have characteristics of ASD but not the full disorder are said to have characteristics of the Broad Autism Phenotype (BAP), and experience similar difficulties to people with ASD (Best, Moffat, Power, Owens, & Johnstone, 2008; Jobe & White, 2007; Kunihira, Senju, Dairoku, Wakabayashi, & Hasegawa, 2006; Palmer, Paton, Enticott, & Hohwy, 2014). People with greater levels of the BAP may have difficulty in expressing their sexuality and may experience more same-sex attraction, as is commonly found in people with ASD

(Bejerot & Eriksson, 2014; Byers, Nichols, & Voyer, 2013; Gilmour, Schalomon, & Smith, 2012; Mehzabin & Stokes, 2011; Rainie & Madden, 2005). In this study, I used continuous measures of BAP characteristics, sexual experiences, and sexual orientation in a typically developing population to see if those who have more characteristics of the BAP show patterns of sexual behavior and sexual orientation similar to those characteristics reported in the literature for people with ASD (Bejerot & Eriksson, 2014; Byers et al., 2013; Gilmour et al., 2012). Learning more about sexuality in people with greater levels of the BAP may help inform interventions designed to help them and individuals with ASD understand their sexual orientation and express their sexuality (Visser et al., 2015).

The Broad Autism Phenotype

The features associated with the BAP are similar to those of ASD, though they are generally less severe and cause less impairment in everyday life (Hoekstra, Bartels, Verweij, & Boomsma, 2007; Jobe & White, 2007; Palmer, Paton, Enticott, & Hohwy, 2014; Piven & Palmer, 1997; Szatmari et al., 2008). Additionally, individuals with greater levels of the BAP may not have traits relating to both the social communication and the restricted and repetitive behaviors/interest domains present in ASD. Instead, they may have difficulties in either the social (e.g., interpersonal difficulties) or the non-social (e.g., detail orientation) domain (Palmer et al., 2014), although there is evidence for a single underlying heritability factor for both areas (Constantino & Todd, 2007). However, the types of difficulties seen in those with greater levels of the BAP resemble the DSM-5 criteria for ASD. Piven and colleagues (1997) assessed the personality traits of parents in families who had more than one child with autism and found traits that mapped onto the three criteria for autism present in DSM-IV-TR (these criteria were collapsed into two dimensions on DSM-5; APA 2000, 2013). The parents of multiple children

with autism were more likely than parents of multiple children with Down's syndrome to have aloof personality and pragmatic conversation difficulties (corresponding to the social and communication defects criteria), as well as rigidity in behavior (corresponding to the restricted, repetitive interests and behaviors criteria; Piven et al., 1997).

Studying the traits of family members of ASD individuals shows that the characteristics of the BAP are highly heritable (Bailey, Palferman, Heavey, & Couteur, 1998; Hoekstra et al., 2007; Piven, Palmer, Jacobi, Childress, & Arndt, 1997; Piven et al., 1997). Social and communication difficulties (e.g., having no friends, being awkward or aloof, having inadequate verbal expression, or otherwise odd verbal interactions) have been found in both parents and siblings of those with ASD (Bailey et al., 1998). Family members of those with ASD have also been found to have decreased expressive and receptive language (Piven & Palmer, 1997), as well as increased difficulty using words to describe their feelings (Szatmari et al., 2008). Researchers thought these sub-diagnostic characteristics in family members of those with ASD were phenotypically similar to the characteristics of ASD and labeled these traits as the Broad Autism Phenotype (Bailey et al., 1998).

The traits associated with the BAP have also been found in the typically developing population in a continuous distribution (Best, Moffat, Power, Owens, & Johnstone, 2008; Hoekstra et al., 2007; Hurst, Mitchell, Kimbrel, Kwapil, & Nelson-Gray, 2007; Pisula, Kawa, Danielewicz, & Pisula, 2015). Young adults with more BAP characteristics are similar to those with ASD in that they have been shown to struggle more with loneliness, creating and maintaining friendships (Jobe & White, 2007), depression, anxiety, and bullying (Kunihira et al., 2006) than members of the population with fewer BAP characteristics. Higher levels of the BAP also correlate with relationship difficulties. Young adults with greater levels of the BAP have

been found to display lower levels of empathy and higher levels of attachment anxiety and avoidance (Lamport & Turner, 2014) and husbands with greater levels of the BAP experienced increased dissatisfaction with responsiveness, intimacy, and trust in their relationships (Pollmann, Finkenauer, & Begeer, 2010). Individuals with greater levels of the BAP have also been found to have less anticipation of social reward, a trait thought to lead to deficits in social interaction and problems with communication similar to those found in individuals diagnosed with ASD (Cox et al., 2015).

Additionally, Best and colleagues (2008) found that young people with a high degree of autistic traits had difficulty on Theory of Mind (TOM) and cognitive flexibility tasks, similar to those diagnosed with ASD. However, a subset of this sample reported an official diagnosis of ASD, throwing doubt on whether these deficits are truly representative of individuals with only BAP. Furthermore, the same deficits were not found in a study by Japanese researchers, although they did use different methods of measuring these constructs (Kunihira et al., 2006).

Sexual Behavior in ASD

People with ASD often have difficulties learning about and participating in sexual behavior, a topic that is not commonly addressed in the research literature (Gilmour et al., 2012; Mehzabin & Stokes, 2011; Stokes & Kaur, 2005; Van Bourgondien, Reichle, & Palmer, 1997). Mehzabin and Stokes (2011) found that adults with ASD did not have as much sexual education or as many sexual experiences as typically developing (TD) adults of the same age. However, this finding has not been replicated across all studies. For instance, Gilmour and colleagues reported finding no differences in self-reported sexual knowledge or behaviors between TD adults and those with ASD (Gilmour et al., 2012). Studies of ASD caregivers have shown that the sexual education that people with ASD receive often does not cover such important areas as

STI prevention and condom use, birth control methods, or types of sex other than intercourse (Ballan, 2012; Holmes et al., 2014; Holmes & Himle, 2014). In contrast, these areas are routinely covered in the sexual education that TD adolescents receive (Lindberg, Maddow-Zimet, & Boonstra, 2016). Also, compared to TD young adults, significantly more young adults with ASD self-reported that they more often received information about sexual health and practices through sources such as the internet, television, and pornography than from sources such as peers, parents, and partners (Brown-Lavoie, Viecili, & Weiss, 2014). This lack of knowledge often contributes to the vulnerability of individuals with ASD to sexual victimization and may also lead these individuals to also commit more inappropriate displays of sexual behavior (Brown-Lavoie et al., 2014; Roberts, Koenen, Lyall, Robinson, & Weisskopf, 2015; Visser et al., 2015).

In addition to differences in sexual education, differences in sexual behaviors also exist between with ASD and TD individuals. Some young adults with ASD (usually men) may have their first sexual experiences in strip clubs or with prostitutes rather than with a romantic partner (Eastgate, Scheermeyer, van Driel, & Lennox, 2012). In contrast to young adults with ASD, most TD males have their first sexual experiences with peers (Caputo, 2009). However, some people with ASD do form relationships with others. A survey of higher-functioning adults with ASD (ages 21 to 73, mean age 35.3) conducted by Byers, Nichols, and Voyer (2013) found that 59% of the sampled group had experienced at least one romantic relationship of three months or longer. These adults reported at most having experienced sexual anxiety or difficulties only sometimes during the past month, on average. However, more positive sexual experiences were found in those who had lower ASD symptomology, as measured by the Autism Spectrum Quotient (Baron-Cohen, Wheelwright, Skinner, Martin, & Clubley, 2001). Although adults with

ASD can form relationships, they still do so less frequently than adults with TD. Studies of the general American population have found that approximately 84% of people surveyed had been married at some time or were currently in a relationship (Rainie & Madden, 2005). This illustrates that people with ASD form fewer relationships and experience less satisfaction in their relationships than people with TD.

Several factors make participating in relationships difficult for those with autism. As children, those with ASD participate in less social interaction than TD children (Lord & Magill-Evans, 1995) and struggle more with participating when they do try to interact (Bauminger, Shulman, & Agam, 2003). This lower frequency of interaction, along with initial inability to respond to others social cues (Weatherby, 2006), can lead to a variety of social communication deficits in ASD (Ozonoff, Dawson, & McPartland, 2002). Theory of Mind, or the knowledge of what others are thinking, is another characteristic vital to relationships that is lacking in those with ASD (Baron-Cohen, 1995). All of these characteristics innate to ASD can lead to later difficulty in forming friendships and close romantic relationships (Byers, Nichols, Voyer, & Reilly, 2012; Carrington, Templeton, & Papinczak, 2003; Fein, 2015; Howlin, Mawhood, & Rutter, 2000; Mehzabin & Stokes, 2011; Orsmond, Krauss, & Seltzer, 2004).

Many of these processes could also exist in people with greater levels of the BAP and contribute to the social deficits and difficulties forming relationships seen in that group (Jobe & White, 2007; Lamport & Turner, 2014; Pollmann et al., 2010). As mentioned above, young adults with greater levels of the BAP struggle with empathy, anxiety, and avoidance in relationships (Lamport & Turner, 2014) and husbands with greater levels of the BAP experienced increased relationship dissatisfaction mediated by problems with responsiveness,

intimacy, and trust in their relationships (Pollmann et al., 2010). Currently, little more is known about sexuality and relationships in individuals with higher levels of the BAP.

Sexual Orientation in ASD

Studies have also found differences in sexual orientation between people with ASD and people with TD. Gilmour and colleagues (2012) found that women with ASD had significantly lower levels of heterosexuality and higher, though not significantly so, levels of homosexuality on the Sell Sexual Orientation Scale (which measures heterosexuality and homosexuality separately; Gonsiorek, Sell, & Weinrich, 1995) compared to men with ASD and typically developing men and women. They also found a higher rate of asexuality among men and women with ASD. Byers and colleagues (2012) similarly found higher rates of homosexuality when they surveyed ASD individuals who had previously been in a relationship for at least 3 months. Almost 42% of the adults with ASD surveyed endorsed a sexual identity other than heterosexual and 55% stated that they were at least somewhat attracted to both men and women (Byers et al., 2012). Bejerot and Eriksson (2014) found that women with ASD were more "tomboyish" as children than were typically developing women and were also more likely to endorse sexual attraction to other women and a lesbian or bisexual identity.

