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Testing a Model of Sexual Minority Orientation in Individuals With And Without the Broad Autism Phenotype

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**TESTING A MODEL OF SEXUAL MINORITY ORIENTATION IN
INDIVIDUALS WITH AND WITHOUT THE BROAD AUTISM
PHENOTYPE**

by

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ABSTRACT

TESTING A MODEL OF SEXUAL MINORITY ORIENTATION IN INDIVIDUALS WITH AND WITHOUT THE BROAD AUTISM PHENOTYPE

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Old Dominion University, 2019
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Individuals with Autism Spectrum Disorder (ASD) and the Broad Autism Phenotype (BAP) are more likely than individuals with typical development (TD) to report a sexual minority orientation (e.g., Bejerot & Eriksson, 2014; DeWinter et al., 2017; Qualls, Hartmann, & Paulson, 2018). There has been no research on how existing theories of sexual orientation might explain the development or increased likelihood of sexual minority orientation in these individuals. The aim of this study was to operationalize and test the fit of an existing model of sexual orientation (Worthington, Savoy, Dillon, & Vernaglia, 2002) in individuals with TD, BAP, and ASD.

Participants included individuals with TD (n=170), BAP (n=199), and ASD (n=66). Data from the TD and BAP groups was entered into a structural equation model (SEM) testing the effects of six biopsychosocial factors: number of LGBTQ+ relatives, sexual prejudice in family and culture, religiosity, heterosexism, and belief in traditional gender norms on sexual minority orientation. ANOVA comparisons between all three groups on these variables and the variable of sexual awareness were conducted due to low sample size of the ASD group. Hierarchical linear regressions were also conducted in the BAP and ASD groups to test the relationship of the above variables on sexual minority orientation.

The model was found to have adequate fit, $\chi^2(130)=374.04$, $p<.001$; RMSEA=0.07; CFI=0.95; SRMR=0.08. However, heterosexism was found to be the only predictor of sexual

minority orientation and was only a significant predictor in the BAP group, $b=0.26$, $p=.002$, with increased daily heterosexist experiences predicting greater sexual minority orientation in this group. None of the other factors predicted sexual minority orientation in either group.

Nevertheless, there were significant positive correlations between several predicting factors.

This study is the first to examine how biopsychosocial factors affect sexual minority orientation in individuals with TD, BAP, and ASD. Additionally, individuals with ASD experience more heterosexism and sexual prejudice than individuals with BAP and TD, making this an important area of intervention and research that has not heretofore been addressed.

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This thesis is dedicated to my parents, Chris and Ruth Qualls, and my brother, Madison Qualls, for their unwavering love and support.

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CHAPTER I

INTRODUCTION

Sexual minority orientation has become increasingly more common in the United States. The term “sexual minority orientation” refers to an individual’s same-sex directed preferences in sexual attraction and sexual behavior, as well as the adoption of a sexual minority identity (Diamond, 2006; McCarn & Fassinger, 1996; Roberts, Austin, Corliss, Vander Morris, & Koenen, 2010). In 1972, only 3.6% of women and 4.5% of men stated that they had had at least one same-sex partner, while in 2014, 8.7% of women and 8.2% of men reported a same-sex partner (Twenge, Sherman, & Wells, 2016). This number is even larger in some specific sub-groups. Among individuals with Autism Spectrum Disorder (ASD), an estimated 42-69% identify as same-sex attracted or a sexual minority (Byers, Nichols, Voyer, & Reilly, 2012; George & Stokes, 2018b). Traits related to ASD have been shown to vary linearly in individuals with the Broad Autism Phenotype (BAP), with increased same-sex attraction, behavior, fantasies, and sexual minority identity present in these individuals (Qualls, Hartmann, & Paulson, 2018).

Despite the increase in sexual minority orientation, there is no model currently for what factors affect the development of this identity. Several milestone models of sexual orientation development exist (Cass, 1979, 1984; D’Augelli, 1994; Diamond, 2007; McCarn & Fassinger, 1996; Troiden, 1988) but none of them adequately integrate the literature on influences that combine to develop a sexual minority orientation. In the literature, multiple pathways, including biological, psychological, and social mechanisms, as well as multiple pathways within each of those three domains, have been found to influence sexual minority orientation (Hines, 2011). However, most studies only investigate one or two of the pathways simultaneously, and articles

that cover multiple pathways are either review articles or theoretically-oriented in nature. Additionally, the literature on sexual orientation largely explores individuals with typical development (TD) and does not identify individuals with the Broad Autism Phenotype (BAP) as a subgroup who might have a developmental difference in this area as they do in other areas, such as reciprocal communication and romantic relationships. This study proposes to examine the biopsychosocial factors that purportedly influence the development of a sexual minority orientation in individuals with and without the BAP and test the fit of a factor-based development model (Worthington et al., 2002) in a sample of individuals from each group.

Autism Spectrum Disorder and Sexuality

In order to understand differences in sexuality and sexual orientation in individuals with the BAP, it is important to first review these differences in individuals with Autism Spectrum Disorders to inform a review of potential difficulties in the BAP. Autism Spectrum Disorders (ASDs) are a group of neurodevelopmental disorders. Individuals with ASD have difficulties with social interaction, social communication, and restricted, repetitive behaviors or interests. These difficulties can manifest behaviorally as decreased social-emotional reciprocity, difficulty comprehending social norms, reduced production and understanding of non-verbal communication behavior, and deficits in understanding, developing, and maintaining friendships and intimate relationships. Moreover, individuals with ASD also have repetitive or stereotyped motor movements or speech, an oversensitivity and aversion to some sensory stimuli, an insistence on performing specific routines or tasks, and interests restricted to a few areas in the absence of other developmentally typical activities (American Psychiatric Association, 2013).

Individuals with ASD differ from those with TD in several areas of sexual behavior and relationships. A survey of adolescents with ASD (ages 14-15) found that males with ASD had

fewer past girlfriends than males without ASD, but this was not significantly different for females with ASD (May, Pang, & Williams, 2017). The relationship gap remains as individuals with ASD develop. A survey of 675 individuals with ASD, ages 15 and older, found that only half of the participants with ASD were in a romantic relationship, compared to 70% of individuals with TD (DeWinter, De Graaf, & Begeer, 2017). An earlier study by Byers, Nichols, and Voyer (2013) found that only 59% of their sample of adults with ASD ages 21-73 had experienced a romantic relationship lasting three months or longer. A review of recent articles on sexuality and ASD also concluded that individuals with ASD, compared to individuals with TD, had fewer romantic relationships, more solitary sexual behaviors, as well as more atypical sexual behaviors such as hypersexuality and paraphilias (Turner, Briken, & Scho, 2017). One reason for some of these atypical behaviors relate to decreased sexual awareness. Nineteen individuals with ASD and 20 individuals with TD who had all been through mainstream sex education reported on their sexual consciousness, sexual monitoring, sexual assertiveness, and sex-appeal consciousness. Although they did not think they needed more sex education than typically developing individuals, young adults with ASD scored significantly lower on all measures of sexual awareness than individuals with TD (Hannah & Stagg, 2016). A recent study by Hartmann and colleagues (2019) found that although individuals with ASD reported desiring and pursuing sexual relationships similarly to TD individuals, ASD individuals also report a greater need for sex education and communication about sexual behaviors and relationships from parents and peers.

Relationship satisfaction may also differ in individuals with ASD. The participants in the Byers et al. (2013) survey who reported more positive sexual experiences also reported lower ASD symptomology, as measured by the Autism Spectrum Quotient (Baron-Cohen,

Wheelwright, Skinner, Martin, & Clubley, 2001). However, another survey of high-functioning adults with ASD found that 73% of the sample reported a romantic relationship experience, and only 7% reported having no desire for a relationship. Adults with ASD whose partner was also on the spectrum reported higher relationship satisfaction than adults with ASD whose partner had TD. This survey found no correlation between symptomology and relationship status (Strunz et al., 2017).

Individuals with ASD are more likely to identify as sexual minorities. One minority identity that is more common in ASD is asexuality. A chart review of adults with ASD seeking treatment at a community clinic (n = 79) showed anecdotally that around one-third of participants “seemed” to have an asexual orientation (Marriage, Wolverton, & Marriage, 2009). A community-based survey of adults with and without ASD also found that both women and men with ASD (n = 82) reported higher levels of asexuality than individuals with TD (n = 282), although the percentage of ASD participants reporting an asexual orientation was lower than that found in the Marriage et al. study (Gilmour, Schalomon, & Smith, 2012). Other studies have also found that ASD participants report more asexuality than TD participants (Bejerot & Eriksson, 2014; DeWinter et al., 2017).

Additionally, men and women with ASD report more same-sex attraction and orientation. The study by Gilmour et al. (2012) of 55 female and 17 male adults with autism found that women with ASD report significantly lower levels of opposite-sex attraction and trend towards reporting higher levels of same-sex attraction than men with ASD and TD men and women (Gilmour et al., 2012) while another study of 26 men and 24 women with ASD found that women with ASD were significantly more likely to report sexual attraction to other women and to identify as a sexual minority (Bejerot & Eriksson, 2014). They were also more likely to be in a

same-sex relationship than women with TD, and all participants with ASD (n = 310) reported more same-sex attraction, more varied sexual identities, and more asexuality than individuals with TD (n = 261; DeWinter et al., 2017).

Individuals with ASD who had at least 3 months of previous relationship experience also reported higher rates of same-sex attraction. In one study of 61 men and 68 women with ASD, nearly 42% of these individuals endorsed a sexual minority identity and 55% stated that they were at least somewhat attracted to women and men (Byers et al., 2012). A meta-analysis including studies of individuals with higher-functioning ASD found between 15 and 35% of these individuals reported a sexual minority identity (Pecora, Mesibov, & Stokes, 2016). A recent review of 11 articles on sexuality and ASD found that individuals with ASD had a greater diversity of sexual orientation, as well as increased asexuality and gender nonconforming feelings (Turner et al., 2017). Finally, the most recent study on this topic found the highest percentage of ASD individuals reporting a sexual minority identity – 69.7% of an international online sample of 310 adults with ASD, compared to 30.3% of 261 adults with TD (George & Stokes, 2018b).

Individuals with ASD are also less impacted by an additional mental health burden of identifying as a sexual minority. Although they did experience a greater mental health burden than heterosexual TD individuals because of their ASD, identifying as a sexual minority did not add to this burden. In contrast, identification as a sexual minority did impact the well-being of TD individuals (George & Stokes, 2018a). The authors hypothesize that the differential impact could be related to the indifference of ASD individuals to social reputation (Izuma, Matsumoto, Camerer, & Adolphs, 2011), less social hostility because of smaller social groups, or because

family members of individuals with ASD report being more accepting of sexual minority identities (George & Stokes, 2018a).

There is currently no reported research investigating why individuals with ASD are more likely than individuals with TD to report same-sex attraction and claim a sexual minority identity. However, the authors of the above studies have hypothesized several reasons why individuals with ASD may be more likely to have same-sex-directed sexual behaviors and attraction and claim a sexual minority orientation. Gilmour and colleagues (2012), as well as Bejerot and Eriksson (2014), posit that an increase in prenatal androgens that masculinizes the brains of both male and female individuals (extreme male brain theory of autism) could be a biological influence on the development of sexual minority orientation in ASD. The data from the Gilmour and colleagues (2012) study lends this theory some support; they found decreased heterosexuality in females and not males, with females having a more “masculine” profile of being attracted to women. However, the study by Bejerot and Eriksson (2014) only found partial support for this theory. While women with ASD had more “masculine” childhood and adult gender behaviors, as well as increased attraction to females, both men and women with ASD had an a-masculine sexual gender role including less libido, less initiation of sexual interactions, and lower frequency of sexual arousal and orgasms (Bejerot & Eriksson, 2014). Additionally, the originators of the extreme male brain theory of autism have downplayed the relevance of the hypothesis to the formation of a sexual minority orientation in ASD, and recent manuscripts on sexual minority orientation in ASD have been asked to not include the hypothesis as a potential influencing factor (G. van Schalkwyk, personal communication, April 16, 2018).

Other researchers posit more psychosocial influences for the increased prevalence of sexual minority orientation in ASD. Individuals with ASD may be around suitable people of the

same-sex more often than those of the opposite-sex, and have less awareness of social norms (Bejerot & Eriksson, 2014; Gilmour et al., 2012). Meeting individuals of the opposite sex requires a certain level of social ability, which some individuals with ASD may lack (George & Stokes, 2018b). In contrast, the study by Gilmour and colleagues found that sexual interests and behaviors were highly correlated in participants with ASD, suggesting that the increased prevalence of sexual minority orientation in ASD is not simply a result of fewer romantic opportunities with the opposite sex (Gilmour et al., 2012).

The Broad Autism Phenotype and Sexuality

The Broad Autism Phenotype is closely related to ASD. Individuals who have characteristics of ASD, but not the full disorder, are said to display the Broad Autism Phenotype, or the BAP. Individuals with the BAP experience difficulties similar to those experienced by individuals with ASD, though they are generally less severe and cause less impairment in everyday life (Best, Moffat, Power, Owens, & Johnstone, 2008; Jobe & White, 2007; Kunihiro, Senju, Dairoku, Wakabayashi, & Hasegawa, 2006; Palmer, Paton, Enticott, & Hohwy, 2014). The BAP was first studied in family members of ASD individuals, and BAP traits were found to be highly heritable (A. Bailey, Palferman, Heavey, & Le Couteur, 1998; Hoekstra, Bartels, Verweij, & Boomsma, 2007; Piven, Palmer, Jacobi, Childress, & Arndt, 1997).

Individuals with 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 or relationship difficulties) or the non-social (e.g., detail orientation or insistence on routines) domain (Palmer et al., 2014), although there is evidence for a single underlying heritability factor for both areas (Constantino & Todd, 2007). Difficulties seen in the BAP resemble the criteria in the fifth edition of the Diagnostic and

Statistical Manual of Mental Disorders (DSM-5) for a diagnosis of ASD. For example, a study of parents of multiple children with ASD found that these parents were more likely than parents of multiple children with Down's syndrome to exhibit aloof personality and pragmatic conversation difficulties (corresponding to the social and communication deficits criteria), and behavioral rigidity (corresponding to the restricted interests and repetitive behaviors criteria; Piven, Palmer, Landa, 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 (A. 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 that 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 (A. Bailey et al., 1998).

BAP traits are continuously distributed in the TD population (Best et al., 2008; Hoekstra et al., 2007; Hurst, Mitchell, Kimbrel, Kwapil, & Nelson-Gray, 2007; Pisula, Kawa, Danielewicz, & Pisula, 2015; Qualls et al., 2018). Young adults meeting criteria for the BAP are similar to those with ASD in their increased struggle with loneliness, creating and maintaining friendships (Jobe & White, 2007), depression, anxiety, and bullying, in contrast to individuals with TD (Kunihira et al., 2006). Young adults with the BAP also have difficulty with

relationships. They have been found to display lower levels of empathy and higher levels of attachment anxiety and avoidance (Lamport & Turner, 2014). They report more anxiety about sexual intimacy, decreased sexual interest, poorer body image, more painful intercourse and more headaches after intercourse compared to young adults with TD (Qualls & Hartmann, 2018). Men with the BAP in heterosexual marriages also reported 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).

Individuals with higher levels of BAP traits also resemble individuals with ASD in that they, too, report higher levels of same-sex attraction (Qualls et al., 2018). A continuous examination of BAP traits found that these traits increased linearly with an increased reporting of same-sex sexual attraction, behavior, fantasies, and sexual minority identity. This effect was mediated by gender, existing for women and not men, as has been found before in the literature (e.g., George & Stokes, 2018; Gilmour et al., 2012), although the authors caution that this could be due to a smaller number of male participants. The study by Qualls and colleagues also found that participants reporting higher levels of education endorsed more same-sex sexual attraction, behavior, fantasies, and sexual minority identity, as did participants identifying as spiritual but not religious or as neither spiritual nor religious, compared to participants identifying as Christian (Qualls et al., 2018).

Sexual Minority Orientation and Models of Development

To determine if sexual orientation is different in those with and without the BAP, it is important to first define sexual orientation. Sexual attraction, sexual behavior, and sexual

identity are three components widely-agreed upon to make up sexual orientation (Diamond, 2003; Dillon, Worthington, & Moradi, 2011; Klein, Sepekoff, & Wolf, 1985; Worthington et al., 2002). For some individuals, these factors are aligned with each other and for others they are not (Klein et al., 1985; Worthington et al., 2002). For example, it is possible for an individual to have an attraction to individuals of multiple genders and participate in sexual encounters with individuals of more than one gender, while still identifying as heterosexual. It is also possible for an individual to have sexual attraction to multiple genders and identify as a bisexual while never having had any other-directed sexual behavior.

Klein, Sepekoff, and Wolf (1985) created a multi-variable measure of sexual orientation based on the dimensional measure originally developed by Kinsey and colleagues (Kinsey, Pomeroy, & Martin, 1948) called the Klein Sexual Orientation Grid (KSOG). This measure was developed based on Klein's previous research and has participants rate their sexual orientation on seven dimensions at three time points – past, present, and ideal. Klein and colleagues identified seven areas of sexual orientation: sexual attraction (“To whom are you sexually attracted?”), sexual behavior (“With whom do you have sex?”), sexual fantasies (“About whom do you have sexual fantasies?”), emotional preference (“Who do you love and like?”), social preference (“With whom do you socialize?”), self-identification (“How would you define your sexual identity?”), and heterosexual/homosexual lifestyle (“With whom do you spend the most time?”). Participants rate the first six items on a 7-point scale from “other sex only” to “same sex only.” The last item is rated on a 7-point scale from “Heterosexuals only” to “Gays only.”

Floyd and Stein (2002) performed a principle component analysis on the items of the KSOG and found that the questions asking about sexual attraction, sexual behavior, sexual fantasies, and self-identification accounted for most of the variance in measuring sexual

orientation. The authors found a 96% agreement between the sexual orientation classifications their analysis provided when using these items and the participants' self-rated sexual orientation. Furthermore, these four items address the three factors that are widely believed to constitute sexual orientation (attraction, behavior, identity; Diamond, 2003; Dillon, Worthington, & Moradi, 2011; Klein, Sepekoff, & Wolf, 1985; Worthington et al., 2002). Sexual fantasy is often included as a fourth factor, as it is closely correlated with sexual attraction in men ($r = .92$) but not in women ($r = .67$; J. M. Bailey, Dunne, & Martin, 2000).

Although several models of sexual minority identity development have been proposed, they take the form either of stage models (Cass, 1979, 1984; McCarn & Fassinger, 1996; Troiden, 1988) or lifespan models (D'Augelli, 1994; Diamond, 2007; Dillon et al., 2011). Currently, no factor models of sexual minority identity development have been proposed. However, Worthington and colleagues (2002) proposed a factor model of heterosexual identity development that consists of the factors identified in the literature as contributing to sexual minority identity development. This model was later proposed by Dillon, Worthington, and colleagues (Dillon et al., 2011) to apply to sexual identity development universally. In this model, the authors identified biological influences; microsocial context (i.e., family and peers); culture; religious orientation; gender norms and socialization; and systematic homonegativity, sexual prejudice, and privilege as influences in heterosexual identity development. Although the description of this model was secondary to their proposal of a stage model of heterosexual identity development, this factor model has utility on its own in describing how these factors affect the development of a sexual minority orientation. As can be seen from the review of the literature below, these factors match the general areas that have been investigated as influencing sexual orientation development. Currently, these factors have not been operationalized into

measurable constructs, nor has there been a factor analysis or fit analysis performed on this model in any population. However, given its close reflection of the literature, operationalizing and testing this model may provide important insight into the development of sexual orientation. In the next two sections, the existing literature is reviewed on the biological and sociocultural factors described in the model below.

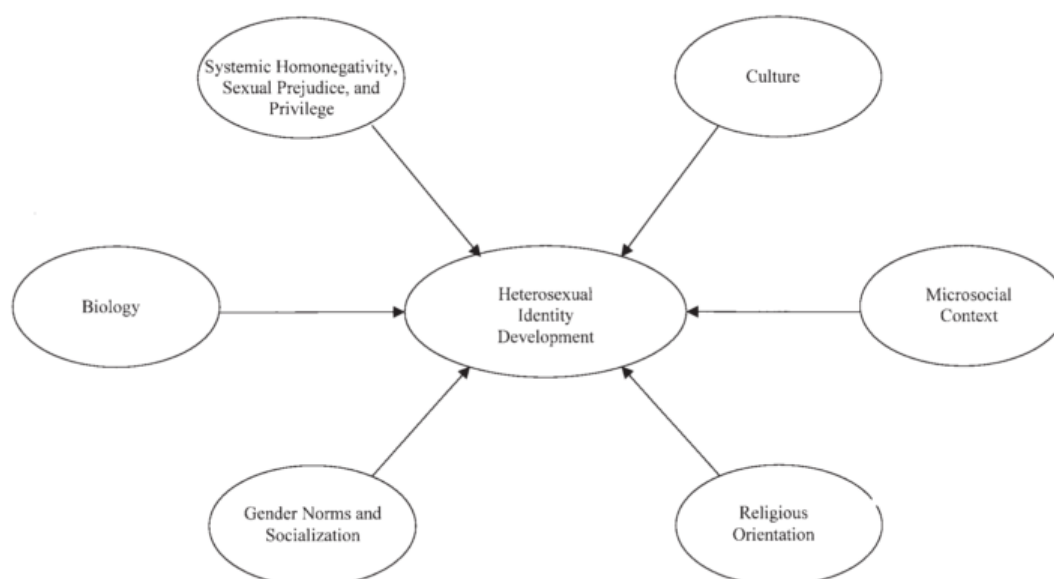


Figure 1. Factors hypothesized to affect sexual orientation development in Worthington et al. (2002).

Factors in the Worthington Model

Biology. Much of the literature on factors affecting the development of a sexual minority orientation centers around biological explanations. There are three main categories of biologically-based hypotheses for the origin of same-sex attraction – (1) prenatal hormone

exposure, (2) fraternal birth order/maternal immunity, (3) heredity and genetic basis (Mustanski, Chivers, & Bailey, 2002). In addition, recent research on the biological basis of sexual minority orientation also includes neuroimaging and neurocircuitry mechanisms (Rahman, 2005), and fecundity effects (Camperio Ciani, Battaglia, Cesare, Camperio Ciani, & Capiluppi, 2017; Iemmola & Camperio, 2009). Fecundity effects suggest sexual orientation is biologically transmitted: genes that cause increased attraction to males can influence sexual orientation in men and cause women to be more attracted to men, have more children, and achieve greater biological success. However, this explanation does not point to a specific genetic determinate, and this effect could exist for reasons that are non-genetic. Similarly, neurodevelopment is either influenced by genes, immune response, hormone exposure, or a combination thereof (Rahman, 2005).

