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Experiences of biphobia, anxiety, and posttraumatic stress symptoms among Ontarian bisexuals: A cross-sectional view of potential moderators

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A thesis submitted in partial fulfillment of the requirements for the Master of Science degree in Epidemiology and Biostatistics

EXPERIENCES OF BIPHOBIA, ANXIETY, AND POSTTRAUMATIC STRESS SYMPTOMS AMONG ONTARIAN BISEXUALS: A CROSS-SECTIONAL VIEW OF POTENTIAL MODERATORS

(Monograph)

by

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ABSTRACT

The literature largely shows that bisexuals are at greater risk for poor mental health compared to heterosexual, gay, and lesbian people. This increased risk has been linked to the 'double' discrimination (e.g. biphobia) that bisexuals face from both the heterosexual and gay communities. This study used previously collected data (n=405) to examine the relationship between biphobia from these sources and two mental health outcomes: anxiety and posttraumatic stress (PTSD) symptoms. Community identification and involvement, positive bisexual identity, and volunteerism/advocacy/activism were tested as moderators. Confirmatory factor analysis showed that the measure used for PTSD symptoms (PCL-C) did not perform well in this sample. Structural equation modelling revealed that biphobia had little impact on anxiety. Volunteerism appeared to be the only significant moderator for people with gender identities other than bigendered with volunteerism related to more anxiety and non-volunteerism associated with less anxiety. More research is needed to clarify these relationships.

KEYWORDS

bisexual, sexual minority, biphobia, discrimination, anxiety, posttraumatic stress disorder, respondent-driven sampling, positive identity, volunteering, advocacy, activism, community involvement, mental health, minority stress theory, resilience, structural equation modelling

EPIGRAPH

“Your assumptions are your windows on the world. Scrub them off every once in a while, or the light won't come in.”

-Isaac Asimov

DEDICATION

To my loving family

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There are several people that I would like to thank for their support during my career as a graduate student and while writing this thesis.

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LIST OF ABBREVIATIONS AND SYMBOLS

ABES: Anti-Bisexual Experience Scale

ABES_GL: Anti-Bisexual Experience Scale-Gay and Lesbian Subscale

ABES_St: Anti-Bisexual Experience Scale-Straight Subscale

CBR: Community-based research

CCHS: Canadian Community Health Survey

CFA: Confirmatory factor analysis

CFI: Comparative fit index

CI: Confidence interval

CIHR: Canadian Institutes of Health Research

DSM-IV: Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition

IIGCS: Identification and Involvement with the Gay Community Scale

LGBTQ: Lesbian, gay, bisexual, transgender, queer (and/or questioning)

MLR: Maximum likelihood with robust standard errors and chi-square

OASIS: Overall Anxiety and Impairment Scale

PLGBTQIA: Positive LGBTQ Identity Assessment

PTSD: Posttraumatic stress disorder

RDS: Respondent-driven sampling

RDSAT: Respondent-Driven Sampling Analysis Tool

RMSEA: Root mean square error of approximation

SD: Standard deviation

SE: Standard error

SEM: Structural equation modelling

SRMR: Standardized root mean square residual

TLI: Tucker-Lewis Index

VIF: Variance inflation factor

$\overline{x}$: mean

CHAPTER 1: INTRODUCTION

This chapter will introduce my thesis, why it is important, my responsibilities throughout the process, and my research questions and objectives.

1.1. Importance of this thesis

Among bisexual people, mental health and discrimination have been considered primary concerns. In a survey that took place at the 2011 Perth Pride Fairday Festival in Australia, Comfort and McCausland (2013) found that bisexuals considered depression, anxiety, excessive worry or panic attacks, and family relationship problems to be individual priorities and they found depression, suicide, and HIV/AIDS to be community priorities. They also described that discrimination was an extremely important contributor to the above mentioned concerns. It is reasonable that many of the same concerns exist among bisexual people in Canada based on the high rates of discrimination and mental health issues often cited in the literature. Additionally, the Institute of Gender and Health within the Canadian Institutes of Health Research (CIHR) acknowledges that research focusing on sex and gender is a priority (Government of Canada, 2010) and bisexual people represent a diverse range of sexes and genders.

The community-based *Risk & Resilience Study* (see section 1.4. Data source: Risk & Resilience Study for more details) included many questions in the survey regarding discrimination and biphobia because they were felt to be important factors related to mental health by the research team and the Advisory Committee. In addition, recent research has shown that bisexuals often experience more discrimination and have more adverse health outcomes than heterosexual, gay, and lesbian people. Despite this, few studies have examined the relationship between biphobia (discrimination, prejudice, and stereotypes specific to bisexual peoples' sexual orientation) and mental health outcomes (see section 2.3.1. Biphobia for a more detailed definition of biphobia). This thesis in particular will examine the relationship between biphobia experienced from both the gay and straight communities and anxiety. It will also explore this relationship for posttraumatic stress symptoms, a subset of event-related anxiety symptoms.

Despite the growing body of literature on bisexual health, there remain several methodological issues. First, many of the published studies focusing on sexual minorities

analyzed the data from bisexuals together with gay and lesbian individuals, which masks any possible difference that may have otherwise been observed. This is an important issue to overcome especially since it might be expected that bisexuals could have different mental health outcomes than gay and lesbian people due to the extra sources of discrimination they may face (Wright, Bonita, & Mulick, 2011). Additionally, several studies have used a behavioural definition of bisexuality as opposed to a self-identified definition. This may be problematic as it requires bisexual people to have more partners than gay and lesbian people which in itself may reflect mental health (Bauer & Brennan, 2013). Finally, due to the difficulty of sampling bisexual-identified individuals, several studies have used convenience samples that may not be representative of the general bisexual population.

This thesis addresses gaps in the current knowledge surrounding strategies for preventing anxiety and posttraumatic stress symptoms for bisexual people when they experience biphobia. Considering that bisexuals, particularly women, have consistently been found to have higher rates of anxiety than gay, lesbian, and heterosexual people (Bostwick, Boyd, Hughes, & McCabe, 2010; Brennan, Ross, Dobinson, Veldhuizen, & Steele, 2010; Engler et al., 2011; Ross, Siegel, Dobinson, Epstein, & Steele, 2012; Tjepkema, 2008), it is reasonable to suggest that different intervention options may be required for bisexuals than for lesbian, gay, and heterosexual people. This is especially true when targeting any effects of biphobia as it is a bi-specific form of discrimination. The protective factors examined in this thesis may provide a starting point for community members, service providers, and future research to target in regard to intervention and prevention efforts. This thesis also draws attention to the importance of reducing biphobia which stems from structural and social inequalities.

1.2. My responsibilities

My responsibilities in this thesis involved cleaning the data collected by the other team members of the *Risk & Resilience Study*, selecting and coding variables, writing all sections of this thesis, creating a conceptual model and having it approved by the *Risk & Resilience* team and the supervisory committee, and performing the analyses presented in this monograph. Cleaning the data comprised of re-coding write-in responses, handling missing responses, and forward-filling variables that included skip patterns.

1.3. Research questions and objectives

i. *What is the relationship between biphobia (from the gay community and from the straight community) and self-reported anxiety symptoms?*
ii. *Do identification and involvement with the lesbian, gay, bisexual, transgender, questioning/queer (LGBTQ) community; positive bisexual identity; and volunteering, advocacy, or activism protect against current anxiety following past biphobic experiences?*
iii. *Are the scales that measure anxiety (Overall Anxiety and Impairment Scale: OASIS) and posttraumatic stress symptoms (PTSD Checklist – Civilian version: PCL-C) reliable and valid scales for measuring symptoms of anxiety and posttraumatic stress disorder (PTSD) in bisexual populations?*
iv. *Exploratory: What is the relationship between biphobia and self-reported PTSD symptoms, and do the above putative protective factors also moderate the relationship for PTSD symptoms as an outcome?*

Despite research demonstrating that bisexuals generally have a high prevalence of both anxiety and discriminatory experiences, very little research has examined the relationship between biphobia and anxiety. Additionally, much of the research has focused on risk factors and very little has focused on potential protective factors such as community involvement, positive identity, and volunteering. This thesis will examine the relationship between biphobia and anxiety and if these factors protect against current anxiety when having experienced biphobia. This information is bisexual-specific and may be important for the bisexual community, the LGBTQ community more broadly, service providers, and researchers. Additionally, this thesis will use structural equation modelling (SEM) to examine if the conceptual model fits the data well and if the scale used to measure anxiety is valid and reliable for this population. The OASIS scale has been validated in college students and a clinical sample (Campbell-Sills et al., 2009; Norman, Hami Cissell, Means-Christensen, & Stein, 2006) but has not been validated in a bisexual population. This is similar to the PCL-C which has only been validated in college students (Ruggiero, Del Ben, Scotti, & Rabalais, 2003); therefore, supporting the need to examine the validity and reliability of this scale to measure posttraumatic stress symptoms in a bisexual population.

The exploratory research question takes on the same form as the main research questions but focuses on PTSD symptoms as an outcome. Very little research has examined PTSD in bisexuals but a few studies suggest that bisexuals may be at greater risk for PTSD compared to heterosexuals and perhaps even gay and lesbian people after experiencing traumatic events such as discrimination (Alessi, Meyer, & Martin, 2013; Long, Ullman, Long, Mason, & Starzynski, 2007; Roberts, Austin, Corliss, Vandermorris, & Koenen, 2010). Considering discrimination as a traumatic event is controversial in the literature; however, recent research describes the importance of doing so, especially when examining PTSD (see section 2.2.2. Posttraumatic stress disorder for more details). This disparity is not as clear in the literature as it is for anxiety; therefore, the relationship between biphobia and PTSD symptoms will be tested in an exploratory manner. Likewise, the same protective factors that will be examined for anxiety symptoms will also be examined for PTSD symptoms since PTSD is considered an anxiety disorder and there is currently very little research surrounding potential moderators in this relationship. This research may provide insight and a starting point for future researchers studying PTSD in bisexual populations.

1.4. Data source: Risk & Resilience Study

The *Risk & Resilience Study* is a community-based research (CBR) study focusing on the mental health of people who self-identify as bisexual and/or as a related term (e.g. pansexual, 2-spirited, fluid) in Ontario, Canada (Ross, Bauer, et al., 2014). This study used both qualitative and quantitative methods to examine the mental health status and determinants of mental health in this population with a particular focus on indicators of discrimination and social/community support. This study gathered extensive information on demographics, relationships, health, substance use, mental health services, and social situations with the aim of addressing gaps in the current literature and informing mental health care strategies.

CBR is a collaborative form of research that engages and involves community members, organizational representatives, and researchers in all aspects of the research process (B. A. Israel, Schulz, Parker, & Becker, 1998). B.A. Israel et al. (1998) indicate that there are several benefits to using CBR; it (1) improves the relevance and usefulness of the data, (2) creates collaboration among partners with diverse skills, knowledge, expertise, and sensitivities, (3) uses local

knowledge to improve the quality and validity of the research, (4) encourages the researcher to be self-critical and reflective of their work, (5) has the possibility to benefit the community by affecting policies and the availability of resources, (6) strengthens the community's research capacity, (7) creates grounded theory based on social experiences, (8) develops trust between the community and researchers, (9) may overcome cultural gaps, (10) may create additional employment opportunities in the community, (11) aims to improve the health of the community, and (12) attempts to reduce marginalization.

The *Risk & Resilience Study* was informed by 15 bisexual community members from across Ontario forming the Advisory committee, and organizational partnerships between the Centre for Addiction and Mental Health, The University of Western Ontario, and Rainbow Health Ontario. Researchers involved with the project include Dr. Lori Ross (Principal Investigator) and co-investigators Dr. Greta Bauer and Loralee Gillis. Additional researchers on the team include Dr. Margaret Robinson, Jenna MacKay, Ishwar Persad, and Cheryl Dobinson. The researchers on this team all provided valuable advice during the development of this thesis and the Advisory Committee members were integral to developing and contextualizing the research objectives in order to be meaningful and sensitive to the community's needs.

The Advisory Committee members were also involved in the *Risk & Resilience Study* in several other ways. Firstly, community members were attracted to more than one sex and/or gender (i.e., bisexual, pansexual) and were recruited to serve on the Advisory Committee in order to promote the project, guide the research process, help interpret the data, share results of the study and plan advocacy strategies around services or policy changes (Flanders & Robinson, 2014). In addition, Advisory members helped select the questions used on the survey, participated in a video to promote recruitment (*Risk & Resilience Study of Bisexual Mental Health*, 2012), started the recruitment process (see section 4.1.1. Respondent-driven sampling), and assisted with data analysis (Flanders & Robinson, 2014). Advisory Committee members also played a significant role in the knowledge translation phase of the project by promoting anti-stigma posters, advising the content of academic articles, and in some cases assisting in the writing process (Flanders & Robinson, 2014).

CHAPTER 2: LITERATURE REVIEW

This chapter begins by introducing bisexuality and the difficulties surrounding defining bisexuality. It continues by outlining the literature on mental health in the bisexual population with a particular focus on anxiety and PTSD. This chapter will also incorporate research on biphobia and discrimination and its impact on mental health. The previously mentioned sections will also draw on research conducted in the general population.

2.1. Definition and prevalence of bisexuality

There is some debate over the definition of bisexuality. For example, Halperin (2009) describes thirteen ways that he can define bisexuality. He argues that this term includes individuals who are sexually attracted to or are not prevented from being sexually attracted to both males and females and individuals who are in relationships with both males and females in varying combinations. For example, someone may be predominately attracted to males but may also be attracted to a small percent of females. He explains that this definition also includes individuals who may identify as bisexual but who only have relationships with males or females and individuals who have relationships with both males and females but identify as gay, lesbian, or heterosexual.