Explanations for these findings differ. Gilmour and colleagues (2012) posit that an increase in prenatal androgens (extreme male brain theory of autism), a lack of suitable opposite-sex partners, and less awareness of social norms may contribute to less heterosexuality and higher asexuality in those with ASD. Bejerot and Eriksson (2014) also suggest that the greater incidence of same-sex attraction among the women with ASD they surveyed may be due to either the extreme male brain theory or to the women with ASD placing less emphasis on social norms in their choice of sexual partners. However, Gilmore and colleagues (2012) also note that

while there has been some evidence for prenatal androgens affecting women with ASD more strongly (De Bruin, De Nijs, Verheij, Verhagen, & Ferdinand, 2009) and for prenatal androgens affecting female homosexuality (Kraemer et al., 2006), some researchers have not found this evidence to correlate with other measures of ASD, including the Autism Spectrum Quotient (Falter, Plaisted, & Davis, 2008; Voracek & Dressler, 2006). The evidence on biological causes of homosexuality is similarly mixed (Jenkins, 2010). As for lack of suitable sexual partners, Gilmour and colleagues (2012) noted that in their sample sexual interests and sexual behaviors were highly correlated in both participants with ASD and TD, a finding that challenges the idea that people with ASD are choosing same-sex partners due to a lack of suitable opposite sex partners.

If the BAP is seen as being a part of the overall autism spectrum (Constantino & Todd, 2007), then it is possible that any of the causes of increased incidence of same-sex attraction in ASD could also affect those with greater levels of the BAP. It is necessary to know if the patterns of same-sex attraction that have been found in individuals with ASD also exist in people with greater levels of the BAP before research can be done to determine which influences on same-sex attraction higher levels of the BAP might have in common with ASD.

The Current Study

Given the similarity of higher levels of the BAP and ASD, I believe it is likely that there are several traits pertaining to sexuality and sexual orientation in common between the two groups. The same social difficulties that affect people with ASD also affect people with greater levels of the BAP, but to a lesser extent. Although they still demonstrate some difficulties in romantic relationships (Jobe & White, 2007; Lamport & Turner, 2014; Pollmann et al., 2010), people with greater levels of the BAP may be more likely to display partnered sexual behavior

than those with ASD. This would make it easier to look for a correlation between these behaviors and BAP traits. Additionally, if people with greater levels of the BAP have the same patterns of sexual orientation as those with ASD, further research can then be done to identify what might influence these patterns in people with greater levels of the BAP and ASD. These findings can then be used to help individuals with ASD and BAP better express their sexual orientation and sexual behavior. Previously, differences between individuals with higher vs. lower BAP traits have been measured categorically. In this study, my goal was to use continuous measures of BAP traits, sexual experiences, and sexual orientation in a typically developing (TD) population to see if those who have more characteristics of the BAP show similar patterns of sexual behavior and sexual orientation to those of people with ASD, as reported in the literature.

In this study, I predicted that:

H1: For TD individuals, characteristics of the BAP would account for a significant amount of the variance in interactive sexual experiences above and beyond demographic characteristics. Additionally, more BAP characteristics would be associated with fewer interactive sexual experiences.

H2: For TD individuals, characteristics of the BAP would account for a significant amount of the variance in sexual orientation above and beyond demographic characteristics. Additionally, more BAP characteristics would be associated with greater same-sex attraction.

CHAPTER II

METHOD

Participants

The survey was given to 340 individuals who were recruited using the SONA research participation system at Old Dominion University, online through social media and psychology research websites, and from psychology classes at a small private liberal arts college in Southwest Virginia, Emory & Henry College. Of these individuals, 177 (132 women, 33 men, 12 other gender) met study criteria and had their data included in the analyses.

Measures

Demographics. The demographics questionnaire asked questions concerning participant's gender, race, sexual orientation, family income, participant's income, parent's education, respondent's education, relationship status and history, religion, field of study/ occupation, year in college, other psychiatric diagnoses, formal ASD diagnosis, and family member ASD diagnosis (see Appendix A)

Broad Autism Phenotype Measures.

Autism Spectrum Quotient. The Autism Spectrum Quotient (AQ; Baron-Cohen, Wheelwright, Skinner, Martin, & Clubley, 2001) is a 50-item self-report measure used to assess symptoms relating to Autism Spectrum Disorder (ASD) in adults of typical intelligence. It has also been used to assess these traits in TD populations (e.g., Hurst, Mitchell, Kimbrel, Kwapil, & Nelson-Gray, 2007; Jobe & White, 2007; Kunihira, Senju, Dairoku, Wakabayashi, & Hasegawa, 2006). It consists of five domains: Communication, Social, Imagination, Local Details, and Attention Switching. The Communication, Social, and Attention Switching domains were based

on the three criteria for autism present in DSM-IV-TR (APA 2000). Imagination and Local Details were based on known areas of abnormalities in cognition present in autism (Baron-Cohen, Wheelwright, Skinner, Martin, & Clubley, 2001). Example items on the AQ include: "I find it difficult to work out people's intentions" and "I am fascinated by numbers." Each item is rated on a 4-point Likert scale that includes *definitely agree, slightly agree, slightly disagree,* and *definitely disagree.* Higher total scores indicate more symptoms of ASD. Some items are reverse-coded.

There is substantial evidence supporting the reliability and validity of the AQ. In a sample including both TD students and those with ASD, Cronbach's alphas of these domains range from .63 to .77, with an overall alpha of .81 (Baron-Cohen et al., 2001b). However, in a general population sample including TD and ASD participants, overall alpha was found to be .71 (Hoekstra, Bartels, Cath, & Boomsma, 2008). Estimates of overall alpha also varied widely in TD-only college student samples, from .67 (Hurst et al., 2007) to .78 (Jobe & White, 2007). In this study's sample, the overall alpha was .85. Test-retest reliability ranges from .70 (two weeks, Baron-Cohen et al., 2001b) to .78 (time interval not given, Hoekstra et al., 2008). A cut-off score of 32 included 79.3% of participants with ASD and only 2% of control participants (Baron-Cohen et al., 2001b). Hoekstra and colleagues (Hoekstra et al., 2008) found that there was no overlap between those diagnosed with AS/HFA (Autism Spectrum/ High Functioning Autism) and TD controls, but some score overlap between those diagnosed with the milder PDD-NOS (Pervasive Developmental Disorder – not otherwise specified) and controls. High scores on the AQ are correlated to a low performance on the *Reading the Mind in the Eyes* test, a measure of Theory of Mind and that has been shown to discriminate between those with AS/HFA and those with typical development (Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001). Participants

with ASD obtained significantly higher scores on the AQ than participants with Obsessive-Compulsive Disorder or Social-Anxiety Disorder (Hoekstra et al., 2008; see Appendix B).

Broad Autism Phenotype Questionnaire. The Broad Autism Phenotype Questionnaire (BAPQ; Hurley, Losh, Parlier, Reznick, & Piven, 2007) is a 36-item self-report measure designed to assess characteristics of the BAP in adults of typical intelligence. While it was first developed to identify characteristic of the BAP in relatives of those with ASD (Hurley et al., 2007), subsequent studies have used this instrument in a general college-age population (Lamport & Turner, 2014; Wainer, Ingersoll, & Hopwood, 2011). The BAPQ has three subscales designed to represent the theoretical constructs of the BAP: aloof, pragmatic language, and rigidity. These subscales map onto the three domains of autism that were present in the DSM-IV-TR (social deficits; communication deficits; and restricted, repetitive behaviors and interests; APA, 2000) and have been postulated as the defining features of the BAP (Piven et al., 1997). Example items on the BAPQ include: "I am flexible about how things should be done," "Conversation bores me," and "I like being around other people." Each item is rated on a 6-point (1-6) scale from *very rarely* to *very often*. Some items are reverse-coded. Scores for this measure are averaged, with a higher score indicating greater likelihood of expressing the BAP. Specific cut-off scores of 3.25, 3.50, and 2.75 are given for the Aloof, Rigid, and Pragmatic Language scales, respectively, while the overall cut-off score is 3.15. These cut-offs are shown to have good sensitivity and specificity in regards to identifying those who had first-degree relatives with autism and those who did not (Hurley et al., 2007).

The BAPQ has also demonstrated good validity and reliability. Cronbach's alphas for each of the three scales were .94, .85, and .91, respectively, with a total scale alpha of .95 (Hurley et al., 2007). In this study's sample, overall alpha was .94. A recent study comparing the

BAPQ to the AQ (Baron-Cohen et al., 2001) and the Social Responsiveness Scale (Constantino & Gruber, 2005) found that the BAPQ had a consistent factor structure, internal consistencies of .76 or above, and good criterion related validity in that it correlated with other measures of BAP as well as aspects of social and interpersonal functioning (Ingersoll, Hopwood, Wainer, & Brent Donnellan, 2011; see Appendix C).

Both the AQ and the BAPQ were used in analyses predicting sexual orientation and partnered sexual behaviors. While both measures have been used to study the BAP, the AQ can also be used in people with ASD. This allows for the findings of this study to be compared directly with those of studies of sexuality in people with ASD. The BAPQ, on the other hand, was directly developed to measure the BAP and thus may capture some traits particular to that phenotype that are not captured by the AQ (Ingersoll et al., 2011).

Brief Index of Sexual Functioning for Women. The Brief Index of Sexual Functioning for Women (BISF-W; Taylor, Rosen, & Leiblum, 1994) is a 22-item self-report index that asks questions organized around three factors: Sexual Activity, Sexual Satisfaction, and Sexual Interest/ Desire. This measure was expanded to 64 questions in the survey for this study, as several questions in the original index ask about multiple behaviors per question. Sample questions include: "Indicate how frequently you have engaged in the following experiences during the past month," "Indicate how frequently you have felt a desire to engage in the following activities during the past month" and "Overall, how satisfied have you been with your sexual relationship with your partner?"

As for reliability and validity, test-retest correlations at one month ranged from .68 to .78 across the three factors (Taylor et al., 1994). Internal consistency of the factors is not reported since data from the BISF-W were not analyzed using these factors. Internal consistency data

from this study is reported below. Questions from this index have previously been used independently from their factor groups. One such study included TD men and women (Rupp & Wallen, 2007) while another focused on a population with ASD (Byers et al., 2013). This measure correlates strongly with the Derogatis Sexual Functioning Inventory (DSFI; Derogatis & Melisaratos, 1979), with correlation coefficients ranging from .59 to .69 (Taylor et al., 1994). The BISF-W was found to be uncorrelated to a measure of social desirability (Taylor et al., 1994). The BISF-W is unique in its ability to reliably and comprehensively assess the breadth and amount of female sexual experience (Salisbury, 2003). Many questions were adapted from a questionnaire of sexual experiences designed for men, the Brief Sexual Functioning Questionnaire (BSFQ; Reynolds et al., 1988). Most of the resulting questions on the BISF-W are worded in a way that allows this measure to be given to both male and female participants. The one female-only question is not directly related to the goals of this study, as it asked about physical sexual difficulties. Nevertheless, this question was adapted to be given to both male and female participants and is included in the survey. As stated above, questions of interest to this study, such as frequency of partnered sexual behaviors, have been used in studies with a sample of both men and women (Byers et al., 2013; Rupp & Wallen, 2007). Since the revised version of this measure for this study included men and women, I refer to this version of the measure as the Brief Index of Sexual Functioning (BISF) throughout the rest of this manuscript. (See Appendix D).