The review of the literature performed by Cohen-Bendahan and colleagues (Cohen-Bendahan, Beek, & Berenbaum, 2005) found that prenatal androgens have a masculinizing effect, especially at high doses and for sex-typed interests, aspects of personality, and spatial ability. The authors conclude that androgens are responsible for some sex differences in these traits, although how much they contribute to variations within the sexes is unclear. In another review, Hines (2011) posited based on the available data that prenatal hormones are a pathway of influence to the development of a sexual minority orientation and same-sex attraction. However, she also adds that there are multiple pathways to sexual orientation and that several of these pathways may occur independently of the effects of hormones.

Another purported biological influence on sexual orientation is fraternal birth order, which is often referred to as “the maternal immunity hypothesis.” This hypothesis states that having more older brothers increases the chance of later-born male children identifying as a

sexual minority (Bogaert & Skorska, 2011). Mothers have an immune response to Y-linked proteins on the surface of fetal male brain cells, specifically the H-Y antigen, a Y-linked protein important in male fetal development. This particularly affects the in anterior hypothalamus, an area linked to sexual orientation. This immune response becomes more likely with each subsequent male child carried by the mother (Bogaert & Skorska, 2011).

Genetic linkage studies have found some relationship between specific genes and sexual orientation. A 1993 study (Hamer, Hu, Magnuson, Hu, & Pattatucci, 1993) looked at DNA markers on the X chromosome and the relationship to sexual orientation using a pedigree analysis (the use of a genogram to track an inherited trait through multiple generations). The data showed increased rates of sexual minority orientation in maternal uncles and maternal male cousins, but not in fathers or paternal relatives, which suggests maternal transmission of genes related to sexual minority orientation. The genetic analysis found linkage markers (five loci on the distal Xq28 chromosome) that indicated with a confidence of more than 99% that at least one subtype of male sexual orientation is genetically influenced. These regions were confirmed by a more up-to-date linkage study performed by Sanders and colleagues (2015). This analysis also took into account the effect of having older brothers on increasing the chance of a sexual minority orientation (i.e., the fraternal birth order effect, related to the maternal immunity hypothesis; see below). The authors found two regions of linkage that had been demonstrated in prior research – the pericentromeric region of chromosome 8 and Xq28 (Sanders et al., 2015). This study brings further support to the idea that male sexual orientation at least is partially biologically influenced.

Twin studies have been used to track the heritability of sexual minority orientation. Bailey and Pillard (1991) found a substantial genetic influence on sexual orientation, with a

higher percentage of monozygotic than dizygotic co-twins being same-sex attracted, and more dizygotic co-twins than adopted brothers being same-sex attracted. However, fewer non-biological siblings were same-sex attracted than a simple genetic hypothesis would predict, indicating additional influences on sexual orientation, such as familial or environmental influences. Contrary to the authors' hypothesis, self-report of gender non-conformity did not predict same-sex attraction. Bailey also conducted a later study examining heredity and environmental influence (Bailey, Bobrow, Wolfe, & Mikach, 1995) which found that more than 90% of the sons of sexual minority men rated their sexual orientation as heterosexual, suggesting that there is not a large environmental effect of gay fathers on sons' sexual orientation (Bailey et al., 1995). These results could also be reasonably seen to challenge the heredity of sexual orientation.

A later twin study by Bailey and colleagues (2000) of 4,901 twin pairs found lower concordance rates for same-sex attraction than expected from previous studies.

However, a study by Kendler and colleagues (Kendler, Thornton, Gilman, & Kessler, 2000) found that familial resemblance for sexual orientation was greater for monozygotic than dizygotic twins or in the dizygotic twins plus non-twin siblings. It is important to note that Bailey and colleagues only examined same-sex attraction, and none of the other aspects of sexual orientation. Kendler and colleagues used a single item to measure sexual orientation. Both studies suggested that familial factors, including both genes and environment, may play a role in the development of a sexual minority orientation, although neither author speculated how (Bailey et al., 2000; Kendler et al., 2000).

Researchers have recently started to examine the breakdown of the variance in sexual orientation due to genetic and environmental factors. Langstrom and colleagues (2010) used

biometric modeling with a sample of 3,826 monozygotic and dizygotic same-sex twin pairs in Sweden. They found that for men, between 34-39% of the variance in same-sex sexual behavior was explained by genetic effects, none by the shared environment, and between 61-66% by the individual-specific environment. For women in the study, 18-19% of the variance was accounted for by genetic factors, 16-17% by shared environmental, and 64-66% by individual-specific environmental factors. The authors concluded that there is evidence for familial clustering of same-sex sexual behavior in both men and women, as well as evidence for individual environmental influence. For women, the hereditary influences were weaker and equaled those of the individual environment. Additionally, Langstrom and colleagues only examined sexual behavior, and did not include the sexual attraction, sexual minority identity, or sexual fantasy components of sexual minority orientation.

Microsocial context. Microsocial context refers to the social interactions to which a person is exposed on a day-to-day basis (Worthington et al., 2002). The microsocial contexts to which a majority of individuals are most frequently exposed to consist of family and peers.

Family. Certain characteristics of family organization have been found to affect sexual minority orientation. Bearman and Bruckner (2002) found that males with female twins report more same-sex attraction (no effect for females with male twins) than males with a full sister, half-sister, or non-related sister. Additionally, males with a female twin and an older brother were LESS likely to be same-sex attracted than males with female twin and no older brothers. The authors hypothesize that this is because older brothers create male socialization (Bearman & Bruckner, 2002). However, this result is contradicted by results in Bogaert's 2006 study, which found that socialization with older brothers was independent of same-sex attraction.

Frisch and Hviid's (2006) study of 419,000 men and 399,486 women via information from the Danish birth registry and Civil Registration System (similar to the U.S. Census) looked at how family structure may have socialized or otherwise influenced an increase in the likelihood of same-sex marriage. They found that, for men, being married to a male partner was associated with having an older mother, absent father, divorced parents, and being the youngest child, although not necessarily having older brothers. For women, having a mother pass away in adolescence and being the only child, youngest child, or only girl in the family influences same-sex marriage. This study is significant because the authors were able to control for several variables by obtaining information from the majority of the Danish population born between 1973 and 1987. They controlled for culture by only including children from Danish-born mothers, and used data from a large, non-convenience sample. However, the authors do note that they were not able to obtain information on religion, income, and education, three variables that have been found to correlate with same-sex attraction and orientation (Felson, 2011; Francis, 2008). They conclude that, while same-sex marriage is not analogous to same-sex attraction and orientation, their study provides probable support that several familial experiences in childhood could affect same-sex marriage in adulthood.

Francis (2008) also found several correlates of same-sex attraction orientation among family structure, education, and race/ethnicity variables. For both males and females, the lack of a biological parent of either gender during childhood was positively associated with same-sex attraction, participation in same-sex relationships, and a sexual minority identity. Additionally, having less than a high school education was positively associated with participation in same-sex relationships and same-sex attraction for males, and was positively associated with same-sex attraction and sexual minority identity in females. This contrasts somewhat with other findings

that college-educated individuals, especially women, are more likely to report a sexual minority orientation (Diamond, 1998). For males, identifying as Black was positively associated with participation in same-sex relationships and same-sex attraction. For women, identifying as Black or another non-White, non-Hispanic ethnicity was negatively associated with same-sex attraction and sexual minority identity. Francis hypothesizes that both biological and social influences could play a role in these associations (Francis, 2008).

With the increasing number of same-sex parents who are raising children, studies have examined if these children are more socialized by their sexual minority parents into a sexual minority orientation. Stacey and Biblarz (2001) performed a meta-analysis of 21 studies examining the effects of lesbian and gay parents on the children they raise. The authors found that having sexual minority parents increased the likelihood for the young adult child to have considered or to have had a same-sex relationship and to have more friends that identify as sexual minorities, but not necessarily to identify as a sexual minority themselves. There was mixed evidence for whether these young adult children departed significantly from typical gender roles and behaviors. The authors concluded that both parental socialization and homophobia played a part in their children's same-sex attraction, behavior, and identities.

Yarhouse, Tan, and Pawlowski (2005) performed a qualitative analysis of sexual minority identity development in individuals who are currently members in a Christian church, experience or have experienced same-sex attraction, and currently either identify or do not identify ("dis-identify") as a sexual minority. One of the phenomena uncovered by the authors in this investigation was the power of negative reactions from family, peers, and religious culture to cause participants to conflate their feelings of same-sex attraction with a sexual minority identity. Of individuals who currently identify as a sexual minority, 29% reported that their families'

negative reactions to their same-sex attraction seemed to affect their sexual identity development by reinforcing their same-sex attractions as a core aspect of their personality. This same phenomenon was noted in 36% percent of individuals who have experienced same-sex attraction but who do not currently identify as a sexual minority. These findings illustrate that negative identity-focused comments from parents and family can influence the development of a sexual minority identity.

Peers. In addition to family influences, the study by Yarhouse, Tan, and Pawlowski (2005) also examined how peers influence the development of a sexual minority identity. The authors found that 36% of participants who currently identified as a sexual minority reported feeling that their peers may have helped them form their sexual minority identity because their negative comments about their same-sex attractions made them think about their attraction in terms of their identity, i.e., it was part of who they were and not just a behavior. An additional 21% of participants with a sexual minority identity stated that their peers influenced their development of a sexual minority identity by supporting rather than condemning it. For the “dis-identified” sexual minority participants, 29% reported that negative comments by peers helped shape their same-sex attractions into a sexual minority identity, while 36% experienced positive support, and an additional 21% experienced neither condemnation nor affirmation, but questioning and concern from their peers. As with family influences, these findings illustrate that both negative and positive identity-focused comments can influence the development of a sexual minority identity.

Diamond (2006, 2007) also used a qualitative approach to explore sexual identity development, albeit in women. Diamond (2007) noted that same-sex orientation cannot be reduced to one predicting factor, but that choice and circumstance play a role in the development

of female sexual minority orientation, if not for that of males. She discusses reports of intense female friendships that can lead to same-sex attraction that may or may not continue after the relationship has ended. Diamond also posits that female sexuality is fluid, and that some women form relationships with other women in more liberal social environments (e.g., college, the feminist movement) and may choose male partners later in life in environments where men and heterosexual relationships are more common. Therefore, peer influence, the context of the social environment, and having a variety of same- and opposite-sex partners to choose from influences female partner choice.

Bos, Sandfort, de Bruyn, and Hakvoort (2008) looked at the relationship between same-sex attraction and social relationships in 866 Dutch high school students, 74 of which reported being same-sex attracted (SSA). Using a computer-based questionnaire, they found that SSA participants reported lower-quality relationships with their peers, which mediated differences in psychosocial functioning. The authors posited that SSA students may be less accepted than their peers and feel different, and that this social disconnect makes them more susceptible to the depression, low self-esteem, and school problems they experience.

Brakefield and colleagues (2014) also examined how peers affect same-sex attraction in adolescents. Using data from the *Add Health* survey of 14,738 adolescents, they found that sexual activity and desire for a romantic relationship were influenced by peers, but that same-sex attraction was not. They stated that, since same-sex attraction does *not* seem to be influenced by peers, that biological theories of same-sex attraction may be more likely to be true (Brakefield et al., 2014). However, peer influence on sexuality may come later in adolescence, as was the case for participants in the Diamond study (2007), many of whom were still exploring their sexuality

as adults. Again, it seems that different factors affect different groups of individuals more strongly than others.

Religion. Individuals who identify as sexual minorities often have a complex relationship with organized religion. They are less likely to identify as religious than the general United States population especially in the case of female sexual minorities, particularly bisexual women. Sexual minority individuals are generally less active in religious organizations, pray less, receive less daily guidance from religion, and are more likely to have left organized religion than heterosexual individuals. This is especially the case for sexual minority women, who are doubly-marginalized in the traditionally patriarchal heteronormative space of the church (Herek, Norton, Allen, & Sims, 2010; Sherkat, 2002).

Despite this tendency, religion may still have an identity-shaping influence in sexual minority individuals. In their qualitative study, Yarhouse, Tan, and Pawlowski (2005) found that in addition to negative feedback from family and peers, negative feedback from their religious community and religious literature could also influence the formulation of participants' sexual minority identity. Fifty percent of sexual-minority-identified individuals and 64% of dis-identified individuals reported that condemnation and judgment from their religious community influenced their sexual minority identity formation. Religious literature played a similar condemnatory-but-identifying role for 29% of the sexual-minority-identifying participants, and a further 21% described scripture as a source of comfort. For 29% of the dis-identified participants, religious literature gave them hope that they could change their sexual minority identity, and an additional 21% of dis-identified participants also identified their behavior more with a sexual minority identity because of the condemnation from the Christian bible. Overall, the findings from this study indicate that for Christian individuals, outside sources that equate

same-sex attraction with a sexual minority identity, either positively or negatively, influence the development of that sexual minority identity. However, one's sexual minority identity may later be dis-identified with, as was the case for several of the participants.

Religious denomination has also been demonstrated to correlate to aspects of sexual orientation. Felson (2011) examined data from three different population-based surveys in the U.S., with a combined N of 38,410, using logistic regression. The results indicated that people from Jewish and secular backgrounds were more likely than those from other religious backgrounds to report same-sex attraction, identity, and behavior, and that this was especially strong for women from a Jewish background. Individuals from conservative Protestant backgrounds were least likely to report same-sex attraction, identity, and behavior. The author posits that these differences may be due to social desirability bias, such that individuals from more conservative religions may experience same-sex attraction but not term it as such or report it.

Barnes and Meyer (2012) used data from *Project Stride*, which examined the relationships between stress, identity, and health outcomes in a diverse sample of 355 sexual minority individuals in New York City. The study found that, as hypothesized, attendance at a non-identity-affirming church was associated with significantly higher internalized homophobia compared to that of individuals who attended an affirming church or who never attended church. However, frequency of attendance at a non-identity-affirming church was not significantly associated with the degree of internalized homophobia. These results were not related to self-esteem or depressive symptoms. However, controlling for internalized homophobia, individuals who attended a non-affirming church displayed lower self-esteem and more depressive symptoms.

These authors also found sexual minority individuals to be less religious, which they hypothesize could be due to a causal relationship between religious affiliation and internalized homophobia. This relationship could begin in early life through continued participation in non-affirming religious settings at a time when children are most susceptible to internalizing homophobic beliefs. These beliefs are then difficult to change once the individual begins to identify as a sexual minority. Consequently, many sexual minority adults disaffiliate from non-affirming religious institutions, and either join a more affirming institution or leave religion altogether (Barnes & Meyer, 2012).

Culture. Several studies also identify cultural influences to the development of a sexual minority orientation. Peplau and Garnets (2000) reviewed the contemporary literature on sexual orientation development and reached several conclusions. They rejected the “illness model of homosexuality” (the idea that same-sex attraction represents psychopathology), which has been out of favor for several decades, but they also rejected developmental models that are still in the popular mindset, such as the “inversion model,” which suggests that sexual orientation is tied to gender and masculinity/femininity. The authors state while some biological research is promising (e.g., genetic influences), sociocultural influences such as society’s view on gender and sexuality, women’s economic and social status, which sexual identities are recognized by the culture, and attitudes of acceptance of sexual minorities all play a part in the development of a sexual minority orientation, for women in particular. They also posit that there are multiple developmental pathways for female sexual orientation, and that the path taken may vary between individuals.

Media is one way in which culture is disseminated through society. Although Yarhouse et al. (2005) found that only 14% of their survey group identified LGB literature as helping shape

their identity, other researchers have found that media and social media affect sexual orientation and sexual minority identity in many different ways. One study found that sexual minority individuals use online information for traditional learning, such as seeking information about LGBTQ+-related issues, as well as social learning (e.g., observing other sexual minority individuals' behaviors and experiences) and experiential learning (e.g., experimenting with online dating sites and apps). These experiences were especially common during the coming out process, when individuals are exploring their same-sex orientation and sharing it with those around them. The Internet was also used for teaching (e.g., sharing one's experiences as a sexual minority individual) and more common among "out" individuals with less common identities (Fox & Ralston, 2016). The authors state that the "visibility, interactivity, association, and persistence" (Fox and Ralston, 2016, p. 641) provided by social media create opportunities for sexual minority individuals to educate each other as well as a broader audience.

The use of the Internet to explore one specific sexual minority identity, pansexuality, was studied by Belous and Bauman (2017). Although the term means different things to different individuals, pansexuality is commonly taken to mean the ability of an individual to be attracted to any other individual regardless of gender or sex. Using a document analysis of Internet blogs, the authors searched for common themes in posts relating to pansexuality. They found that most posts had themes promoting acceptance and awareness of pansexuality, and its definable difference from bisexuality. The authors also note that recent widespread speaking out of celebrities in the media might influence individuals to identify as pansexual. McInroy and Craig (2017) looked at more traditional media, such as television, and how the portrayal of sexual minority individuals in these media were perceived by emerging adults (ages 18 to 25) who identified as a sexual minority. These emerging adults stated that representation of sexual

minority individuals in traditional media creates a common dialogue and validates sexual minority identity. However, television also portrays sexual minority individuals as one-dimensional and ignores many sub-groups of the LGBTQ+ community, thus limiting young sexual minority individuals' perceptions of their future identity trajectories, while not offering opportunities for critique. The participants stated that Internet media offers better spaces for discussion and creativity in the LGBTQ+ community than traditional media.

Gender norms. The relationship between a society's gender normative roles and sexuality has been an under-studied area. However, the perception of gender roles in society can have an effect on the development of a sexual minority orientation. For example, the part of the male gender role can be emphasizing his acceptance of the "default" heterosexual identity and enacting homophobia to avoid being perceived as gay. This can also lead to less extreme but equally negative consequences such as the failure to develop close friendships with other men, being uncomfortable expressing emotions or receiving physical contact from other men, and being hypervigilant to perceived "homosexual" behaviors (Worthington et al., 2002). If this stereotypical masculine behavior is enacted from childhood on, it could prevent men from forming romantic relationships with other men even if there is an underlying inclination to do so (Blumenfeld, 1992).

Female gender roles are also situated in a heteronormative context. Women are taught that their sexuality and sexual behavior is for the benefit of men. This sets up an environmental expectation for women to compete to make sex a limited resource to attract the attention of men (Baumeister & Twenge, 2002). Once women are able to identify and confront the patriarchal norms of society, they are able to develop a sense of feminine identity based on their own personal standards. This in turn encourages a cooperative, rather than a competitive view of

relationships with other women (Worthington et al., 2002), which may in time develop into romantic or sexual relationships with other women (Diamond, 2007).

Heterosexism. Systematic homonegativity, prejudice, and stigma can be simplified into the term “heterosexism.” Heterosexism is defined as “a cultural ideology embodied in institutional practices that work to the disadvantage of sexual minority groups even in the absence of individual prejudice or discrimination” (Herek, 2007, p. 907). Heterosexual individuals are a powerful majority group in the United States (Worthington et al., 2002). Heterosexual relationships are portrayed exponentially more than same-sex relationships in the media, which are usually minor, stereotypical (see McNroy & Craig, 2017, above), or otherwise negatively portrayed. These portrayals of sexual minority individuals may even implicitly sanction violence against them (Worthington et al., 2002), which is not always regarded as undesirable by society (Herek, 2007).

A study by Dworkin and Yi (2003) examined statistics published by the New York City Gay and Lesbian Anti-Violence Project over the two-year period of 1998-1999 and 1999-2000. Although exceptionally violent and biased-related murders, serious injuries and hospitalizations, sexual assaults and rapes of sexual minority individuals had declined, other troubling violence had increased, such as attempted assaults with weapons, harassment, and intimidation. These acts were perpetrated by a more diverse group of individuals, including an increase in female perpetrators. More victims reported knowing their attackers or harassers and more trans women were victimized. There was less police response and more police misconduct and abuse in these cases. Finally, statistics almost certainly underrepresent the true scope of the problem, as most victims do not report (Dworkin & Yi, 2003). More recent numbers from the FBI for 2016 shows that hate crimes against sexual minority individuals continue to increase (Dashow, 2017).

Reports of hate crimes increased 5% from 2015 to 2016, with an increase in incidents based both on sexual orientation and gender identity bias. Violence against transgender individuals increased by 44% percent. However, like Dworkin and Yi, Dashow also notes that these numbers are likely under representative of the true violence against sexual minority individuals, as it is not mandatory for local jurisdictions to report hate crimes to the FBI.

This sexual prejudice and violence has the consequence of forcing heteronormativity on people who might otherwise identify as sexual minorities. For their own safety, they must refrain from forming close, intimate relationships with members of their own gender. They may also feel pressured into heterosexual intercourse or marriage, and therefore possibly parenthood, before they are ready for and comfortable with these undertakings (Blumenfeld, 1992). Once ensconced in a heteronormative family environment, it can be difficult if not impossible for the individual to explore other aspects of one's sexuality.

Sexual awareness. Although not mentioned explicitly in the Worthington et al. (2002) model, sexual awareness is another factor that could be a social influence on sexual minority orientation development. Snell, Fisher, and Miller (1991) developed a measure of sexual awareness to assess attentional tendencies related to sexuality. They noted a lack of measures that focused on attention to the sexual aspects of an individual's life, attention to other's impressions of an individual's sexuality expression, sensitivity to others regarding an individual as "sexy," or an individual's degree of sexual assertiveness. The authors created items to measure aspects of these four areas, and a factor analysis confirmed these four independent areas, which the authors labeled as *sexual consciousness*, *sexual monitoring*, *sexiness consciousness*, and *sexual assertiveness*.

Of the four factors, the most likely to influence sexual minority orientation development are sexual consciousness and sexual monitoring. These factors refer to attention to one's own sexuality and attention to other's impressions of one's sexuality. The degree to which one is aware of one's sexuality and its impression on others might affect the degree to which one lets other's opinions about their sexuality affect the expression of that sexuality. In this respect, the authors found that high sexual consciousness was positively correlated with positive emotional responses to sex, thinking often about sex, positively evaluating one's sexual performance, a concern for other's needs and desires in relationships and sex, higher relationship and sexual satisfaction for both men and women, and high internal locus of control for women. It was negatively correlated with guilt and anxiety about sex, feeling chronically depressed about one's sex life, and focusing on what one can get out of sex, as well as with an other-focused locus of control. Those who have high sexual consciousness view sex positively, as a giving and caring act with one's partner, do not feel anxious or guilty about sex, positively evaluate themselves sexually, have high relationship and sexual satisfaction, and see themselves as in control (Snell et al., 1991).

Sexual monitoring was also positively correlated with positive emotional responses to sex, thinking often about sex, and negatively correlated to sexual anxiety in men and women. In contrast to sexual consciousness, sexual monitoring was found to be related to often feeling depressed about one's sex life. It was also found to be related to the general degree to which individuals are aware of their self-presentation, other's perceptions of it, and a tendency to modify self-presentation in reaction to other's perceptions in a public setting. Men and women with high sexual monitoring expressed ideas about caution and caring in sexual relationships, as well as a focus on what both the other and oneself were getting out of sexual relationships.