This provides an example of the various ways in which bisexuality can be defined. Essentially, this term describes a sexual orientation where individuals are attracted to and/or are sexually or romantically involved in relationships with people of more than one gender. In this study, participants self-identifying as bisexual was preferred over categorizing participants as bisexual based on their sexual behaviour since the focus is on experiences of discrimination, which are more likely to be associated with sexual identity than sexual behaviour. There are also several other reasons why it may be preferable to use self-identification versus a behavioural definition of bisexuality. For instance, behavioural definitions may require that bisexuals have more sexual partners (e.g. a male and a female partner) than heterosexual or gay people over the same time frame to participate in a study (Bauer & Brennan, 2013). This artifactual increase in sex partners, rather than bisexual identity, may explain some of the health disparities found between bisexual people and gay or heterosexual people (Bauer & Brennan, 2013). One additional reason is that self-identification does not always coincide with behaviour. For

example, a youth study in the United States found that 37% of women with both male and female partners identified as straight and 19% identified as bisexual whereas 57% of men with both male and female partners identified as straight and 11% identified as bisexual (Lindley, Walsemann, & Carter Jr, 2012). Bauer and Brennan (2013) also found that bisexual behaviour in the past year did not always indicate a bisexual identity and that it was not a strong predictor of lifetime behavioural bisexuality. This is not to say that a behavioural definition of bisexuality is unwarranted; for example, this definition would be useful in a study focusing on sexual behaviour where participants were all required to have high numbers of sex partners. There are several related terms that bisexual individuals may identify with such as fluid, omnisexual, biaffectionate, 2-spirited, ambisexual, asexual, bisensual, heteroflexible, homoflexible, pansexual, queer, and questioning (discussed in the following section). It was important to include these sexual orientations as options in the *Risk & Resilience Study* survey in addition to bisexuality because some people who meet the study's broad definition of bisexual[1] may not self-identify as bisexual or may prefer to identify as bisexual in addition to another term.

These related terms were important to include in the survey because many sexual minority individuals may reject the bisexual label. Savin-Williams (2001) explained that this may be for individual, political, or cultural reasons. Correspondingly, in a participant observation study in Kentucky, Callis (2013) found that many people had rejected bisexuality as a sexual orientation identity because they felt that it was limiting and strengthened the belief that there are only two genders—male and female. Many people felt that bisexuality as a label was not inclusive to transgender, intersex, and androgynous people (Callis, 2013). It should also be noted that many people may not feel this way. For example, using data collected for the pilot study of the *Risk & Resilience Study*, it was demonstrated that many people who identified as bisexual reported being attracted to and/or had sexual experiences with transgender people (75% and 40% respectively) (Scheim, Robinson, Dobinson, & Ross, 2014). It has also been noted in the literature that people's identities may change over time. For example, Diamond (2008) found that 67% of women not exclusively attracted to the opposite sex changed their sexual orientation

[1] "This study is for bisexuals living in Ontario. Our definition of bisexual includes people attracted to more than one sex and/or gender. This may include those who self-identify as bisexual, pansexual, omnisexual, 2-spirited, fluid, queer, questioning, or who choose not to use an identity label."

identity label over a ten year period and 33% changed it two or more times. Other people may choose not to identify as bisexual in order to avoid the stereotypes associated with it (see section 2.3.1. Biphobia) (Callis, 2013). This conflict surrounding bisexuality as a identity can be seen in this quote by Klesse (2005); "bisexuality [...] bears the potential to radically undermine the constrictive ways we tend to think about sexuality and gender, others argue that the category simply reinforces the binary it claims to challenge" (p. 447).

In light of the above mentioned difficulties, the prevalence of bisexuality based on self-identification in women was found to be 0.9% which was similar to the prevalence of lesbian identity (0.8%) in the Canadian population (Tjepkema, 2008). This relationship; however, was shown to be the opposite for men. The Canadian Community Health Survey (CCHS) showed that 1.4% of the male population identified as gay while 0.7% identified as bisexual (Tjepkema, 2008). Overall, Tjepkema (2008) found that 0.8% of the Canadian population between the ages of 18 and 59 identified as bisexual using combined data from the years 2003 and 2005. This is consistent with data from the 2009 CCHS survey which showed that 0.9% of Canadians aged 18 to 59 identified as bisexual (Statistics Canada, 2011). This estimate; however, may be low because the CCHS is a telephone survey that requires participants to identify their sexual orientation to an interviewer working within the government. Some people may be uncomfortable disclosing this data to the government as they are unsure how it will be used.

Several population based surveys conducted in the United States demonstrate that there may be quite a range in prevalence of people who identify as bisexual depending on the survey that was administered. For example, the National Epidemiological Survey on Alcohol and Related Conditions found that 0.7% of Americans aged 18 years and older identify as bisexual based on combined data from the years 2004 and 2005 (Gates, 2011). This is in contrast to the National Survey of Family Growth which showed that 2.3% of people between the ages of 18 and 44 identified as bisexual using combined data from 2006 to 2008 (Gates, 2011). Furthermore, the 2008 U.S. General Social Survey found that 1.1% of people aged 18 years or older identified as bisexual. This is similar to the 2009 California Health Interview Survey which illustrated that 1.4% of people identified as bisexual (Gates, 2011). The California Health Interview Survey reaches children (ages 11 and under), teenagers (ages 12 to 17) and adults as well as cell-phone only households (UCLA Center for Health Policy Research, 2012). The

National Survey of Sexual Health and Behavior demonstrated the highest prevalence with 3.1% of Americans between the ages of 14 and 94 self-identifying as bisexual in 2009 (Gates, 2011).

The large variability between surveys may partly be because the National Survey of Sexual Health and Behavior is administered by researchers from Indiana University's Center for Sexual Health Promotion as opposed to a government agency (e.g. U.S. Department of Health and Human Services for the National Epidemiological Survey on Alcohol and Related Conditions). People may be more likely to disclose their sexual orientation to academics in the field of sexual health and behaviour compared to people working within the government. Additional differences may be in part due to time trends; for example, people may have been more likely to identify as bisexual in 2009 than in 2004/2005. The variations in prevalence may also be partly attributed to differences in the age ranges of the samples where younger people are more likely to identify as bisexual. Rodriguez Rust (2002) argues that the prevalence of bisexuality depends on the time period and definition being used. It is also important to note that despite the proximity of Canada to the United States, the prevalence of bisexuality may differ between these countries.

2.1.1. Defining some additional terms in the field of sexual and gender minority research

In this section, for clarity, there will be brief descriptions of the additional sexual orientation identities given as options in the survey. It should be noted that these terms may change and evolve over time and may be used differently by different people; therefore, these definitions provide only a general understanding and are by no means an official or even the only definition. In addition, they are all terms used to describe people's identities rather than scientific terms.

- Fluid sexual orientation describes a sexual identity that may change over time (Barbara, Chaim, & Doctor, 2007).
- Omnisexual identity characterizes someone who is attracted to people of all genders (Robinson, 2014). This term is often used interchangeably with pansexual and may be differentiated from pansexual identity when omnisexual people identify as being attracted to people regardless of gender whereas pansexual people recognize gender and are attracted to all or many genders (Flanders, 2014; Green & Peterson, 2006).

- Biaffectionate describes people who are attracted in a romantic or non-sexual way to both people of the same sex and people of a different sex, but may also describe people who are attracted to both men and women (Robinson, 2014).
- 2-spirited is a sexual orientation and gender identity that portrays the mixed gender roles in First Nations or Aboriginal communities. This term demonstrates that 2-spirited people have the presence of two spirits; male and female. This term may be a source of empowerment for Aboriginal people used to reclaim their cultural identity (A. McLeod & Wilson, 2014). A. McLeod and Wilson (2014) more specifically define 2-spirited as someone who "assumes cross- or multiple gender roles, attributes, dress, and attitudes for personal, spiritual, cultural, ceremonial, or social reasons." (slide 16). This term may also be defined differently by each cultural group and can be fluid, or changing, overtime (A. McLeod & Wilson, 2014).
- "Ambisexual describes people who are sexually attracted to both people of the same sex and people of a different sex, but may also describe people who are attracted to both men and women." (Robinson, 2014, para. 1).
- An asexual identity defines someone who is not sexually/romantically active or does not experience sexual/romantic attraction but may experience love and affection (Barbara et al., 2007).
- "Bisensual identity describes people who are sensually attracted to both people of the same sex and people of a different sex, but may also describe people who are attracted to both men and women." (Robinson, 2014, para. 1).
- Heteroflexible describes someone who is mostly attracted to people of a different sex and is less often attracted to people of the same sex whereas homoflexible describes someone who is primarily attracted to people of the same sex and occasionally people of different sex (Robinson, 2014).
- Queer is an umbrella term that may be used to represent people who identify as non-heterosexual although not all transgender people feel included in this term. This term was reclaimed from being a derogatory term for sexual and gender minority people (Ross, Tarasoff, et al., 2014).
- Someone who identifies as questioning is not sure what sexual orientation they feel accurately describes them or are choosing to explore options (Barbara et al., 2007).

These identities were important to include in addition to bisexual because they all have

different nuances and people may identify with one or more of them in addition to or instead of identifying as bisexual. It was also important to the Advisory Committee to include these terms so that the participants would recognize that the *Risk & Resilience* team had an appreciation of the complexity of bisexual identity.

In addition to sexual orientation, there are several different gender identities that bisexual and other people may identify with in addition to or other than woman and man. These may include identities such as bigendered, crossdresser, genderqueer, trans man, and trans woman.

- Someone who identifies as bigendered identifies as a combination of male/man and female/woman (Green & Peterson, 2006).
- Someone who sometimes takes on the appearance of a different gender/sex may identify as a cross-dresser (Barbara et al., 2007; Green & Peterson, 2006).
- Genderqueer identity refers to someone who feels that their gender does not align with any one specific gender. Green and Peterson (2006) define genderqueer as "[a] gender variant person whose gender identity is neither male nor female, is between or beyond genders, or is some combination of genders. Often includes a political agenda to challenge gender stereotypes and the gender binary system." (p.4).
- A trans man is someone who was assigned a female sex at birth but identifies as and may have transitioned into a male identity whereas a trans woman is someone who was assigned a male sex at birth but identifies as and may have transitioned into a female identity. Transgender may describe anyone who does not fall into traditional gender binaries of masculine or feminine or whose gender identity does not correspond to their assigned sex at birth (Ross, Tarasoff, et al., 2014).
- Cisgender refers to someone whose gender identity corresponds with their assigned sex at birth (i.e. someone who is not trans) (Ross, Tarasoff, et al., 2014).

The *Risk & Resilience Study* survey also included the option for people to identify as intersex instead of or in addition to male or female at birth. Being intersex refers to someone who has either external or internal sexual organs that are not traditionally understood to be either male or female. This may present in a number of different ways. The Intersex Society of North America (n.d.) provides several examples, one being that "a person might be born appearing to

be female on the outside, but having mostly male-typical anatomy on the inside" (para. 1). However, being intersex may not always be visible at birth and it is largely based on what the medical system considers normal sexual anatomy as opposed to the idea that there may be a spectrum of normal sex anatomy (Intersex Society of North America, n.d.).

2.2. Overview of mental health concerns

Before commenting on any disparities that have been found between bisexuals as a group compared to lesbian, gay, and heterosexual people, it is important to emphasize that bisexuals are similar in many ways to most other people regardless of sexual orientation. For example, a participant interviewed for a health needs assessment stated that "[t]here is no difference between what the general heterosexual population and LGBT need, we all have needs... love, food, shelter, warmth, self-actualisation, secure finances..." (Ash & Mackereth, 2013, p. 26). In fact, Savin-Williams (2001) stated that this should be a basic assumption; however, he also illustrated that there are many differences among bisexuals as a group. The disparities between bisexuals as a group compared to gay and heterosexual people that will be described below are not solely a result of identifying as bisexual; rather, they are considered to be the result of negative experiences such as discrimination that stem from social situations, culture, and policies (Ritch C. Savin-Williams, 2001). These negative experiences will also be described in a later section.

It has been shown by many sources that sexual minorities generally experience poorer health outcomes than heterosexuals and within sexual minorities the discrepancy is often largest for bisexuals. This disparity is particularly striking in the area of mental health. The following section will begin with a comparison of diverse mental health outcomes for bisexuals compared to gay, lesbian, and heterosexual people. This will be followed by a summary of various mental health disparities between sexual minorities as one group compared to heterosexuals.