The partnered sexual behaviors this survey asked about were kissing, mutual masturbation, petting and foreplay, oral sex, vaginal sex, and anal sex. In this study's sample, questions asking about desire for, arousal from, engaging in, and orgasming from the above partnered sexual behaviors were summed to provide a composite score for each of these four

areas. Cronbach's alphas for each of these areas ranged from .82 (BISF Desire) to .88 (BISF Engaged). I chose to use the composite measure for engaging in each of the partnered sexual behaviors (BISF Engaged) in the analysis, as it most closely measured the construct I wanted to examine.

Klein Sexual Orientation Grid. The Klein Sexual Orientation Grid (KSOG; Klein, Sepekoff, & Wolf, 1985) is a 21-item self-report instrument that provides an estimate of a person's past, present, and ideal sexual orientation and preference. On the KSOG, participants rate themselves in seven areas, including "Sexual Attraction," "Sexual Behaviors," and "Sexual Fantasies." To simplify the measure, Floyd and Stein (2002) performed a principle components analysis on the items and identified a principle component of sexual orientation that accounted for a majority of the variance. The factor of sexual orientation was best identified by the questions on sexual attraction, sexual behavior, sexual fantasies, and self-identification. Additionally, they only used the ratings on present and ideal scales to look at respondents' current thinking about their sexual orientation. Ratings are done on a seven-point scale ranging from 1 (*Heterosexual Only*) to 7 (*Homosexual Only*). For this study, a 0 point (*Asexual/ No one*) option has been added, due to higher rates of asexuality among those with ASD (Gilmour et al., 2012). Scores consist of the average of the ratings for the eight questions (four areas by two time periods). Higher scores indicate more homosexual sexual preference.

In terms of reliability and validity, values for test-retest and internal consistency were reported by the authors only as "generally determined to be excellent" (Klein, Sepekoff, & Wolf, 1985, p. 43), but the Floyd and Stein study identified the internal consistency of their eight-question model as being quite high (α = .95; Floyd & Stein, 2002). In this study's sample, Cronbach's alpha for the eight-question model was .96. Klein and colleagues (Klein et al., 1985)

reported that a person's self-labeled sexual orientation accounted for 70% of the variance on the KSOG. Alternatively, Floyd and Stein (2002) found that there was a 96% agreement between the sexual orientation classifications they made using the KSOG and participants self-rated sexual orientation. Therefore, the score formulation used by these two authors was used to represent sexual orientation for this study (See Appendix E). In this study, self-reported sexual orientation significantly correlated with sexual orientation as measured by the KSOG, $r = .71$.

Validity check. To ensure that survey participants were paying attention and answering accurately, I inserted a question into the AQ and the BISF scales that asked participants to select a certain response if they are paying attention. The scale for this question matched the scale of the measure in which it is embedded. Participants that incorrectly answered both questions were removed (see Data Screening section for number of cases excluded).

Procedure

Study Procedures. This study was approved by the college review committee of Old Dominion University and the Internal Review Board at Emory & Henry College. Interested persons were asked to participate in a study of personality traits and sexuality. They read a notification form that described the study process and provided informed consent by clicking the statement, "I am 18 years of age or older and I agree to the above statements." Participants then anonymously completed the survey online. Those recruited from Old Dominion University were compensated for their time with research credit. Those recruited from Emory & Henry College were provided with extra credit in their psychology course.

Power Analysis. A power analysis was performed at a power level of .8, alpha level of .05, for a small effect size of $f^2 = .10$. The analysis allowed for 8 demographic predictors in addition to the two main predictors (the AQ and the BAPQ). The results indicated that I should

recruit 160 participants to be able to find an effect this size. To control for attrition due to incomplete surveys, I took into account the average completion rate for online surveys (78.6%; FluidSurveys Team, 2014) and allowed for an additional 35 participants. I also accounted for United States population base rates for disorders excluded from the study, which were ASD (1%) and psychotic disorders (1%; APA 2013). These calculations indicated I should allow for an additional 7 participants, bringing up the total number of participants needed up to 202.

CHAPTER III

RESULTS

Data Screening

I first went through the data and removed cases that did not fit certain inclusion criteria. Cases that did not indicate consent (11) or did not provide enough data to be used in any of the main analyses (137) were removed. To have enough data to be used for the main analyses, the participant must have completed one of the ASD trait measures and either the BISF or the KSOG with less than 33% data missing. Additionally, those who indicated a formal diagnosis of ASD (6) or who did not pass the validity check (9) were also excluded. No participants indicated a formal diagnosis of a psychotic disorder. In total, 163 cases were excluded from the final analyses, leaving 177 cases to be analyzed cases.

Demographic variables that I had planned to include as covariates in the analysis were age, gender identity, race, religion, family income, participant's income, parent's education, respondent's education, participant's year in college, and other psychiatric diagnosis. However, the age variable was mistakenly left out of the online questionnaire. Additionally, about one-third of the participants did not include their income or their family's income, which meant their cases were excluded from the analysis when these variables were included. Therefore, I decided not to use family income and participant income as covariates in the final analysis.

I performed a Missing Values Analyses to see what demographic variables were associated with missingness on the test variables. Missingness on the AQ composite score was predicted by Participant Income, $t(1, 36) = -4.3$, $p < .001$, Family Income $t(1, 168) = -4.6$, $p < .001$, and KSOG composite score, $t(1, 9) = -2.7$, $p = .02$. To correct for the missing values, I

performed Multiple Imputation for each of the four test measures (AQ, BAPQ, BISF, and KSOG) separately, with 5 imputations performed for each and correlates of missingness included in the imputation.

Next, I performed a regression with the chosen demographic variables predicting AQ and BAPQ to check for multicollinearity using VIF/Tolerance tests. All Tolerance values were less than 1 and all VIF values were less than 2.

Lastly, I examined box plots of all the composite variables and found no outliers. Tests of skewness and kurtosis were less than 2 for all composite variables. Tests of multivariate outliers showed some cases that exceeded cutoffs for leverage and Mahalanobis distance; however, no cases exceeded cutoffs for Cook's *d*. Additionally, performing the main analyses with these variables removed did not change the significance of the outcomes.

To support my assumption that BAP traits are continuously distributed in a TD population, I created a histogram of that variable. The histogram supports my assumption that BAP traits are continuously distributed in a TD population. Additionally, including the cut-off for higher-BAP shows that almost half of the sample could be considered to have higher-BAP, demonstrating that I have sufficient variance in this trait to examine my hypotheses (see Figure 1).

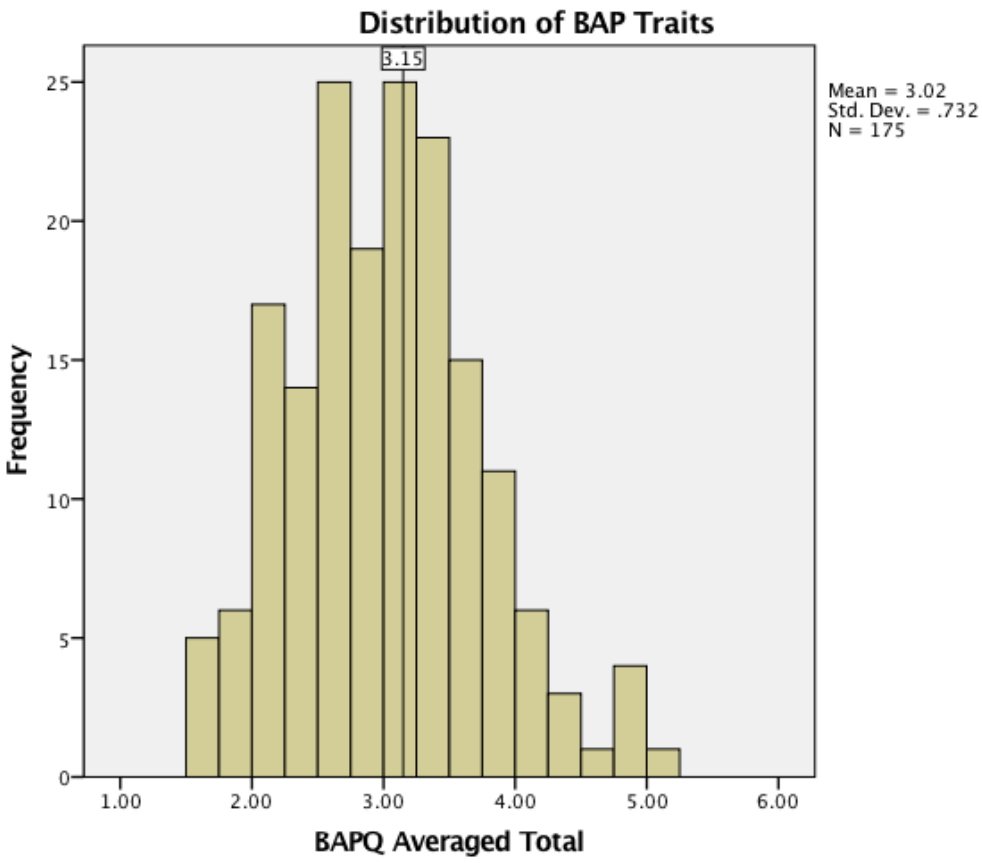

Figure 1. The distribution of BAP traits (as measured by the BAPQ). The line labeled "3.15" indicates the cut-off for having higher-BAP.

The gender identity, race, and religion variables were dummy coded before being entered in the regression. For gender identity, "female" was chosen as the reference group and "male", "genderfluid/genderqueer/agender", and "other gender/transgender" were chosen as the comparison groups. For race, "White" was chosen as the reference group and "Black", "Hispanic", "Asian", "Multiracial", and "Other" were chosen as the comparison groups. For religion, "Christianity" was chosen as the reference group and "other organized religion" (a combination of the "Muslim," "Jewish," "Hindu," "Buddhist," and "Other" categories),

"spiritual but not religious", "neither spiritual nor religious", and "nothing in particular" were chosen as the comparison groups (see Table 1 for demographic variables).

Table 1

Demographics of Study Sample

	N	Percentage
Gender		
Male	33	18.6
Female	132	74.6
Transgender	1	0.6
Genderfluid/Genderqueer	4	2.3
Agender	5	2.8
Other	2	1.1
Sexual Orientation		
Straight/Heterosexual	118	66.7
Lesbian/Gay/Homosexual	9	5.1
Bi/Pansexual	34	19.2
Other non-hetero orientation	5	2.8
Race		
White	119	67.2
Black or African American	15	8.5
Hispanic/Latino	16	9.0

Table 1 Continued

	N	Percentage
Race		
American Indian/Alaskan	1	0.6
Asian	11	6.2
Multi-racial	14	7.9
Other	1	0.6
Participant Education		
Less than high school	7	4.0
High school graduate	25	14.1
Some college	99	55.9
2-year degree	17	9.6
4-year degree	21	11.9
Professional degree	6	3.4
Doctorate	1	0.6
Participant Recruitment Source		
Old Dominion University	6	3.4
Emory and Henry College	47	26.6
Social Media	35	20.1
Research Website	48	27.1
Other	41	23.2
Religion		
Christian	79	44.6

Table 1 Continued

	N	Percentage
Religion		
Muslim	3	1.7
Jewish	4	2.3
Hindu	2	1.1
Buddhist	3	1.7
Other	6	3.4
Spiritual but not religious	28	15.8
Neither spiritual nor religious	28	15.8
Nothing in particular	24	13.6

Primary Analyses

I conducted two sets of linear hierarchical multiple regressions with the AQ and BAPQ serving as the predictor variables and sexual orientation measured by the KSOG and partnered sexual behaviors measured by BISF Engaged serving as the criterion variables. The demographic variables listed in the Data Screening section were used for each regression.