However, ideas towards relationships in general were more self-focused in these individuals. Although sexual monitoring was negatively correlated to sexual guilt and anxiety in women, it was positively correlated with depression and the tendency to see chance or others, rather than one's self, as being in control. Men who have high sexual monitoring view sex positively and do not have anxiety about it, but have lower relationship satisfaction. Women with high sexual monitoring view sex positively and are not anxious about it, although they may be more likely to be depressed, have lower sexual satisfaction and sexual esteem, be more other-focused in relationships, and see others or luck as being in control of one's life. Both men and women with high sexual monitoring may modify their presentation of their sexuality in reaction to others' perceptions. Additionally, sexual consciousness and sexual monitoring were found to be correlated in women, but uncorrelated in men (Snell et al., 1991).

Sexual assertiveness and sexiness consciousness are also components of sexual awareness. The authors found that greater sexual assertiveness was associated with less guilt and anxiety about sex, less depression about sexual prospects, greater confidence in their sexual prowess, and more sexual preoccupation in both men and women. In women, it was associated with less depression and more self-esteem, erotophilia, and an internal locus of control. Greater sexiness consciousness was associated with less guilt about sex in men and women. It was also associated with greater sexual preoccupation, self-centered attitudes about sex, and more exchange-oriented relationships. In men, greater sexiness consciousness was associated with greater internal locus of control, erotophilia, and self-monitoring and with less depression, less anxiety about sex, and less belief that powerful others have control (Snell et al., 1991).

Pilot Study of Sexual Minority Individuals with ASD

The above research on the formation of sexual minority orientation has been studied solely in a typically developing population. Therefore, a pilot study was conducted with the aim of testing how well the factors identified in the research as affecting sexual minority orientation apply to individuals with ASD. A further goal was to identify any additional factors that might be relevant to the formation of sexual minority orientation in these individuals. Eleven individuals were recruited for a study on “ASD and LGBTQ+ Individuals” and answered questions about their childhood, sexuality, sexual orientation, and relationships either in person ($n = 1$) or via an anonymous online survey ($n = 10$). Data were analyzed using a method of thematic analysis described by Braun and Clarke (2006), a process by which themes or categories in the data are identified through coding data, grouping into themes and refining through re-examination of the themes in light of theory from the literature. Themes that arose from this analysis included the six factors from the Worthington et al. (2002) model on which many of the questions were based. The other four factors related to Openness, Sexuality and Relationships, Sexual Orientation, and Being a Sexual Minority with Autism.

Data from this pilot study supported some expected effects hypothesized by the literature. A minority of participants (37%) reported having heterosexist experiences, which could support the hypothesis that having more heterosexist experiences would lead a participant to *not* develop a sexual minority orientation. Since most participants did not have these experiences, their development of a sexual minority orientation was not impeded. Additionally, most participants did not attend or did not enjoy religious services (82%), both in religious settings that condemned sexual minorities and those that did not. Two individuals stated that they enjoyed religious services, one whose religious setting did not condemn sexual minorities and one who

enjoyed religious activities despite the condemnation of sexual minorities. Also in line with expected directions, most participants' microsocial context (family, peers, and community) did not openly condemn sexual minority individuals. Only 27% of participants reported family settings where talk about sexual minority individuals was predominantly negative. This was similar for negative talk from peers (27%) and from the community (36%). Furthermore, 82% of participants reported that media, the Internet especially, was a positive influence for them. Finally, several participants (36%) reported a change in views, which appeared from the data to be due in part to a change in cultural environment. Reasons for developing more positive views included moving into a more accepting culture geographically and learning more about sexual minority culture.

Other findings from this pilot study were not as expected. Although the literature would predict a preponderance of older brothers in a sample of sexual minority individuals, only 3 of the 11 participants had an older brother or half-brother. Additionally, many of these individuals stated that they believed they were less willing than most others to talk about their sexual orientation (55%) and relationships and sexual behavior (45%). The numbers are likely even higher in the general population of sexual minority individuals with ASD, as this sample was willing to take a survey about sexual orientation, relationships, and sexual behavior.

Furthermore, a majority of participants reported that they were aware of gender norms (73%) and had others around them try to enforce these norms on the participant (82%). However, a majority of these individuals (55%) did not believe that their behavior was affected by the awareness or enforcement of gender norms, and all participants reported that they believed gender norms were negative in some way. Most of the participants (82%) had also had at least one dating relationship, with some having had many relationships and 4 participants reported being either

married or in a life-partner relationship. The higher number of participants with dating experience could be due to the higher-functioning nature of this sample.

Lastly, many participants discussed ways in which their ASD affected their sexual minority orientation. A majority of instances mentioned (74%) that it was more difficult for the participants to develop or express their sexual minority orientation due to their ASD. They thought that it was difficult for neurotypical people to understand their sexual orientation, that sensory issues affected their intimate behavior, and that they did not always have the verbal knowledge needed to understand the feelings they were experiencing regarding their sexual orientation. However, there were some instances in which participants reported that their ASD had a positive or enhancing effect on the development and expression of their sexual minority identity, such as allowing them to see and understand the “gray” areas of sexuality, teaching them to love harder, and encouraging them to explore other, less common forms of sexual expression, such as polyamorous relationships. Also, three participants stated that they had influenced the sexual minority development of other same-age peers.

Results from this pilot study affected how data was collected for this dissertation study. Firstly, they support the use of the Worthington et al. (2002) model in an ASD sample, since four out of the six factors in the model operate similarly in ASD compared to TD, with two factors operating differently likely due to sample size (biological factors) or a possible relationship to the factor of sexual awareness (gender norms). Secondly, the dissertation survey included open-ended response options in addition to the multiple-choice format for gender identity, and an open-ended response option for sexual orientation, given that 3 of the 11 participants identified as non-binary and that participants used a wide variety of terms to describe their sexual and romantic orientation. Thirdly, the Klein Sexual Orientation Scale was modified (see Measures,

below) to include an option for non-binary individuals or those who are attracted to non-binary individuals). Lastly, given that several respondents reported that they were aware of gender norms but disregarded them, the variable of sexual awareness was included to see if it explained any differences in sexual minority orientation between individuals with TD, the BAP, and ASD.

Summary of Literature Review

The literature indicates that individuals with the BAP and ASD have a greater likelihood of those with TD of having a sexual minority orientation, and these populations also have difficulty with social situations and relationships. A model by Worthington et al. (2002) identified six factors affecting sexual orientation development, but this model has not been operationalized or tested in any clinical research study. These six factors reflect six areas of research in the literature on sexual minority orientation development – biological influences (including prenatal hormone exposure, genetics and heredity, and maternal immunity hypothesis), microsocial context (including family and peers), religion, culture, gender norms, and heterosexism. Sexual awareness was also identified as a factor that might affect sexual minority orientation outside of the Worthington model in individuals with ASD and the BAP (Hannah & Stagg, 2016).

Summarizing the literature on each of these factors, biological characteristics (having more older brothers, having more sexual minority relatives) have been found to increase the likelihood of an individual having a sexual minority orientation. Having a microsocial context and culture that have negative views of sexual minorities, increased religious attendance and adherence, subscribing to traditional gender norms, and experiencing larger amounts of heterosexism have been found to decrease the likelihood of an individual having a sexual minority orientation. A pilot study in sexual minority individuals with ASD showed that four out

of the six factors in the Worthington et al. (2002) model operate similarly in ASD compared to TD, with the deviations being ascribed to the small sample size of the pilot study (for biological factors) or a possible relationship to the factor of sexual awareness, which was not part of the model (gender norms). Therefore, the factors in the Worthington model were used to investigate sexual minority orientation in individuals with ASD and the BAP.

The Current Study and Hypotheses

The current study aimed to create and test a model of sexual minority orientation based on factors identified in the literature and a factor model hypothesized by Worthington et al. (2002). Most studies of factors affecting sexual minority orientation only test a few of these factors together in any given study. No studies currently published have operationalized or tested a factor model for sexual orientation development that includes most of the factors established by the literature as relevant. The model by Worthington et al. (2002) includes all major factors identified in the literature as contributing to sexual minority orientation and seems to provide the best starting point to test for how these factors together influence sexual orientation development. Additionally, previous studies have not consistently operationalized sexual orientation, looking variously at sexual behavior, attraction, and identity. This study used sexual behavior, attraction, fantasies, and sexual minority identity to operationalize a person's current sexual minority orientation.

Furthermore, given that more individuals with ASD and the BAP identify as a sexual minority than individuals with TD, this model of sexual orientation development may fit differently in these populations than in sexual minority individuals with typical development. One potential moderating factor may be *sexual awareness*, identified by Hannah and Stagg (2016) as being lower in individuals with ASD compared to individuals with TD. It is possible

that a decreased awareness of how others perceive their sexuality in individuals with ASD might moderate how much social factors influence the identity development of sexual minority individuals with ASD. Since individuals with the BAP also have some of the same difficulties and differences in the area of sexuality as individuals with ASD, sexual awareness may moderate the effects of social factors on their sexual orientation.

Studying how various biopsychosocial factors work together to influence sexual minority orientation, and how this process may differ between individuals with and without the BAP will allow those working with individuals who identify as a sexual minority to help these individuals better explore their identity development, whether that development takes a typical path or follows along the Autism Spectrum. This study was guided by the following specific research questions:

- 1a. Does the factor model developed by Worthington et al. (2002) have good fit in describing sexual minority orientation development – the sexual attraction, sexual behaviors, sexual fantasies, and sexual minority identity – of individuals identifying as a sexual minority?
- 1b. Does this fit vary between sexual minority individuals with and those without the BAP?
- 1c. If so, for which group does this model have the best fit?
2. Which factors, if included in the model, most affect the model fit for each of the groups?
3. Additionally, does sexual awareness affect sexual minority orientation for individuals with the BAP? If so, how?

An additional exploratory research question was addressed in a limited sample of ASD participants.

4a. How does the quality of fit of the Worthington model in individuals with ASD differ from that of individuals with and without the BAP?

4b. What factors affect the fit of the Worthington model in individuals with ASD?

4c. How does sexual awareness affect sexual minority orientation in individuals with ASD?

Given the findings from the literature review, this study specifically hypothesized that:

H1a: The factor model based on Worthington et al. (2002) will have a good fit explaining current sexual minority orientation.

H1b: The factor model based on Worthington et al. (2002) will fit better for individuals without the BAP than for individuals with the BAP.

H2a: For both groups, the biological influences factor will be positively correlated with having a sexual minority orientation, while the other factors will be negatively correlated with having a sexual minority orientation.

H2b: The biological influences factor will affect the sexual minority orientation of both groups equally, but the effect of the sociocultural factors of religion, gender norms, microsocial context (family, peer, and community influences), culture, and heterosexism will have less influence (lower or nonsignificant path coefficients) for individuals with the BAP and may be removed from a respecified model to increase fit.

H3: The interaction of sociocultural factors and sexual awareness will explain a significant amount of the variance in sexual minority orientation in individuals with the BAP.

Exploratory hypotheses were proposed for a sufficiently large sample of ASD participants:

H4a: The Worthington model will fit less well for individuals with ASD than for individuals with and without the BAP.

H4b: The sociocultural factors will have less influence on sexual minority orientation in individuals with ASD.

H4c: The interaction of sociocultural factors and sexual awareness will explain a significant amount of the variance in sexual minority orientation in individuals with ASD.

CHAPTER II

METHOD

Participants and Recruitment

The survey was taken by 528 individuals, of whom 435 met eligibility for having their data included in the analysis (see Data screening section). The majority of participants were cisgender female ($n = 130$, 40.5%) and the average age was 22.29 ($SD = 3.40$). Ethnicity and other demographic variables are reported in Table 1. Participants were eligible for the study if they were young adults between the ages of 18 and 30 who identified as a sexual minority. Participants were excluded if they have an intellectual or cognitive disability, or a psychotic disorder. Participants were recruited through the Autism Spectrum Disorder Program at Eastern Virginia Medical School (EVMS), EVMS Faculty, and community providers both locally and nationally. Participants were also recruited nationally through study flyers posted to Facebook, activist organizations, and other online study recruitment websites. Participants were also recruited through Facebook advertisements. Advertisements targeted participants who “Liked” pages related to sexual minority interests, including “LGBT community,” “LGBT culture,” “Gay pride” and “Gay News.” Individuals who viewed the ad had the opportunity to click to learn more and were directed to the consent form for the survey, which provided additional information about the study and stated that it has been approved by the EVMS IRB. The use of Facebook for advertising research studies has been detailed in other publications (Kosinski, Matz, Gosling, Popov, & Stillwell, 2015). It has also been found to be a good recruitment tool for sexual minority research participants (Guillory et al., 2018).

Table 1

Demographics of Study Sample

	TD (%)	BAP (%)	ASD (%)	Total (%)
<u>Gender</u>				
Cisgender female	75 (17%)	72 (16%)	12 (3%)	159 (36%)
Cisgender male	54 (12%)	45 (10%)	5 (1%)	104 (24%)
Transgender female	1 (.002%)	4 (.009%)	3 (.007%)	8 (2%)
Transgender male	7 (2%)	28 (6%)	15 (3%)	50 (11%)
Genderfluid/Genderqueer	14 (3%)	27 (6%)	17 (4%)	58 (13%)
Agender	6 (1%)	8 (2%)	8 (2%)	22 (5%)
Other	13 (3%)	15 (3%)	8 (2%)	36 (8%)
<u>Sexual Orientation</u>				
Lesbian	15 (4%)	22 (5%)	9 (2%)	46 (11%)
Gay	44 (11%)	32 (8%)	5 (1%)	81 (19%)
Bisexual	63 (15%)	65 (16%)	18 (4%)	146 (35%)
Pansexual	23 (6%)	28 (7%)	10 (2%)	61 (15%)
Asexual	8 (2%)	23 (6%)	10 (2%)	41 (10%)
Other non-hetero orientation	8 (2%)	19 (5%)	14 (3%)	41 (10%)
<u>Race</u>				
White	138 (33%)	165 (39%)	61 (14%)	364 (86%)
Black or African American	5 (1%)	13 (3%)	2 (.003%)	20 (5%)
Hispanic/Latino	15 (4%)	12 (3%)	2 (.003%)	29 (7%)
American Indian/Alaskan	2 (.003%)	3 (.007%)	4 (.009%)	9 (2%)

Table 1 Continued

	TD (%)	BAP (%)	ASD (%)	Total (%)
<u>Race, continued</u>				
Asian	15 (4%)	6 (1%)	2 (.003%)	23 (5%)
Multi-racial	9 (2%)	9 (2%)	4 (.009%)	22 (5%)
Other	2 (.003%)	1 (.002%)	0 (0%)	3 (.007%)
<u>Participant Education</u>				
Less than high school	8 (2%)	11 (3%)	2 (.005%)	21 (5%)
High school graduate	23 (6%)	38 (9%)	19 (5%)	80 (19%)
Some college	43 (10%)	75 (18%)	20 (5%)	138 (33%)
2-year degree	7 (2%)	13 (3%)	5 (1%)	25 (6%)
4-year degree	55 (13%)	40 (10%)	15 (4%)	110 (26%)
Professional degree	4 (1%)	0 (0%)	0 (0%)	4 (.009%)
Master's degree	20 (5%)	11 (3%)	5 (1%)	36 (9%)
Doctorate	2 (.005%)	1 (.002%)	0 (0%)	3 (.007)
<u>Participant Recruitment Source</u>				
Old Dominion University	4 (1%)	6 (1%)	0 (0%)	10 (2%)
Flyer	3 (1%)	1 (.002%)	0 (0%)	4 (1%)
Psychology research website	26 (6%)	21 (5%)	1 (.002%)	48 (12%)
Social media via friend	5 (1%)	11 (3%)	13 (3%)	29 (7%)
Facebook/Instagram	94 (23%)	129 (31%)	50 (12%)	273
Advertisement				(65%)
Other	30 (7%)	21 (5%)	2 (.004%)	53 (13%)

Table 1 Continued

	TD	BAP	ASD	Total (%)
<u>Religion</u>				
Christian	37 (9%)	43 (10%)	7 (2%)	87 (21%)
Muslim	1 (.002%)	0 (0%)	0 (0%)	1 (.002%)
Jewish	5 (1%)	5 (1%)	5 (1%)	15 (5%)
Buddhist	2 (.004%)	2 (.004%)	3 (1%)	7 (2%)
Spiritual but not religious	36 (9%)	29 (7%)	16 (4%)	81 (19%)
Neither spiritual nor religious	37 (9%)	54 (13%)	14 (3%)	105 (25%)
Nothing in particular	37 (9%)	32 (8%)	13 (3%)	82 (20%)
Other	7 (2%)	24 (6%)	9 (2%)	40 (10%)
<u>Self Income</u>				
Less than \$10,000	63 (17%)	92 (25%)	37 (10%)	192 (52%)
\$10,000 - \$19,999	26 (7%)	36 (10%)	10 (3%)	72 (20%)
\$20,000 - \$29,999	21 (6%)	17 (5%)	7 (2%)	45 (12%)
\$30,000 - \$39,999	12 (3%)	13 (4%)	2 (1%)	27 (7%)
\$40,000 - \$49,999	10 (3%)	5 (1%)	0 (0%)	15 (4%)
\$50,000 and above	10 (3%)	4 (1%)	4 (1%)	18 (5%)

Note: Totals may not match due to missing data. Percentages may not add up to 100% due to rounding.

The minimum sample size for the Structural Equation Modeling (SEM) analysis is based on the $N:q$ rule – the ratio of number of cases (N) to the number of model parameters that require statistical estimates (q). The ratio of 10:1 is the minimum ratio that still produces trustworthy results, with 20:1 being the ideal ratio (Kline, 2016). With 10 estimated parameters in the model, a ratio of 10:1 dictates 100 participants per group. Ultimately, there ended up being 17 parameters in the model (see Figure 3). For overall analyses, the ratio was 21.6:1 and for the multigroup analysis, the ratio was 10:1 for the TD group and 11.7:1 for the BAP group.

For the linear hierarchical multiple regression analyses, a power analysis was performed with a power level of .8, alpha level of .05, for a medium effect size of $f^2 = .15$, allowing for 10 predictors. These include the seven demographic predictors – age, gender identity, race, family income, participant income, parent education, participant education, the BAPQ, and three predicting factors – the sociocultural variable for each analysis (either SPS – Micro-social Context, SPS-Culture, ROS-I, BGN, or DHEQ), sexual awareness, and the interaction of the two variables. The results indicated that 56 participants per group should be recruited to be able to find an effect of this size.

Measures

Demographics. The demographics questionnaire consisted of questions concerning participant's age, birth gender, gender identity, race, religion, family income, parent's education, respondent's education, other psychiatric diagnoses, questions about sexual behaviors and relationships, formal ASD diagnosis, and family member ASD diagnosis. (See Appendix A)

Autism Spectrum Quotient-10. The Autism Spectrum Quotient-10 (AQ-10; Allison, Auyeung, & Baron-Cohen, 2012) is a short-form version of the Autism Spectrum Quotient (AQ; Baron-Cohen, Wheelwright, Skinner, Martin, & Clubley, 2001). This measure aims to investigate

whether adults of average intelligence have symptoms of ASD. Each question allows the subject to indicate an answer ranging from *Definitely agree* to *Definitely disagree* in five different areas; social skill, attention switching, attention to detail, communication, imagination. To score, each item is given 1 point if the respondent reports the abnormal or autistic-like behavior either mildly or strongly and 0 points if the respondent reports the typical behavior either mildly or strongly. Approximately half the items are worded to produce a neurotypical response of “agree” and half are worded to produce a neurotypical response of “disagree”.

To create the AQ-10 Adult from the AQ Adult, the AQ Adult was given to 447 adults with ASD, as well as 838 adults without ASD who served as controls. The authors calculated a discrimination index (DI) for each of the 50 items by subtracting the number of control-group individuals who indicated the autism response from the number of individuals with ASD that indicated the autism response on that item. The two items with the best DI from each subscale were chosen for the 10-item measure. Cronbach’s alpha for the AQ-10 Adult was .85 (Allison et al., 2012). In this sample, Cronbach’s alpha was .89. With a cut point of 6, previous research has confirmed the validity of the AQ-10 in comparison to the full scale AQ to sensitively identify individuals with ASD from individuals without ASD (Allison et al., 2012; Booth et al., 2013) The AQ-10 was used in conjunction with self-report diagnosis to include participants in the ASD group (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 (e.g.,

Lampert & 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 a cut-off of 3.15 was given for the total score. 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). The alpha for this study was .86. A recent study comparing the BAPQ to the AQ and SRS (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). Since the factor structure of the BAPQ was found to be superior to that of the AQ, the BAPQ was used to determine the degree of BAP traits in participants (see Appendix C).

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, *Other sex only* to 7, *Same sex only* or 1, *Heterosexual only* to 7, *LGBQ+ only* for questions about sexual orientation. The scale was updated to use "LGBQ+" instead of "homosexual" or "Gay-Lesbian," and an explanation of the term "LGBQ+" was provided at the beginning of the scale. An option for *Asexual/ No one* was added as an 8 on the scale, since asexuality is also a sexual minority identity, but it is rarer than being both same- and other-sex attracted (DeWinter et al., 2017). For questions that ask about other or same sex, an option for non-binary individuals or those attracted to non-binary individuals was also added as a 9 on the scale, based on data from the pilot study described above. Since non-binary identities are more rare than same-sex attraction, other-sex attraction, and asexuality (DeWinter et al., 2017), non-binary was ranked as the highest point of the scale. Scores consist of the average of the ratings for the eight questions (four areas by two time periods). Higher scores indicate more sexual minority orientation.

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 ($\alpha = .95$; Floyd & Stein, 2002). 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 will be used to examine sexual orientation for this study. Cronbach’s alpha for this formulation was .89. For this study, codes of for *Asexual* and *I or my partner is non-binary* were coded as 8 and 9, respectively. Cronbach’s alpha for the recoded data was .91 (see Appendix D).

Biological Influences Coefficient. The measure of the influence of biology on sexual orientation development that has been most replicated and is easiest to assess is the self-reported number of sexual minority relatives. As there is evidence for the heritability of sexual minority orientation (J. M. Bailey et al., 2000; J. M. Bailey & Pillard, 1991; Sanders et al., 2015), this survey will also ask participants to report the number of individuals in their family that identify as a sexual minority. This number will be termed the Biological Influences Coefficient (BIC; see Appendix E).

Sexual Prejudice Scale. The Sexual Prejudice Scale (SPS; Chonody, 2013) was developed to measure bias against gay men and lesbian women. For this study, the scale author gave permission for 12 questions from the affective-valuation subscale of both the gay and the lesbian questionnaires to be adapted to measure the attitudes and beliefs prevalent in participants’ social context and culture. This subscale has been determined to have good

reliability and validity. The stereotyping subscale and social equity belief subscales were omitted as the way these scales are phrased is not conducive to participants reporting the beliefs of others. Content validation was provided by an expert panel, and items were retained only if the expert panel determined they represented sexual prejudice “well” or “very well.” Exploratory and confirmatory factor analyses were also conducted to divide the items into internally consistent subscales. The scale also has convergent validity with several other measures designed to measure prejudice towards gay and lesbian individuals, and discriminant validity from a measure in traditional sexism or belief in old-fashioned gender norms. Internal consistencies for the affective-valuation portion of the original scale were determined to be excellent ($\alpha = .91$ for gay men scale; $\alpha = .93$ for lesbian women scale; Chonody, 2013).