In a United States population-based study, Bolton and Sareen (2011) found that bisexual women reported higher lifetime prevalence of all mental disorders than heterosexual women. Specifically, they found that the lifetime prevalence of mood disorders, anxiety disorders, and substance use disorders were all above 60% for bisexual women while 25% of bisexual women were found to have attempted suicide in their life (Bolton & Sareen, 2011). This is compared to

lesbian women where it was estimated that 44.4% have a mood disorder, 48.4% have an anxiety disorder, 60.8% have a substance use disorder, and 10.9% have attempted suicide in their life (Bolton & Sareen, 2011). The discrepancy is even larger when compared to heterosexual women; it was shown that 30.5% have a mood disorder, 36.3% have an anxiety disorder, 24.3% have a substance use disorder, and 4.2% have attempted suicide in their lifetime (Bolton & Sareen, 2011). They also found higher rates of mental health issues in bisexual men compared to heterosexual men but not always compared to gay men. Compared to heterosexual men, bisexual men were shown to have higher lifetime prevalence of anxiety disorders, mood disorders, suicide attempts, and Cluster A personality disorders (paranoid personality disorder, schizoid personality disorder, and schizotypal personality disorder, or disorders with symptoms of eccentric thoughts or behaviour) (Bolton & Sareen, 2011). Specifically, 40.6% of bisexual men were shown to have an anxiety disorder compared to 45.8% of gay men and 21.4% of heterosexual men. Moreover, 36.9% of bisexual men were estimated to have a mood disorder compared to 42.3% of gay men and 19.8% of heterosexual men (Bolton & Sareen, 2011). In regard to suicide attempts, they demonstrated that 10.0% of bisexual men attempted suicide in the past year compared 9.8% of gay men and 2.1% of heterosexual men. In addition, 20.5% of bisexual men were found to have any Cluster A personality disorder compared to 13.5% of gay men and 8.7% of heterosexual men (Bolton & Sareen, 2011).

More recently, a study of college women found that bisexual women had the worst mental health compared to lesbian and heterosexual women when examining anxiety, anger, depression, self-injury, and suicidal ideation (Kerr, Santurri, & Peters, 2013). Furthermore, in a study of Californians, it was shown that bisexual men had a greater past-year prevalence of generalized anxiety disorder compared to heterosexual men but not gay men and bisexual women were shown to be more likely to meet criteria for past-year major depression, generalized anxiety disorder, panic, and alcohol dependency compared to heterosexual and lesbian women (S. D. Cochran & Mays, 2009). Similarly, in a study sampling from health care sites across the United States, Koh and Ross (2006) found that bisexual women were more than twice as likely to have had an eating disorder compared to lesbians and were twice as likely compared to heterosexual women. They also found that 24% of bisexuals, 11% of lesbians, and 18% of heterosexual women were depressed (Koh & Ross, 2006). Moreover, in an Australian population-based study, 34% of bisexual women reported having depression, 20% reported having anxiety, and they also

reported the highest level of stress and lowest levels of life satisfaction compared to lesbians and heterosexual women (McNair, Szalacha, & Hughes, 2011). In comparison, 25% of lesbians reported depression and 15% reported anxiety while 11% of heterosexual women reported depression and 6% reported anxiety (McNair et al., 2011). When studying sexual minority elders, Jessup and Dibble (2012) found that bisexual elders had more depression, anxiety and suicidality than lesbian, gay, and heterosexual elders in addition to having lower health service use.

Despite this evidence demonstrating greater mental health disparities among bisexuals, studies still often group bisexuals with lesbian and gay participants in their analyses. For instance, Grella et al. (2011) support that lesbian and bisexual women have the highest past-year prevalence of mood and anxiety disorders (38%) followed by gay and bisexual men (34%) compared to 23% for heterosexual women and 16% for heterosexual men. Similarly, B. S. Mustanski et al. (2010) found that 33% of sexual minority youth met criteria for any mental disorder using the *Diagnostic and Statistical Manual of Mental Disorders IV* (DSM-IV) diagnoses. Specifically, they found that 17% had a conduct disorder, 15% had major depression, and 9% had PTSD (B. S. Mustanski, Garofalo, & Emerson, 2010). Furthermore, in a population-based study in the United States, it was demonstrated that gay and bisexual men were three times more likely to meet criteria for major depression compared to heterosexual men (S. D. Cochran, Sullivan, & Mays, 2003). It was also found that 15% of lesbian/bisexual women, 4% of heterosexual women, 3% of gay/bisexual men, and 2% of heterosexual men had an anxiety disorder (S. D. Cochran et al., 2003). In addition, a study using an American national sample found that sexual minorities over 50 years of age had a higher risk in general of poor mental health than heterosexuals (Fredriksen-Goldsen, Kim, Barkan, Muraco, & Hoy-Ellis, 2013). Overall, Cochran and Mays (2009) estimated that 8.5% of major depression, 10.5% of generalized anxiety disorder, and 15.4% of alcohol dependency would be eliminated among adult Californians if sexual minorities had the same prevalence of risk factors and the same strength of associations between the risk factors and the outcomes (population attributable risk) as heterosexuals. There are clearly disparities in mental health that exist between sexual minorities and heterosexuals that should be addressed; however, it is also evident in the literature that mental health research needs to be conducted independently for bisexual people as opposed to combining their information with gay and lesbian people in order to achieve a clearer representation of their mental health needs.

2.2.1. Anxiety

Due to the high prevalence of anxiety and the disparities in rates of anxiety disorders and symptoms between bisexual people and gay and heterosexual people, this thesis will focus on anxiety as an outcome. However, this thesis may only identify a subgroup of factors impacting these disparities since it includes only bisexual people. In general, anxiety is a common physical and mental reaction that most people have experienced at some point in their life; it's a response that includes increased heart rate, worry, and tensed muscles which are part of the "fight-or-flight" response (AllPsych & Heffner Media Group, Inc., 2011). This common response may become problematic when it interferes with one's life. When this is the case, the person may be considered to have an anxiety disorder (see section 2.2.3. A brief critique of the medical model for a brief discussion surrounding the concept of psychiatric disorders). There are several other medical disorders that are considered anxiety disorders including acute stress disorder, agoraphobia, generalized anxiety disorder, obsessive compulsive disorder, panic disorder, phobias, and PTSD (AllPsych & Heffner Media Group, Inc., 2011). Maniglio (2012) supports that anxiety is one of the most common mental health problems worldwide and rates in adults vary internationally from 11% to 17%.

Within the literature on mental health, it has largely been shown that bisexual women have higher rates of anxiety than lesbian and heterosexual women while bisexual men have higher rates of anxiety than heterosexual men but not consistently higher rates than gay men (Table 1). Specifically in Canada, a study of perinatal women found that bisexuals had higher scores on the State-Trait Anxiety Inventory than other identities (39 vs. 31 respectively) (Ross et al., 2012). In a Canadian internet-based study, Engler et al. (2011) found that 37.6% of bisexual men reported anxiety in the past year. These estimates were slightly lower than those found for gay men (48.0%) (Engler et al., 2011). Similarly, using data from the CCHS, Tjepkema (2008) found that 25% of bisexual women reported a mood or anxiety disorder whereas Steele et al. (2009) found that 31% of bisexual women, 13% of lesbian women, and 10% of heterosexual women had a mood or anxiety disorder when rates were unadjusted. Data from the 2003 CCHS demonstrated that 14% of bisexual men reported a mood or anxiety disorder compared to 16% of gay men and 5% of heterosexual men (Brennan et al., 2010). In the United States, Bostwick et al. (2010) found that men and women who identified as bisexual had higher rates of past year anxiety

disorders than heterosexuals and after adjusting for demographics, bisexual women were found to have twice the rates of anxiety or mood disorders than heterosexual women.

Table 1. Prevalence of anxiety among bisexuals compared to gays, lesbians, and heterosexuals

	Bisexual	**Gay/Lesbian**	**Straight and/or "General population"**
Bolton & Sareen (2011)	66.2% of women and 40.6% of men reported lifetime anxiety disorder	48.4% of women and 45.8% of men reported lifetime anxiety disorder	N/A
Brennan et al. (2010), Steele et al. (2009) – CCHS data	31% of women and 14% of men reported current mood or anxiety disorder	13% of women and 16% of men reported current mood or anxiety disorder	10% of women and 5% of men reported current mood or anxiety disorder
Cochran & Mays (2009)	20.3% of women and 15.6% of men reported generalized anxiety disorder in the past year	9.2% of women and 15.4% of men reported generalized anxiety disorder in the past year	7.6% of women and 5.9% of men reported generalized anxiety disorder in the past year
Engler et al. (2011)	37.6% of men reported anxiety in the past year	48.0% of men reported anxiety in the past year	N/A
Kessler et al. (2005)	N/A	N/A	28.8% of Americans aged 18 years and older reported lifetime anxiety disorder
Maniglio (2012)	N/A	N/A	Rates of anxiety in adults varies internationally from 11% to 17%
Meng & D'Arcy (2012)	N/A	N/A	4.7% of Canadians 12 years and older reported anxiety disorder in the last year

Several studies have also examined anxiety in the broader LGBT population. Burgess et al. (2008) used data from a population health surveillance survey and found that 21% of LGBT participants had an anxiety disorder compared to 10% of cisgender heterosexuals. In a national household survey of Latino and Asian American adults from the United States, it was found that 10.9% of gay and bisexual men, 11.3% of lesbian and bisexual women, 6.8% of heterosexual

men, and 10.3% of heterosexual women had an anxiety disorder in the past year (S. D. Cochran, Mays, Alegria, Ortega, & Takeuchi, 2007). S. D. Cochran et al. (2007) may not have found any differences in past-year anxiety prevalence between lesbian/bisexual women, gay/bisexual men, and heterosexual women because their sample included Latino and Asian American adults only who may have different risk factors for anxiety, for example, based on additional sources of discrimination. Furthermore, a meta-analysis conducted by King et al. (2008) demonstrated that lesbian and bisexual women had a risk ratio of 1.66 (95% CI: 1.02, 2.68) compared to heterosexual women while gay and bisexual men had a risk ratio of 1.88 (95% CI:1.26, 2.83) compared to heterosexual men for anxiety in the past year. These studies largely support that sexual minorities experience more anxiety than heterosexuals but also that levels of anxiety may be impacted by racial or ethnic identity.

When examining anxiety in the general population, a Canadian study using data from the CCHS found that the yearly prevalence of anxiety disorder was 4.7% (Meng & D'Arcy, 2012). Meng & D'Arcy (2012) also support that mood and anxiety disorders are the most common mental health problems. When examining lifetime prevalence, an American study found that 28.8% of the population had an anxiety disorder (Kessler et al., 2005). These studies demonstrate not only how common anxiety is but also how much more prevalent it is in sexual minorities, often especially so in bisexual populations. It is also important to note that despite differences in sampling strategies (e.g. population based studies vs. convenience samples) and their limitations, it has predominately been shown that bisexual women are at greater risk for high levels of anxiety than lesbian women and heterosexual women while bisexual men are at greater risk for high levels of anxiety than heterosexual men but not gay men.

2.2.2. Posttraumatic stress disorder

The second outcome that this thesis explores is posttraumatic stress disorder, or PTSD. This thesis examines PTSD among bisexual people as there is currently a lack of available research for this population. PTSD is a group of symptoms that occur after experiencing a traumatic event that remain over time and may disrupt a person's life. Many people experience some form of stress-related reaction after a traumatic event but the majority do not develop PTSD (U.S. Department of Veterans Affairs, 2013b). Generally, if the symptoms last beyond four

weeks, interfere with life, and cause distress then the person may have PTSD (U.S. Department of Veterans Affairs, 2013b). The symptoms that make up PTSD include (1) reliving the event, (2) avoiding situations that trigger memories of the event, (3) negative beliefs and feelings including fear, guilt, or shame, and (4) hyperarousal that may manifest in trouble concentrating or sleeping (U.S. Department of Veterans Affairs, 2013b). These symptoms may not appear until months or years after the event and may vary in severity over time.

One of the prerequisites for PTSD diagnosis is experiencing a traumatic event. The DSM-IV limits the types of traumatic experiences required for diagnosis to those that cause "actual or threatened death or serious injury or a threat to the physical integrity of self or others" (Kira, 2001, p. 1). However, Kira (2001) argues that the range of traumatic experiences is greater than this definition and includes "out of ordinary stressors that have low expectancy, probability, and controllability" (p.2). This can include experiences such as discrimination and biphobia. To support this, it has been found that racism may in itself be a traumatic event that cumulatively leads to PTSD (Williams, 2013). In order for racism to be considered a traumatic event according to the DSM-IV, the racist event would be required to be a discrete event such as an assault which is often not the case (Williams, 2013). Therefore, this requirement may not be reasonable for populations with high rates of discrimination. In this thesis, discrimination will be considered as a traumatic event which is outside the conventional DMS-IV criteria for PTSD. Using a more flexible definition of trauma where events do not have to be life-threatening has previously been used by Alessi et al. (2013) in relation to PTSD. It has also been applied to other populations that experience discrimination such as race-based discrimination (Williams, 2013).

When examining PTSD, prevalence has been found to vary depending on the sampling strategy and types of traumatic events considered. The majority of studies examining PTSD do not focus on traumas common in sexual minority communities; instead, they largely examine military related trauma, first responder trauma, natural disasters, terrorism related trauma, general losses or injuries, school shootings, child abuse, and even trauma related to visiting WWII concentration camps (DiGangi et al., 2013). There are several studies available; however, that examine PTSD in sexual minorities and in bisexuals specifically (Table 2 for a summary). For example, a study recruiting participants from business establishments found that 17% of bisexuals had PTSD based on the classical requirements for traumatic events and 30% of

bisexuals had PTSD when using a relaxed definition of traumatic events (i.e. events were not required to be life-threatening) (Alessi, Meyer, et al., 2013). They also found that Latino participants were more likely than White participants to have PTSD and that there were no differences between males and females (Alessi, Meyer, et al., 2013). Moreover, Alessi et al. (2013) demonstrated that there are certain events that are most likely to be related to a DMS-IV diagnosis of PTSD, including the unexpected death of a loved one (10%), childhood sexual abuse (9%), adult physical assault (6%), a terrorist attack (3%), a life-threatening illness of a significant other (3%), attempted rape (2%), childhood physical abuse (2%), and seeing an injured or dead body (2%).