To test H1, that engaging in partnered sexual behavior is predicted by BAP traits over and above the effects of any demographic variables, I performed a hierarchical multiple regression. The demographic variables were entered in Step 1, and the AQ Total was entered in Step 2, with both sets of variables serving as predictors for BISF Engaged. Significant demographic predictors were participant's level of education, $\beta = 0.26$, $t = 3.23$, $p = .002$, and

other organized religion compared to Christian religion, β = -0.19, t = -2.18, p = .03. Participants with higher levels of education engaged in more partnered sexual behavior, whereas participants identifying with an organized religion other than Christianity engaged in less partnered sexual behavior. AQ Total was not a significant predictor of BISF Engaged, β = 0.04, t = 0.48, p = .64. Demographic variables predicted BISF Engaged in the first step, R = .44, R^2 = .19, F(16, 154) = 2.26, p = .005, but the addition of AQ Total did not make a significant change in the model, ΔR^2 = .001, F = 0.22, p = .64 (see Table 2).

Table 2

Summary of Hierarchal Regression Analyses for Demographic Variables and AQ Predicting Partnered Sexual Behaviors

Predictors	*B*	*SE B*	ß	*t*	*F*	R^2	ΔR^2
Step 1					2.26**	.19	--
Participant education	1.90	0.59	0.26	3.23***			
Other organized religion	-5.20	2.38	-0.19	-2.18*			
Step 2					.022	--	.001
AQ	0.02	0.04	0.04	0.48			

Note. N = 171, *p < .05, **p < .01, ***p < .005; AQ = Autism Spectrum Quotient. Only significant predictors are shown.

To further test H1, I performed another hierarchical multiple regression, again with the demographic variables entered in Step 1, but using BAPQ Total instead of AQ Total in Step 2. Again, both sets of variables served as predictors for BISF Engaged. Significant demographic predictors were participant's level of education, β = 0.26, t = 3.21, p = .002, and other organized religion compared to Christian religion, β = -0.19, t = -2.19, p = .03. Participants with higher levels of education engaged in more partnered sexual behavior, whereas participants identifying with an organized religion other than Christianity engaged in less partnered sexual behavior. BAPQ Total was not a significant predictor of BISF Engaged, β = -0.11, t = -1.32, p = .19. Demographic variables predicted BISF Engaged in the first step, R = .43, R^2 = .19, F(16, 152) = 2.21, p = .007, but the addition of BAPQ Total did not make a significant change in the model, ΔR^2 = .009, F = 1.73, p = .19 (see Table 3).

Table 3

Summary of Hierarchal Regression Analyses for Demographic Variables and BAPQ Predicting Partnered Sexual Behaviors

Predictors	*B*	*SE B*	ß	*t*	*F*	R^2	ΔR^2
Step 1					2.21**	.19	--
Participant education	1.89	0.59	0.26	3.21***			
Other organized religion	-5.24	2.40	-0.19	-2.19*			
Step 2					1.73	--	.009

BAPQ	-0.03	0.03	-0.11	-1.32

Note. N = 169, *p < .05, **p < .01, ***p < .005; BAPQ = Broad Autism Phenotype Questionnaire. Only significant predictors are shown.

To test H2, that sexual orientation is predicted by BAP traits over and above the effects of demographic variables, I performed another hierarchical regression. The demographic variables were entered in Step 1, and the AQ Total was entered at Step 2, with both sets of variables serving as predictors for KSOG Total. Significant demographic predictors were identifying as spiritual but not religious compared to Christian religion, β = 0.26, t = 3.15, p = .002, and identifying as neither spiritual nor religious compared to Christian religion, β = 0.24, t = 2.81, p = .006. Participants who identified as spiritual but not religious or as neither spiritual nor religious endorsed more same-sex attraction than those who identified as Christian. AQ Total was not a significant predictor of KSOG Total, β = 0.12, t = 1.49, p = .14. Demographic variables predicted KSOG Total in the first step, R = .48, R^2 = .23, F(16, 148) = 2.70, p = .001, but the addition of AQ Total did not make a significant change in the model, ΔR^2 = .012, F = 2.22, p = .14 (see Table 4).

Table 4

Summary of Hierarchal Regression Analyses for Demographic Variables and AQ Predicting Sexual Orientation

Predictors	*B*	*SE B*	ß	*t*	*F*	R^2	ΔR^2

Step 1					2.70**	.23	--
Spiritual but not religious	1.16	0.37	0.26	3.15***			
Neither spiritual nor religious	1.05	0.38	0.24	2.81*			
Step 2					2.22	--	.012
AQ	0.01	0.01	0.12	1.49			

Note. $N = 165$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .005$; AQ = Autism Spectrum Quotient. Only significant predictors are shown.

To further test H2, I performed another hierarchical multiple regression, again with the demographic variables entered in Step 1, but using BAPQ Total instead of AQ Total in Step 2. Again, both sets of variables predicted KSOG Total. One demographic predictor was significant: identifying as spiritual but not religious compared to Christian religion, $\beta = 0.27$, $t = 3.16$, $p = .002$. Participants who identified as spiritual but not religious endorsed more same-sex attraction than those who identified as Christian. BAPQ Total was also a significant predictor of KSOG Total, $\beta = 0.22$, $t = 2.72$, $p = .007$. Participants that endorsed more BAP traits also endorsed more same-sex attraction. While the demographic variables did predict KSOG Total in the first step, $R = .47$, $R^2 = .22$, $F(16, 147) = 2.67$, $p = .001$, the addition of BAPQ Total predicted KSOG Total above and beyond the demographic variables, $\Delta R^2 = .04$, $F = 7.41$, $p = .007$ (see Table 5).

Table 5

Summary of Hierarchal Regression Analyses for Demographic Variables and BAPQ Predicting Sexual Orientation

Predictors	*B*	*SE B*	ß	*t*	*F*	R^2	ΔR^2
Step 1					2.67**	.22	--
Spiritual but not religious	0.99	0.38	0.27	3.16***			
Step 2					7.41**	--	.04
BAPQ	0.01	0.01	0.22	2.72**			

Note. $N = 164$, $^*p < .05$, $^{**}p < .01$, $^{***}p < .005$; BAPQ = Broad Autism Phenotype Questionnaire. Only significant predictors are shown.

Due to findings in the literature that show gender as a moderator of the relationship between BAP traits and sexual orientation, I ran separate hierarchical regression of demographic variables and BAPQ predicting sexual orientation on the KSOG for female and male participants. For female participants, BAPQ was still a significant predictor of sexual orientation above and beyond the demographic variables, $\beta = 0.23$, $t = 2.40$, $p = .018$, $\Delta R^2 = .04$, $F = 5.76$, $p = .018$. However, for male participants, BAPQ was not a significant predictor of sexual orientation, $\beta = 0.18$, $t = 1.07$, $p = .299$, $\Delta R^2 = .02$, $F = 1.15$, $p = .299$.

Additionally, since recruitment source was largely split between those who found the study online ($n = 130$) and participants recruited from Emory and Henry College ($n = 47$), I ran separate hierarchical regression of demographic variables and BAPQ predicting sexual orientation on the KSOG for participants from online sources and participants from Emory and

Henry College. For participants recruited online, BAPQ was still a significant predictor of sexual orientation above and beyond the demographic variables, $\beta = 0.23$, $t = 2.40$, $p = .018$, $\Delta R^2 = .04$, $F = 5.77$, $p = .018$. However, for participants from Emory and Henry College, BAPQ was not a significant predictor of sexual orientation, $\beta = -0.18$, $t = -1.78$, $p = .084$, $\Delta R^2 = .02$, $F = 3.18$, $p = .084$.

CHAPTER IV

DISCUSSION

Primary Findings

In this study, BAPQ scores which assessed BAP significantly predicted sexual orientation above and beyond demographic traits, accounting for 4% of the variance in sexual orientation. However, AQ scores did not predict sexual orientation over demographic traits. Additionally, neither measure of the BAP significantly predicted engaging in partnered sexual behaviors. Furthermore, BAP traits as measured on the BAPQ were found to be continuously distributed in the TD population.

The findings in this study build off those of Kunihara and colleagues (2006), Jobe and White (2007), Pollmann, Finkenauer, and Begeer (2010), and Lamport and Turner (2014) in examining the presentation of the BAP in a TD population, and the similarity of these presentations to those seen in ASD. Kunihara and colleagues (2006) reported that anxiety, depression, and peer victimization (bullying) were more likely to occur in young adults with greater levels of the BAP. Jobe and White (2007) reported that individuals with greater levels of the BAP were lonelier and had fewer and shorter friendships. Pollmann, Finkenaur, and Begeer (2010) examined BAP traits in married couples and found that husbands with greater levels of the BAP experienced increased dissatisfaction with responsiveness, intimacy, and trust in their relationships. Lamport and Turner (2014) found that young adults with greater levels of the BAP have lower levels of empathy and higher levels of attachment anxiety and avoidance. My study further characterizes the group, that is, similar to individuals with ASD, individuals with higher levels of the BAP have higher levels of same-sex attraction.

The BAPQ's prediction of sexual orientation fits with my hypothesis on the relationship between BAP traits and sexuality, which was based on findings in the ASD population. Previous research has suggested that those with ASD were more likely than those with typical development to endorse a non-heterosexual sexual orientation and greater levels of same-sex attraction (Bejerot & Eriksson, 2014; Byers et al., 2012; Gilmour et al., 2012), and the current study suggests that this might also be true for people with greater levels of the BAP. It is unknown why same-sex attraction is more common in people with ASD and greater levels of the BAP. Both extreme male brain theory (the theory that prenatal androgens affect women with ASD more strongly [De Bruin et al., 2009] and influence female homosexuality [Kraemer et al., 2006]) and a lack of suitable opposite-sex partners have been hypothesized, but as noted above, both findings have been challenged (Falter et al., 2008; Gilmour et al., 2012; Jenkins, 2010; Voracek & Dressler, 2006). Other theories need to be proposed. Another possible explanation for this relationship is a single underlying heritability factor for domains contributing to the BAP and ASD (Constantino & Todd, 2007) that could also contribute to factors influencing homosexuality. Alternatively, people with ASD and greater levels of the BAP may also be less sensitive to social stigma regarding same-sex relationships, which may lead them to be more open to expressing their same-sex attraction. Another theory has been posited by practitioners working with the ASD population. Some individuals with ASD report that because it is difficult for them to understand other people in a relationship, they prefer to be in a relationship with individuals who are more like them (i.e., the same gender) because they are easier to understand (M. Urbano, personal communication, March 2, 2017). Further research on this phenomenon is needed.