Participants will be prompted to think about the attitudes of their family and their culture towards gay and lesbian individuals during the participant’s childhood. Questions will be phrased as, “People in my family believed it’s wrong for men to have sex with men,” and “People in my culture thought gay men were immoral.” Participants will be asked to write in the culture they most identify with and think of that culture while they answer the questions pertaining to culture. In total, participants answered 24 questions, answering the 12 questions each from the viewpoint of their family and their culture. Questions are measured on a 6-point Likert scale, from 1, *Strongly disagree* to 6, *Strongly agree*. The last three items on the scale are reverse-scored. Scores for each scale will be summed, with the total scores for the family termed SPS-Family and the scale asking about culture being termed SPS – Culture. Higher scores indicate higher prejudice against sexual minority individuals in an individual’s microsocial context and culture (Chonody, 2013). For this study, the SPS-Family scale had a Cronbach’s alpha of .98 and the SPS-Culture scale had a Cronbach’s alpha of .95 (see Appendix F).

Religious Orientation Scale – Intrinsic (ROS-I). The Intrinsic and Extrinsic Scales of Religious Orientation (Allport & Ross, 1967) were created to measure both how religious a person is and if their religiosity is intrinsically or extrinsically motivated. The version of the scale revised by Gorsuch and McPherson (1989) can be administered to all age ranges, and the authors more clearly examine the differences between the intrinsic and extrinsic scale. This version has been used before in measuring the relationship between religiosity and homophobia (Wilkinson, 2004). Given that the intrinsic and extrinsic versions of the scale are theoretically different, it is suggested that the scales be used separately and not combined for a total score (Allport & Ross, 1967; Gorsuch & McPherson, 1989). The Intrinsic scale will be used for this study as it is the best measure of a person’s intrinsically-motivated religiosity and therefore best represents their personal religious beliefs.

Internal consistency of the ROS-I is considered good (Cronbach’s alpha = .83). Cronbach’s alpha for this study was .76 for the scale as written and .83 with items 2 and 8 removed (see primary analyses section below for why these items were removed). The scale also has good construct validity; the ROS-I is also empirically distinct from the Extrinsic Scale of Religious Orientation (ROS-E; $r = -.89$), which instead measures material reasons a person might report being religious, such as meeting friends at church and praying for personal gain. The ROS-I also correlates with church attendance ($r = .60$), an important part of many Christian religions. There are eight items on the ROS-I. Items are answered on a scale from (1) *Strongly Disagree* to (5) *Strongly Agree*. Sample items are “I try hard to live all my life according to my religious beliefs” and “My whole approach to life is based on my religion.” The items are summed to a total score. Lower scores mean more intrinsically-motivated religiosity (Gorsuch & McPherson, 1989; see Appendix G).

Belief in Gender Norms. The Attitudes Toward Women Scale (Spence, Helmreich, & Stapp, 1973) and the Male Role Norms Inventory (Levant, Hall, & Rankin, 2013) have been used together to measure belief in traditional gender roles held by men and women in relation to individuals' beliefs about sexual minority individuals (Whitley, 2001).

Attitudes Toward Women Scale. The Attitudes Toward Women Scale (AWS; Spence & Helmreich, 1978; Spence et al., 1973) scale is a 15-question measure designed to examine the degree to which participants agree with traditional female gender norms. Though this measure was developed in the 70s, it has been used in recently published research (i.e., Hill & Marshall, 2017). The item contains two subscales: the traditional attitudes subscale (e.g., “Swearing and obscenity are more repulsive in the speech of a woman than of a man”) and the egalitarian attitudes subscale (e.g., “A woman should be as free as a man to propose marriage”). The scores on the 15-item version correlate well with scores on the full scale ($r = .91$), with a Cronbach alpha of .89. For this study, the Cronbach's alpha score was .86. The measure demonstrates construct validity in that women score higher (are more pro-feminist) than men, college students score higher than their same-sex parent, and high-scoring individuals differ in their reactions to competent women (Spence & Helmreich, 1978). Other studies have found strong evidence of reliability in the 15-item scale, as well: in another sample of college students, Cronbach's alpha was found to be .81, split-half reliability was .83, and test-retest reliability was .86 (Daugherty & Dambrot, 1986). Responses are on a 4-point scale ranging from 1, *Strongly Agree* to 4, *Strongly Disagree*. Scores on the items for the egalitarian attitudes subscale are reverse-scored and added to the scores for the items on the traditional attitudes subscale. Higher scores represent more agreement with traditional female gender norms (see Appendix H).

Male Role Norms Inventory – Short Form. The Male Role Norms Inventory-Short Form (MRNI-SF; Levant, Hall, & Rankin, 2013) is a 21-item instrument developed to measure the degree to which participants agree with traditional male gender norms. The short form inventory was adapted from the revised version of the scale (Levant, Rankin, Williams, Hasan, & Smalley, 2010). The revised scale was determined to have convergent validity with another scale measuring male role attitudes developed by a different team of authors, divergent validity with a scale of masculine personality traits rather than masculine behavior, and concurrent validity through significant correlations with three scales that measure related constructs. The original scale had alpha coefficients ranging from .75 to .92 for the seven subscales (Avoidance of Femininity, Negativity toward Sexual Minorities, Self-reliance through Mechanical Skills, Toughness, Dominance, Importance of Sex, and Restrictive Emotionality), and an alpha of .96 for the total scale score. The short form inventory was created by selecting the three highest-loading items from each of the seven subscales of the revised form in a manner that captured that specific construct and avoided redundancy. Cronbach's alphas for the subscales ranged from .79 to .90 for men and .75 to .88 for women, with the alphas for the total scale being .92 for men and .94 for women. The overall alpha for this study was .90. Responses are on a 7-point Likert scale with responses from 1, *Strongly Disagree* to 7, *Strongly Agree*. Higher scores represent more agreement with traditional male gender norms (Levant et al., 2013; see Appendix I).

Scores for the AWS-15 and the MRN-SF will be averaged separately and then added together to form a Belief in Gender Norms (BGN) composite score. Cronbach's alpha for the composite score was .92.

The Daily Heterosexist Experiences Questionnaire. The Daily Heterosexist Experiences Questionnaire (DHEQ; Balsam, Beadnell, & Molina, 2013) was developed to

measure aspects of minority stress experienced by individuals who identify as sexual minorities. The full scale consists of 50 items, divided into nine subscales. The DHEQ specifies a 12-month time frame for asking about these experiences, in addition to response categories that measure the subjective distress concomitant with stressors experienced by individuals who identify as a sexual minority. The DHEQ demonstrates excellent internal reliability in terms of total score (reported $\alpha = .91$, study $\alpha = .89$), and acceptable internal reliability among all subscales (reported $\alpha = .76$ to $.86$, study $\alpha = .66$ to $.83$). Content validity of the scale was supported by asking individuals who identify as a sexual minority to assist in the creation of scale items, which were then narrowed via exploratory factor analysis (EFA). The items were further reviewed by an additional 900 individuals who identify as sexual minorities, with the options to include additional stressors not currently addressed, and again narrowed via EFA, resulting in a final pool of 50 items (Balsam et al., 2013).

The DHEQ has been called the closest thing to a “gold standard” measure of discrimination against individuals who identify as a sexual minority that currently exists in the field. A recent review of measures of sexual minority discrimination found that the DHEQ was the only measure that had acceptable reliability, factor structure, content validity, criterion-related validity, and construct validity (Morrison, Bishop, Morrison, & Parker-Taneo, 2016).

I decided to remove the sub-scales related to gender expression, parenting, and HIV/AIDS because these experiences are not experienced by all individuals and may complicate statistical calculations due to lower variability in the responses. Additionally, studying these experiences is not within the scope of this dissertation. The subscales for vigilance (reported $\alpha = .86$, this study $\alpha = .79$), discrimination/harassment (reported $\alpha = .85$, this study $\alpha = .83$), vicarious trauma (reported $\alpha = .82$, this study $\alpha = .82$), family of origin (reported $\alpha = .79$, this

study $\alpha = .82$), victimization (reported $\alpha = .87$, this study $\alpha = .72$), and isolation (reported $\alpha = .76$, $\alpha = .66$) are used in this study. Together, these scales comprise 33 items that describe experiences individuals who identify as a sexual minority may have had, such as “watching what you say and do around heterosexual people,” “being verbally harassed by people you know because you are LGBT,” and “your family talking about being rejected by other relatives because you are LGBT.” Participants respond using a 6-point Likert scale, ranging from 0, *Did not happen/not applicable to me*, to 5, *It happened, and it bothered me EXTREMELY*. These items demonstrated strong internal reliability scores (listed above) in a racially diverse sample of individuals who identified as a sexual minority (Balsam et al., 2013). Items will be summed for a total score. Higher scores will indicate the experience of more heterosexism (see Appendix J).

The Sexual Awareness Questionnaire. The Sexual Awareness Questionnaire (SAQ; Snell et al., 1991) is an objective self-report instrument designed to measure four personality tendencies associated with various aspects of awareness of one’s sexuality: sexual consciousness, sexual monitoring, sexual assertiveness, and sexiness consciousness. These subscales measure one’s attention to one’s own sexuality, attention to other’s impressions of one’s sexuality, the degree to which one is assertive with one’s partner regarding sexual wants and needs, and the degree to which one is aware of how sexy others perceive them to be, respectively. This measure consists of 26 items (Snell et al., 1991).

The convergent validity of each of these subscales is illustrated by their high correlation with conceptually-related measures. These measures included degree of negativity or positivity about sex, level of guilt and anxiety around sex, degree paid to the opinions of others, and an interpersonal or self-focused attitude towards sex. Relationships with these measures were in the expected directions for each subscale (Snell et al., 1991).

Internal consistency was also found to be high for each subscale. The Cronbach's alpha for sexual consciousness was .83 for males and .86 for females, while the Cronbach's alpha for sexual monitoring was .80 for males and .82 for females. For sexual assertiveness, Cronbach's alpha was .80 for males and .85 for females, and for sexiness consciousness, .92 for males and .92 for females. For this study, overall alpha for both groups was .76. Example items from this scale are "I am very aware of my sexual feelings," and "I don't care what others think of my sexuality," which would be reverse-scored. Answer choices are on a 5-point scale from 1, *Describes me extremely well* to 5, *Does not describe me*. Answer totals will be added for each subscale, and subscale totals will be added together to form a sexual awareness total score, with higher scores indicating less sexual awareness (Snell et al., 1991; see appendix K).

Procedure

This study was approved by the Internal Review Board of Eastern Virginia Medical School. Interested persons were asked to anonymously complete a survey of personality traits, experiences, and sexuality. They read a notification form that describes the study process and provided consent by clicking the statement, "I certify that I am 18 years of age or older, meet the eligibility criteria stated above, and agree to take part in this study." Participants then anonymously completed the survey online. To ensure that survey participants were paying attention and answering accurately, a question was inserted into the AQ, the ROS-I, and the DHEQ scales that asked participants to select a certain response if they were paying attention. This assured participant attention through the beginning, middle, and end of the survey. The scale for this question matched the scale of the measure in which it was embedded. Participants who incorrectly answered the first attention check question were alerted to that fact, reminded to answer the survey carefully and honestly, and were not allowed to continue until they select the

appropriate scale response. The second and third attention check questions did not alert the participant or screen them out of the study. Data from participants who failed one of these two attention checks were not used, unless multivariate outlier screenings determined that the participants were responding reliably despite failing an attention check. Participants were allowed to save their progress and could return to complete the survey for up to a week after first beginning the survey. The questionnaires appeared in the same order online as is presented in the appendix and this order was the same for every participant.

The participants were divided into groups based on reporting an ASD diagnosis and their scores on the AQ and BAPQ. Group membership was determined as follows: TD=score below BAPQ and AQ cut-off, BAP=score above BAPQ cutoff, ASD=self-report diagnosis combined with a score above the AQ cutoff. Any cases that were above the AQ cutoff, but not the BAPQ cutoff were discarded.

Participants who provided good data were entered into a raffle to win 1 of 10 \$50 gift cards. Additionally, participants were provided with referral information for the university counseling center or an outside mental health line should any study participant feel psychological distress during or following the completion of these questionnaires.

Analyses

Preliminary Analyses. Data was screened for completeness, outliers, normality, skewness, kurtosis, and multicollinearity. Zero order correlations were run with the predictors before they are entered into the model to avoid biasing path coefficients. Scores were imputed for cases that have at least 75% of the data for each scale (Manly & Wells, 2015). Cases that have less than 75% of the data for each scale were dropped from the analyses.

Primary Analyses. SEM was used to determine the relationship between the observed and latent variables and to test the fit of the proposed model in each of the three groups. Observed variables in the model were the BIC, SPS - Micro-social Context, SPS-Culture, ROS-I, BGN, and DHEQ. The latent variable is sexual minority orientation, which is a single-indicator variable. Prior to running the full SEM model, confirmatory factor analysis (CFA) was used to assess the factor structure of all the variables in the model across groups, and this structure was found to be acceptable. The model was recursive because all of the causal effects are unidirectional and it is therefore also an identified model (see Figure 2).

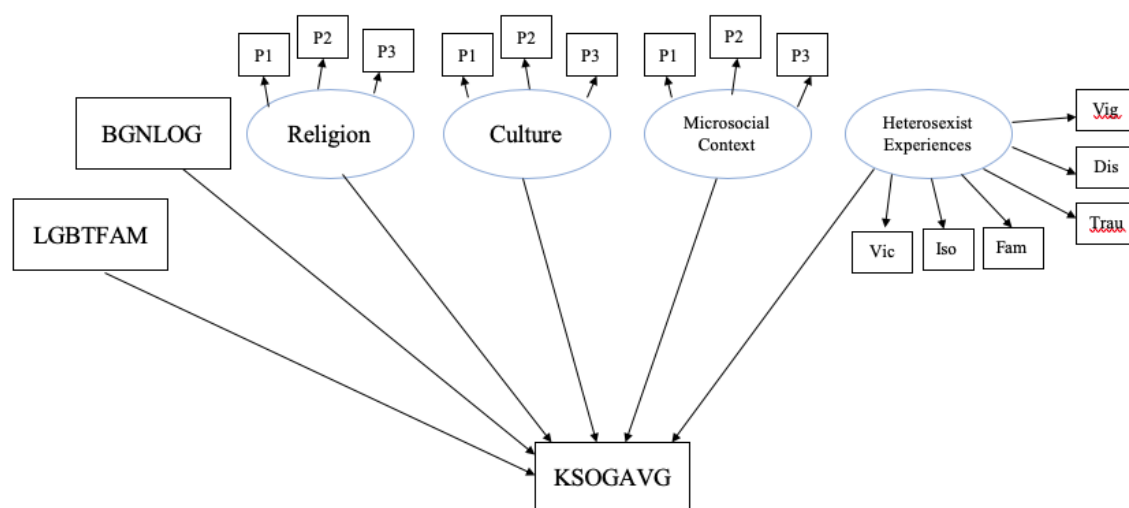


Figure 2. Hypothesized structural equation model.

Parameters were estimated using the full information maximum likelihood (FIML) estimation method. This method used all of the data for any parameter to choose estimates that maximize the likelihood that the data came from this population. For testing the fit of the overall model, chi-square tests, comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR) served as model fit statistics. For the chi-square statistic, a good fit is indicated if the χ^2/df ratio is close to 1 and $p \geq .05$. A significant p value indicates a poor model fit; in that way, χ^2 is a statistic that increases when the model fit is poor and measures departure from an exact model fit. A non-significant model χ^2 does not indicate a good model, only that the model has not yet been found to have poor fit (Kline, 2016). This metric is reported with the rest of the fit statistics, but a significant χ^2 alone was not used to reject model fit.

CFI is an incremental fit index and a goodness-of-fit statistic that compares the fit of the tested model to a hypothetical null model that assumes zero covariances between variables. CFI values range from 0 to 1.0, with 1.0 being the best result. For detecting measurement invariance and differences between the groups, a change in CFI (ΔCFI) $\geq .01$ indicates a difference between models. For testing overall model fit, values of .90 indicate an adequate fit of the data, whereas a value of .95 was considered a good fit. CFI is especially valuable in this study, as it typically performs well in small samples, being largely independent of sample size (Chen, 2007).

RMSEA is a statistic that increases when model fit is poor. It is an absolute fit index that measures departure from even an approximate fit of the model. The RMSEA statistic is represented by a 90% confidence interval in which the statistic (symbolized by ϵ) usually does not fall in the exact center. For detecting differences between groups, a change in RMSEA ($\Delta RMSEA$) ≥ 0.015 indicated a significant difference. For testing fit of the overall model, an ϵ_0

of 0 is the best result, and a close fit may be indicated by $\epsilon_0 \leq .05$, and a poor fit is indicated by $\epsilon_0 \geq .10$. If a 90% confidence interval includes both of these values, it shows that the point estimate of ϵ is imprecise, and the sample size may be too small to obtain a more precise result (Kline, 2016).

SRMR is another absolute fit index that increases when model fit is poor. SRMR measures the total difference between predicted and observed correlations. Better values of SRMR are closest to 0, while values $> .10$ may indicate poor fit. In addition to this statistic, absolute correlation residuals were also inspected to determine if the model underpredicts observed associations between variables (Kline, 2016). SRMR is also helpful in a small sample, as it, too, is not overly influenced by sample size (Chen, 2007).

For multigroup analysis, the model was first fit freely across all groups. Next, constraints were issued across all paths to examine the model fit. Since a group of like constraints were being tested, all constraints were imposed at once. Differences in covariances between groups indicated that group membership moderates the difference between the observed variables and current sexual minority orientation (the latent variable). Modification indices were examined to determine which factors were significantly different between groups and what relationships between variables needed to be added to the model to improve fit. In testing for differences in the model between groups, the least restrictive parameters for model invariance were used, as they are conversely the most restrictive parameters for detecting the variance between models. Differences in Comparative Fit Index (CFI) and root mean square error of approximation (RMSEA) were identified as the best fit statistics to detect measurement invariance (Kline, 2016).

Path coefficients between the exogenous variables and the endogenous variable were examined for strength and direction of correlation. If the statistics listed above indicate that the model does not have a good fit, either for all participants or in one or more of the groups, local fit statistics were inspected to determine which paths, if any, could be dropped in model respecification. Model respecification were done independently for each group. Path coefficients that are not significant were the starting point for this, and absolute correlation residuals, modification indices, and standardized residuals were also inspected to determine which paths needed to be dropped from the model.

In the last step, the interaction between sexual minority orientation, sociocultural factors, and sexual awareness were tested in individuals the BAP. Five linear hierarchical multiple regressions were conducted, one for each sociocultural variable. The demographic variables and BAPQ total score were entered into Step 1. For each regression, one sociocultural variable (SPS – Micro-social Context, SPS-Culture, ROS-I, BGN, and DHEQ), the SAQ, and the product of the variable and the SAQ were entered into Step 2. Since 5 regressions were performed, a Bonferroni correction indicates an alpha of 0.01 will be used in evaluating the statistical significance of these analyses and any other post-hoc analyses.

CHAPTER III

RESULTS

Preliminary Analyses

Data screening. Before performing any analyses, cases that did not fit the inclusion criteria were removed. Cases were removed if they did not fit age (11) or sexuality (64) criteria, failed an attention check (9), or did not complete the survey (193). Participants without an ASD diagnosis who met ASD but not BAP criteria were excluded so as to not bias the analyses (8). In total, 285 cases were excluded. Furthermore, 66 participants with ASD were not included in the SEM analyses as there were not enough cases to power this group. However, they were included in the exploratory regression analyses. This left 369 cases for analysis with Structural Equation Modeling, 170 in the TD group and 199 BAP group.

Data were also examined for missingness, normality, outliers, skewness, and kurtosis. For the final sample of 369 participants who had completed the survey, 21 cases (5%) had missing data on one variable. None of the missingness of the main variables were correlated. Age was correlated with missingness on Participant Income, $t(46.1) = 4.0, p < .001$, Family Income, $t(318.9) = -5.2, p < .001$, and Relationship History, $t(220) = -2.1, p = .035$. To correct for the missing values, Multiple Imputation was performed by taking the series mean for the SAQ, DHEQ, MRNI, AWS, ROS-I, SPS-Culture, SPS-Family, and the KSOG. The variables for Belief in Gender Norms and Number of LGBTQ+ Family members were both significantly skewed and kurtotic. To correct for this, robust maximum likelihood estimations were used for all analyses (Kline, 2016). Extreme outliers beyond three interquartile ranges were examined using boxplots. These were found in one variable, Belief in Gender Norms. To preserve the range of data reflected by these outliers, rather than Winsorizing the outliers, the log10 of the variable was

taken, which also helped correct for skewness and kurtosis. Tests of multivariate outliers showed some cases that exceeded cutoffs for leverage and Mahalanobis distance; however, no cases exceeded cutoffs for Cook's *d*. Lastly, a regression was performed with the predictor variables predicting sexual minority orientation to check for multicollinearity using VIF/Tolerance tests. All Tolerance values were less than 1 and all VIF values were less than 2. All dependent variables examined for between-group variables with an analysis of variance (ANOVA) test were found to be continuous.

The gender identity and race variables were dummy coded before being analyzed. For gender identity, "female" was chosen as the reference group and "male" and "other gender identity" were chosen as the comparison groups. For race, "White" was chosen as the reference group and "Black," "Hispanic," "Indigenous," "Asian," "Multiracial," and "Other" were chosen as comparison groups.

Zero order correlations were performed with the KSOG and the 7 predictor variables, first for all participants (Table 2), then for each group (Tables 3-5). For all participants, sexual orientation as measured by the KSOG was correlated with heterosexist experiences and sexual awareness (see Table 2 for additional correlations). For TD participants, sexual orientation was only correlated with heterosexist experiences (see Table 3 for additional correlations), but for BAP and ASD participants, sexual orientation was correlated with both heterosexist experiences and sexual awareness (see Tables 4 and 5 for additional correlations).