When this relationship was examined in LGBT youth that were considered gender atypical in New York, it was found that 15% of females and 4% of males met criteria for PTSD diagnosis (D'Augelli, Grossman, & Starks, 2006). These youth were also found to have experienced significantly more lifetime physical and sexual violence than youth not considered to be gender atypical. Similarly, in the United Kingdom, 17% of LGB youth were found to have symptoms of PTSD and this was related to having depression as well as to victimization experienced at school as a result of their actual or perceived sexual orientation (Rivers & Cowie, 2006). This demonstrates that sexual minority youth may also be at increased risk of PTSD and different forms of victimization.

A population-based study using data from the National Epidemiologic Survey on Alcohol and Related Conditions found that 26% of bisexual women exposed to a potentially traumatic event had PTSD compared to 18% of lesbians, and 13% of heterosexual women with no same-sex attractions (Roberts et al., 2010). This relationship was different for men who experienced a potentially traumatic event with 9% of bisexual men, 13% of gay men, and 5% of heterosexual men with no same-sex attractions exhibiting PTSD (Roberts et al., 2010). The differences between men and women may be because lesbian and bisexual women experienced similar levels of traumatic events (and more traumatic events than men) while gay men experienced more traumatic events than bisexual men; both gay/lesbian and bisexual groups experienced more traumatic events than heterosexuals, particularly interpersonal violence and child abuse or neglect (Roberts et al., 2010). Roberts et al. (2010) also discussed that the disparities were explained by the type of traumatic event, the age someone experienced their worst event, and the

amount of events occurring before the worst event (cumulative traumatic events). Moreover, a study of LGB veterans showed that they were more likely to have PTSD, depression, and alcohol problems than non-LGB veterans with 18% having PTSD, 12% having depression, and 11% having alcohol problems (B. N. Cochran, Balsam, Flentje, Malte, & Simpson, 2013). This increased risk for PTSD was found to be related to veterans feeling that they had to conceal their sexual orientation while they were in the military which increased anxiety (B.N. Cochran et al., 2013). These individuals were also found to be more likely to have depression (B. N. Cochran et al., 2013). Finally, a study focusing on male-perpetrated assault against women found that bisexuals had slightly higher mean scores on the Posttraumatic Stress Disorder Diagnostic Scale than lesbian and heterosexual women (Long et al., 2007).

However, the majority of individuals that experience a trauma do not develop PTSD. To illustrate this, it was noted in a Canadian study that 75.9% of people were exposed to one or more traumatic event in their life; however, lifetime PTSD prevalence was found to be 9.2% and current PTSD prevalence was found to be 2.4% (Van Ameringen, Mancini, Patterson, & Boyle, 2008). Similarly, a German study found that 26.0% of males and 17.7% of females had experienced at least one traumatic event yet only 1.0% of males and 2.2% of females were diagnosed with PTSD (Perkonigg, Kessler, Storz, & Wittchen, 2000). Another study estimated that one third of the population will experience a traumatic event in their life and of these people, 10% to 20% are expected to develop PTSD resulting in an estimated lifetime prevalence of 3% to 6% (Brunello et al., 2001). Finally, a Detroit study found that 39.1% of people were exposed to a traumatic event and 23.6% of those exposed to a trauma developed PTSD while in general it was found that 9.2% of the population had PTSD in their lifetime (Breslau, Davis, Andreski, & Peterson, 1991). This supports that trauma is not sufficient to develop PTSD (Brewin, Andrews, & Valentine, 2000). Nonetheless, it has been found that bisexuals may experience more traumatic events (such as discrimination and victimization) than heterosexuals and often more than gay and lesbian people. Any possible disparities; however, are not clear in regard to the prevalence of PTSD.

Table 2. Prevalence of PTSD in bisexuals compared to lesbians, gays, and heterosexuals

	Bisexual	**Gay/Lesbian**	**Straight and/or "General population"**
Alessi et al. (2013)	17% had PTSD using the DSM-IV definition of trauma and 30% using a relaxed definition of trauma	N/A	N/A
Breslau et al. (1991)	N/A	N/A	9.2% of people had PTSD in their lifetime in Detroit
Perkonigg et al. (2000)	N/A	N/A	2.2% of women and 1.0% of men had PTSD in Germany
Roberts et al. (2010)	26% of women and 9% of men exposed to a potentially traumatic event had PTSD	18% of women and 13% of men exposed to a potentially traumatic event had PTSD	13% of women and 5% of men exposed to a potentially traumatic event had PTSD
Van Ameringen et al. (2008)	N/A	N/A	9.2% of Canadian adults with lifetime PTSD, 2.4% with current PTSD

2.2.3. A brief critique of the medical model

The medical model is often considered to be a traditional scientific process in medicine that focuses on symptoms and biology to describe, diagnose, and treat a patient. This model treats mental health like physical health in that there is thought to be a biological cause for all mental health issues (e.g. differences in someone's brain structure or genes) (S. McLeod, 2008) This model has strengths but it also has weaknesses. For example, the value of doctors' expertise, objectivity, and the ability to use evidence-based medicine has been shown in the advancement of medicine over time (Grobstein & Cyckowski, 2006). However, one large critique of this model rests in its tendency to rely on norms, ideals, and categorizing people as either having a disorder or not (Grobstein & Cyckowski, 2006). It is true that categories and norms have their place in medicine; they help distinguish people who may need further attention (Grobstein & Cyckowski, 2006). Although, when mental health is considered to be either healthy or disordered, it does not take into account the continuum of mental health that may exist among

people. People are complex and may have different ideals – some people with many anxiety symptoms may not feel that it is a problem and others may feel that it is. This model has had considerable criticism from groups such as The Disabled People's Movement who feel that the medical model "sees people with disabilities as the problem, focuses on their impairment, [and] provoking [*sic*] fear and patronizing attitudes […]" (Shah & Mountain, 2007, p. 375).

The creation of the term 'disorder' is biomedical and although the basis for the symptoms presenting may be biological, it is also important to consider the social context surrounding the person. In this thesis, it is argued that the increased levels of anxiety and posttraumatic symptoms seen in the bisexual community are related to social events (i.e. biphobia). This is well documented in literature using a social determinants of health approach. This approach supports that income and social status, social support networks, education, employment, social environments, physical environments, personal health practices and coping skills, healthy child development, gender, and culture influence people's health (Public Health Agency of Canada, 2014). The impact of social environments on health has been described in depth in regard to social exclusion. Galabuzi (2004) confirms that bisexual people may experience social exclusion and this social exclusion is a form of stress that can negatively affect health. Social exclusion often results in an exclusion of needs (e.g. protection from discrimination), the opportunity to contribute to society, and the opportunity to have equal access to economic consumption of goods and services (Galabuzi, 2004). It is not uncommon for different aspects of social exclusion to occur together which may worsen health for the excluded group; for example, sexual minorities experiencing discrimination may also experience barriers to accessing health services and employment, inadequate housing, and isolation from society (Galabuzi, 2004). Furthermore, when socially excluded groups experience mental health problems, they may be apprehensive to seek mental health services if they feel that the stigma of having a mental health problem may worsen their marginalization (Galabuzi, 2004). All of these factors resulting from social exclusion may lead to poor mental health.

Therefore, it is important to reflect on both the biological and social aspects of mental health for a more complete understanding of someone's illness. It is also essential to shift the emphasis from the disease as being the problem to societal structures that create inequality as the problem. This view is more commonly known as a social model. For example, in the medical

model someone is labeled as having a disorder whereas in a social model the focus is on identifying barriers and developing solutions (Office for Disability Issues, 2010). In this thesis, the focus is on identifying experiences of biphobia which are thought to influence levels of anxiety and posttraumatic stress symptoms and determining factors that may protect against these symptoms following biphobia. It should also be noted that the outcomes of anxiety and posttraumatic stress are not being considered disorders but as symptoms on a continuous scale.

2.3. Overview of biphobia and discrimination

This next section will describe biphobia and discrimination and their impact on mental health. There is a large body of literature to support the effects of discrimination on mental health. There is less research specifically focusing on biphobia; however, this form of discrimination, prejudice, and stereotypes specific to bisexual peoples' sexual orientation is important to consider for this population. Before delving into more detail surrounding biphobia and discrimination, a few related terms will be defined for clarity. Firstly, stereotypes are widely held preconceived or oversimplified generalizations about a group of people that does not take into consideration individual differences within that group; they can be negative or positive (Green & Peterson, 2006) whereas prejudice refers to negative beliefs (unconscious or conscious) about a whole group of people and its members (Green & Peterson, 2006). A related term, discrimination, describes the unjust or prejudicial treatment of different categories of people by a more powerful social group (Green & Peterson, 2006). Discrimination may be structural in that it is based on norms and patterns of attitudes and behaviour in institutions or societal structures which is an obstacle for individuals aiming to achieve the same rights as the majority (Najcevska, n.d.). It may also be a major event or a daily occurrence. Green and Peterson (2006) state that "ongoing discrimination creates a climate of oppression for the affected group" (p. 3). Oppression is prolonged cruel or unjust treatment or exercise of authority by a group of people with social power over another group that is maintained by social beliefs and practices (Green & Peterson, 2006). Finally, marginalization is a type of oppression and a process of exclusion that refers to the social process of someone being made or kept powerless in society or in a group (Young, 2004).

2.3.1. Biphobia

Biphobia is a broad term for the prejudice, stereotypes, and discrimination experienced by bisexual people because of their sexual identity. There are several common manifestations of biphobia described in the literature. Firstly, bisexuals are often subject to monosexism. Monosexism is a term that describes the belief that individuals should only partner with individuals of one gender, specifically implying that heterosexuality and homosexuality are the only valid sexual orientations (Ross, Dobinson, & Eady, 2010). This is analogous to the construct of heterosexism which is a belief system that people should only partner with members of a different sex. This often leads to bisexuals feeling obligated to justify their sexual identity and can result in one questioning their bisexuality which may have emotional consequences such as low self-esteem (Dodge et al., 2012; Ross et al., 2010; Wright et al., 2011).

A second prevalent manifestation described in the literature is the stereotype that bisexuals are driven by sexual need, are promiscuous, and are always non-monogamous (Callis, 2013; Eliason, 1997; Klesse, 2005). Callis (2013) found that this stereotype stems from the belief that bisexual men are really gay men who want to find a man and that bisexual women are either pretending to be attracted to women to attract a man or will eventually leave a woman for a man. This of course is not accurate and Klesse (2005) argues that accusing a person of being promiscuous is highly gendered, classed, and racialized. The underlying assumptions in this belief are that a) having multiple partners is negative and b) that bisexual people are more likely than people of other orientations to have more than one partner which is not supported by empirical data (University Health Centre, 2013). Differences in acceptability of bisexuality by gender can be seen in a study by Eliason (1997) where he found that bisexual men were less acceptable to heterosexual undergraduate students than gay men and lesbians whereas bisexual women were more acceptable to heterosexual undergraduate students than gay men and lesbians. Eliason (1997) states that there are several factors that predict biphobic negative attitudes among heterosexuals such as not having bisexual friends or acquaintances, being young, having a conservative religion, and being homophobic. That being said, bisexuals are also subject to homophobia and heterosexism (Ross et al., 2010) because they are also attracted to and may be partnered with same-gendered individuals, and therefore may be perceived as gay.

This difference in acceptability by gender creates a double standard in bisexuality and to support this Callis (2013) states that bisexual women have become trendy and are considered to really be heterosexual, thus not real, while bisexual men are still considered to really be gay and therefore not a valid identity. Similar to Eliason's findings, a United States telephone survey showed that heterosexual adults had more negative feelings towards bisexuals than they did towards gay and lesbian people as well as various religious, racial, ethnic, and political groups (Herek, 2002). These negative feelings were related to participant characteristics, including higher age, less education, lower income, more religiosity, conservative political views, and lack of social integration with gay men or lesbians (Herek, 2002). These negative beliefs have also been noted in the gay community. For example, a study described that gay and lesbian people felt more negative towards bisexuals than did people who identify as bisexual (Friedman, 2013). Negative beliefs coming from the gay community will be discussed in more detail in the following paragraphs.

A third theme in regard to biphobia is invisibility. Invisibility is common among bisexuals as people generally assume that someone is straight or gay based on their partner at the time. This invisibility often adds burden for bisexuals because they have to repeatedly and explicitly disclose their sexual orientation compared to partnered gay or lesbian people who implicitly disclose their sexual orientation by disclosing the gender of their partner(s) (Ochs, 1996; Ross et al., 2010). This invisibility may also result in others questioning their sexual orientation if they are in a monogamous relationship (Ross et al., 2010). Invisibility may also be a strategy employed by bisexual individuals in order to avoid biphobia (Ochs, 1996). This compartmentalization of identity based on the environmental context may be necessary to ensure one's safety but it has also been argued to strengthen the sexual binary that bisexuals are trying to overcome because it results in bisexuals not being visible in the community and in national dialogue (Callis, 2013). This may also lead to a lack of bisexual community which has been found to lead to sadness or loneliness (Dodge et al., 2012).