Although I hypothesized that both the AQ and the BAPQ would predict sexual orientation, only the BAPQ was a significant predictor. There are several possible reasons why this could be. The first is that the BAPQ was specifically designed to measure BAP traits in TD individuals (Ingersoll et al., 2011), whereas the AQ was designed to be used with ASD individuals (Baron-Cohen et al., 2001) even though it has been used in a TD population (e.g., Hurst et al., 2007; Jobe & White, 2007). My study only looked at TD individuals, which is perhaps why the BAPQ and not the AQ was a significant predictor. Although both the AQ and BAPQ contain domains based on the three domains of autism that were present in the DSM-IV-TR (social deficits; communication deficits; and restricted, repetitive behaviors and interests; APA, 2000), the AQ contains two additional factors, Imagination and Local Details, which were based on known areas of abnormalities in cognition present in autism (Baron-Cohen, Wheelwright, Skinner, Martin, & Clubley, 2001). These factors may not be present in individuals without an ASD diagnosis; therefore, they may not characterize individuals with high-BAP. Additionally, the factor structure of the AQ has been found to vary, while that of the BAPQ is fairly consistent (Ingersoll et al., 2011). Having a more consistent factor structure may make the BAPQ a more reliable measure of BAP traits. Further research is needed to look for differences on these two measures in terms of predicting sexual orientation.

Additionally, the relationship between BAP traits on the BAPQ and sexual orientation on the KSOG was mediated by gender and recruitment source. For women with higher-BAP, an increase in BAP traits was associated with an increase in same-sex attraction. However, this relationship did not exist for males with higher-BAP. This mirrors findings in the literature for ASD that having ASD predicted more same-sex attraction for women, but not for men (Gilmour et al., 2012). These findings might also be due to the smaller number of male participants

enrolled in the study compared to female participants. Recruitment source also mediated this relationship, such that for participants recruited from online sources, an increase in BAP traits was associated with an increase in same-sex attraction. However, this relationship did not exist for participants from Emory and Henry College. One reason might be that participants recruited online had greater variation in their scores of sexual orientation on the KSOG (M = 2.32, SD = 1.74) than did E&H participants (M = 1.28, SD = 0.98). Additionally, E&H is a private college associated with the United Methodist religion, so participants from this college might be more traditional than students from other colleges, including having a more traditional heterosexual sexual orientation.

Another difference from my hypotheses is that neither the AQ nor the BAPQ predicted partnered sexual behaviors. This hypothesis was based on studies that found individuals with higher levels of the BAP suffered more from loneliness, difficulty with friendships (Jobe & White, 2007), anxiety, depression, and peer victimization (Kunihira et al., 2006) than TD individuals. Additionally, Lamport and Turner (2014) found individuals with higher levels of the BAP to have more attachment anxiety and avoidance, as well as lower levels of empathy. These traits associated with individuals that have higher levels of the BAP were why I hypothesized that these individuals might participate in less partnered sexual behavior. However, it is possible that these social impairments in those with higher levels of the BAP are not debilitating enough to have a significant effect on their partnered sexual behaviors. It is also possible that there are different levels of social competence required for sustaining a friendship or a romantic relationship and engaging in a one-off sexual encounter. People with higher levels of the BAP may struggle with sustaining friendships and romantic relationships, but may still be capable of engaging in sexual relationships of shorter durations.

Further reasons for the hypothesis that BAP traits would predict partnered sexual behaviors came from similarities of those with higher levels of the BAP and those with ASD. TOM is an important characteristic in relationship formation that is lacking in those with ASD (Baron-Cohen, 1995) and can lead to later difficulty in forming friendships and close romantic relationships (Byers et al., 2012; Carrington et al., 2003; Fein, 2015; Howlin et al., 2000; Mehzabin & Stokes, 2011; Orsmond et al., 2004). Indeed, those with ASD participate in fewer relationships than those with TD (Byers, Nichols, and Voyer 2013; Rainie & Madden, 2005). However, it appears that there is little evidence for similarity between those with the BAP and ASD on the trait of TOM. One of the key studies of TOM in people with greater levels of the BAP was methodologically flawed by the inclusion of a subset of participants who reported an official diagnosis of ASD in the BAP group (Best et al., 2008). Furthermore, another study of TOM deficits did not find similarities in this trait between those with higher levels of the BAP and those with ASD (Kunihira et al., 2006). Therefore, if individuals with greater levels of the BAP do not have TOM deficits, then they may be able to participate in sexual and romantic relationships to some degree, though they may still have some social impairment (e.g., Jobe & White, 2007; Kunihira et al., 2006; Lamport & Turner, 2014).

A final consideration for why this hypothesis was not supported is that the BISF Engaged scale by which partnered sexual behaviors was measured was only part of a larger questionnaire. Although the questions on the BISF Engaged measure had good face and internal validity, it may be possible that using a more extensive and better-validated questionnaire would have changed the outcomes. However, I did not find a questionnaire in my literature search that directly measured this topic, so perhaps one should be constructed.

Secondary Findings

Other significant predictors of partnered sexual behavior and sexual orientation came from the demographic variables. Participant level of education predicted both engaging in more partnered sexual behavior and endorsing more same-sex attraction. Religion also affects sexuality and sexual behaviors in different ways. Identifying with a non-Christian organized religion predicted engaging in less partnered sexual behavior, while identifying as spiritual but not religious or as neither spiritual nor religious compared to identifying as Christian predicted endorsing greater same-sex attraction.

Studies examining the predictors of sexual orientation have shown that college-educated people, especially women, were more likely to report a homosexual sexual orientation. This could be because of the more accepting nature of higher education, because of the education resources on sexual orientation prevalent at many colleges, or a combination of these or other reasons (Diamond, 1998). More educated adults could also have more positive views on sex in general, leading them to engage in more partnered sexual behaviors.

My study found that those of another organized non-Christian religion (see Methods section for religions included in this label) were less likely to participate in partnered sexual behaviors than those who identified with the Christian religion, although it is hard to draw any strong conclusions as only 18 people were included in the other organized non-Christian religion category. Many religions promote sexual abstinence before marriage, and almost half of adults from ages 25-34 have never been married (Wang & Parker, 2014), so it could be that those who were most devoted to their religion were less likely to have engaged in partnered sexual behaviors. However, a recent Pew Research study looking at religious beliefs found that of the other non-organized Christian religions, only those who identified as Muslim came close to

rating religion as important to them as Christians (64% compared to 66%; Pew Research Center, 2015), casting doubt on this hypothesis.

The strong religious devotion of Christians may also explain why they are less likely to identify as non-heterosexual compared to those not religiously affiliated. Forty-three percent of Christians surveyed by a Pew Research Center survey said that "Homosexuality should be discouraged by society," while only 12% of the religiously unaffiliated endorsed this view (Pew Research Center, 2015). While religion is often a protective factor, this is not always the case for LGBT individuals. These individuals may have poorer mental health outcomes if they identify with a religion that condemns homosexuality (Barnes & Meyer, 2012). Consequently, many LBGT individuals leave the religious institution they grew up with, participate less in religious institutions if they do attend, and state that they receive less daily guidance from their religion, compared to non-LGBT individuals (Barnes & Meyer, 2012; Herek, Norton, Allen, & Sims, 2010; Sherkat, 2002).

Strengths and Limitations

One of the limitations to this study was leaving out the demographic variable age in the online survey. Age could have been a moderating variable for engaging in partnered sexual behaviors: older people are more likely to have a partner (Wang & Parker, 2014) and may therefore be more likely to engage in partnered sexual behavior on a regular basis. Additionally, the design of my survey had both measures of BAP traits sequentially at the beginning. My survey took between 45 minutes to an hour to complete. As a result, many participants got tired stopped taking the survey halfway through and only completed these measures, so I was unable to use their data to look at either of my hypotheses. It appeared that ODU students were among

those who dropped out without taking the entire survey, as only 6 participants indicated that they found the study on ODU SONA.

Another weakness of my study is limited generalizability as 83% of the sample reported being in college. This sampling may have left out people that were too impaired by their broad autism phenotype to attend college and therefore reduced the variability of the sample. However, as this survey was offered online, it could have been taken by many students who were taking online courses rather than traditional on-campus courses. Online classes involve less social engagement than traditional classes, so individuals with higher levels of the BAP may be more comfortable taking these classes than on campus classes and using online surveys rather than in-person experiments to fulfill their courses' research credit requirements. Additionally, the distribution of BAP traits measured by the BAPQ was not indicative of limited variability (see Figure 1, above). Future studies might ask students taking a survey on the BAP for class credit if their course is an on-campus or online course.

Lastly, as noted above, the measure that I used for partnered sexual behaviors was adapted from a larger measure and had not been validated for use on its own. It is possible that this was the reason that I did not find the hypothesized relationship with ASD trait variables. Further research for developing a measure of partnered sexual behavior is needed.

In addition to these weaknesses, my study has several strengths. I used two different measures of BAP traits, which captured some differences that appeared between the two measures. I recruited enough participants for each analysis to have more than 160 cases in it, which was the number of participants needed to find a small effect size if it were present, as indicated by a power analysis (see Methods section). Furthermore, using an online study may have allowed me to recruit participants with more traits of the BAP, as mentioned above. My

study also looked at several topics that are not often present in the research literature. Sexual behaviors and sexual orientation of a young adults, especially those with ASD and higher levels of the BAP, are not often investigated (Gilmour et al., 2012; Mehzabin & Stokes, 2011; Stokes & Kaur, 2005; Van Bourgondien et al., 1997). Additionally, the BAP is a topic that has received very little attention compared to other areas of ASD research. Difficulties experienced by higher-BAP individuals are often investigated for how they correlate to those difficulties experienced in ASD. These studies often ignore how these difficulties affect the lives of people with higher levels of the BAP, even though they have similar challenges to those with ASD. My study investigated individuals with higher-BAP as an independent population, used a continuous measure of BAP traits, and examined characteristics related to the BAP that had not yet been investigated. This study now adds to the literature on traits associated with higher levels of the BAP and provides further support for the continuous nature of BAP traits in a TD population.