Table 2

Intercorrelations between KSOG and Predictor Variables for All Participants

	1	2	3	4	5	6	7	8
1. Sexual Orientation	1	.06	-.06	-.01	-.01	-.04	.16**	.26**
2. LGBTQ+ Family Members		1	-.06	-.06	-.07	-.04	.12*	-.08
3. Belief in Gender Norms			1	.18**	.20**	-.18**	-.13**	-.04
4. Sexual Prejudice Family				1	.32**	-.08	.22*	-.02
5. Sexual Prejudice Culture					1	-.11*	.12*	-.02
6. Religion						1	-.09	-.01
7. Daily Heterosexist Experiences							1	-.07
8. Sexual Awareness								1

Note: * = $p < .05$, ** = $p < .01$

Table 3

Intercorrelations between KSOG and Predictor Variables for TD Participants

	1	2	3	4	5	6	7	8
1. Sexual Orientation	1	-.02	-.08	.06	.09	-.04	.30**	.10

Table 3 continued

	1	2	3	4	5	6	7	8
2. LGBTQ+ Family Members		1	-.12	-.12	-.12	-.11	.11	-.16*
3. Belief in Gender Norms			1	.15	.13	-.15	-.12	.07
4. Sexual Prejudice Family				1	.43**	.07	.30**	.16*
5. Sexual Prejudice Culture					1	-.06	.28**	.13
6. Religion						1	-.01	.01
7. Daily Heterosexist Experiences							1	-.06
8. Sexual Awareness								1

Note: * = $p < .05$, ** = $p < .01$

Table 4

Intercorrelations between KSOG and Predictor Variables for BAP Participants

	1	2	3	4	5	6	7	8
1. Sexual Orientation	1	.03	-.07	-.01	.03	.04	.15*	.28**

Table 4 continued

	1	2	3	4	5	6	7	8
2. LGBTQ+ Family Members		1	-.03	-.01	-.10	.10	.09	-.06
3. Belief in Gender Norms			1	.23**	.20**	-.20**	-.12	-.14
4. Sexual Prejudice Family				1	.27**	-.19**	.10	-.02
5. Sexual Prejudice Culture					1	-.22**	.10	-.03
6. Religion						1	-.13	.03
7. Daily Heterosexist Experiences							1	-.11
8. Sexual Awareness								1

Note: * = $p < .05$, ** = $p < .01$

Table 5

Intercorrelations between KSOG and Predictor Variables for ASD Participants

	1	2	3	4	5	6	7	8
1. Sexual Orientation	1	.13	.01	-.28*	-.07	-.06	-.27*	.29*
2. LGBTQ+ Family Members		1	-.04	-.09	.20	-.18	.12	-.17

Table 5 continued

	1	2	3	4	5	6	7	8
5. Sexual Prejudice Culture					1	.03	.20	-.04
6. Religion						1	.04	.09
7. Daily Heterosexist Experiences							1	-.37**
8. Sexual Awareness								1

Note: * = $p < .05$, ** = $p < .01$

The demographic and predictor variables were examined for between-group differences. An ANOVA revealed the groups differed on participant income level, $F(2, 366) = 4.04, p = .018$, as well as education, $F(2, 414) = 9.12, p < .001$, with individuals with BAP making significantly less than individuals with TD, 95% CI [-\$500, -\$9800], and participants with ASD, 95% CI [-1.22, -0.16], and the BAP, 95% CI [-1.00, -0.22] being less educated than participants with TD. Odds-ratio analysis for male vs. female gender showed that participants with the BAP were 3.6 times more likely than their ASD counterparts to be male compared to female and participants with TD were 6 times more likely than their ASD counterparts to be male compared to female. In contrast, participants with ASD were 10 times more likely than their TD counterparts and 4.6 times more likely than their BAP counterparts to be other gender compared to female.

For the predictor variables, there were significant between-group differences on the DHEQ, $F(2, 414) = 9.70, p < .001$, with participants with ASD experiencing significantly more

heterosexism than those with BAP, 95% CI [4.61, 21.22], and TD, 95% CI [10.08, 27.10].

Significant differences were also found between groups on SPSCulture, $F(2, 414) = 11.91, p < .001$, with participants with ASD reporting more sexual prejudice in their culture compared to individuals with the BAP, 95% CI [5.40, 19.72], and with TD, 95% CI [6.00, 20.67]. There were also significant differences between the groups on Sexual Awareness, $F(2, 414) = 18.11, p < .001$. Participants with ASD, 95% CI [-15.96, -4.83], and the BAP, 95% CI [-11.69, -3.43], reported less sexual awareness than those with TD.

There was also a between-group difference in the dependent variable, the KSOG, between groups, $F(2, 413) = 10.46, p < .001$, with individuals with ASD, 95% CI [0.07, 0.93], and the BAP, 95% CI [0.47, 1.63], reporting significantly greater sexual minority orientation (e.g., more same-sex, asexual, and non-binary-directed sexual attraction, fantasies, behavior, and identity) than individuals with TD (see Tables 6 and 7).

Table 6

Means for Between Groups Analysis of Variance Tests

Variable	Group	Mean	Standard Deviation
Total Yearly Income	TD	\$10,458	\$1,420
	BAP	\$9,340	\$1,310
	ASD	\$9,532	\$1,693
Level of Education	TD	4.12	1.54
	BAP	3.51	1.36
	ASD	3.42	1.44

Table 6 continued

Variable	Group	Mean	Standard Deviation
ROS-I Total	TD	26.92	6.19
	BAP	25.41	6.64
	ASD	24.74	5.42
DHEQ Total	TD	60.92	21.18
	BAP	66.59	23.32
	ASD	79.51	27.37
KSOG Total	TD	5.50	1.62
	BAP	6.00	1.57
	ASD	6.55	1.56
SAQ Total	TD	77.03	15.24
	BAP	84.59	15.41
	ASD	87.42	14.44
SPS-Culture Total	TD	41.25	19.34
	BAP	40.48	21.30
	ASD	27.92	17.84

Note: $n(\text{TD}) = 138$, $n(\text{BAP}) = 164$, $n(\text{ASD}) = 59$. ROS-I = Religious Orientation Scale – Intrinsic, DHEQ = Daily Heterosexist Experiences Questionnaire, KSOG = Klein Sexual Orientation Grid, SAQ = Sexual Awareness Questionnaire, SPS-Culture = Sexual Prejudice Scale – Culture. For education, 1 = less than high school, 2 = high school graduate, 3 = some college, 4 = 2-year degree, 5 = 4-year degree, 6 = Master's degree, 7 = Professional degree, 8 = Doctorate. For the ROS-I, higher scores mean less religious.

Table 7

Analysis of Variance for Between-Group Variables

Source	SS (error)	df (error)	Mean Square (Error)	F	Partial η^2
Total Yearly	21.90	2 (358)	10.95 (2.91)	3.77*	.021
Income	(1040.612)				
Level of Education	34.31	2 (358)	17.15 (2.09)	8.21***	.044
	(747.55)				
ROS-I Total	260.76	2 (358)	130.38	3.30*	.018
	(14141.12)		(39.50)		
DHEQ Total	14281.32	2 (358)	7140.66	13.21***	.069
	(193544.50)		(540.63)		
KSOG Total	48.80	2 (358)	24.40 (2.51)	9.72***	.051
	(898.85)				
SAQ Total	6237.44	2 (358)	3118.72	13.51***	.070
	(82639.92)		(230.84)		
SPS-Culture Total	8279.14	2 (358)	4139.57	10.31***	.054
	(143703.60)		(401.41)		

Note: * = $p < .05$, ** = $p < .01$, *** = $p < .001$.

Primary Analyses

Observed variables in the model are the BIC, SPS - Family, SPS-Culture, ROS-I, BGN, and DHEQ. In attempting to create the “microsocial” variable with the SPS-Family and the SPS-Community, a principal component analysis extracted 2 components, illustrating that the scales are not unifactorial and therefore not appropriate for parceling into a single variable. In selecting which scale to use for this factor, literature for empirical studies that had examined the influences of peers/community and family on sexual minority orientation was examined. Of the literature reviewed in the introduction section, there were five empirical studies which examined how family affected sexual minority orientation, all five of which showed a clear effect. In contrast, a literature search found only three empirical studies which examined how peers or community affected sexual minority orientation, only one of which showed a clear effect. Therefore, SPS-Family alone was chosen to represent microsocial context.

The latent variable was the average score on the KSOG, which was a single-indicator factor. The model is recursive because all of the causal effects are unidirectional, and it is therefore also identified. The BIC and BGN were both single-indicator factors, as they were defined by summary scores. The DHEQ factor was created by the indicators represented by each of the six subscales, Vigilance (Vig), Discrimination/Harassment (Dis), Vicarious Trauma (Trau), Family of Origin (Fam), Victimization (Vic), and Isolation (Iso). The factor structure of the relationship between the subscales and the factor was verified using confirmatory factor analysis (CFA).

Indicators for the variables SPS-Family, SPS-Culture, and ROS-I were defined by parcels, since structural relationships were of more import than the measurement model for each item. This allowed me to reduce the number of overall indicators in the model so that it was

sufficiently powered for a multigroup analysis with the number of participants obtained. The dimensionality for each of these factors was verified using exploratory factor analysis (EFA). SPS-Family and SPS-Culture were both unidimensional and therefore appropriate for parceling. The ROS-I had two dimensions, one consisting of six items and one consisting of two items. The two items, item 2, “It doesn’t much matter what I believe so long as I am good,” and item 8 “Although I believe in my religion, many other things are more important in life,” were excluded as they appeared to relate more to a personal morality or spirituality, and not a personal religion as the measure was attempting to capture. Indicator parcels were created by matching the items based on factor loadings, pairing the highest with the lowest items to create three indicators for each factor. Indicators for SPS-Family and SPS-Culture consisted of four items each, while indicators for the ROS-I consisted of two items each.

The following model was entered into Mplus, Version 7 (Muthén & Muthén, 2008) to be analyzed using SEM (see Figure 3). The initial fit statistics to the model were $\chi^2(130) = 374.04$, $p < .001$; RMSEA = 0.07, 90% CI [0.07, 0.08]; CFI = 0.95; SRMR = 0.08 (see Table 4). Based on the parameters stated above in the proposed analyses section, this model has adequate fit. However, only one of the observed variables, heterosexist experiences (measured by the DHEQ) had a significant path on the predictive variable, sexual minority orientation, measured by average values on the KSOG (KSOGAVG). Heterosexist experiences were also correlated with several other predictor variables, including microsocial context (SPS-Family), culture (SPS-Culture), and religion (ROS-I). Culture and microsocial context were correlated with each other, and culture was significantly correlated with religion. Religion was also significantly correlated with belief in gender norms (BGNLOG; see Figure 3 and Table 4).

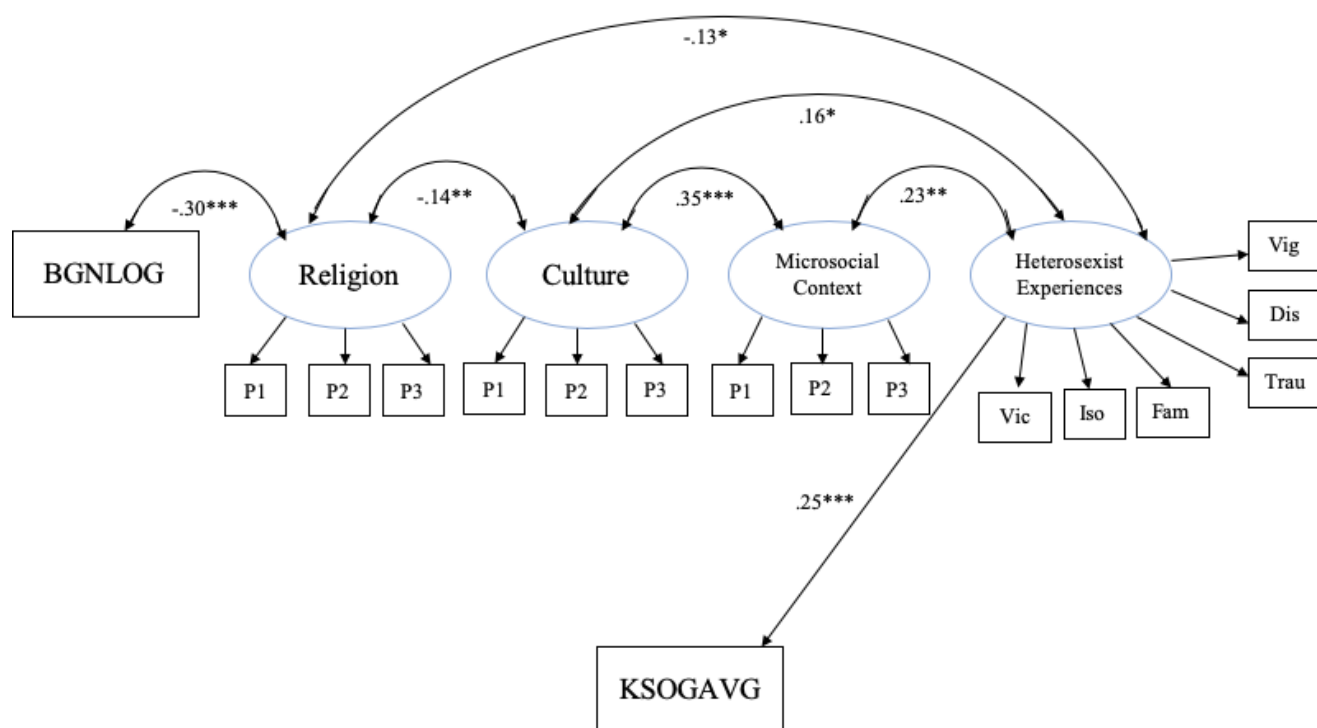


Figure 3. Overall SEM model

Table 8

Significant Pathways for Overall Model

Pathway	<i>b</i>	95% CI	<i>p</i> value
KSOG on DHEQ	0.25	0.07 – 3.74	.000
DHEQ with SPS-Family	0.23	0.07 – 32.8	.001
DHEQ with SPS-Culture	0.16	0.08 – 1.97	.049
DHEQ with ROS-I	-0.13	-1.96 – 0.07	.050

Table 8 continued

Pathway	<i>b</i>	95% CI	<i>p</i> value
SPS-Family with SPS-Culture	0.35	0.05 – 6.94	.000
SPS-Culture with ROS-I	-0.14	-2.43 – 0.06	.015
ROS-I with BGNLOG	-0.30	-3.63 – 0.06	.000

Note: ROS-I = Religious Orientation Scale – Intrinsic, DHEQ = Daily Heterosexist Experiences Questionnaire, KSOG = Klein Sexual Orientation Grid, SAQ = Sexual Awareness Questionnaire, SPS-Culture = Sexual Prejudice Scale – Culture, BGNLOG = Belief in Gender Norms with log10 of scores. For the ROS-I, higher scores mean less religious.

Next, the model was run in a multigroup comparison between the TD and the BAP groups with all of the factors for both the measurement models and the structural models constrained between groups. Model fit with these constraints was poorer than in the overall model, $\chi^2(280) = 597.4, p < .001$; RMSEA = 0.08, 90% CI [0.07, 0.09]; CFI = 0.94; SRMR = 0.09. Chi-square difference testing showed a significant difference between models, $\Delta\chi^2(150) = 223.40, p < .001$. Additionally, the change in CFI was greater than the .01 threshold specified in the planned analyses section. Although no significant level of change was prespecified for SRMR, the magnitude of the change was equal to that of the CFI. The RMSEA also changed, although the magnitude was not great enough to meet the significance level specified in the planned analyses section (see Table 5).

Table 9

Fit Indices for Overall and Multigroup Structural Equation Model

Model	χ^2	RMSEA	CFI	SRMR
1. Overall Model	375.04***	0.07	0.95	0.08
2. Multigroup Model	597.40***	0.08	0.94	0.09

Note: *** $p < .001$.

For the TD group, the path of KSOGAVG on heterosexist experiences (DHEQ) was no longer significant. Heterosexist experiences was significantly correlated with microsocial context and culture. Microsocial context and culture were still correlated with each other. Belief in gender norms was also still correlated with religion (see Figure 4 and Table 6).

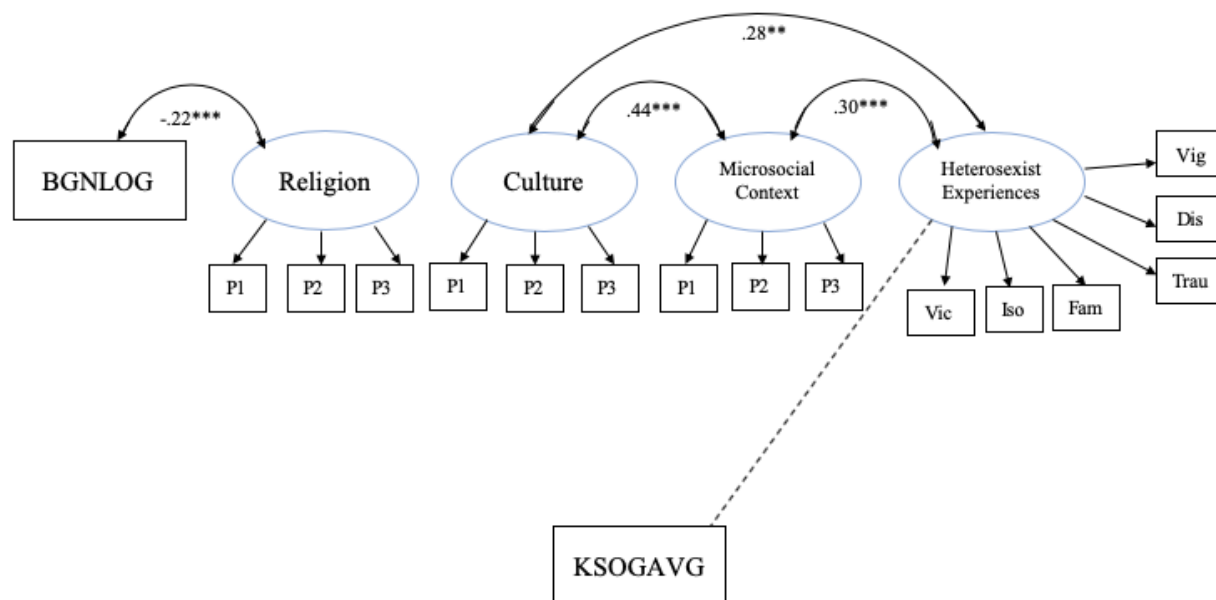


Figure 4. SEM model in the TD group

Table 10

Significant Pathways for Multigroup Model – TD Group

Pathway	<i>b</i>	95% CI	<i>p</i> value
DHEQ with SPS-Family	0.305	0.094 – 3.262	.001
DHEQ with SPS-Culture	0.276	0.098 – 2.819	.005
SPS-Family with SPS-Culture	0.439	0.068 – 6.451	.000
ROS-I with BGNLOG	-0.223	-3.366 – 0.066	.001

Note: ROS-I = Religious Orientation Scale – Intrinsic, DHEQ = Daily Heterosexist Experiences

Questionnaire, SAQ = Sexual Awareness Questionnaire, SPS-Culture = Sexual Prejudice Scale –

Culture, BGNLOG = Belief in Gender Norms with log10 of scores. For the ROS-I, higher scores mean less religious.

For the BAP group, the relationship between sexual minority orientation and heterosexual experiences was still significant. Additionally, heterosexual experiences were still significantly correlated with microsocial context, but not culture or religion. Culture and microsocial context were still correlated with each other and were now both correlated with religion. Religion was also still significantly correlated with BGNLOG (i.e., belief in gender norms, see Figure 5 and Table 7).

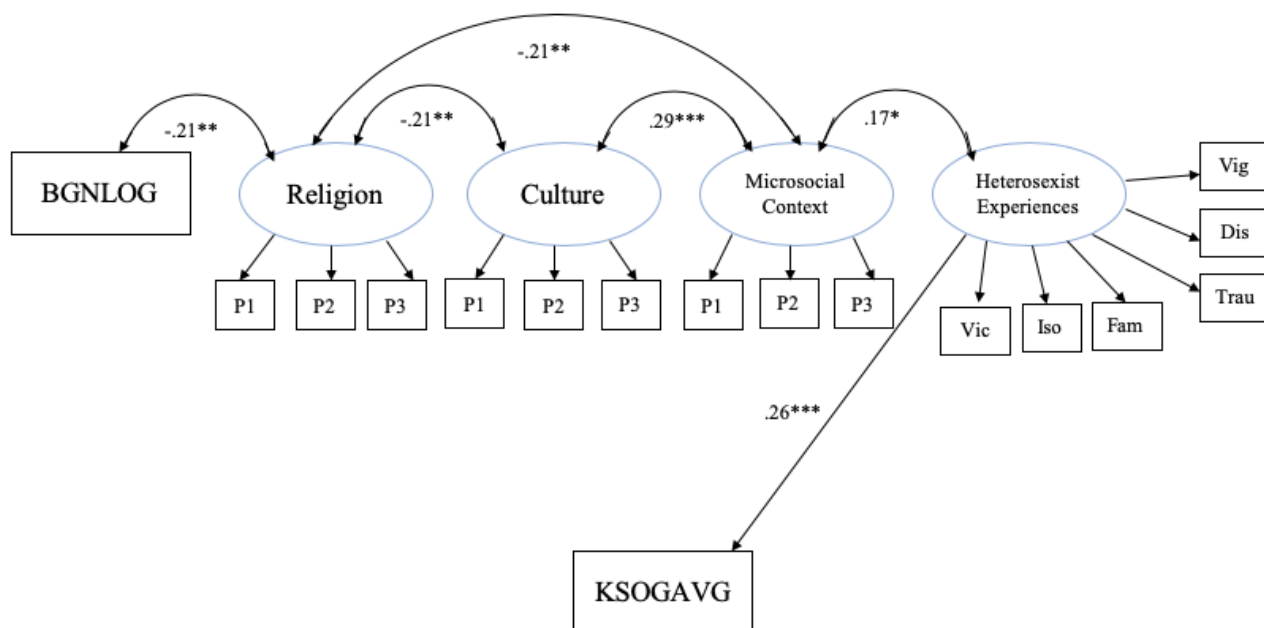


Figure 5. SEM model in the BAP group.

Table 11

Significant Pathways for Multigroup Model – BAP Group

Pathway	<i>b</i>	95% CI	<i>p</i> value
KSOG on DHEQ	0.256	0.084 – 3.036	.002
DHEQ with SPS-Family	0.174	0.086 – 2.021	.043
SPS-Family with SPS-Culture	0.293	0.071 – 4.123	.000
SPS-Culture with ROS-I	-0.211	-2.667 – 0.079	.008
SPS-Family with ROS-I	-0.209	-2.758 – 0.76	.006
ROS-I with BGNLOG	-0.206	-3.221 – 0.064	.001

Note: ROS-I = Religious Orientation Scale – Intrinsic, DHEQ = Daily Heterosexist Experiences Questionnaire, KSOG = Klein Sexual Orientation Grid, SAQ = Sexual Awareness Questionnaire, SPS-Culture = Sexual Prejudice Scale – Culture, BGNLOG = Belief in Gender Norms with log10 of scores. For the ROS-I, higher scores mean less religious.