A final theme found in the literature on biphobia was the concept of bisexuals as being dangerous. Callis (2013) found that it is a common belief that bisexuals are disease transmitters. This in part stems from the belief that bisexuals are promiscuous and really only want men in the long run. It is also commonly believed that bisexual men brought HIV/AIDS into the

heterosexual community (Callis, 2013; Ross et al., 2010). As a result of all of these manifestations of biphobia, bisexuals are often not accepted as part of the gay community, despite the recognition of the acronym LGBT (Callis, 2013). This has been illustrated by lesbians' attitudes towards bisexual women where 75% of lesbians believed that bisexuality is not a stable identity, 60% believed that bisexuals are less committed to relationships with women than lesbians are, and most lesbians stated that they would not date a bisexual woman (Rust, 2003). Rust (2003) explains that bisexuals may be accepted into the gay community initially if it is believed that they will eventually come out as gay but once it is evident that that is not the case then they will become excluded from the gay community. It has been argued that this is the case in part because lesbians and gay men have historically fought for their rights together and they feel that they need to keep an explicit boundary between themselves and straight people; this boundary becomes less clear when bisexuals are involved (Ochs, 2005). In addition, some people in the LGBTQ community feel that bisexuals take advantage of having straight privilege and are not committed to the LGBTQ community (Ochs, 2005). This assumption is problematic because bisexuals who feel invisible may be confused as taking advantage of straight privilege so while they may be viewed negatively by the gay community, in reality they may be committed to the LGBTQ community and would like to feel more visible (i.e. just because someone has the potential to "pass" as straight does not mean that they want to be seen as straight). A common sentiment shared by bisexual people who have been excluded from the gay community can be seen in this quote by Denise Ingram, a 41 year old bisexual women, "When bigotry comes from the straight community, it's hurtful. But when it comes from the gay community, it's worse—because they should understand" (Philadelphia Magazine, 2012, para. 4). These experiences of biphobia may negatively impact one's mental health similar to discrimination more generally.

2.3.2. Discrimination in sexual minorities

Bisexual people may also experience discrimination based on other aspects of themselves and in general, discrimination can negatively impact mental health in a number of ways. Ross et al. (2010) explain that discrimination can impact mental health directly and indirectly – directly through anxiety from fear of violence and indirectly by decreasing self-esteem. Similarly, an older study found that social discrimination predicted psychosocial distress in Latino gay and bisexual men through social isolation and low self-esteem (Diaz, Ayala, Bein, Henne, & Marin,

2001). Correspondingly, discrimination as well as anti-gay verbal harassment and physical violence were found to be associated with low self-esteem in gay and bisexual men in the Southwestern United States (Huebner, Rebchook, & Kegeles, 2004).

A meta-analysis found that discrimination is not strongly associated with any particular mental health outcomes but instead is equally strongly related to many mental health outcomes (Pascoe & Smart Richman, 2009). Additionally, bisexuals are often considered to experience extra or 'double' discrimination because they experience discrimination from both the heterosexual and gay communities (Ochs, 1996; Wright et al., 2011). This was supported in the qualitative interviews conducted as part of the *Risk & Resilience Study* when participants described discrimination from the gay community and a lack of bi community. It has also been suggested that it may be more difficult for bisexuals to confront sexual identity discrimination because in order to do so one must disclose their identity whereas for other types of discrimination that may not be necessary (Platt & Lenzen, 2013).

Bisexuals can also experience discrimination based on other identities that they may hold such as racialized or ethnic identities and gender identities (Ross et al., 2010). When considering all forms of discrimination, it was found that 76% of gay and bisexual people compared to 65% of heterosexuals have experienced discrimination (Mays & Cochran, 2001). Interestingly, only 42% of gay and bisexual people attributed their experiences of discrimination to their sexual orientation (Mays & Cochran, 2001). In addition, an American study examined different forms of discrimination in the general population and found that 20% experienced discrimination based on sexual identity while 67% were discriminated against based on race, 51% were discriminated against based on gender, and 50% were discriminated against based on social class (Grollman, 2012). In the same study, 60% of people reported two or more types of discrimination (Grollman, 2012).

In a study of gay and bisexual men in New York, it was found that discrimination type and yearly prevalence based on participant's attribution was as follows: 62.6% sexual orientation, 17.7% income or socioeconomic position, 37.8% race or ethnicity, 7.1% HIV status, 28.9% age, and 9.9% gender (Gamarel, Reisner, Parsons, & Golub, 2012). However, this study also found that attributing discrimination to race or ethnicity, gender, age, sexual orientation, or

HIV status was not statistically significantly associated with mental health problems (depression and anxiety symptoms) when controlling for socio-demographic characteristics other than the variable related to the type of discrimination (Gamarel et al., 2012). Conversely, they did find a relationship between discrimination based on income or socio-economic status and depression and anxiety symptoms (Gamarel et al., 2012). These results may not be generalizable because the participants were sampled from a LGB community event in New York City and were limited to men. Overall, it has been suggested that many forms of discrimination and oppression are interconnected; therefore, in order to completely eliminate discrimination based on sexual orientation, there also needs to be progress in eliminating other forms of discrimination (Ochs, 1996). However, this is beyond the scope of this thesis.

In a recent study in New York, it was found that discrimination often resulted in major life changes such as moving, switching schools, asking for money (e.g. when fired), and altering well-established routines as well as compromising one's sense of safety and security (Alessi, Martin, Gyamerah, & Meyer, 2013). These major changes and concerns of safety and security have the potential to negatively affect one's mental health, particularly in regard to levels of anxiety. Similarly, studies examining institutional, or structural, discrimination have found that individuals considered moving to different states or countries to avoid discriminatory laws, in particular bans on same-sex marriages (Hatzenbuehler, McLaughlin, Keyes, & Hasin, 2010; Rostosky, Riggle, Horne, Nicholas Denton, & Huellemeier, 2010). Rostosky et al. (2010) describe that in response to the bans, LGB people felt fearful about protecting their relationships and families, felt hopeless, were hurt by the negative messages in the media about LGB people, and felt isolated. Despite this, they describe how LGB people also felt optimistic, hopeful, and more determined to fight for their rights and to move forward by creating conversations surrounding the issue (Rostosky et al., 2010).

Similarly, in a national study, Hatzenbuehler et al. (2010) found that generalized anxiety disorder in LGB people increased by 248.2% in states where a same-sex marriage ban was implemented. This is in comparison to states with no same-sex marriage bans where he found that there was no significant increase in anxiety among LGB people (Hatzenbuehler et al., 2010). He also found no increase of the same level among heterosexual people in the aforementioned states (Hatzenbuehler et al., 2010). In a more recent study, it was shown that anti-gay prejudice

in communities (a form of structural stigma) was related to sexual minority peoples' life expectancy where sexual minority people had on average 12 years shorter life expectancy in communities with high anti-gay prejudice compared to communities with low anti-gay prejudice (Hatzenbuehler et al., 2014). Hatzenbuehler et al. (2014) described that people in the high anti-gay prejudiced communities had significantly higher risk of suicide, homicide or violence, and cardiovascular disease. This shows the importance of taking into consideration structural discrimination as well as interpersonal discrimination when examining bisexual peoples' mental health.

Even though some studies did not find a relationship between discrimination and mental health, discrimination can potentially affect mental health by resulting in negative feelings such as loneliness and depression as well as low self-esteem and isolation (Ash & Mackereth, 2013). Ash and Mackereth (2013) explain that it is important for people's well being to be accepted; it has been found to be particularly difficult when one's sexual identity was thought to be accepted but in reality it was not. This was illustrated by Platt and Lenzen (2013) in their discussion of microaggressions. Microaggressions are brief verbal, behavioural, or environmental communications that may be intentional or unintentional but cause someone to feel shame because the messages are hostile, derogatory, or negative (Sue et al., 2007). This may include using heterosexist language; Fordham University (n.d.) provides the example of explaining to students that "magnets are attracted to each other like males and females" (para. 9). In their study, Platt and Lenzen (2013) showed that it was especially hurtful when individuals such as family members were neutral or supportive of their identity until they were in a relationship. These initially supportive individuals were revealed to actually be unsupportive because the partnership dismissed the belief that their identity was not stable; this is an example of a behavioural microaggression. Platt and Lenzen (2013) support that microaggressions are generally subtle forms of discrimination that come from well-meaning people. Despite the meaning behind the discrimination, it may still affect one's mental health. For example, a study examining the effects of subtle heterosexism on LGB people found that those experiencing more subtle heterosexism were less likely to come out (Burn, Kadlec, & Rexer, 2005) and disclosing one's sexual identity has largely been associated with better mental health outcomes (Koh & Ross, 2006; Schrimshaw, Siegel, Downing, & Parsons, 2013; Walker, Hernandez, & Davey, 2012).

2.4. Limitations of current literature

A recent content analysis of use of the term bisexuality in the scientific literature highlights several limitations that exist within the current literature. Firstly, the authors note that most studies mentioning bisexuality studied sexual minorities in general and results often combined bisexual people with gay and lesbian people to increase sample size and power (Kaestle & Ivory, 2012). This is consistent with findings from the literature review that was conducted for this thesis. In fact, they found that fewer than 20% of the articles analyzed data for bisexuals separately (Kaestle & Ivory, 2012). Reasons suggested for doing this were to simplify analyses or because of an assumption that bisexuals and gay and lesbian people are equivalent or that bisexuality is a transitional phase between identifying as straight and gay (T. Israel & Mohr, 2004; Kaestle & Ivory, 2012). More recent studies that analyzed bisexuals separately have shown higher rates of many mental health problems compared to lesbian women but not gay men. In the future, these populations should be studied or analyzed separately because pooled analyses mask any differences that may exist between the populations. Research supports that bisexuals have unique challenges such as biphobia, monosexism, and invisibility that may put them at increased risk for many health problems (T. Israel & Mohr, 2004; Meyer, 2003; Rodriguez Rust, 2002). These unique challenges provide further support for separate analyses focusing on bisexuals in the future.

To reiterate section 2.1, another common concern throughout the literature is the issue of measuring bisexuality. Many studies have measured bisexuality based on behaviour. This is an issue for several reasons; the first being that bisexual individuals are required to have more partners to be included than gay, lesbian, or heterosexual individuals because inclusion is based on whether or not they have had same-sex and other-sex partners in the study period (Bauer & Brennan, 2013). This multiple partnerships requirement in itself may affect estimates for many health outcomes (Bauer & Brennan, 2013). In addition, bisexuals may be incorrectly categorized as lesbian, gay, or heterosexual according to their partnerships at the time of the study (Kaestle & Ivory, 2012). Other studies have measured bisexuality based on self-identification. This method may also be insufficient by excluding those who are not willing to self-identify (Kaestle & Ivory, 2012). In reality; however, there is no one measure of bisexuality that will perfectly capture all individuals at any given time but it has been supported that self-identification is generally

preferred over behavioural measures.

Finally, it was found that much of the available research is phrased in such a way that promotes stereotypes and prejudices about bisexuals. Kaestle and Ivory (2012) determined that 20% of articles framed bisexuality as an ‘infection bridge’ or as a vector of diseases which promotes stereotypes of promiscuity while only 18% framed bisexuality as a legitimate identity. It is important to have new research that supports bisexuality as a valid identity and provides information about their health needs that can be framed in a helpful way.

CHAPTER 3: CONCEPTUAL MODEL

The conceptual model for this thesis incorporates aspects from two different theories - minority stress theory and resiliency theory which will be outlined below. It also builds off of past research, the knowledge of the *Risk & Resilience* research team, and the qualitative interviews from the *Risk & Resilience Study*. In order to assess if the information in the interviews was consistent with the conceptual model, interview summaries were examined as well as quotes in the interviews pertaining to mental health, discrimination, stress, and violence. This section will conclude with the conceptual model designed for this thesis.

3.1. Minority stress theory

Minority stress theory describes how minority groups are stigmatized and that this stigmatization is related to high levels of stress. It encompasses both externally stressful events as well as the internalization of society's negative attitudes (Meyer, 2003). This theory postulates that sexual minorities experience more mental health problems than heterosexual people because they have additional stressors specifically related to sexual orientation such as discrimination and poor social support. These stressors are in addition to everyday general stressors that people may experience regardless of their sexual orientation. This additive stress can be chronic when it stems from social inequities (Benibgui, 2010). As previously mentioned, bisexuals may experience more minority stress than gay and lesbian people since they may be socially isolated from both the gay community and the heterosexual community. For example, this may occur when gay men, lesbians, and heterosexuals question whether bisexuality is a legitimate identity (Lewis, Derlega, Brown, Rose, & Henson, 2009). This was also supported by the finding that heterosexual people felt more negative about bisexuals than they did about gay men or lesbians (Lewis et al., 2009, p. 8). The minority stress theory (Figure 1) may be one way to understand the higher prevalence of anxiety and discrimination previously found in this population.