CHAPTER V

CONCLUSIONS

Clinical Implications

The findings of this study also have clinical implications and highlight new directions for interventions. Since members of the LGBT population have higher levels of stress and are more likely to have a mental disorder (Meyer, 2003), people who have ASD or higher levels of the BAP and identify as LGBT are likely to have even more stress. Being aware of the increased vulnerability of the combined LGBT/ASD-and-higher-BAP population can help providers that interact with this population better treat their unique mental health needs. Additionally, given the higher prevalence of same-sex attraction in the ASD and higher-BAP populations, social skills interventions targeted towards these groups should include lessons on navigating same-sex relationships. Furthermore, since those with higher levels of the BAP are not generally the target of social skills groups or other types of interventions even though studies show that they have some of the same deficits in this area as those with ASD (e.g., Jobe & White, 2007; Kunihira et al., 2006), more research is needed on what interventions may be needed in the higher-BAP population.

Future Directions

Based off the limitations listed above, I plan to implement different methods in my future research. I will check future surveys thoroughly to make sure that I have included all proposed variables. I will also make sure that the order of measures is such that two measures examining the same concept are not presented back to back; therefore, participants that stop halfway through the study will still provide some data that can be analyzed. Qualtrics has a measure randomization tool that I will utilize next time for this purpose. Additionally, I am also

considering ways to incentivize completion of future surveys by using monetary incentives for individuals not participating for course credit and by requiring participants to reach the end of the survey to receive their payment. Finally, I plan to concentrate my recruitment efforts towards groups of people who are motivated to complete the survey in its entirety and provide good data.

When doing research with people that have ASD or greater levels of the BAP, it is important to look at populations outside of college, as the challenges present in this population may prevent them from seeking higher education. For future surveys, I will need to look at other methods of recruitment that target young adults not enrolled in college. Platforms such as MTurk and Craigslist have been used in other studies to recruit from this population, although studies that use these platforms must be well-funded as they require participants be paid.

Due to the scarcity of literature on TD individuals with higher levels of the BAP, I hope to continue to do research with this population, especially research focused on romantic partners and sexual orientation. Individuals with higher levels of the BAP suffer from many of the same difficulties of those with ASD (Jobe & White, 2007; Kunihira et al., 2006; Lamport & Turner, 2014), yet they are not a population that is often targeted for intervention. Future studies might investigate the feasibility of screening for higher levels of the BAP in a treatment-seeking population and educating treatment providers on the difficulties that this population is more likely to face. Another promising direction for future investigation could be planning group interventions that teach interpersonal interaction skills to people with higher levels of the BAP, and testing for beneficial effects of these interventions. Finally, as the BAP and sexuality is such a new area, it may benefit from qualitative research, such as interviewing individuals who have greater levels of the BAP about their experiences with romantic partners and their sexuality. This research could help elucidate the possible causes for increased same-sex attraction among people

with greater levels of the BAP and ASD. Anecdotal reports from this population about their sexuality could be used to guide hypotheses for further empirical research.

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APPENDIX A

DEMOGRAPHICS

What is your birth gender?
- ❍ Female
- ❍ Male
- ❍ Intersex

What is your current gender identity?
- ❍ Female
- ❍ Male
- ❍ Gender fluid/ genderqueer
- ❍ Transgender male
- ❍ Transgender female
- ❍ Agender
- ❍ Other

How do you label your sexual orientation?

_____

What is your race/ ethnicity?
- ❍ White
- ❍ Hispanic/ Latino
- ❍ Black or African American
- ❍ American Indian or Alaska Native
- ❍ Asian
- ❍ Bi-racial/ Multi-racial/ Mixed
- ❍ Other

What is your total yearly income?
- ❍ Less than $10,000
- ❍ $10,000 - $19,999
- ❍ $20,000 - $29,999
- ❍ $30,000 - $39,999
- ❍ $40,000 - $49,999
- ❍ $50,000 - $59,999
- ❍ $60,000 - $69,999
- ❍ $70,000 - $79,999
- ❍ $80,000 - $89,999
- ❍ $90,000 - $99,999
- ❍ $100,000 - $149,999
- ❍ More than $150,000
- ❍ Don't know

If you still rely on your family, what is their total yearly income?

- ❍ Less than $10,000
- ❍ $10,000 - $19,999
- ❍ $20,000 - $29,999
- ❍ $30,000 - $39,999
- ❍ $40,000 - $49,999
- ❍ $50,000 - $59,999
- ❍ $60,000 - $69,999
- ❍ $70,000 - $79,999
- ❍ $80,000 - $89,999
- ❍ $90,000 - $99,999
- ❍ $100,000 - $149,999
- ❍ More than $150,000
- ❍ Don't know
- ❍ Not applicable

What is your current relationship status?
- ❍ Single
- ❍ Single, dating casually
- ❍ Single, long-term relationship
- ❍ Single, cohabitating
- ❍ Married
- ❍ Life partner/ Domestic partnership
- ❍ Separated
- ❍ Divorced
- ❍ Widowed

Answer If What is your current relationship status? Single Is Selected
Have you ever been in a relationship?
- ❍ Yes
- ❍ No

How long have you been in your current or most recent relationship?
_____

How long was your longest relationship?
_____

How old were you (in years) when you first had sexual contact (oral, anal, or vaginal sex) with another person? (Enter N/A if not applicable).
_____

What is the zip code of your current residence?
_____

What is the education level of your most educated parent?
- ❍ Less than high school

- ❍ High school graduate
- ❍ Some college
- ❍ 2 year degree
- ❍ 4 year degree
- ❍ Professional degree
- ❍ Doctorate

What is your level of education?
- ❍ Less than high school
- ❍ High school graduate
- ❍ Some college
- ❍ 2 year degree
- ❍ 4 year degree
- ❍ Professional degree
- ❍ Doctorate

If you are still in college, what year are you?
- ❍ First-year
- ❍ Sophomore
- ❍ Junior
- ❍ Senior
- ❍ Graduate Student
- ❍ Not in college

Where did you find the link to this survey?
- ❍ ODU SONA
- ❍ Online psychology research website (please specify which one) _____
- ❍ Social media
- ❍ Other _____

What is your occupation or field of study?
_____

Do you identify with a particular spirituality or religion?
- ❍ Christian
- ❍ Muslim
- ❍ Jewish
- ❍ Hindu
- ❍ Buddhist
- ❍ Other
- ❍ Spiritual but not religious
- ❍ Neither spiritual nor religious
- ❍ Nothing in particular

Have you received a formal diagnosis of an Autism Spectrum Disorder?
- ❍ Yes

❍ No

Answer If Have you received a formal diagnosis of an Autism Spectrum Disorder? Yes Is Selected
Who gave you the formal diagnosis?
❍ Family physician/ primary care provider
❍ Specialist doctor
❍ Psychologist
❍ Psychiatrist
❍ Other _____

Has anyone in your immediate family (parent, child, brother, or sister) received a formal diagnosis of an Autism Spectrum Disorder?
❍ Yes
❍ No

Answer If Has anyone in your immediate family (parent, child, brother, or sister) received a formal diagnos... Yes Is Selected
If so, who? (Select all that are applicable).
❑ Mother
❑ Father
❑ Brother
❑ Sister
❑ Male child
❑ Female child

Answer If Has anyone in your immediate family (parent, child, brother, or sister) received a formal diagnos... Yes Is Selected
Who gave them the formal diagnosis?
❍ Family physician/ primary care provider
❍ Specialist doctor
❍ Psychologist
❍ Psychiatrist
❍ Other _____
❍ Don't know

Do you have any other formal psychiatric diagnosis?
❍ Yes
❍ No

Answer If Do you have any other formal psychiatric diagnosis? Yes Is Selected
If yes, please write your other psychiatric diagnoses here:
_____

APPENDIX B

AUTISM SPECTRUM QUOTIENT

I prefer to do things with others rather than on my own.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I prefer to do things the same way over and over again.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

If I try to imagine something, I find it very easy to create a picture with my mind.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I frequently get so strongly absorbed in one thing that I lose sight of other things.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I often notice small sounds when others do not.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I usually notice car number plates or similar strings of information.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

Other people frequently tell me that what I've said is impolite, even though I think it is polite.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

When I'm reading a story, I can easily imagine what the characters might look like.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I am fascinated by dates.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

In a social group, I can easily keep track of several different people's conversations.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I find social situations easy.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I should please select slightly disagree for this question.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I tend to notice details that others do not.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I would rather go to a library than a party.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I find making up stories easy.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I find myself drawn more strongly to people than to things.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I tend to have very strong interests which I get upset about if I can't pursue.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I enjoy social chit-chat.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

When I talk, it isn't always easy for others to get a word in edgeways.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I am fascinated by numbers.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

When I'm reading a story, I find it difficult to work out the characters' intentions.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I don't particularly enjoy reading fiction.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I find it hard to make new friends.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I notice patterns in things all the time.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I would rather go to the theatre than a museum.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

It does not upset me if my daily routine is disturbed.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I frequently find that I don't know how to keep a conversation going.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I find it easy to "read between the lines" when someone is talking to me.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I usually concentrate more on the whole picture, rather than the small details.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I am not very good at remembering phone numbers.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I don't usually notice small changes in a situation, or a person's appearance.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I know how to tell if someone listening to me is getting bored.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I find it easy to do more than one thing at once.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

When I talk on the phone, I'm not sure when it's my turn to speak.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I enjoy doing things spontaneously.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I am often the last to understand the point of a joke.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I find it easy to work out what someone is thinking or feeling just by looking at their face.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

If there is an interruption, I can switch back to what I was doing very quickly.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I am good at social chit-chat.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

People often tell me that I keep going on and on about the same thing.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

When I was young, I used to enjoy playing games involving pretending with other children.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I like to collect information about categories of things (e.g. types of car, types of bird, types of train, types of plant, etc.).

- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I find it difficult to imagine what it would be like to be someone else.

- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I like to plan any activities I participate in carefully.

- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I enjoy social occasions.

- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I find it difficult to work out people's intentions.

- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

New situations make me anxious.

- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I enjoy meeting new people.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I am a good diplomat.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I am not very good at remembering people's date of birth.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

I find it very easy to play games with children that involve pretending.
- ❍ Definitely agree
- ❍ Slightly agree
- ❍ Slightly disagree
- ❍ Definitely disagree

APPENDIX C

BROAD AUTISM PHENOTYPE QUESTIONNAIRE

I like being around other people
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

I find it hard to get my words out smoothly
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

I am comfortable with unexpected changes in plans
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

It's hard for me to avoid getting sidetracked in conversation
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

I would rather talk to people to get information than to socialize
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

People have to talk me into trying something new
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

I am "in-tune" with the other person during conversation
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

I have to warm myself up to the idea of visiting an unfamiliar place
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

I enjoy being in social situations
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

My voice has a flat or monotone sound to it
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

I feel disconnected or "out of sync" in conversations with others
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

People find it easy to approach me
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

I feel a strong need for sameness from day to day
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

People ask me to repeat things I've said because they don't understand
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

I am flexible about how things should be done
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

I look forward to situations where I can meet new people
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

I have been told that I talk too much about certain topics
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

When I make conversation it is just to be polite
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

I look forward to trying new things
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

I speak too loudly or softly
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

I can tell when someone is not interested in what I am saying
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

I have a hard time dealing with changes in my routine
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

I am good at making small talk
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

I act very set in my ways
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

I feel like I am really connecting with other people
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

People get frustrated by my unwillingness to bend
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

Conversation bores me
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

I am warm and friendly in my interactions with others
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

I leave long pauses in conversation
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

I alter my daily routine by trying something different
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

I prefer to be alone rather than with others
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

I lose track of my original point when talking to people
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

I like to closely follow a routine while working
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

I can tell when it is time to change topics in conversation
- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

I keep doing things the way I know, even if another way might be better

- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

I enjoy chatting with people

- ❍ Very rarely
- ❍ Rarely
- ❍ Occasionally
- ❍ Somewhat often
- ❍ Often
- ❍ Very often

APPENDIX D

BRIEF INDEX OF SEXUAL FUNCTIONING

Do you currently have a sexual partner? (A sexual partner is defined as someone with whom you have had any sexual contact, from a hookup to a continuing relationship.)
- ❍ Yes
- ❍ No

Have you been sexual active in the past year?
- ❍ Yes
- ❍ No

During the past year, how frequently have you had sexual thoughts, fantasies, or erotic dreams? (Please click the most appropriate response.)
- ❍ Not at all
- ❍ Once
- ❍ 2 or 3 times
- ❍ Once a week
- ❍ 2 or 3 times per week
- ❍ Once a day
- ❍ More than once a day

How frequently have you felt a desire to engage in the following activities during the past year? (An answer is required for each, even if it may not apply to you.)
Kissing
- ❍ Not at all
- ❍ Once
- ❍ 2 or 3 times
- ❍ Once a week
- ❍ 2 or 3 times per week
- ❍ Once a day
- ❍ More than once a day

Masturbation alone
- ❍ Not at all
- ❍ Once
- ❍ 2 or 3 times
- ❍ Once a week
- ❍ 2 or 3 times per week
- ❍ Once a day
- ❍ More than once a day

Mutual masturbation with a partner
- ❍ Not at all

- ❍ Once
- ❍ 2 or 3 times
- ❍ Once a week
- ❍ 2 or 3 times per week
- ❍ Once a day
- ❍ More than once a day

Petting and foreplay
- ❍ Not at all
- ❍ Once
- ❍ 2 or 3 times
- ❍ Once a week
- ❍ 2 or 3 times per week
- ❍ Once a day
- ❍ More than once a day

Oral sex
- ❍ Not at all
- ❍ Once
- ❍ 2 or 3 times
- ❍ Once a week
- ❍ 2 or 3 times per week
- ❍ Once a day
- ❍ More than once a day

Vaginal penetration and intercourse
- ❍ Not at all
- ❍ Once
- ❍ 2 or 3 times
- ❍ Once a week
- ❍ 2 or 3 times per week
- ❍ Once a day
- ❍ More than once a day

Anal sex
- ❍ Not at all
- ❍ Once
- ❍ 2 or 3 times
- ❍ Once a week
- ❍ 2 or 3 times per week
- ❍ Once a day
- ❍ More than once a day

How frequently have you become aroused by the following sexual experiences during the past year? (An answer is required for each even if it may not apply to you.)
Kissing

- ❍ Have not engaged in this activity
- ❍ Not at all
- ❍ Seldom, less than 25% of the time
- ❍ Sometimes, about 50% of the time
- ❍ Usually, about 75% of the time
- ❍ Always became aroused

Masturbation alone
- ❍ Have not engaged in this activity
- ❍ Not at all
- ❍ Seldom, less than 25% of the time
- ❍ Sometimes, about 50% of the time
- ❍ Usually, about 75% of the time
- ❍ Always became aroused

Mutual masturbation with a partner
- ❍ Have not engaged in this activity
- ❍ Not at all
- ❍ Seldom, less than 25% of the time
- ❍ Sometimes, about 50% of the time
- ❍ Usually, about 75% of the time
- ❍ Always became aroused

Petting and foreplay
- ❍ Have not engaged in this activity
- ❍ Not at all
- ❍ Seldom, less than 25% of the time
- ❍ Sometimes, about 50% of the time
- ❍ Usually, about 75% of the time
- ❍ Always became aroused

Oral sex
- ❍ Have not engaged in this activity
- ❍ Not at all
- ❍ Seldom, less than 25% of the time
- ❍ Sometimes, about 50% of the time
- ❍ Usually, about 75% of the time
- ❍ Always become aroused

Vaginal penetration or intercourse
- ❍ Have not engaged in this activity
- ❍ Not at all
- ❍ Seldom, less than 25% of the time
- ❍ Sometimes, about 50% of the time
- ❍ Usually, about 75% of the time
- ❍ Always became aroused

Anal sex
- ❍ Have not engaged in this activity
- ❍ Not at all
- ❍ Seldom, less than 25% of the time
- ❍ Sometimes, about 50% of the time
- ❍ Usually, about 75% of the time
- ❍ Always became aroused

Overall, during the past year, how frequently have you become anxious or inhibited during sexual activity with a partner?
- ❍ I have not had a partner
- ❍ Not at all anxious or inhibited
- ❍ Seldom, less than 25% of the time
- ❍ Sometimes, about 50% of the time
- ❍ Usually, about 75% of the time
- ❍ Always become anxious or inhibited

How frequently have you engaged in the following sexual experiences during the past year? (An answer is required for each, even if it may not apply to you.)
Kissing
- ❍ Not at all
- ❍ Once
- ❍ 2 or 3 times
- ❍ Once a week
- ❍ 2 or 3 times per week
- ❍ Once a day
- ❍ More than once a day

Sexual fantasy
- ❍ Not at all
- ❍ Once
- ❍ 2 or 3 times
- ❍ Once a week
- ❍ 2 or 3 times per week
- ❍ Once a day
- ❍ More than once a day

Masturbation alone
- ❍ Not at all
- ❍ Once
- ❍ 2 or 3 times
- ❍ Once a week
- ❍ 2 or 3 times per week
- ❍ Once a day
- ❍ More than once a day

Mutual masturbation with a partner
- ❍ Not at all
- ❍ Once
- ❍ 2 or 3 times
- ❍ Once a week
- ❍ 2 or 3 times per week
- ❍ Once a day
- ❍ More than once a day

Petting and foreplay
- ❍ Not at all
- ❍ Once
- ❍ 2 or 3 times
- ❍ Once a week
- ❍ 2 or 3 times per week
- ❍ Once a day
- ❍ More than once a day

Oral sex
- ❍ Not at all
- ❍ Once
- ❍ 2 or 3 times
- ❍ Once a week
- ❍ 2 or 3 times per week
- ❍ Once a day
- ❍ More than once a day

Vagina penetration or intercourse
- ❍ Not at all
- ❍ Once
- ❍ 2 or 3 times
- ❍ Once a week
- ❍ 2 or 3 times per week
- ❍ Once a day
- ❍ More than once a day

Anal sex
- ❍ Not at all
- ❍ Once
- ❍ 2 or 3 times
- ❍ Once a week
- ❍ 2 or 3 times per week
- ❍ Once a week
- ❍ More than once a day

During the past year, who has usually initiated sexual activity?
- ❍ I have not had a partner
- ❍ I have not had sex with a partner during the past month
- ❍ I usually have initiated activity
- ❍ My partner and I have equally initiated activity
- ❍ My partner has usually initiated activity

During the past year, how have you usually responded to your partner's sexual advances?
- ❍ I have not had a partner
- ❍ Has not happened during the past month
- ❍ Usually refused
- ❍ Sometimes refused
- ❍ Accepted reluctantly
- ❍ Accepted, but not necessarily with pleasure
- ❍ Usually accepted with pleasure
- ❍ Always accepted with pleasure

During the past year, have you felt pleasure from any forms of sexual experience?
- ❍ I have not had a partner
- ❍ Have had no sexual experience during the past month
- ❍ Have not felt any pleasure
- ❍ Seldom, less than 25% of the time
- ❍ Sometimes, about 50% of the time
- ❍ Usually, about 75% of the time
- ❍ Always felt pleasure

How often have you reached orgasm during the past year with the following activities? (An answer is required for each, even if it may not apply to you.)

In dreams or fantasy
- ❍ I have not had a partner
- ❍ Have not engaged in this activity
- ❍ Not at all
- ❍ Seldom, less than 25% of the time
- ❍ Sometimes, about 50% of the time
- ❍ Usually, about 75% of the time
- ❍ Always reached orgasm

Kissing
- ❍ I have not had a partner
- ❍ Have not engaged in this activity
- ❍ Not at all
- ❍ Seldom, less than 25% of the time
- ❍ Sometimes, about 50% of the time
- ❍ Usually, about 75% of the time
- ❍ Always reached orgasm

Masturbation alone
- ❍ I have not had a partner
- ❍ Have not engaged in this activity
- ❍ Not at all
- ❍ Seldom, less than 25% of the time
- ❍ Sometimes, about 50% of the time
- ❍ Usually, about 75% of the time
- ❍ Always reached orgasm

Mutual masturbation with a partner
- ❍ I have not had a partner
- ❍ Have not engaged in this activity
- ❍ Not at all
- ❍ Seldom, less than 25% of the time
- ❍ Sometimes, about 50% of the time
- ❍ Usually, about 75% of the time
- ❍ Always reached orgasm

Petting and foreplay
- ❍ I have not had a partner
- ❍ Have not engaged in this activity
- ❍ Not at all
- ❍ Seldom, less than 25% of the time
- ❍ Sometimes, about 50% of the time
- ❍ Usually, about 75% of the time
- ❍ Always reached orgasm

Oral sex
- ❍ I have not had a partner
- ❍ Have not engaged in this activity
- ❍ Not at all
- ❍ Seldom, less than 25% of the time
- ❍ Sometimes, about 50% of the time
- ❍ Usually, about 75% of the time
- ❍ Always reached orgasm

Vaginal penetration or intercourse
- ❍ I have not had a partner
- ❍ Have not engaged in this activity
- ❍ Not at all
- ❍ Seldom, less than 25% of the time
- ❍ Sometimes, about 50% of the time
- ❍ Usually, about 75% of the time
- ❍ Always reached orgasm

Anal sex
- ❍ I have not had a partner
- ❍ Have not engaged in this activity
- ❍ Not at all
- ❍ Seldom, less than 25% of the time
- ❍ Sometimes, about 50% of the time
- ❍ Usually, about 75% of the time
- ❍ Always reached orgasm

During the past year, has the frequency of your sexual activity with a partner been:
- ❍ I have not had a partner
- ❍ Less than you desired
- ❍ As much as you desired
- ❍ More than you desired

How much, if any, have the following areas changed during the past year?
(An answer is required for each, even if it may not apply to you)
Sexual interest
- ❍ Not applicable
- ❍ Much lower
- ❍ Somewhat lower
- ❍ About the same
- ❍ Somewhat higher
- ❍ Much higher

Sexual arousal
- ❍ Not applicable
- ❍ Much lower
- ❍ Somewhat lower
- ❍ About the same
- ❍ Somewhat higher
- ❍ Much higher

Sexual activity
- ❍ Not applicable
- ❍ Much lower
- ❍ Somewhat lower
- ❍ About the same
- ❍ Somewhat higher
- ❍ Much higher

Sexual satisfaction
- ❍ Not applicable
- ❍ Much lower
- ❍ Somewhat lower
- ❍ About the same

- ❍ Somewhat higher
- ❍ Much higher

Sexual anxiety
- ❍ Not applicable
- ❍ Much lower
- ❍ Somewhat lower
- ❍ About the same
- ❍ Somewhat higher
- ❍ Much higher

During the past year, how frequently have you experienced the following?