The last hypothesis tested if sexual minority orientation is related to the interaction of sociocultural factors and sexual awareness in individuals with the BAP. Five hierarchical multiple regressions were conducted, one for each sociocultural variable, which served as the independent variables, predicting sexual minority orientation, the dependent variable. BAPQ score, age, dummy-coded gender identity, and dummy-coded race were first entered into Step 1. For Step 2 of each regression, the sociocultural variable, sexual awareness (measured by the SAQ), and the

product of the sociocultural variable and sexual awareness were entered. For the BAP group, one demographic predictor was significant; having a non-binary gender identity, $\beta = .33$, $t = 4.00$, $p < .001$. There were no significant predictors among the sociocultural variables, sexual awareness, or the interactions between the sociocultural variables and sexual awareness.

In the regression testing the interaction of culture and sexual awareness, sexual awareness was a significant predictor of sexual minority orientation at the $p = .05$ level, $\beta = .40$, $t = 2.42$, $p = .017$. To follow up on this finding, a regression was performed in for the BAP group with all 6 predictor variables plus sexual awareness. The overall regression was significant with the demographic variables alone, $R = .34$, $R^2 = .11$, $F(10, 174) = 2.20$, $p = .02$, and the addition of the predictor variables caused a significant improvement in the model, $\Delta R^2 = .10$, $F(1, 173) = 2.91$, $p = .007$. Again, having a non-binary gender identity was a significant predictor of sexual minority orientation, $\beta = .32$, $t = 3.94$, $p < .001$. Additionally, sexual awareness was a significant predictor of sexual minority orientation, $\beta = .30$, $t = 3.98$, $p < .001$ (see Table 8).

Table 12

*Summary of Hierarchical Regression Analyses for Demographic Variables and SAQ Predicting**Sexual Minority Orientation in the BAP Group*

Predictors	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>F</i>	<i>R</i> ²	ΔR^2
<i>Step 1</i>					2.36*	.11	--
Non-binary gender identity	1.07	0.26	0.33	4.07***			
<i>Step 2</i>					2.77***	.21	.10
SAQ	0.30	0.01	0.30	4.13***			

Note: * $p < .05$, ** $p < .01$, *** $p < .005$; SAQ = Sexual Awareness Questionnaire. Only significant predictors are shown

Sexual awareness as a significant predictor of sexual minority orientation was also tested with a regression in the ASD group. Since the other predictors were not significant in the BAP group, and there were not enough participants in the ASD group to provide power to test all the predictors with sexual awareness, only the demographic variables were included in the first step and only sexual awareness was included in the second step. The demographic variables were not significant predictors of sexual minority orientation, $R = .27$, $R^2 = .07$, $F(9, 56) = .48$, $p = \text{n.s.}$ However, the inclusion of sexual awareness as a predictor produced a significant improvement in the model, $\Delta R^2 = .07$, $F(1, 55) = 4.60$, $p = .036$, showing that sexual awareness was a significant predictor of sexual minority orientation in the ASD group, $\beta = .27$, $t = 2.14$, $p = .036$ (see Table 9). However, this does not meet the Bonferroni corrected p -level of .01 for consideration of significance for this study.

Table 13

Summary of Hierarchical Regression Analyses for Demographic Variables and SAQ Predicting Sexual Minority Orientation in the ASD Group

Predictors	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>F</i>	<i>R</i> ²	ΔR^2
<i>Step 1</i>					0.048	.07	--
n.s.	---	---	---	---			
<i>Step 2</i>					4.60*	.14	.07
SAQ	0.30	0.01	0.27	2.14*			

*Note: *p < .05; SAQ = Sexual Awareness Questionnaire. Only significant predictors are shown.*

CHAPTER IV

DISCUSSION

Primary Findings

The goal for this study was to operationalize the model of sexual minority orientation development put forth by Worthington et al. (2002) and to test the fit of this model in individuals with and without the BAP. This study found that only one of the factors hypothesized to affect sexual minority orientation, heterosexist experiences, actually did predict sexual minority orientation in the overall model, with more heterosexist experiences predicting greater sexual minority orientation. Furthermore, when the sample was divided into BAP and non-BAP, this effect was not present in the non-BAP group. Although the other biopsychosocial predictors did not significantly predict sexual minority orientation, several of these factors were significantly correlated with each other.

Model fit. Hypothesis 1a was that the Worthington et al. (2002) factor model would have a good fit in describing sexual minority development. This hypothesis was not supported by the data – only one of the factors hypothesized to predict sexual minority orientation was found to be significant. H1b, that the fit would vary between groups and that it would fit better for individuals without the BAP than individuals with the BAP, was partially supported. There were significant differences in fit between individuals with and without the BAP, as evidenced by the multigroup model having poorer fit than the overall model. However, the model for the group without the BAP did not have any of the hypothesized factors (biological indicators, belief in gender norms, sexual prejudice in family and culture, religion, daily heterosexist experiences) predicting sexual minority orientation; therefore, the model could be said to best fit in the group with the BAP.

The lack of a relationship between many of the hypothesized predictors and sexual minority orientation is likely related to the high intercorrelations between the predictor variables. Although these factors represent distinct theoretical constructs, they related to each other on a conceptual level and are operationalized similarly. It is possible that one or more the hypothesized predictors, such as religion, culture, or microsocial context, could still predict sexual minority orientation indirectly through the relationship with daily heterosexist experiences.

Hypothesis 2a, that the biological indicators factor will be positively correlated with having a sexual minority orientation, while the other factors will be negatively correlated with having a sexual minority orientation, was also not supported. Hypothesis 2b, that the biological indicators factor will affect the two groups equally, but the sociocultural factors will have less influence for individuals with the BAP, was also not supported. The biological indicators factor was not significantly associated with sexual minority orientation in either group and the one group in which a sociocultural factor (heterosexist experiences) affected sexual minority orientation was in the BAP group.

It is likely that the biological factor did not significantly influence either group due to how the factor was measured, i.e., a low incidence of sexual minority relatives in this sample and using self-report instead of genogram or genetic information. Although there is strong evidence for the heritability of sexual minority orientation (J. M. Bailey et al., 2000; J. M. Bailey & Pillard, 1991; Sanders et al., 2015), much of this research was conducted with twin studies or genetic analysis, methods which were not feasible for this study. Although data about sexual minority relatives of sexual minority participants has been analyzed to examine heredity through pedigree analyses (Hamer et al., 1993; Sanders et al., 2015), this data has been used in

conjunction with genetic linkage studies. It is likely that number of LGBTQ+ biological relatives is not a robust enough measure of the heredity of sexual minority orientation on its own.

Relationship between predicting factors. In addition to predicting sexual minority orientation, heterosexual experiences were inversely correlated with religion and positively correlated with culture and microsocial context. This means that participants who reported more daily heterosexual experiences also reported more sexual prejudice in their culture and family, and also reported being more religious (lower scores on the ROS-I mean more internalized religion). Although the relationship between the heterosexual experiences and religion was found in the overall model, it was not found in either of the individual group models, possibly because it was a small effect and looking at the groups individually decreased power.

The positive correlation between the two variables, meaning that as sexual minority orientation increases (e.g., individuals report greater same-sex attraction, asexuality, or non-binary attraction), daily heterosexual experiences also increases, may be explained by the decreased emphasis individuals with ASD place on social reputation (Izuma et al., 2011). If a person with ASD does not have a strong concern for social reputation, they may openly display or discuss their sexual minority orientation in environments that are less welcoming to sexual minority individuals, as opposed to downplaying it or not talking about it, and therefore experience increased heterosexism. It is possible that individuals with the BAP have a similar insensitivity to social reputation and report a more non-heterosexual orientation despite experiencing increased daily heterosexual experiences. It is also possible that the direction of the relationship is reversed and expressing a more non-heterosexual orientation could lead individuals with the BAP to experience increased daily heterosexism. Perhaps the difficulties with social situations experienced by those with the BAP could lead them to have difficulty

identifying situations in which expressing a more non-heterosexual identity could lead to experiencing more heterosexism.

Additionally, participants with the BAP and ASD were more likely than participants with TD to report being asexual. Asexuality was coded as being on the higher end on the scale of sexual minority orientation (see Method section, above) and studies have shown that individuals who identify as asexual experience more discrimination and harassment than other sexual minorities (Bogaert, 2015; Rothblum, Krueger, Kittle, & Meyer, 2019). This might help explain the correlation between having a more sexual minority orientation and experiencing more daily heterosexist experiences.

Furthermore, sexual prejudice and heterosexism are two related, though distinct concepts. Heterosexism represents prejudice against sexual minority individuals at various levels of the social structure, whereas sexual prejudice measures the attitudes of individuals (Chonody, 2013). Nevertheless, it makes sense that these constructs are highly correlated. Additionally, it makes sense that sexual prejudice in family and culture are highly interrelated. Family is subsumed under the cultural context, and many individuals learn about and relate to their culture through their family (Worthington et al., 2002). These concepts were also measured using the same adapted Sexual Prejudices Scale (Chonody, 2013). Therefore, the interrelatedness of these concepts is likely a product of both how they were measured and how they exist in vivo.

Despite the relationship between these two concepts, the correlation between cultural sexual prejudice and daily heterosexist experiences was found in the TD group but not the BAP group. This could be because individuals with the BAP feel more connected to family, in which sexual prejudice did have a relationship with daily heterosexist experiences, than a larger culture. Another interpretation is that insensitivity to social reputation and decreased theory of mind, if

these exist in the BAP as postulated, could provide a buffering factor against the perceived experience of heterosexism and sexual prejudice in certain contexts. No research has been done to date on insensitivity to social reputation in individuals with the BAP, and research on theory of mind deficits in this group is inconclusive, with some researchers reporting finding deficits (Best et al., 2008) and others reporting no deficits in this group (Kunihira et al., 2006).

Belief in traditional gender norms (BGNlog) was strongly related to intrinsic religiosity (ROS-I) in the overall model and in both groups. This relationship has been demonstrated in several other contexts and studies (Bang, Hall, Anderson, & Willingham, 2005; Mikołajczak & Pietrzak, 2014). Sexual minority individuals who report staying involved with organized religion, especially non-identity-affirming churches, tend to experience negative effects such as internalized homophobia, lower self-esteem, and more depressive symptoms (Barnes & Meyer, 2012). Sexual minority individuals who internalized religious principles to the point of incorporating more religion in their lives may have been raised in cultures and families where more sexual prejudice existed, and because of their religious environment, perhaps experienced more heterosexism.

Sexual awareness. Hypothesis 3, that the interaction of sociocultural factors and sexual awareness will explain a significant amount of the variance in the sexual minority orientation of individuals with the BAP, was not supported. Although the interaction of sexual awareness and the sociocultural factors did not explain a significant amount of the variance in the sexual minority orientation of individuals with the BAP, sexual awareness alone did explain a significant amount of the variance. Sexual awareness was negatively correlated with sexual minority orientation, meaning that the more non-heterosexual one's orientation, the less sexual awareness they have. This relationship was only found in the BAP and ASD groups, who had

significantly less sexual awareness than the TD group. This would suggest that there is another mediating factor through which sexual awareness relates to sexual minority orientation. In Hannah and Stagg (2016), the authors hypothesize that perhaps individuals with ASD have more difficulty reflecting on the relationship their sexuality has to the individuals around them. Additionally, data from the pilot study referenced in the introduction section suggests that individuals with ASD are aware of traditional beliefs about gender norms and same-sex relationships but do not internalize these beliefs. This again relates back to insensitivity to social reputation (Izuma et al., 2011) and theory of mind differences (Simon Baron-Cohen, 1995) that are seen in individuals with ASD and may exist in individuals with the BAP as well. These findings may also be the reason that a relationship between increased intrinsic religiosity and increased family and cultural sexual prejudice was found in the BAP group and not the TD group. It is possible that the lack of awareness of how others see their sexuality, combined with an insensitivity to social reputation, could allow individuals with the BAP to withstand being in an environment that is hostile to their sexual minority orientation.

Findings with ASD participants. Although there were not enough participants in the ASD group to test hypotheses 4a, 4b, and 4c, there were several demographic differences between participants with ASD and those with and without the BAP. Individuals with ASD were, along with those with the BAP, less educated and made marginally less than those without ASD or the BAP. Participants with ASD were more likely to be female than male, and more likely to identify as “other gender” compared to female. Participants with ASD also reported having more daily heterosexist experiences and more sexual prejudice in their culture those with and without the BAP. Participants with ASD and those with the BAP reported less sexual awareness and a more non-heterosexual sexual orientation than participants without the BAP or ASD.

These findings replicate those from other studies that have found individuals with ASD more likely to describe themselves as non-binary or gender non-conforming (DeWinter et al., 2017; Turner et al., 2017), have a more non-heterosexual orientation (e.g., Bejerot & Eriksson, 2014; Byers, Nichols, Voyer, & Reilly, 2012; George & Stokes, 2018; Gilmour, Schalomon, & Smith, 2012; Pecora, Mesibov, & Stokes, 2016), and have less sexual awareness (Hannah & Stagg, 2016). This study also replicates previous findings that individuals with the BAP are also more likely to have a more non-heterosexual orientation (Qualls et al., 2018). Although in most studies of individuals with ASD, participants are more often male than female (Watkins, Zimmermann, & Poling, 2014), this may not be true for the subsample of individuals with ASD which this study investigates, namely sexual minority individuals with ASD.

Several studies of sexual orientation in individuals with ASD report women with ASD as being more same-sex attracted and/or less other-sex attracted than their male counterparts (Bejerot & Eriksson, 2014; DeWinter et al., 2017; Gilmour et al., 2012; Pecora et al., 2016), although small sample sizes of males were reported in at least one of these studies (Gilmour et al., 2012). Differences were also found between men and women with the BAP, although a small sample size of males was also reported in the study (Qualls et al., 2018). Studies of sexual orientation in TD women have also found that they are more likely to report same-sex attraction than TD men (Diamond, 2008). Given these gender differences, it might be expected that recruiting a study sample consisting exclusively of sexual minorities might result in a majority of female participants.

While a preponderance of female participants is perhaps to be expected, it nevertheless could have possible effects on some of the independent factors examined in this study. Sexual minority women have been found to be less religious than sexual minority men (Sherkat, 2002).

There were also between-gender differences found in terms of heterosexist experiences by the authors of the DHEQ, with men scoring higher than women on the victimization subscale ($d = .25$) and women scoring higher than men on the vicarious trauma and family of origin subscales ($ds = .24$ and $.17$, respectively). However, gender differences in overall scores on this measure were not reported (Balsam et al., 2013). Gender differences have also been found for belief in traditional norms, with men reporting more traditional views than women for both male (Levant et al., 2013) and female (Spence et al., 1973) gender roles. Endorsement of traditional gender norms was very low in this sample, which could be due to the fact that a large percentage of the sample was female. Lastly, the authors of the sexual awareness questionnaire did not find any gender differences in overall score on this measure, although men tended to score higher on measures of sexual assertiveness than women (Snell et al., 1991).

Individuals with ASD reported experiencing more heterosexism and more sexual prejudice in their family environment. These experiences could share similar causality to reasons postulated above for why individuals with the BAP experience greater heterosexism, and relate to reasons why heterosexism varies positively with increased sexual minority orientation. In TD populations, experiencing more heterosexism has been shown to lead to decreased “outness,” or being open about one’s sexual minority orientation (Moradi et al., 2010). Perhaps individuals with ASD, having greater insensitivity to social reputation (Izuma et al., 2011) and decreased sexual awareness (shown in this study as well as in Hannah & Stagg, 2016) are less sensitive to heterosexism and do not let the opinions of others affect the expression of their sexual minority identity. Although this freedom of expression could have positive effects for self-esteem and self-identification, it could possibly lead to experiencing greater heterosexism and increased sexual prejudice.

Individuals with ASD in our sample were also more female rather than male and likely to have lower educational attainment, compared to individuals with TD. There was also a trend for individuals with ASD to report lower income than individuals with TD. The latter two findings are in line with research on ASD: individuals with ASD are often found to have lower educational attainment and more often be unemployed or under-employed than individuals with typical development (e.g., Henninger & Taylor, 2013; Taylor & Seltzer, 2011). However, the predominantly-female sample represents a divergence from other ASD literature; most participants in ASD research are male (Watkins et al., 2014). Nevertheless, other studies examining sexual orientation in individuals with ASD also have an equal or higher percentage of female participants with ASD compared to male participants with ASD (e.g., DeWinter et al., 2017; George & Stokes, 2018). This could be due to recruitment which targets individuals who have both ASD and a sexual minority orientation, as some research has shown that females but not males with ASD are more likely than individuals with TD to have a sexual minority orientation (Gilmour et al., 2012; Qualls et al., 2018). Lastly, these three findings could also be related: studies show that women with ASD are less likely than men with ASD to maintain employment or secondary education over time (Taylor, Henninger, & Mailick, 2015).

Strengths and Limitations

There are limitations to the conclusions that may be drawn from this study. Testing all factors from the Worthington et al. (2002) model in one study required a large number of measures and a long survey (1 hour on average) which contributed to participant drop out and random responding at the end of the survey. Although data were screened to remove cases that contained random responding, it is still possible that fatigue may have affected how participants responded to measures at the end of the survey. This is especially a consideration with the format

DHEQ, which was the second-to-last survey and had a grid format for item responses where participants could quickly move through the measure selecting the same response for each question.

Limitations from this study may also result from testing the Worthington et al. (2002) model, which was originally developed to examine heterosexual identity development, in a non-heterosexual population. Although this model was later expanded upon to include non-heterosexual orientations (Dillon et al., 2011), operationalizing and studying this model in a solely non-heterosexual sample might limit the variance between groups in each of these factors. Only examining this model in a sexual minority sample might further limit the variance in the KSOG, as it would cause the data to be skewed towards more same-sex attraction, behavior, fantasies and identities. Future research on this model in heterosexual individuals in addition to sexual minority individuals is necessary to compare how this model operates differently in each group.

Measurement of the factors from the Worthington et al. (2002) model required some existing measures to be modified to properly measure the factors. Although Cronbach's alpha and other tests indicated that these measures were psychometrically acceptable for the study, since they were not being used as written, it cannot be certain that they were measuring the variable as intended. For example, the SPS-Family and SPS-Culture measures were developed from one subscale of the original Sexual Prejudice Scale (Chonody, 2013), which was designed to measure Sexual Prejudice in an individual. It could be that asking participants to report on the sexual prejudice of their family members and culture might not accurately capture the actual level of sexual prejudice in these groups. Also, the Belief in Gender Norms factor was formed by two separate scales (Male Role Norms Inventory, Levant et al., 2013; Attitudes Towards

Women Scale, Spence et al., 1973) that measured related but different concepts (male and female gender roles and norms, respectively). Although CFA and internal reliability tests showed that combined scores functioned as a unifactorial measure, it is possible that the combined score from these two measures reflects data from one scale or the other more strongly. Lastly, two items were removed from the ROS-I (Allport & Ross, 1967) after factor analysis showed that they did not fit into the overall factor structure of the data. Although removing these two items ensured a unifactorial scale that could be accurately parceled for SEM, it is possible that removing these two items created differences in how the concept was measured by the original scale.

The KSOG (Klein et al., 1985) was also modified for this study in a way that could have impacted the results, as response categories for asexual and non-binary attraction were added at the end of the scale. Individuals with ASD and the BAP were found in this study to report being asexual and non-binary at a greater rate than individuals with TD. There may be aspects of asexual and non-binary individuals that are different than other sexual minorities, such as discussed above with asexual individuals experiencing more harassment and discrimination than other sexual minorities. Further studies should include asexual and non-binary individuals as a group separate from same-sex attracted sexual minorities.

The study sample, although larger than originally anticipated, was still small for a study using SEM. With 17 parameters being measured, and 369 overall participants, the ratio of participants to parameters for the overall analysis was 21.70:1, which is the $n:q$ ratio recommended for many SEM analyses (Klein, 2016). However, for the individual models, the ratio was 11.7:1 for the BAP group and 10:1 for the TD group. Although these ratios were close to the recruitment aim, they are still fairly low numbers for SEM analyses. Therefore, there may

be some between-groups differences that were obscured due to the analyses being underpowered.

Limitations also arise from the cross-sectional design of this study. The measures largely only captured one point in time, and measures that looked at the factors retrospectively (i.e., the questions asking about past sexual orientation on the KSOG) were not examined for this study. Since the formation of a sexual minority orientation is a developmental process over time, the cross-sectional nature of the study limits any causal conclusions that may be drawn between each of the factors and sexual minority orientation. Additionally, the relationship between sexual minority orientation and the biopsychosocial factors of the Worthington et al. (2002) model is likely not unidirectional. Once an individual develops a sexual minority orientation, the expression of this orientation affects how social factors influence the individual. Looking at factors that influence sexual minority orientation from a cross-sectional and unilateral perspective can obscure the developmental and bi-directional nature of sexual minority orientation.

There were more female participants than male or other gender participants, which limit the generalizability of these results in those populations. As discussed above, gender differences have been found in several of the factors that were the focus of this study, namely belief in traditional gender norms and religiosity, and in a more limited way, heterosexist experiences and sexual awareness. Future studies should aim to recruit a more balanced sample of men and women to be able to control for these differences. Finally, the sample was also purposely limited to young adults ages 18-30, so caution should be utilized when generalizing these results to other age groups.

In addition to these limitations, this study also had several strengths. The $n:q$ ratio for the overall model was above the recommended amount, which means that more confidence can be

placed in conclusions drawn from the overall model. The sample, although largely female, nevertheless had decent representation of several gender identities. The factors from the Worthington et al. (2002) were clearly operationalized and included to test together, and examined in two different groups, individuals with and without the BAP.

CHAPTER V

CONCLUSIONS

Clinical Implications

The findings of this study have several important clinical implications and indicate directions for future research. One of the more actionable findings from this research is that individuals with ASD reported more daily heterosexist experiences and more sexual prejudice in their culture than individuals with TD and the BAP. Although research indicates that identifying as a sexual minority did not increase the health burden of individuals with ASD, identifying as a gender minority with ASD, like many individuals in this sample, was associated with greater anxiety, depression, and stress (George & Stokes, 2018a). Providers of clients with ASD should introduce topics of heterosexism and sexual prejudice with their clients and assist them in finding appropriate coping mechanisms for dealing with this discrimination, as well as finding safe spaces for expressing their sexuality and gender identities. Parents also need to be made aware of the increased likelihood of sexuality and gender minority identities in ASD and can be provided with resources to support their child if they do identify as a gender or sexual minority.

Individuals with ASD and the BAP also need to be supported in finding ways to communicate with their family and peers about their sexual minority identity. Individuals with ASD communicate less with their peers about sexuality (Hartmann et al., 2019), and participants in the study by Hannah and Stagg (2016) and in the pilot study discussed in the introduction indicated that difficulties communicating with others about their sexuality and sexual orientation left them feeling isolated. Connection with supportive others can be a protective factor against the burden of heterosexism and sexual prejudice in an individual's culture and family (Hong & Garbarino, 2012). The outcomes also suggest that it is important for religious individuals find a

church that is affirming of their sexual and gender minority expression, lest they experience increased internalized homophobia, depression, and anxiety (Barnes & Meyer, 2012).