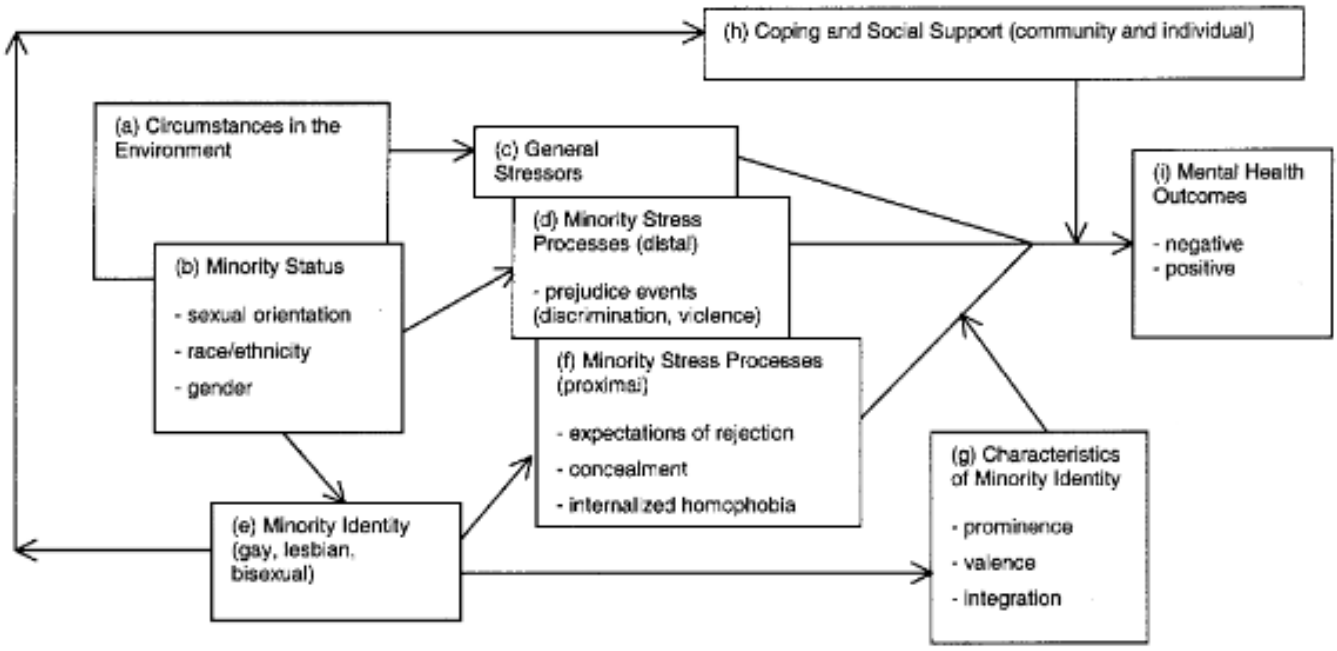

Figure 1. Minority stress theory (Meyer, 2003)

This framework begins with the environment which affects general stressors experienced by everyone regardless of sexual orientation such as employment instability. In addition to these stressors, people with minority identities such as sexual minorities experience minority stress processes. There are four processes including the distally externally stressful events such as discrimination and the more proximal expectations of rejection and prejudice events, concealment of one's sexual orientation, and the internalization of society's negative attitudes (internalized homophobia). Individuals who identify as sexual minorities may also have other minority statuses such as a racialized identity. These characteristics are considered minority statuses because they have been marginalized based on social inequities; they may or may not be characteristics that people identify as. Different combinations of minority identity and minority statuses may affect what minority stress processes someone is exposed to. For example, bisexual men have been shown to experience more violence and harassment whereas bisexual women had more family-related stress (Lewis, Derlega, Berndt, Morris, & Rose, 2001).

These general stressors and minority stress processes additively combine to affect mental

health. Discrimination, rejection, concealment of sexual orientation, and internalized homophobia have all been linked to poor mental health (James et al., 2012; Kertzner, Meyer, Frost, & Stirratt, 2010; Koh & Ross, 2006; Newcomb & Mustanski, 2010; Schrimshaw et al., 2013; Walker et al., 2012). This added stress may lead to worse mental health. Alternatively, this stress may help someone develop resilience if they can overcome it. Similarly, poor coping skills and low levels of social support may lead to poor mental health. Sexual minority status in itself may also impact levels of social support available. For example, the presence of a supportive gay community may be a source of social support. Conversely, bisexual people may have lower levels of social support due to a perceived lack of bisexual community.

Similarly, characteristics of minority identity may increase or lessen the negative effects of the minority stress processes. For example, minority stresses may worsen mental health more so for someone who has a prominent sexual minority identity compared to someone whose sexual orientation is secondary in the identities that they hold (Meyer, 2007). In addition, valence refers to how someone evaluates and validates their identity (Meyer, 2007). If someone feels that their identity is valid then they may be more resilient to the additional stress. Finally, integration refers to the assimilation of multiple identities and has been associated with better mental health outcomes (Meyer, 2007). For instance, integration may be when someone has a strong sexual minority identity and racial/ethnic identity.

This thesis incorporates minority stress theory by focusing on bisexuals, who are a sexual minority, and describing how bisexuals experience distal minority stress processes, in particular discrimination based on their sexual orientation in the form of biphobia. It will also take into consideration bisexual peoples' gender (minority status) to examine if experiences of biphobia are different for bisexuals of different genders. This will be discussed in more detail later. The impact of the minority stress process will be evaluated in relation to anxiety symptoms and posttraumatic stress symptoms. It is thought that the minority stress process of biphobia will increase mental health symptoms but also that the effects of biphobia may be reduced for people who volunteer (potentially a form of coping), identify and are involved with the LGBTQ community (a potential source of social support), and have a positive bisexual identity (characteristic of minority identity). However, one limitation is that this thesis will not take into consideration general stressors despite their inclusion in the minority stress model. This is

because the data were not available in the survey.

3.2. Resiliency theory

The concept of resilience has changed over time. Originally, resilience was thought to reflect individual characteristics, familial characteristics, and community characteristics; however, it is now considered to be a dynamic process (Freitas & Downey, 1998; Luthar, Cicchetti, & Becker, 2000; Luthar & Cicchetti, 2000). Luthar et al. (2000) define resilience as "a dynamic process encompassing positive adaptation within the context of significant adversity" (p. 543). More recently, it has been defined as "a style of behaviour with identifiable patterns of thinking, processing, and adaptation to traumatic stress" (Agaibi & Wilson, 2005, p. 197). It has been shown that this adaptation may occur in different areas of a person's life depending on the person and the circumstances (Freitas & Downey, 1998; Luthar et al., 2000). For example, one person may show resilience in their social life but not in their educational environment and this resilience may fluctuate over time. Individuals are constantly adapting to new situations and adversities and this adaptation may develop new strengths or negatively affect development. Nonetheless, Luthar et al. (2000) provide some evidence of stability of resilience over time, that is, resilient children generally remain resilient over time.

Resiliency can be viewed in many different ways. For instance, depending on the outcome, resiliency may be viewed as a lack of mental health problems or alternatively as excelling in a domain such as education after experiencing adversity (Luthar & Cicchetti, 2000). In an Australian study, characteristics that demonstrate resiliency such as self-confidence, optimism, decisiveness, being solution-focused, having a strong sense of purpose, and being persistent were found to be negatively associated with anxiety and depression (Bitsika, Sharpley, & Peters, 2010). These characteristics, although not guaranteeing resilience, are implicated in the dynamic process of adapting to adversity. In addition to characteristics, personality and coping strategies have also been found to be important in demonstrating resilience (Agaibi & Wilson, 2005). In general, resilience is a very complicated concept because there are many interactions between different factors resulting in different levels of resiliency depending, for example, on the person, the trauma, the way they perceive the trauma, and the way they react to the trauma (Agaibi & Wilson, 2005). This complexity can be seen below in Figure 2. Overall, resiliency

theory emphasizes developing strengths without minimizing the problems (Luthar & Cicchetti, 2000). Developing resilience as a method of prevention is important because it may reduce the burden on developing treatment strategies to address health problems following adversities.

Resilience is a central theme in this thesis because this thesis is examining protective factors (moderators) against anxiety and posttraumatic stress symptoms for bisexuals who may experience biphobia. As DiFulvio (2011) states, protective factors are "processes that foster resilience" (p. 1612). This thesis will be limited to the mobilization and utilization of protective factors (part (e) in the "activation of allostatic stress response" section of the above model) in the concept of resilience. This is in part due to the complexity of resilience and also because many of these aspects of resilience can be learned, for example, though training programs (Agaibi & Wilson, 2005). By way of illustration, there are programs available to help individuals increase their self-esteem and develop a positive identity (Igartua, Gill, & Montoro, 2003; Southwick & Charney, 2012). Therefore, these protective factors may largely be considered as intervenable factors. Resilience in this thesis can be viewed as lower levels of or an absence of anxiety symptoms or PTSD symptoms after experiencing biphobia. Taking a resiliency focused approach is important for this population because the majority of the research currently uses a risk factor approach. As DiFulvio (2011) argues, it is important to know risk factors; however, our knowledge is incomplete without an understanding of how to overcome adversity.

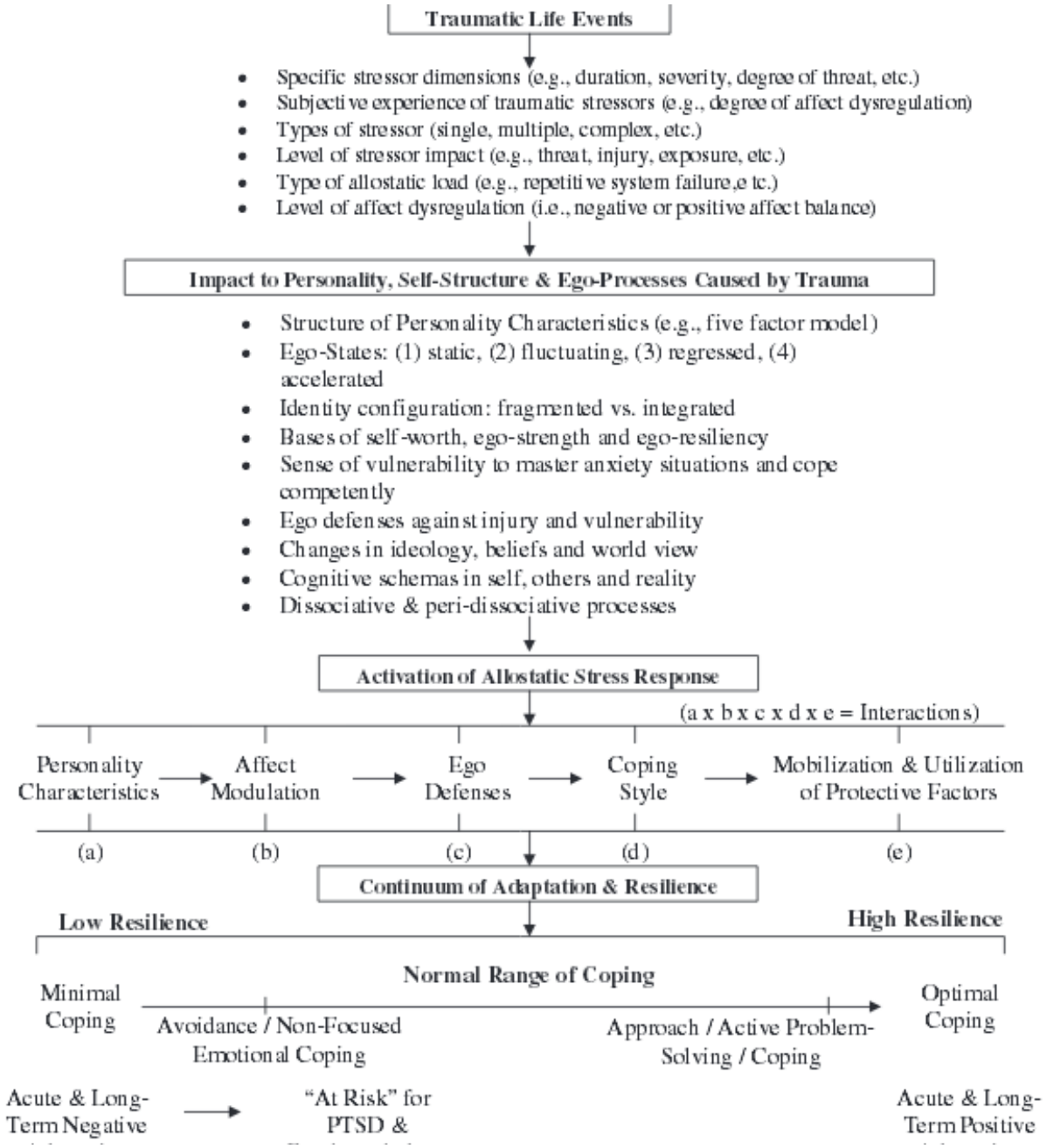

Figure 2. A model of resilience in response to psychological trauma (Agaibi & Wilson, 2005)

3.2.1. Potential protective factors against anxiety and PTSD following discrimination

There are several factors in the relationship between discrimination and/or biphobia and anxiety that have been examined in the literature and could potentially be protective. These factors have been limited in this analysis in part based on what data are available in the *Risk & Resilience Study*. The *Risk & Resilience Study* survey questions were selected based on the theoretical model developed for the pilot study (Ross et al., 2010). Based on this model,

intrapersonal factors such as internalized biphobia, interpersonal factors such as social support, and social factors such as biphobia were included in the survey whereas personality factors such as optimism, for example, were not (Ross et al., 2010). It was decided that this thesis would focus on three specific factors because of their potential usefulness for the LGBTQ community, service providers, and researchers in addressing mental health problems associated with biphobia. The three potential protective factors that will be examined are identification and involvement with the LGBTQ community, positive bisexual identity, and volunteering, advocacy, or activism.