Bleeding or irritation after vaginal penetration or intercourse
- ❍ Not at all
- ❍ Seldom, less than 25% of the time
- ❍ Sometimes, about 50% of the time
- ❍ Usually, about 75% of the time
- ❍ Always

Lack of vaginal lubrication/ lack of erection
- ❍ Not at all
- ❍ Seldom, less than 25% of the time
- ❍ Sometimes, about 50% of the time
- ❍ Usually, about 75% of the time
- ❍ Always

Painful penetration or intercourse
- ❍ Not at all
- ❍ Seldom, less than 25% of the time
- ❍ Sometimes, about 50% of the time
- ❍ Usually, about 75% of the time
- ❍ Always

Difficulty reaching orgasm
- ❍ Not at all
- ❍ Seldom, less than 25% of the time
- ❍ Sometimes, about 50% of the time
- ❍ Usually, about 75% of the time
- ❍ Always

Vaginal/ penile tightness
- ❍ Not at all
- ❍ Seldom, less than 25% of the time
- ❍ Sometimes, about 50% of the time
- ❍ Usually, about 75% of the time

- ❍ Always

Involuntary urination
- ❍ Not at all
- ❍ Seldom, less than 25% of the time
- ❍ Sometimes, about 50% of the time
- ❍ Usually, about 75% of the time
- ❍ Always

Headaches after sexual activity
- ❍ Not at all
- ❍ Seldom, less than 25% of the time
- ❍ Sometimes, about 50% of the time
- ❍ Usually, about 75% of the time
- ❍ Always

Vaginal/ penile infection
- ❍ Not at all
- ❍ Seldom, less than 25% of the time
- ❍ Sometimes, about 50% of the time
- ❍ Usually, about 75% of the time
- ❍ Always

How frequently have the following factors influenced your level of sexual activity during the past year?
My own health problems (for example, infection or illness)
- ❍ I have not had a partner
- ❍ Not at all
- ❍ Seldom, less than 25% of the time
- ❍ Sometimes, about 50% of the time
- ❍ Usually, about 75% of the time
- ❍ Always

My partner's health problems
- ❍ I have not had a partner
- ❍ Not at all
- ❍ Seldom, less than 25% of the time
- ❍ Sometimes, about 50% of the time
- ❍ Usually, about 75% of the time
- ❍ Always

Conflict in the relationship
- ❍ I have not had a partner
- ❍ Not at all
- ❍ Seldom, less than 25% of the time
- ❍ Sometimes, about 50% of the time

- ❍ Usually, about 75% of the time
- ❍ Always

Lack of privacy
- ❍ I have not had a partner
- ❍ Not at all
- ❍ Seldom, less than 25% of the time
- ❍ Sometimes, about 50% of the time
- ❍ Usually, about 75% of the time
- ❍ Always

Other (please specify in the next question)
- ❍ I have not had a partner
- ❍ Not at all
- ❍ Seldom, less than 25% of the time
- ❍ Sometimes, about 50% of the time
- ❍ Usually, about 75% of the time
- ❍ Always

Other influencing factor _____

How satisfied are you with the overall appearance of your body?
- ❍ Very satisfied
- ❍ Somewhat satisfied
- ❍ Neither satisfied nor dissatisfied
- ❍ Somewhat dissatisfied
- ❍ Very dissatisfied

During the past year, how frequently have you been able to communicate your sexual desires or preferences to your partner?
- ❍ I have not had a partner
- ❍ I have been unable to communicate my desires or preferences
- ❍ Seldom, about 25% of the time
- ❍ Sometimes, about 50% of the time
- ❍ Usually, about 75% of the time
- ❍ I was always able to communicate my desires or preferences

Overall, how satisfied have you been with your sexual relationship with your partner?
- ❍ I have not had a partner
- ❍ Very satisfied
- ❍ Somewhat satisfied
- ❍ Neither satisfied nor dissatisfied
- ❍ Somewhat dissatisfied
- ❍ Very dissatisfied

Overall, how satisfied has your partner been with your sexual relationship?

- ❍ I have not had a partner
- ❍ Very satisfied
- ❍ Somewhat satisfied
- ❍ Neither satisfied nor dissatisfied
- ❍ Somewhat dissatisfied
- ❍ Very dissatisfied

Please choose somewhat satisfied for this question?

- ❍ I have not had a partner
- ❍ Very satisfied
- ❍ Somewhat satisfied
- ❍ Neither satisfied nor dissatisfied
- ❍ Somewhat dissatisfied
- ❍ Very dissatisfied

Overall, how important a part of your life is your sexual activity?

- ❍ Not at all important
- ❍ Somewhat unimportant
- ❍ Neither important nor unimportant
- ❍ Somewhat important
- ❍ Very important

Which statement best describes your sexual experience?

- ❍ Entirely heterosexual
- ❍ Largely heterosexual, but some homosexual experiences
- ❍ Largely heterosexual, but considerable homosexual experiences
- ❍ Equally heterosexual and homosexual
- ❍ Largely homosexual, but considerable heterosexual experience
- ❍ Largely homosexual, but some heterosexual experience
- ❍ Entirely homosexual
- ❍ No sexual experience

What statement best describes your sexual desires?

- ❍ Entirely heterosexual
- ❍ Largely hetersexual, but some homosexual desire
- ❍ Largely heterosexual, but considerable homosexual desire
- ❍ Equally heterosexual and homosexual
- ❍ Largely homosexual, but considerable heterosexual desire
- ❍ Largely homosexual, but some heterosexual desire
- ❍ Entirely homosexual
- ❍ No sexual desires

APPENDIX E

KLEIN SEXUAL ORIENTATION GRID

To whom are you sexually attracted now (your life in the most recent 12 months)?

- ❍ (1) Other sex only
- ❍ (2) Other sex mostly
- ❍ (3) Other sex somewhat more
- ❍ (4) Both sexes equally
- ❍ (5) Same sex somewhat more
- ❍ (6) Same sex mostly
- ❍ (7) Same sex only
- ❍ (0) I am asexual

With whom do you actually have sex with now (your life in the most recent 12 months)?

- ❍ (1) Other sex only
- ❍ (2) Other sex mostly
- ❍ (3) Other sex somewhat more
- ❍ (4) Both sexes equally
- ❍ (5) Same sex somewhat more
- ❍ (6) Same sex mostly
- ❍ (7) Same sex only
- ❍ (0) I am asexual/ No one

Who do you have sexual fantasies about now (your life in the most recent 12 months)? (They may occur during masturbation, daydreaming, as a part of real life, or purely in your imagination.)

- ❍ (0) I am asexual
- ❍ (1) Other sex only
- ❍ (2) Other sex mostly
- ❍ (3) Other sex somewhat more
- ❍ (4) Both sexes equally
- ❍ (5) Same sex somewhat more
- ❍ (6) Same sex mostly
- ❍ (7) Same sex only

How would you define your sexual identity now (your life in the most recent 12 months)?

- ❍ (1) Heterosexual only
- ❍ (2) Heterosexual mostly
- ❍ (3) Heterosexual somewhat more
- ❍ (4) Hetero/ Gay-Lesbian equally
- ❍ (5) Gay-Lesbian somewhat more

- ❍ (6) Gay-Lesbian mostly
- ❍ (7) Gay-Lesbian only
- ❍ (0) Asexual

To whom would you be sexually attracted to, ideally (in the future)?
- ❍ (1) Other sex only
- ❍ (2) Other sex mostly
- ❍ (3) Other sex somewhat more
- ❍ (4) Both sexes equally
- ❍ (5) Same sex somewhat more
- ❍ (6) Same sex mostly
- ❍ (7) Same sex only
- ❍ (0) I am asexual

With whom would you have sex, ideally (in the future)?
- ❍ (1) Other sex only
- ❍ (2) Other sex mostly
- ❍ (3) Other sex somewhat more
- ❍ (4) Both sexes equally
- ❍ (5) Same sex somewhat more
- ❍ (6) Same sex mostly
- ❍ (7) Same sex only
- ❍ (0) I am asexual/ No one

Who would you like to have sexual fantasies about, ideally (in the future)? (They may occur during masturbation, daydreaming, as a part of real life, or purely in your imagination.)
- ❍ (1) Other sex only
- ❍ (2) Other sex mostly
- ❍ (3) Other sex somewhat more
- ❍ (4) Both sexes equally
- ❍ (5) Same sex somewhat more
- ❍ (6) Same sex mostly
- ❍ (7) Same sex only
- ❍ (0) I am asexual/ No one

How would you define your sexual identity, ideally (in the future)?
- ❍ (1) Heterosexual only
- ❍ (2) Heterosexual mostly
- ❍ (3) Heterosexual somewhat more
- ❍ (4) Hetero/ Gay-Lesbian equally
- ❍ (5) Gay-Lesbian somewhat more

- (6) Gay-Lesbian mostly
- (7) Gay-Lesbian only
- (0) Asexual

VITA

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Background

Lydia Ruth Qualls is a second year graduate student at the Virginia Consortium Program in Clinical Psychology. She is pursuing her Master's degree in Experimental Psychology from Old Dominion University while also pursuing her Ph.D. in Clinical Psychology from the Virginia Consortium Program. Lydia currently does research with the East Virginia Medical School Autism Research Group. Her research interests include Autism Spectrum Disorders, the Broad Autism Phenotype, sexuality, and sexual orientation.

Selected Publications

Qualls, L. R. & Corbett, B. A. (2017) Examining the relationship between social communication on the ADOS and real-world reciprocal social communication in children with ASD. *Research in Autism Spectrum Disorders, 33,* 1-9. http://dx.doi.org/10.1016/j.rasd.2016.10.003.

Selected Presentations

Qualls, L. R., Hartmann, K., Paulson., J. (2017, May) *Sexuality and the Autism Spectrum: Implications for the Broad Autism Phenotype*. Poster to be presented at the 2017 International Meeting for Autism Research, San Francisco, CA.

Hartmann, K., Williams, T. V., Kozikowski, C. T., Urbano, M. R., **Qualls, L. R.**, and Peterkin, A. L. (2016, May) *Communication about Sexuality Between Young Adults with Autism Spectrum Disorder (ASD) and Their Parents.* Poster presented at the 2016 International Meeting for Autism Research, Baltimore, MD.