Future Directions

The most proximal future direction for this research is to use SEM to test the Worthington et al. (2002) model in sexual minority individuals with ASD. These analyses will extend and expand on the results and conclusions of this dissertation. This research will allow providers to better support individuals with ASD in exploring and expressing their sexual orientation and sexuality.

Research questions that arise out of the study results include whether insensitivity to social reputation and difficulties with theory of mind exist in individuals with the BAP. As mentioned above, no research has been done on insensitivity to social reputation in this group, and research on theory of mind in this group has been done in samples that were not well defined. If these traits are characteristic of the BAP, further research examining their relationship to having less sexual awareness and how they buffer against heterosexism and sexual prejudice may help elucidate the relationship between daily heterosexist experiences and sexual minority orientation in this group.

Since many factors in the Worthington et al. (2002) model were related to each other, it may be possible that they have an indirect effect on sexual minority orientation, rather than the direct effect which was hypothesized. These analyses are already under way and may be included in the eventual published version of this manuscript. Since the Worthington et al. (2002) model was developed to explain heterosexual sexual identity, testing the model in a heterosexual population is needed to compare how it operates differently in heterosexual compared to sexual minority populations.

Examining subscales on measures such as the DHEQ might also reveal meaningful between-group differences. For example, the isolation subscale on this measure asks participants to report various ways they have felt isolated due to being LGBTQ+. However, it is possible that individuals with the BAP and ASD may feel socially isolated due to differences in social interaction that exist between individuals in these groups and individuals with TD. Similarly, participants may experience victimization and view it as a result of being LGBTQ+, when it may instead be due to having ASD or the BAP. Further examination of these subscales may help researchers and clinicians learn ways to help sexual minority individuals with ASD and the BAP avoid isolation and victimization.

Additionally, more research is needed on constructing and validating measures for the factors in the Worthington et al. (2002) model. Although measures that operationalize heterosexism, religion, and belief in gender norms are well-validated and had to be adapted very little to fit in this study, measures of sexual prejudice in a family and cultural context, as well as biological inheritance of sexual minority orientation, were adapted or created for this study and need to be further investigated and validated. A measure of biological inheritance that takes into account degree of relation of LGBTQ+ family members may help elucidate biological influences as a factor.

Given the effect of sexual awareness on sexual minority orientation for individuals with ASD and the BAP, future models of sexual minority orientation in these groups should include this as a factor. Additionally, a measure of social awareness, such as a subscale of the Social Responsiveness Scale (Constantino & Gruber, 2012), may help explain the interaction between the social factors of the model and sexual minority orientation.

Further tests of this model should also examine the developmental aspect of sexual minority orientation, including the bidirectional relationship between sexual minority orientation and social factors. If possible, a longitudinal study which measures the factors in the model, especially social factors such as sexual prejudice in family and culture, religion, belief in gender norms, and heterosexism, should be measured prior to a person's developing a sexual minority orientation, and then again afterwards. Grounded qualitative research may also be useful in examining if these factors are seen as being relevant to sexual minority individuals in developing their orientation, especially in groups where sexual orientation is understudied, such as the BAP and ASD.

Furthermore, research on sexual minority orientation should include asexual and non-binary individuals as separate population groups, due to differences in factors such as heterosexist experiences that may be experienced differently in these groups compared to other sexual minorities. This is another area in which grounded qualitative research is needed to examine factors that affect the sexual orientation in these particular sub-groups. Heterosexist experiences may also be more pronounced for transgender men and women, agender, and gender-queer individuals. Future studies should look at these gender categories as separate sub-groups, as well.

Lastly, men and women vary on several of the factors that are thought to be related to sexual minority orientation, such as religiosity and belief in traditional gender norms. Future studies should include equal numbers of male and female participants to be able to control for gender differences in these variables.

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APPENDIX A
DEMOGRAPHICS

What is your age?

▼ Under 18 (11) ... Over 30 (63)

What is your birth gender?

- Female (0)
- Male (1)
- Intersex (2)

What is your current gender identity?

- Female (0)
- Male (1)
- Gender fluid/ genderqueer (2)
- Transgender male (3)
- Transgender female (4)
- Agender (5)
- Other (6) _____

How do you label your sexual orientation? (e.g., heterosexual, gay, lesbian, asexual, etc.)

What is your race/ ethnicity (select all that apply)?

- White (1)
- Hispanic/ Latino (2)
- Black or African American (3)
- American Indian or Alaska Native (4)
- Asian (5)
- Bi-racial/ Multi-racial/ Mixed (6)
- Other (7) _____

What religion (if any) do you currently identify with?

- Christian (1)
- Muslim (2)
- Jewish (3)
- Hindu (4)
- Buddhist (5)
- Other (6) _____
- Spiritual but not religious (7)
- Neither spiritual nor religious (8)
- Nothing in particular (9)

What is your total yearly income?

- Less than \$10,000 (1)
- \$10,000 - \$19,999 (2)
- \$20,000 - \$29,999 (3)
- \$30,000 - \$39,999 (4)
- \$40,000 - \$49,999 (5)
- \$50,000 - \$59,999 (6)
- \$60,000 - \$69,999 (7)
- \$70,000 - \$79,999 (8)
- \$80,000 - \$89,999 (9)
- \$90,000 - \$99,999 (10)
- \$100,000 - \$149,999 (11)
- More than \$150,000 (12)
- Don't know (13)

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

- Less than \$10,000 (1)
- \$10,000 - \$19,999 (2)
- \$20,000 - \$29,999 (3)
- \$30,000 - \$39,999 (4)
- \$40,000 - \$49,999 (5)
- \$50,000 - \$59,999 (6)
- \$60,000 - \$69,999 (7)

- \$70,000 - \$79,999 (8)
- \$80,000 - \$89,999 (9)
- \$90,000 - \$99,999 (10)
- \$100,000 - \$149,999 (11)
- More than \$150,000 (12)
- Don't know (13)
- Not applicable (14)

What is your current relationship status?

- Single (1)
- Single, dating casually (2)
- Single, long-term relationship (3)
- Single, cohabitating (4)
- Casual polyamorous relationship
- Exclusive polyamorous relationship
- Married (5)
- Life partner/ Domestic partnership (6)
- Separated (7)
- Divorced (8)
- Widowed (9)

Display This Question:

If What is your current relationship status? = Single

Have you ever been in a romantic or dating relationship?

- Yes (1)
- No (2)

Display This Question:

If Have you ever been in a relationship? = Yes

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

Display This Question:

If Have you ever been in a relationship? = Yes

How long was your longest romantic or dating relationship?

How old were you (in years) when you were first romantically intimate with another person?

▼ 12 or younger (11) ... I have never had sexual contact (13)

What is the zip code of your current residence?

What is the education level of your most educated parent/guardian?

- Less than high school (1)
- High school graduate (2)
- Some college (3)
- 2 year degree (4)
- 4 year degree (5)
- Master's degree (8)
- Professional degree (6)
- Doctorate (7)

What is your level of education? If you are still in school, please select your highest degree already earned.

- Less than high school (1)
- High school graduate (2)
- Some college (3)
- 2 year degree (4)
- 4 year degree (5)
- Master's degree (8)
- Professional degree (6)
- Doctorate (7)

If you are still in college, what year are you?

- First-year (1)
- Sophomore (2)
- Junior (3)
- Senior (4)
- Graduate Student (5)
- Not in college (6)

Where did you find the link to this survey?

- ODU SONA (1)
- Online psychology research website (please specify which one) (2)
-

Social media (3)

Other (4) _____

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

Yes (1)

No (2)

Display This Question:

If Have you received a formal diagnosis of an Autism Spectrum Disorder? = Yes

Who gave you the formal diagnosis?

Family physician/ primary care provider (1)

Specialist doctor (2)

Psychologist (3)

Psychiatrist (4)

Other (5) _____

Has anyone in your immediate family (parent, child, brother, or sister) received a formal diagnosis of an Autism Spectrum Disorder?

Yes (1)

No (0)

Display This Question:

If Has anyone in your immediate family (parent, child, brother, or sister) received a formal diagnos... = Yes

If so, who? (Select all that are applicable).

- Mother (1)
- Father (2)
- Brother (3)
- Sister (4)
- Son (7)
- Daughter (6)

Display This Question:

If Has anyone in your immediate family (parent, child, brother, or sister) received a formal diagnos... = Yes Who gave them the formal diagnosis?

- Family physician/ primary care provider (1)
- Specialist doctor (2)
- Psychologist (3)
- Psychiatrist (4)
- Other (5) _____
- Don't know (6)

Do you have any other formal psychiatric diagnosis?

- Yes (1)
- No (0)

Display This Question:

If Do you have any other formal psychiatric diagnosis? = Yes

If yes, please write your other psychiatric diagnoses here:

APPENDIX B

AUTISM SPECTRUM QUOTIENT – 10

I often notice small sounds when others do not.

- Definitely agree (1)
- Slightly agree (2)
- Slightly disagree (3)
- Definitely disagree (4)

When I'm reading a story, I find it difficult to work out the characters' intentions.

- Definitely agree (1)
- Slightly agree (2)
- Slightly disagree (3)
- Definitely disagree (4)

I find it easy to "read between the lines" when someone is talking to me.

- Definitely agree (1)
- Slightly agree (2)
- Slightly disagree (3)
- Definitely disagree (4)

I usually concentrate more on the whole picture, rather than the small details.

- Definitely agree (1)
- Slightly agree (2)
- Slightly disagree (3)
- Definitely disagree (4)

I know how to tell if someone listening to me is getting bored.

- Definitely agree (1)
- Slightly agree (2)
- Slightly disagree (3)
- Definitely disagree (4)

I find it easy to do more than one thing at once.

- Definitely agree (1)
- Slightly agree (2)
- Slightly disagree (3)
- Definitely disagree (4)
-

I find it easy to work out what someone is thinking or feeling just by looking at their face.

- Definitely agree (1)
- Slightly agree (2)
- Slightly disagree (3)
- Definitely disagree (4)

If there is an interruption, I can switch back to what I was doing very quickly.

- Definitely agree (1)
- Slightly agree (2)
- Slightly disagree (3)
- Definitely disagree (4)

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 (1)
- Slightly agree (2)
- Slightly disagree (3)
- Definitely disagree (4)

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

- Definitely agree (1)
- Slightly agree (2)
- Slightly disagree (3)
- Definitely disagree (4)

Please select slightly disagree for this question.

- Definitely agree (1)
- Slightly agree (2)
- Slightly disagree (3)
- Definitely disagree (4)

Appendix CBroad Autism Phenotype Questionnaire

I like being around other people

- Very rarely (6)
- Rarely (5)
- Occasionally (4)
- Somewhat often (3)
- Often (2)
- Very often (1)

I find it hard to get my words out smoothly

- Very rarely (1)
- Rarely (2)
- Occasionally (3)
- Somewhat often (4)
- Often (5)
- Very often (6)

I am comfortable with unexpected changes in plans

- Very rarely (6)
- Rarely (5)
- Occasionally (4)
- Somewhat often (3)
- Often (2)
- Very often (1)

It's hard for me to avoid getting sidetracked in conversation

- Very rarely (1)

- Rarely (2)
- Occasionally (3)
- Somewhat often (4)
- Often (5)
- Very often (6)

I would rather talk to people to get information than to socialize

- Very rarely (1)
- Rarely (2)
- Occasionally (3)
- Somewhat often (4)
- Often (5)
- Very often (6)

People have to talk me into trying something new

- Very rarely (1)
- Rarely (2)
- Occasionally (3)
- Somewhat often (4)
- Often (5)
- Very often (6)

I am "in-tune" with the other person during conversation

- Very rarely (6)
- Rarely (5)
- Occasionally (4)
- Somewhat often (3)
- Often (2)
- Very often (1)

I have to warm myself up to the idea of visiting an unfamiliar place

- Very rarely (1)
- Rarely (2)
- Occasionally (3)
- Somewhat often (4)
- Often (5)
- Very often (6)

I enjoy being in social situations

- Very rarely (6)
- Rarely (5)
- Occasionally (4)
- Somewhat often (3)
- Often (2)
- Very often (1)

My voice has a flat or monotone sound to it

- Very rarely (1)
- Rarely (2)
- Occasionally (3)
- Somewhat often (4)
- Often (5)
- Very often (6)

I feel disconnected or "out of sync" in conversations with others

- Very rarely (1)
- Rarely (2)
- Occasionally (3)

- Somewhat often (4)
- Often (5)
- Very often (6)

People find it easy to approach me

- Very rarely (6)
- Rarely (5)
- Occasionally (4)
- Somewhat often (3)
- Often (2)
- Very often (1)

I feel a strong need for sameness from day to day

- Very rarely (1)
- Rarely (2)
- Occasionally (3)
- Somewhat often (4)
- Often (5)
- Very often (6)

People ask me to repeat things I've said because they don't understand

- Very rarely (1)
- Rarely (2)
- Occasionally (3)
- Somewhat often (4)
- Often (5)
- Very often (6)

I am flexible about how things should be done

- Very rarely (6)
- Rarely (5)
- Occasionally (4)
- Somewhat often (3)
- Often (2)
- Very often (1)

I look forward to situations where I can meet new people

- Very rarely (6)
- Rarely (5)
- Occasionally (4)
- Somewhat often (3)
- Often (2)
- Very often (1)

I have been told that I talk too much about certain topics

- Very rarely (1)
- Rarely (2)
- Occasionally (3)
- Somewhat often (4)
- Often (5)
- Very often (6)

When I make conversation it is just to be polite

- Very rarely (1)
- Rarely (2)
- Occasionally (3)

- Somewhat often (4)
- Often (5)
- Very often (6)

I look forward to trying new things

- Very rarely (6)
- Rarely (5)
- Occasionally (4)
- Somewhat often (3)
- Often (2)
- Very often (1)

I speak too loudly or softly

- Very rarely (1)
- Rarely (2)
- Occasionally (3)
- Somewhat often (4)
- Often (5)
- Very often (6)

I can tell when someone is not interested in what I am saying

- Very rarely (6)
- Rarely (5)
- Occasionally (4)
- Somewhat often (3)
- Often (2)
- Very often (1)

I have a hard time dealing with changes in my routine

- Very rarely (1)
- Rarely (2)
- Occasionally (3)
- Somewhat often (4)
- Often (5)
- Very often (6)

I am good at making small talk

- Very rarely (6)
- Rarely (5)
- Occasionally (4)
- Somewhat often (3)
- Often (2)
- Very often (1)

I act very set in my ways

- Very rarely (1)
- Rarely (2)
- Occasionally (3)
- Somewhat often (4)
- Often (5)
- Very often (6)

I feel like I am really connecting with other people

- Very rarely (6)
- Rarely (5)
- Occasionally (4)

- Somewhat often (3)
- Often (2)
- Very often (1)

People get frustrated by my unwillingness to bend

- Very rarely (1)
- Rarely (2)
- Occasionally (3)
- Somewhat often (4)
- Often (5)
- Very often (6)

Conversation bores me

- Very rarely (1)
- Rarely (2)
- Occasionally (3)
- Somewhat often (4)
- Often (5)
- Very often (6)

I am warm and friendly in my interactions with others

- Very rarely (6)
- Rarely (5)
- Occasionally (4)
- Somewhat often (3)
- Often (2)
- Very often (1)

I leave long pauses in conversation

- Very rarely (1)
- Rarely (2)
- Occasionally (3)
- Somewhat often (4)
- Often (5)
- Very often (6)

I alter my daily routine by trying something different

- Very rarely (6)
- Rarely (5)
- Occasionally (4)
- Somewhat often (3)
- Often (2)
- Very often (1)

I prefer to be alone rather than with others

- Very rarely (1)
- Rarely (2)
- Occasionally (3)
- Somewhat often (4)
- Often (5)
- Very often (6)

I lose track of my original point when talking to people

- Very rarely (1)
- Rarely (2)
- Occasionally (3)

- Somewhat often (4)
- Often (5)
- Very often (6)

I like to closely follow a routine while working

- Very rarely (1)
- Rarely (2)
- Occasionally (3)
- Somewhat often (4)
- Often (5)
- Very often (6)

I can tell when it is time to change topics in conversation

- Very rarely (6)
- Rarely (5)
- Occasionally (4)
- Somewhat often (3)
- Often (2)
- Very often (1)

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

- Very rarely (1)
- Rarely (2)
- Occasionally (3)
- Somewhat often (4)
- Often (5)
- Very often (6)

I enjoy chatting with people

- Very rarely (6)
- Rarely (5)
- Occasionally (4)
- Somewhat often (3)
- Often (2)
- Very often (1)

Appendix D

Klein Sexual Orientation Grid

These next questions are about your PAST sexual and romantic experiences (up to 12 months ago). Please answer these questions even if you have not had any past sexual or romantic experiences (there is an option for that). *Note LGBTQ+, when it is used, refers to any sexual orientation that at least somewhat same-sex romantic or sexually attracted.

To whom have you been sexually attracted to in the past (your life up to 12 months ago)?

- Other sex only (1)
- Other sex mostly (2)
- Other sex somewhat more (3)
- Both sexes equally (4)
- Same sex somewhat more (5)
- Same sex mostly (6)
- Same sex only (7)
- No one (0)
- I am non-binary/most of the individuals I was attracted to were non-binary (8)

With whom have you actually had sex with in the past (your life up to 12 months ago)?

- Other sex only (1)
- Other sex mostly (2)
- Other sex somewhat more (3)
- Both sexes equally (4)
- Same sex somewhat more (5)
- Same sex mostly (6)
- Same sex only (7)
- No one (0)
- I am non-binary/most of the individuals I had sex with were non-binary (8)

Who have you had sexual fantasies about in the past (your life up to 12 months ago)? (They may occur during masturbation, daydreaming, as a part of real life, or purely in your imagination.)

- Other sex only (1)
- Other sex mostly (2)
- Other sex somewhat more (3)
- Both sexes equally (4)
- Same sex somewhat more (5)
- Same sex mostly (6)
- Same sex only (7)
- No one (0)
- I am non-binary/most of the individuals I had fantasies about were non-binary (8)

What groups of people have you had an emotional preference for in the past (your life up to 12 months ago)? (Who do you love and like?)

- Other sex only (1)
- Other sex mostly (2)
- Other sex somewhat more (3)
- Both sexes equally (4)
- Same sex somewhat more (5)
- Same sex mostly (6)
- Same sex only (7)
- No one (0)
- I am non-binary/most of individuals I had an emotional preference for were non-binary (8)

What groups of people have you socialized with in the past (your life up to 12 months ago)?

- Other sex only (1)
- Other sex mostly (2)
- Other sex somewhat more (3)
- Both sexes equally (4)
- Same sex somewhat more (5)
- Same sex mostly (6)
- Same sex only (7)
- No one (0)
- Mostly non-binary individuals (8)

What is the sexual identity of people with whom you have socialized with in the past (your life up to 12 months ago)? (Take your best guess if you are not sure.)

- Heterosexual only (1)
- Heterosexual mostly (2)
- Heterosexual somewhat more (3)
- Hetero/ LGBTQ+ equally (4)
- LGBTQ+ somewhat more (5)
- LGBTQ+ mostly (6)
- LGBTQ+ only (7)
- I don't socialize (0)

How would you define your sexual identity in the past (your life up to 12 months ago)?

- Heterosexual only (1)
- Heterosexual mostly (2)
- Heterosexual somewhat more (3)
- Hetero/LGBQ+ equally (4)
- LGBQ+ somewhat more (5)
- LGBQ+ mostly (6)
- LGBQ+ only (7)
- Asexual (0)

These next questions are about your CURRENT sexual and romantic experiences (during the past year/12 months). Please answer these questions even if you have not had any sexual or romantic experiences during the past year (there is an option for that). *Note LGBQ+, when it is used, refers to any sexual orientation that at least somewhat same-sex romantic or sexually attracted.

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

- Other sex only (1)
- Other sex mostly (2)
- Other sex somewhat more (3)
- Both sexes equally (4)
- Same sex somewhat more (5)
- Same sex mostly (6)
- Same sex only (7)
- No one (0)
- I am non-binary/most of the individuals I am sexually attracted to are non-binary (8)

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

- Other sex only (1)
- Other sex mostly (2)
- Other sex somewhat more (3)

- Both sexes equally (4)
- Same sex somewhat more (5)
- Same sex mostly (6)
- Same sex only (7)
- No one (0)
- I am non-binary/most of the individuals I have sex with are non-binary (8)

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.)

- Other sex only (1)
- Other sex mostly (2)
- Other sex somewhat more (3)
- Both sexes equally (4)
- Same sex somewhat more (5)
- Same sex mostly (6)
- Same sex only (7)
- No one (0)
- I am non-binary/most of the individuals I fantasize about are non-binary (8)

What groups of people do you have an emotional preference for now (your life in the most recent 12 months)? (Who do you love and like?)

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

- No one (0)
- I am non-binary/most of the individuals I have an emotional preference for are non-binary (8)

What groups of people do you socialize with now (your life in the most recent 12 months)?

- Other sex only (1)
- Other sex mostly (2)
- Other sex somewhat more (3)
- Both sexes equally (4)
- Same sex somewhat more (5)
- Same sex mostly (6)
- Same sex only (7)
- No one (0)
- Mostly non-binary individuals (8)

What is the sexual identity of people with whom you socialize now (your life in the most recent 12 months)? (Take your best guess if you are not sure.)

- Heterosexual only (1)
- Heterosexual mostly (2)
- Heterosexual somewhat more (3)
- Hetero/LGBQ+ equally (4)
- LGBQ+ somewhat more (5)
- LGBQ+ mostly (6)
- LGBQ+ only (7)
- I don't socialize (0)

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

- Heterosexual only (1)
- Heterosexual mostly (2)

- Heterosexual somewhat more (3)
- Hetero/LGBQ+ equally (4)
- LGBQ+ somewhat more (5)
- LGBQ+ mostly (6)
- LGBQ+ only (7)
- Asexual (0)

These next questions are about your IDEAL sexual and romantic experiences (in the future). Please answer these questions even if you do not desire any sexual or romantic experiences (there is an option for that). *Note LGBQ+, when it is used, refers to any sexual orientation that at least somewhat same-sex romantic or sexually attracted.

To whom would you be sexually attracted to, ideally (in the future)?

- Other sex only (1)
- Other sex mostly (2)
- Other sex somewhat more (3)
- Both sexes equally (4)
- Same sex somewhat more (5)
- Same sex mostly (6)
- Same sex only (7)
- No one (0)
- I am non-binary/most of the individuals I would be sexually attracted to are non-binary (8)

With whom would you have sex, ideally (in the future)?

- Other sex only (1)
- Other sex mostly (2)

- Other sex somewhat more (3)
- Both sexes equally (4)
- Same sex somewhat more (5)
- Same sex mostly (6)
- Same sex only (7)
- No one (0)
- I am non-binary/most of the individuals I would like to have sex with are non-binary (8)

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.)