Identification and involvement with the LGBTQ community

In a study examining resiliency in veterans, Pietrzak and Cook (2013) found that resilient veterans were more socially engaged than non-resilient veterans. The authors measured social engagement by the frequency that participants visited family and friends and considered resilience as lower levels of anxiety and PTSD. Additionally, a study in New York found that bisexuals who were more socially connected to the community had better social well-being (Kertzner et al., 2010). However, it has been stated that social connectedness may be more difficult for sexual minorities because they may feel that some locations are not safe places to be out (DiFulvio, 2011). This may result from a lack of acceptance by gay or lesbian people, or experiences of biphobia from the gay community; supposedly part of the LGBTQ community. It is hypothesized that connectedness to a bisexual community would be beneficial but there is currently a lack of developed "bi community" in most areas. A meta-analysis supports the potential for community identification to have positive or negative effects; several studies found that group identification buffers against poor mental health stemming from discriminatory experiences, although, several other studies found no effect and the opposite effect (Pascoe & Smart Richman, 2009). Specifically, it was found that 18% of studies reported a positive effect of group identification on mental health, 12% found a negative effect, and 71% found no effect (Pascoe & Smart Richman, 2009). For these reasons, it is plausible that identification and involvement with the LGBTQ community may be either protective or harmful for bisexual peoples' mental health or, alternatively, it may not have an effect.

Nonetheless, DiFulvio (2011) explains that community connectedness can be important

for sexual minority youth because it gives people a sense of belonging, purpose, and pride and facilitates advocacy and activism on their behalf against oppression or discrimination that they may experience. It may also be beneficial because it may give one a sense of group identity in a socio-historical context that can be empowering and lead to better health outcomes (DiFulvio, 2011). Similar results were also found in regard to the significance of remaining connected to one's culture following trauma (Johnson, Thompson, & Downs, 2009). Johnson et al. (2009) describe that by being connected to the community, many experiences became normalized which helped people reframe their experiences in a way that helped them become resilient (for example the belief that if someone else could get through this then so can they or that their experiences were not as bad as others which made them feel grateful).

Positive bisexual identity

In this thesis, positive bisexual identity is represented by someone feeling that their bisexual identity has conferred advantages in their life. For example, their identity may have helped them find meaning in life, increased their self-reflection, provided unique experiences, improved their relationships, and increased their appreciation for others (see Appendix A for a complete list of factors considered to be related to positive identity). Someone may have a more positive identity when these favourable outcomes are associated with their bisexual identity because they feel that their bisexual identity is beneficial in their life.

Conversely, Igartua et al. (2003) explain that a negative self identity can cause anxiety whether or not one is out. In their Canadian study, they found that internalized homophobia accounted for 13% of the variance in anxiety for LGBQ individuals (Igartua et al., 2003). Brubaker et al. (2009) explain that internalized heterosexism or biphobia can lead to anxiety because negative beliefs about oneself that are perpetrated by society are accepted as part of how they view themselves and this personal schema may conflict with their sexual desire. Correspondingly, a meta-analysis demonstrated a small to moderate correlation between internalized homophobia and anxiety (Newcomb & Mustanski, 2010). In general, the literature largely supports that self-esteem is negatively correlated with anxiety, regardless of sexual orientation.

Just as a negative self identity may lead to more anxiety, having a positive identity may

lead to less anxiety. For example, a study in New York found that bisexuals with a more positive sexual identity had better social well-being (Kertzner et al., 2010). Correspondingly, a recent study found that resolving internalized homophobia improved health outcomes compared to those who did not resolve their internalized homophobia for men who have sex with men (Herrick et al., 2013). Although a lack of internalized biphobia, homophobia, or heterosexism may not necessarily indicate a positive bisexual identity, it is hypothesized that a positive identity may lessen anxiety after experiencing discrimination or biphobia. It is thought that someone with a positive identity may not perceive or respond to discrimination in the same way as someone with a negative LGBTQ identity; for example, it may be less likely to affect their self-esteem and they may be more likely to challenge the discrimination.

Volunteering, advocacy, or activism

Using data from the pilot study, Ross et al. (2010) found that advocacy and activism were important individual level factors influencing mental health. To quote one participant, "[Speaking to others about bisexuality] helped me immensely. Just being able to tell my story to other people was really beneficial, I think. Because after every lecture that I did, there was [*sic*] always a couple people in the group that [would] come up and talk to me and say, 'I've never heard a bisexual person speak before, that was really powerful.'" (Ross et al., 2010, p. 500). Overall, many participants found their experiences of volunteering, advocacy, or activism to be gratifying. Additionally, in the veteran resiliency study mentioned above, the authors found that veterans with less anxiety and PTSD following traumatic experiences were more altruistic (volunteer on a weekly basis and/or help others with instrumental activities of daily living) than non-resilient veterans (Pietrzak & Cook, 2013).

An earlier study by Musick and Wilson (2003) describe several reasons why volunteering may promote good mental health. They state that volunteering may increase social support by improving access to social and psychological resources, encouraging social integration, fostering trust and a sense of security and acceptance, and increasing interaction with a variety of people which may increase social networks (Musick & Wilson, 2003). This is important because social support has been found to improve mental health. Additionally, volunteering may help build self-esteem, self-efficacy, and personal skills which can lead to a sense of pride, sense of purpose,

and structure which can be important for mental health (Musick & Wilson, 2003). More recently, a meta-analysis was conducted and it suggests that volunteering may be beneficial for mental health but the mechanisms are not clear and there is not enough evidence to show a consistent effect of volunteering on mental health (Jenkinson et al., 2013). Conversely, it has been noted that the positive effects may be limited when the volunteer does not feel any benefit and when they feel burdened because of a busy schedule (Wood, 2013). Therefore, volunteering may promote or have a negative effect on mental health although a positive effect has been reported more often.

The majority of the above research used anxiety as an outcome. There is considerably less research focusing on PTSD. The limited information on possible protective factors in the relationship between biphobia and PTSD in sexual minorities was noted above and the conclusions largely correspond with the findings surrounding the proposed moderators for anxiety. This and other sections of the thesis that focus on PTSD symptoms are exploratory, therefore, the same moderators will be considered for anxiety and PTSD symptoms. This is also reasonable as PTSD is considered an anxiety disorder.

3.3. Conceptual model

After taking into consideration theories, previous research, the advice and knowledge of the *Risk & Resilience* team members, the advice and knowledge of my supervisory committee, the qualitative interview summaries and excerpts from the *Risk & Resilience Study* related to violence, stress, discrimination, and mental health, an integrated conceptual model (Figure 3) was developed. This model demonstrates that biphobia from the straight and gay communities will impact anxiety. In addition, biphobia interacts with identification and involvement with the LGBTQ community, positive bisexual identity, and volunteering, advocacy, or activism to moderate the role of biphobia on anxiety symptoms. The same model will be used to explore these relationships for both anxiety and PTSD symptoms as outcomes.

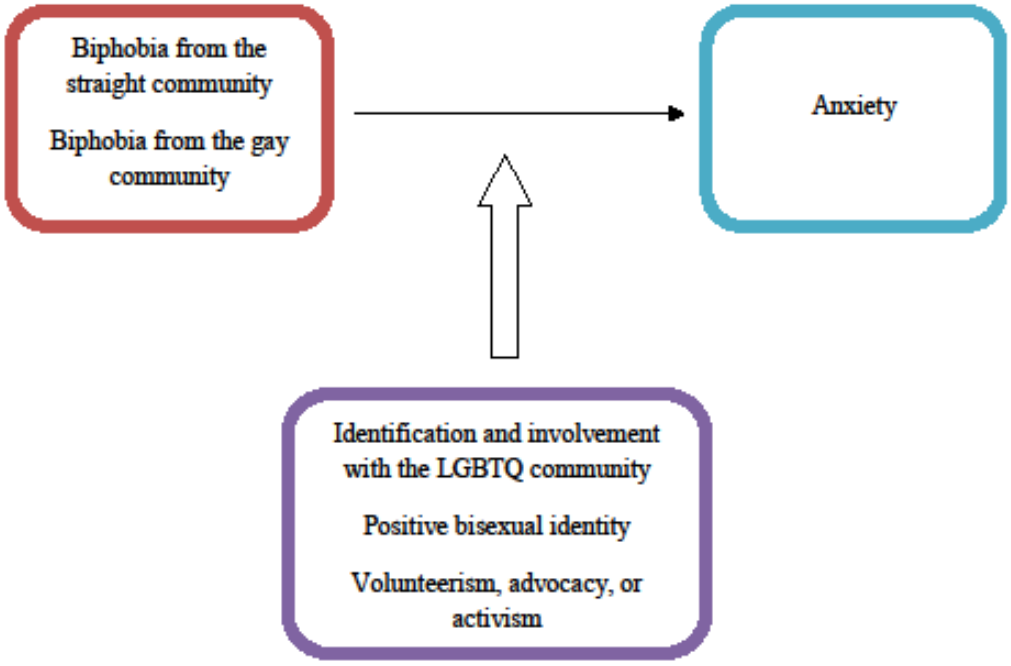

Figure 3. Integrative conceptual model for protective factors against anxiety following biphobia

CHAPTER 4: METHODOLOGY

This chapter will describe the study design including the sampling method and the recruitment network structure. The data source was previously discussed in section 1.4. Data source: Risk & Resilience Study and will not be explored further. This chapter will also describe the measures being used and their coding as well as the data analysis including data quality, generating descriptive statistics and weights, and structural equation modelling (SEM).

4.1. Study design

4.1.1. Respondent-driven sampling

Given the inherent flaws of using convenience sampling to access hidden populations (e.g. not all bisexual people attend pride events) coupled with the inability to use random sampling for this population (Heckathorn, 1997; Magnani, Sabin, Saidel, & Heckathorn, 2005), sampling was done using respondent-driven sampling (RDS). RDS is a modified form of snowball sampling that connects participants through their social networks. Based on these connections, or

recruitment patterns, the sample is weighted to account for the non-random recruitment patterns (Heckathorn, 1997). This weighting is done using the probabilities of recruitment (better connected individuals are more likely to be recruited) to give more isolated individuals greater weight as they are likely standing in for a greater number of individuals who were not reached (Heckathorn, 1997). This sampling method is superior to traditional convenience sampling as it is more likely to reflect more isolated individuals in the analyses. A limitation; however, is that it cannot reach completely isolated, or non-networked, individuals.

Initially the sample is biased because it starts with the "seed" participants who may be sampled purposively. These participants then recruit new participants to create the first wave who can then recruit more new participants using uniquely numbered coupons to create additional waves. The issue of homophily, or the tendency of participants to recruit individuals similar to themselves in some way (Heckathorn, 2002), is addressed in this method by limiting the amount of people one person can recruit (Magnani et al., 2005). As the number of waves increase, the sample becomes more representative of the population until eventually equilibrium is reached. Equilibrium refers to a state where variable estimates remain stable (within 2%) during subsequent waves (Heckathorn, 1997; Magnani et al., 2005). This equilibrium usually occurs by the sixth wave regardless of the similarities or differences in the seeds (Magnani et al., 2005) although more diverse seeds tend to result in equilibrium being reached earlier (Heckathorn, 1997; Ramirez-Valles, Heckathorn, Vázquez, Diaz, & Campbell, 2005). In the *Risk & Resilience Study*, the seeds were selected purposively to represent diverse characteristics and a total of nine waves were completed. Once equilibrium is reached and the sample is weighted, it provides a good approximation of the population's characteristics.

RDS is a relatively new sampling method that was originally designed to be used when sampling hidden populations and has been shown to be effective in studies on HIV surveillance and intravenous drug use among gay men (Magnani et al., 2005; Ramirez-Valles et al., 2005). More recently, a CBR project led by Dr. Bauer studying the health of transgender Ontarians (Trans PULSE) effectively used RDS as a method to recruit participants (Bauer, Travers, Scanlon, & Coleman, 2012). In 2011, the *Risk & Resilience Study*'s recruitment began with 18 seeds. Fifteen of these seeds were members of the advisory committee and they were chosen to be diverse in regard to socio-demographic characteristics and geographic location within

Ontario. Later in the study, three additional seeds were added. In the *Risk & Resilience Study*, participants were limited to ten coupons each, allowing each seed to recruit up to ten other bisexual-identified individuals in their social network. Consistent with RDS methods, recruiters were compensated with $5 for each referral. Additional compensation of $20 was provided after survey completion.

4.1.2. Networks

A total of 405 people attracted to more than one sex and/or gender, aged 16 and older, and living in Ontario completed the survey and were included in the final study sample. By the end of recruitment nine waves were completed, not including the "seeds". The study originally began with 18 seeds and these seeds successfully recruited 71 participants in wave 1. The majority of participants (91 individuals) were recruited in wave 3 and this number slowly decreased with successive waves until wave 9 where only 1 new participant was recruited. The networks surrounding these seeds can be visualized as recruitment trees (Figure 4). The size of recruitment trees varied greatly among seeds with the smallest tree recruiting one participant and the largest tree recruiting ninety-three participants. In total, three seeds did not recruit any new participants. In the figure below, the squares are the initial participants, or seeds, and the circles are the participants they recruited and the participants their participants recruited and so on.