- Other sex only (1)
- Other sex mostly (2)
- Other sex somewhat more (3)
- Both sexes equally (4)
- Same sex somewhat more (5)
- Same sex mostly (6)
- Same sex only (7)
- No one (0)
- I am non-binary/most of the individuals I would like to have sexual fantasies about are non-binary (8)

What groups of people do you want to have an emotional preference for, ideally (in the future)? (Who do you love and like?)

- Other sex only (1)

- Other sex mostly (2)
- Other sex somewhat more (3)
- Both sexes equally (4)
- Same sex somewhat more (5)
- Same sex mostly (6)
- Same sex only (7)
- No one (0)
- I am non-binary/most of the individuals I would have an emotional preference for are non-binary (8)

What groups of people would you like to socialize with, ideally (in the future)?

- Other sex only (1)
- Other sex mostly (2)
- Other sex somewhat more (3)
- Both sexes equally (4)
- Same sex somewhat more (5)
- Same sex mostly (6)
- Same sex only (7)
- No one (0)
- Mostly non-binary people (8)

What is the sexual identity of people with whom you would like to socialize, ideally (in the future)?

- Heterosexual only (1)
- Heterosexual mostly (2)
- Heterosexual somewhat more (3)
- Hetero/LGBQ+ equally (4)
- LGBQ+ somewhat more (5)
- LGBQ+ mostly (6)
- LGBQ+ only (7)
- I do not want to socialize (0)

How would you define your sexual identity, ideally (in the future)?

- Heterosexual only (1)
- Heterosexual mostly (2)
- Heterosexual somewhat more (3)
- Hetero/LGBQ+ equally (4)
- LGBQ+ somewhat more (5)
- LGBQ+ mostly (6)
- LGBQ+ only (7)
- Asexual (0)

Appendix E

Biological Influences Questionnaire

Do any of your biological first-degree relatives (mother, father, children, brothers or sisters) identify as LGBTQ+?

Yes (1)

No (0)

Display This Question:

If Do any of your biological first-degree relatives (mother, father, children, brothers or sisters)... = Yes

If so, how many?

▼ 1 (4) ... 5 or more (19)

Do any of your biological second-degree relatives (grandparents, grandchildren, aunts, uncles, or cousins) identify as LGBTQ+?

Yes (1)

No (0)

Display This Question:

If Do any of your biological second-degree relatives (grandparents, grandchildren, aunts, uncles, or... = Yes

If so, how many?

▼ 1 (4) ... 5 or more (8)

Are there any other individuals in your extended (biological) family that identify as LGBTQ+ that you have not counted above?

Yes (1)

No (0)

Display This Question:

If Are there any other individuals in your extended (biological) family that identify as LGBTQ+ that... = Yes

If so, how many?

▼ 1 (4) ... 5 or more (20)

Appendix F

Sexual Prejudice Scale

SPS-Microsocial Context – Family

Please answer the next questions in reference to the attitudes held by the family you grew up in when you were a child.

People in my family believed it's wrong for men to have sex with men.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

People in my family believed that marriage between two men should be kept illegal.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

People in my family believed that lesbians were confused about their sexuality.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

People in my family believed that a sexual relationship between two men is unnatural.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

People in my family believed gay men are immoral.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)

- Disagree (5)
- Strongly disagree (6)

People in my family thought it was gross when they saw two men who were clearly "together."

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

People in my family thought it was morally wrong to be a lesbian.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

People in my family thought that lesbians were harming the traditional family.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

People in my family disapproved of lesbians.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

People in my family believed marriage between two women should be legal.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

People in my family believed that there's nothing wrong with being a gay man.

- Strongly agree (1)
- Agree (2)

- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

People in my family believed being a lesbian is a normal expression of sexuality.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

SPS-Micro-social Context-Peers and Community

Please answer the next questions in reference to the attitudes held by THE MAJORITY of your peers and people in your community when you were a child.

Peers/people in my community believed it's wrong for men to have sex with men.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

Peers/people in my community believed that marriage between two men should be kept illegal.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

Peers/people in my community believed that lesbians were confused about their sexuality.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

Peers/people in my community believed that a sexual relationship between two men is unnatural.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)

- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

Peers/people in my community believed gay men are immoral.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

Peers/people in my community thought it was gross when they saw two men who were clearly "together."

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

Peers/people in my community thought it was morally wrong to be a lesbian.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

Peers/people in my community thought that lesbians were harming the traditional family.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

Peers/people in my community disapproved of lesbians.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

Peers/people in my community believed marriage between two women should be legal.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

Peers/people in my community believed that there's nothing wrong with being a gay man.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

Peers/people in my community believed being a lesbian is a normal expression of sexuality.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

SPS-Culture

What culture(s) do you most identify with (e.g., African-American, Latinx, Christian, Military, Deaf, Southern, Irish-American, etc.)?

Please answer the next questions in reference to the attitudes held by THE MAJORITY of people in the culture you named above as most identifying with.

People in my culture believe it's wrong for men to have sex with men.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

People in my culture believe that marriage between two men should be kept illegal.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)

- Strongly disagree (6)

People in my culture believe that lesbians were confused about their sexuality.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

People in my culture believe that a sexual relationship between two men is unnatural.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

People in my culture believe gay men are immoral.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

People in my culture think it's gross when they see two men who are clearly "together."

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

People in my culture think it is morally wrong to be a lesbian.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

People in my culture think that lesbians are harming the traditional family.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)

- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

People in my culture disapprove of lesbians.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

People in my culture believe marriage between two women should be legal.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

People in my culture believe that there's nothing wrong with being a gay man.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

People in my culture believe being a lesbian is a normal expression of sexuality.

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Somewhat disagree (4)
- Disagree (5)
- Strongly disagree (6)

Appendix G

Religious Orientation Scale - Intrinsic

I enjoy reading about my religion.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

It doesn't much matter what I believe so long as I am good.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

It is important to me to spend time in private thought and prayer.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I have often had a strong sense of God's presence.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

I try hard to live all my life according to my religious beliefs.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

Although I am religious, I don't let it affect my daily life.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

My whole approach to life is based on my religion.

- Strongly Disagree (1)

- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

Although I believe in my religion, many other things are more important in life.

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

Please select "Neither Agree nor Disagree"

- Strongly Disagree (1)
- Disagree (2)
- Neither Agree nor Disagree (3)
- Agree (4)
- Strongly Agree (5)

Appendix H

Attitudes towards Women Scale – 15

The statements listed below describe attitudes toward the roles of women and men in society which different people have. There are no right or wrong answers, only opinions.

Swearing and obscenity are more repulsive in the speech of a woman than a man.

- Agree strongly (1)
- Agree mildly (2)
- Disagree mildly (3)
- Disagree strongly (4)

Under modern economic conditions with women being active outside the home, men should share in household tasks such as washing dishes and doing the laundry.

- Agree strongly (1)
- Agree mildly (2)
- Disagree mildly (3)
- Disagree strongly (4)

It is insulting to women to have the "obey" clause remain in the marriage service.

- Agree strongly (1)
- Agree mildly (2)
- Disagree mildly (3)
- Disagree strongly (4)

A woman should be as free as a man to propose marriage.

- Agree strongly (1)

- Agree mildly (2)
- Disagree mildly (3)
- Disagree strongly (4)

Women should worry less about their rights and more about becoming good wives and mothers.

- Agree strongly (1)
- Agree mildly (2)
- Disagree mildly (3)
- Disagree strongly (4)

Women should assume their rightful place in business and all the professions along with men.

- Agree strongly (1)
- Agree mildly (2)
- Disagree mildly (3)
- Disagree strongly (4)

A woman should not expect to go to exactly the same places or to have quite the same freedom of action as a man.

- Agree strongly (1)
- Agree mildly (2)
- Disagree mildly (3)
- Disagree strongly (4)

It is ridiculous for a woman to run a locomotive and for a man to darn socks.

- Agree strongly (1)
- Agree mildly (2)
- Disagree mildly (3)

Disagree strongly (4)

The intellectual leadership of a community should be largely in the hands of men.

- Agree strongly (1)
- Agree mildly (2)
- Disagree mildly (3)
- Disagree strongly (4)

Women should be given equal opportunity with men for apprenticeship in the various trades.

- Agree strongly (1)
- Agree mildly (2)
- Disagree mildly (3)
- Disagree strongly (4)

Women earning as much as their dates should bear equally the expense when they go out together.

- Agree strongly (1)
- Agree mildly (2)
- Disagree mildly (3)
- Disagree strongly (4)

Sons in a family should be given more encouragement to go to college than daughters.

- Agree strongly (1)
- Agree mildly (2)
- Disagree mildly (3)
- Disagree strongly (4)

In general, the father should have greater authority than the mother in the bringing up of children.

- Agree strongly (1)
- Agree mildly (2)
- Disagree mildly (3)
- Disagree strongly (4)

Economic and social freedom is worth far more to women than acceptance of the ideal of femininity which has been set up by men.

- Agree strongly (1)
- Agree mildly (2)
- Disagree mildly (3)
- Disagree strongly (4)

There are many jobs in which men should be given preference over women in being hired or promoted.

- Agree strongly (1)
- Agree mildly (2)
- Disagree mildly (3)
- Disagree strongly (4)

Appendix IMale Role Norms Inventory – Short Form

Homosexuals should never marry.

- Strongly agree (7)
- Agree (6)
- Somewhat agree (5)
- Neither agree nor disagree (4)
- Somewhat disagree (3)
- Disagree (2)
- Strongly disagree (1)

The President of the U.S. should always be a man.

- Strongly agree (7)
- Agree (6)
- Somewhat agree (5)
- Neither agree nor disagree (4)
- Somewhat disagree (3)
- Disagree (2)
- Strongly disagree (1)

Men should be the leader in any group.

- Strongly agree (7)
- Agree (6)
- Somewhat agree (5)

- Neither agree nor disagree (4)
- Somewhat disagree (3)
- Disagree (2)
- Strongly disagree (1)

Men should watch football games instead of soap operas.

- Strongly agree (7)
- Agree (6)
- Somewhat agree (5)
- Neither agree nor disagree (4)
- Somewhat disagree (3)
- Disagree (2)
- Strongly disagree (1)

All homosexual bars should be closed down.

- Strongly agree (7)
- Agree (6)
- Somewhat agree (5)
- Neither agree nor disagree (4)
- Somewhat disagree (3)
- Disagree (2)
- Strongly disagree (1)

Men should have home improvement skills.

- Strongly agree (7)
- Agree (6)
- Somewhat agree (5)
- Neither agree nor disagree (4)
- Somewhat disagree (3)
- Disagree (2)
- Strongly disagree (1)

Men should be able to fix most things around the house.

- Strongly agree (7)
- Agree (6)
- Somewhat agree (5)
- Neither agree nor disagree (4)
- Somewhat disagree (3)
- Disagree (2)
- Strongly disagree (1)

A man should prefer watching action movies to reading romantic novels.

- Strongly agree (7)
- Agree (6)
- Somewhat agree (5)
- Neither agree nor disagree (4)
- Somewhat disagree (3)

- Disagree (2)
- Strongly disagree (1)

Men should always like to have sex.

- Strongly agree (7)
- Agree (6)
- Somewhat agree (5)
- Neither agree nor disagree (4)
- Somewhat disagree (3)
- Disagree (2)
- Strongly disagree (1)

Boys should prefer to play with trucks rather than dolls.

- Strongly agree (7)
- Agree (6)
- Somewhat agree (5)
- Neither agree nor disagree (4)
- Somewhat disagree (3)
- Disagree (2)
- Strongly disagree (1)

A man should not turn down sex.

- Strongly agree (7)
- Agree (6)

- Somewhat agree (5)
- Neither agree nor disagree (4)
- Somewhat disagree (3)
- Disagree (2)
- Strongly disagree (1)

A man should always be the boss.

- Strongly agree (7)
- Agree (6)
- Somewhat agree (5)
- Neither agree nor disagree (4)
- Somewhat disagree (3)
- Disagree (2)
- Strongly disagree (1)

Homosexuals should never kiss in public.

- Strongly agree (7)
- Agree (6)
- Somewhat agree (5)
- Neither agree nor disagree (4)
- Somewhat disagree (3)
- Disagree (2)
- Strongly disagree (1)

A man should know how to repair his car if it should break down.

- Strongly agree (7)
- Agree (6)
- Somewhat agree (5)
- Neither agree nor disagree (4)
- Somewhat disagree (3)
- Disagree (2)
- Strongly disagree (1)

A man should never admit when others hurt his feelings.

- Strongly agree (7)
- Agree (6)
- Somewhat agree (5)
- Neither agree nor disagree (4)
- Somewhat disagree (3)
- Disagree (2)
- Strongly disagree (1)

Men should be detached in emotionally charged situations.

- Strongly agree (7)
- Agree (6)
- Somewhat agree (5)
- Neither agree nor disagree (4)
- Somewhat disagree (3)

- Disagree (2)
- Strongly disagree (1)

It is important for a man to take risks, even if he might get hurt.

- Strongly agree (7)
- Agree (6)
- Somewhat agree (5)
- Neither agree nor disagree (4)
- Somewhat disagree (3)
- Disagree (2)
- Strongly disagree (1)

A man should always be ready for sex.

- Strongly agree (7)
- Agree (6)
- Somewhat agree (5)
- Neither agree nor disagree (4)
- Somewhat disagree (3)
- Disagree (2)
- Strongly disagree (1)

When the going gets tough, men should get tough.

- Strongly agree (7)
- Agree (6)

- Somewhat agree (5)
- Neither agree nor disagree (4)
- Somewhat disagree (3)
- Disagree (2)
- Strongly disagree (1)

I think a young man should try to be physically tough, even if he's not big.

- Strongly agree (7)
- Agree (6)
- Somewhat agree (5)
- Neither agree nor disagree (4)
- Somewhat disagree (3)
- Disagree (2)
- Strongly disagree (1)

Men should not be too quick to tell others that they care about them.

- Strongly agree (7)
- Agree (6)
- Somewhat agree (5)
- Neither agree nor disagree (4)
- Somewhat disagree (3)
- Disagree (2)
- Strongly disagree (1)

Appendix J

Daily Heterosexist Experiences Questionnaire

How much has this problem distressed or bothered you during the past 12 months?

	Did not happen/not applicable to me (0)	It happened, and it bothered me NOT AT ALL (1)	It happened, and it bothered me A LITTLE BIT (2)	It happened, and it bothered me MODERATELY (3)	It happened, and it bothered me QUITE A BIT (4)	It happened, and it bothered me EXTREMELY (5)
Difficulty finding a partner because you are LGBT	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Difficulty finding LGBT friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Having very few people you can talk to about being LGBT	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Watching what you say and do around heterosexual people	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hearing about LGBT people you know being treated unfairly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hearing about LGBT people you don't know being treated unfairly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hearing about hate crimes (e.g., vandalism, physical or sexual assault) that	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

happened to
LGBT
people you
don't know

Being called
names such
as "fag" or
"dyke"

Hearing
other people
being called
names such
as "fag" or
"dyke"

Hearing
someone
make jokes
about LGBT
people

Family
members not
accepting
your partner
as a part of
the family

Your family
avoiding
talking about
your LGBT
identity

Please
choose "It
happened,
and it
bothered me
QUITE A
BIT."

Feeling like
you don't fit
in with other
LGBT
people

Pretending
that you have
an opposite-
sex partner

Pretending
that you are
hetero

sexual						
Hiding your relationship from other people	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People staring at you when you are out in public because you are LGBT	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being rejected by your mother for being LGBT	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Did not happen/not applicable to me (1)	It happened, and it bothered me NOT AT ALL (2)	It happened, and it bothered me A LITTLE BIT (3)	It happened, and it bothered me MODERATELY (4)	It happened, and it bothered me QUITE A BIT (5)	It happened, and it bothered me EXTREMELY (6)
Being rejected by your father for being LGBT	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being rejected by a sibling or siblings because you are LGBT	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being rejected by other relatives because you are LGBT	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being verbally harassed by strangers because you are LGBT	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being verbally harassed by	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

people you
know
because you
are LGBT

Being treated
unfairly in
stores or
restaurants
because you
are LGBT

People
laughing at
you or
making jokes
at your
expense
because you
are LGBT

Hearing
politicians
say negative
things about
LGBT
people

Avoiding
talking about
your current
or past
relationships
when you are
at work

Hiding part
of your life
from other
people

Being
punched, hit,
kicked, or
beaten
because you
are LGBT

Being
assaulted
with a
weapon
because you
are LGBT

Being raped
or sexually
assaulted

because you
are LGBT

Having
objects
thrown at
you because
you are
LGBT



Appendix K

Sexual Awareness Questionnaire

Please answer the following questions in regards to your and others' awareness of your sexuality and sexual orientation.

I am very aware of my sexual feelings.

- Describes me extremely well (1)
- Describes me very well (2)
- Describes me moderately well (3)
- Describes me slightly well (4)
- Does not describe me (5)

I wonder whether others think I'm sexy.

- Describes me extremely well (1)
- Describes me very well (2)
- Describes me moderately well (3)
- Describes me slightly well (4)
- Does not describe me (5)

I'm very assertive about the sexual aspects of my life

- Describes me extremely well (1)
- Describes me very well (2)
- Describes me moderately well (3)
- Describes me slightly well (4)
- Does not describe me (5)

I'm very aware of my sexual motivations.

- Describes me extremely well (1)
- Describes me very well (2)
- Describes me moderately well (3)
- Describes me slightly well (4)
- Does not describe me (5)

I'm concerned about the sexual appearance of my body.

- Describes me extremely well (1)
- Describes me very well (2)
- Describes me moderately well (3)
- Describes me slightly well (4)
- Does not describe me (5)

I'm not very direct about voicing my sexual desires.

- Describes me extremely well (1)
- Describes me very well (2)
- Describes me moderately well (3)
- Describes me slightly well (4)
- Does not describe me (5)

I'm very alert to changes in my sexual desires.

- Describes me extremely well (1)
- Describes me very well (2)
- Describes me moderately well (3)

Describes me slightly well (4)

Does not describe me (5)

I know immediately when others consider me sexy

Describes me extremely well (1)

Describes me very well (2)

Describes me moderately well (3)

Describes me slightly well (4)

Does not describe me (5)

I am somewhat passive about expressing my sexual desires.

Describes me extremely well (1)

Describes me very well (2)

Describes me moderately well (3)

Describes me slightly well (4)

Does not describe me (5)

I am very aware of my sexual tendencies.

Describes me extremely well (1)

Describes me very well (2)

Describes me moderately well (3)

Describes me slightly well (4)

Does not describe me (5)

I am quick to sense whether others think I'm sexy.

Describes me extremely well (1)

- Describes me very well (2)
- Describes me moderately well (3)
- Describes me slightly well (4)
- Does not describe me (5)

I do not hesitate to ask for what I want in a sexual relationship.

- Describes me extremely well (1)
- Describes me very well (2)
- Describes me moderately well (3)
- Describes me slightly well (4)
- Does not describe me (5)

I usually worry about making a good sexual impression on others.

- Describes me extremely well (1)
- Describes me very well (2)
- Describes me moderately well (3)
- Describes me slightly well (4)
- Does not describe me (5)

I'm concerned about what other people think of my sex appeal.

- Describes me extremely well (1)
- Describes me very well (2)
- Describes me moderately well (3)
- Describes me slightly well (4)
- Does not describe me (5)

I'm the type of person who insists on having my sexual needs met.

- Describes me extremely well (1)
- Describes me very well (2)
- Describes me moderately well (3)
- Describes me slightly well (4)
- Does not describe me (5)

I'm very aware of the way my mind works when I'm sexually aroused.

- Describes me extremely well (1)
- Describes me very well (2)
- Describes me moderately well (3)
- Describes me slightly well (4)
- Does not describe me (5)

I rarely think about my sex appeal.

- Describes me extremely well (1)
- Describes me very well (2)
- Describes me moderately well (3)
- Describes me slightly well (4)
- Does not describe me (5)

When it comes to sex, I usually ask for what I want.

- Describes me extremely well (1)
- Describes me very well (2)
- Describes me moderately well (3)

Describes me slightly well (4)

Does not describe me (5)

I know what turns me on sexually.

Describes me extremely well (1)

Describes me very well (2)

Describes me moderately well (3)

Describes me slightly well (4)

Does not describe me (5)

I don't care what others think of my sexuality.

Describes me extremely well (1)

Describes me very well (2)

Describes me moderately well (3)

Describes me slightly well (4)

Does not describe me (5)

I rarely think about the sexual aspects of my life.

Describes me extremely well (1)

Describes me very well (2)

Describes me moderately well (3)

Describes me slightly well (4)

Does not describe me (5)

I don't think about my sexuality very much.

- Describes me extremely well (1)
- Describes me very well (2)
- Describes me moderately well (3)
- Describes me slightly well (4)
- Does not describe me (5)

Other people's opinions of my sexuality don't matter very much to me.

- Describes me extremely well (1)
- Describes me very well (2)
- Describes me moderately well (3)
- Describes me slightly well (4)
- Does not describe me (5)

If I were to have sex with someone, I'd tell my partner what I like.

- Describes me extremely well (1)
- Describes me very well (2)
- Describes me moderately well (3)
- Describes me slightly well (4)
- Does not describe me (5)

I know when others think I'm sexy.

- Describes me extremely well (1)
- Describes me very well (2)
- Describes me moderately well (3)
- Describes me slightly well (4)

Does not describe me (5)

If I were to have sex with someone, I'd let my partner take the initiative.

Describes me extremely well (1)

Describes me very well (2)

Describes me moderately well (3)

Describes me slightly well (4)

Does not describe me (5)

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Selected Publications

- Qualls, L. R.,** Hartmann, K., & Paulson, J. F. (2018). Broad autism phenotypic traits and the relationship to sexual orientation and sexual behavior. *Journal of Autism and Developmental Disorders*, 48(12):3974-3983. doi:10.1007/s10803-018-3556-3
- 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. doi:10.1016/j.rasd.2016.10.003

Selected Presentations

- Qualls, L. R.** (2019, June). *Sexuality in Autism Spectrum Disorder and the Broad Autism Phenotype*. Invited talk given for Psychiatry Grand Rounds, Eastern Virginia Medical School, Norfolk, VA.
- Qualls, L. R.,** Hartmann, K., Kreiser, N. L., and Paulson, J. F. (2019, May). *Testing a Model of Sexual Minority Orientation in Individuals with and without the Broad Autism Phenotype*. Poster presented at the 2019 International Society for Autism Research Conference, Montreal, QC, Canada.
- Qualls, L. R.,** Raffale, C. T., and Hartmann, K. (2019, May). *Insights from a Qualitative Analysis of Sexual Minority-Identifying Individuals with Autism Spectrum Disorder*. Poster presented at the 2019 International Society for Autism Research Conference, Montreal, QC, Canada.