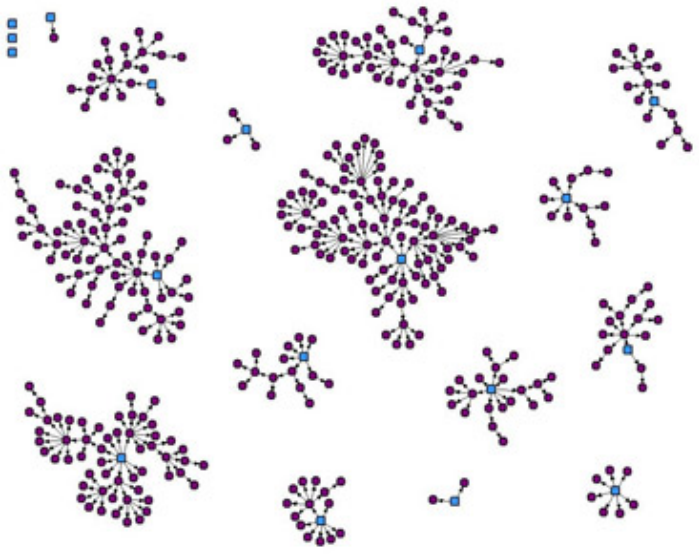

Figure 4. Recruitment trees for the Risk & Resilience Study (Centre for Addiction and Mental Health, 2011) developed by Dr. Greta Bauer

4.2. Measures

Measures used in this thesis include validated scales as well as self-report questions created for the *Risk & Resilience Study* by the research team and advisory committee members. These measures and any re-coding of the measures done for this thesis will be described below.

4.2.1. Outcomes

Overall Anxiety and Impairment Scale (OASIS)

The Overall Anxiety and Impairment Scale (OASIS) is a 5-item overall scale that measures four domains of anxiety symptoms; frequency, intensity, behavioural avoidance, and functional impairment (as measured by two questions) (Campbell-Sills et al., 2009). Potential response options for each item ranged from 0 (none) to 4 (extreme). This scale is one of the shortest scales available to assess anxiety (Campbell-Sills et al., 2009) and it demonstrated high internal consistency in the *Risk & Resilience Study* (Cronbach's alphas: 0.88). The specific questions used in the *Risk & Resilience Study* survey were: "In the past week, how often have you felt anxious?", "In the past week, when you have felt anxious, how intense or severe was your anxiety?", "In the past week, how often did you avoid situations, places, objects, or activities because of anxiety or fear?", "In the past week, how much did your anxiety interfere with your ability to do the things you needed to do at work, at school, or at home?", and "In the past week, how much has anxiety interfered with your social life and relationships?". These responses were then summed to create a total OASIS score that ranged from 0 to 25. Each item represents the four domains of anxiety symptoms while functional impairment is measured twice, creating a total score that may reach 25.

Campbell-Sills et al. (2009) determined that a cut-off score of eight is ideal for classifying individuals as possibly having an anxiety disorder. This cut-off value classified 87% of the sample correctly with 89% sensitivity and 71% specificity in their study (Campbell-Sills et al., 2009). This thesis; however, will examine anxiety as a continuous outcome because it was felt by the *Risk & Resilience* advisory committee that this would be more meaningful and less pathologizing than a binary outcome. We were interested in the severity of symptoms rather than

whether or not someone may have an anxiety disorder.

PTSD Checklist – Civilian Version (PCL-C)

The PTSD Checklist – Civilian Version (PCL-C) is a 17-item self-report scale that is used to predict clinical diagnosis of PTSD. The items on this scale closely follow the DSM-IV criteria for diagnosis but do not reference war veterans, unlike the original PTSD Checklist (PCL) (Ruggiero et al., 2003). Additionally, all of the questions comprising the scale make reference to a stressful experience from the past but do not indicate that this event must be life-threatening. In total, there are three domains (Re-experiencing, Avoidance, and Hyperarousal) with items that range from 1 (Not at all) to 5 (Extremely) that are summed to obtain a total score that ranges from 17 to 85. The specific questions from the PCL-C scale that were asked in the *Risk & Resilience Study* that fall into the re-experiencing scale are: "Repeated, disturbing memories, thoughts, or images of a stressful experience from the past?", "Repeated, disturbing dreams of a stressful experience from the past?", "Suddenly acting or feeling as if a stressful experience were happening again (as if you were reliving it)?", "Feeling very upset when something reminded you of a stressful experience from the past?", and "Having physical reactions (example: heart pounding, trouble breathing, or sweating) when something reminded you of a stressful experience from the past?".

The avoidance section of the scale contained the following questions: "Avoiding thinking about or talking about a stressful experience from the past or avoiding having feelings related to it?", "Avoiding activities or situations because they remind you of a stressful experience from the past?", "Trouble remembering important parts of a stressful experience from the past?", "Loss of interest in things that you used to enjoy?", "Feeling distant or cut off from other people?", "Feeling emotionally numb or being unable to have loving feelings for those close to you?", and "Feeling as if your future will somehow be cut short?" Finally, the hyperarousal subscale questions included: "Trouble falling or staying asleep?", "Feeling irritable or having angry outbursts?", "Having difficulty concentrating?", "Being "super alert" or watchful on guard?", and "Feeling jumpy or easily startled?". All of the above questions were framed to ask about these experiences over the last month. Internal consistency of this scale was high for the *Risk & Resilience Study* with Cronbach's alphas of 0.92. Ruggiero et al. (2003) suggest that either a cut-

off of 44 or 50 provides the best diagnostic efficiency; however, this scale has the highest level of diagnostic efficiency when using a mixed scoring system requiring individual symptom items to have a score of three or four to meet diagnostic criteria. In regard to the cut-off values, it has been suggested that using a lower cut-off value will be more clinically meaningful for civilians (Andrykowski, Cordova, Studts, & Miller, 1998; Blanchard, Jones-Alexander, Buckley, & Forneris, 1996). However, in this thesis PTSD will be examined as a continuous outcome where higher scores indicate more PTSD symptoms, similar to the analysis for anxiety.

Recently, the DSM-V was released (American Psychiatric Association, 2013b) and this has several implications for PCL-C as a future measure of PTSD. Firstly, events constituting a trauma are revised to include sexual violation along with exposure to actual or threatened death or serious injury (American Psychiatric Association, 2013a). The symptoms of PTSD predominantly remain the same from the DSM-IV; however, the diagnostic criteria are now divided into four sections as opposed to three. These sections are now labelled re-experiencing, avoidance, negative cognitions and mood, and arousal (American Psychiatric Association, 2013a). Additionally, only one avoidance criteria symptom as opposed to the previous three is now required for clinical diagnosis of PTSD. Moreover, three new symptoms were added in the new edition; persistent and distorted blame of self or others, persistent negative emotional state, and reckless or destructive behaviour (U.S. Department of Veterans Affairs, 2013a). As a result of these changes, the PCL-C is currently being revised and validated (U.S. Department of Veterans Affairs, 2013a). These changes will impact future research focussing on PTSD; however, at the time when the *Risk & Resilience Study* was being developed and administered, these changes were not publicized.

4.2.2. Exposure

Anti-Bisexual Experience Scale (ABES)

Experiences of biphobia were measured in the *Risk & Resilience Study* using the ABES. The ABES was developed to measure experiences of prejudice from heterosexuals as well as from gay and lesbian people (two subscales). It can be divided into three broad concepts – sexual orientation instability, sexual irresponsibility, and interpersonal hostility with questions in the scale describing each concept (Brewster & Moradi, 2010). For each question (Figure 5),

participants were asked to select how often they have had that particular experience "with gay and lesbian people" and "with straight (heterosexual) people". Possible response options included "1=Never", "2=Once in a while", "3=Sometimes", "4=A lot", "5=Most of the time", or "6=All of the time". By summing the responses to all of the items, a total ABES score was calculated (Brewster & Moradi, 2010). Similarly, the two subscales (gay and lesbian subscale: ABES_GL and straight subscale: ABES_St) were calculated by summing responses for the two sources of biphobia ("with gay and lesbian people" and "with straight (heterosexual) people"). These subscales each range from 17 to 102 when there is no missing data. This scale had good internal reliability in the *Risk & Resilience Study* (Cronbach's alphas: 0.84).

Factor 1: Sexual Orientation Instability
- People have addressed my bisexuality as if it means that I am simply confused about my sexual orientation (2)
- People have acted as if my sexual orientation is just a transition to a gay/lesbian orientation (18)
- People have acted as if my bisexuality is only a sexual curiosity, not a stable sexual orientation (20)
- Others have pressured me to fit into a binary system of sexual orientation (i.e., either gay or straight) (12)
- People have not taken my sexual orientation seriously because I am bisexual (23)
- When I have disclosed my sexual orientation to others, they have continued to assume that I am really heterosexual or gay/lesbian (14)
- When my relationships haven't fit people's opinions about whether I am really heterosexual or lesbian/gay, they have discounted my relationships as "experimentation" (35)
- People have denied that I am really bisexual when I tell them about my sexual orientation (25)

Factor 2: Sexual Irresponsibility
- People have treated me as if I am likely to have an STD/HIV because I identify as bisexual (26)
- People have treated me as if I am obsessed with sex because I am bisexual (57)
- People have assumed that I will cheat in a relationship because I am bisexual (21)
- People have stereotyped me as having many sexual partners without emotional commitments (28)

Factor 3: Interpersonal Hostility
- I have been alienated because I am bisexual (40)
- People have not wanted to be my friend because I identify as bisexual (17)
- I have been excluded from social networks because I am bisexual (6)
- Others have acted uncomfortable around me because of my bisexuality (38)
- Others have treated me negatively because I am bisexual (22)

Figure 5. Anti-Bisexual Experience Scale (Brewster & Moradi, 2010)

4.2.3. Moderators of primary interest

Identification and Involvement with the Gay Community Scale (IIGCS)

Identification and involvement with the LGBTQ community was measured using the 6-item IIGCS scale (Flores, Mansergh, Marks, Guzman, & Colfax, 2009). Several of the questions making up the scale were modified by the *Risk & Resilience* team from Flores et al. (2009) items

that were used to measure identity-related factors. These modifications were to make the questions more applicable for bisexual participants. The original phrasing will be noted in square brackets within each item. The items that make up the general attitudes and experiences section of this scale are: “It is very [very was not originally included] important to me that at least some of my friends are bisexual, gay, or lesbian”, “Being [gay or] bisexual makes me feel part of a community”, “Being [gay or] bisexual is important to my sense of who I am”, and “I feel very distant from the LGBTQ community [Over the past 12 months, how often did you go to a gay bar or dance club?]”. Possible response options include “Strongly disagree”, “Disagree”, “Neutral”, “Agree”, or “Strongly agree”. The final two questions that constitute this scale are “In the last six months, how often have you read a [gay- or bisexual-] LGBTQ-orientated paper, magazine, or zine [zine was not originally included]?” and “In the last six months, how often have you attended [gay or bisexual organizational] LGBTQ activities such as meetings, fundraisers, and political events?” Participants were able to select one of the following options: “Never”, “Once a month or less”, “Several times a month”, “Once a week”, or “Several times a week or daily”.

The total IIGCS score is calculated by summing the responses for each item and ranges from 6 to 30 (Flores et al., 2009). In the *Risk & Resilience Study*, the Cronbach’s alphas were 0.5466 and 0.5451 raw and standardized, respectively indicating moderate internal reliability. This may be in part explained by the modifications of the scale to focus on bisexuality and the target population because people may have felt distant from the LGBTQ community and like there is no bisexual community.

Positive LGBTQ Identity Assessment (PLGBTQIA)

Positive bisexual identity was assessed in the *Risk & Resilience Study* by using a modified version of the unpublished PLGBTQIA developed by Dr. Ellen Riggle (University of Kentucky). This scale consists of 24 items measured by Likert scales (Appendix A) that are summed to obtain a total score ranging from 24 to 120. The questions in this scale were modified by the *Risk & Resilience* team to focus on positive aspects of bisexual identity as opposed to positive aspects of LGBTQ identity more generally. Some questions that make up this scale include, “I am honest with myself about my bisexual identity”, “My bisexual identity and

experiences give me a unique perspective on life", "I have had better relationships with my friends because I share my bisexual identity", "I feel like an equal in relationships with a partner", "I speak out against prejudice and discrimination because of my bisexual identity", and "I appreciate the diversity of the LGBTQ community". This scale had high internal reliability within the study with Cronbach's alphas of 0.90.

Volunteerism, advocacy, or activism

This variable was determined by the question developed by the research team and Advisory Committee: "Do you engage in any volunteerism, advocacy, or activism (example: bisexual community building)?" which was a "yes/no" question.

4.2.4. Confounders and moderators of secondary interest

Age

Age was calculated by subtracting birth year (write-in option) from the year of study completion. Ages ranged from 16 to 71. Age is considered a confounder as it represents life-course factors associated with biphobia and anxiety. Many studies have found that youth are at increased risk for anxiety (McNair, Kavanagh, Agius, & Tong, 2005; Meng & D'Arcy, 2012) and that youth experience more biphobia (Eliason, 1997; Lehavot & Simoni, 2011).

Gender identity

Gender identity was determined by the question "Which of the following describes your present gender identity?" and the options given were "2-spirited", "Bigendered", "Crossdresser", "Genderqueer", "Man", "Trans man", "Trans woman", "Woman", and "You do not have an option that applies to me" which was a write-in option. Participants could select more than one option. This variable was re-coded into five categories: man, woman, genderqueer, bigendered, and 2-spirited because research has shown that men and women experience biphobia very differently (Eliason, 1997) and that men and women have different risks for anxiety (Bao & Swaab, 2010). This is also the basis for considering gender identity as a moderator. These categories were included in the model as five separate variables as opposed to one variable with five different categories and a reference group because there was considerable overlap between

the categories; the latter method assumes that each level is mutually exclusive.

Genderqueer was kept as its own category because people who identify as genderqueer do not fit into a binary category of male or female. Similarly, bigendered people may identify as a man, woman, or another gender at different points in time so it is not possible to re-categorize them explicitly as man, woman, or genderqueer. Furthermore, 17 people responded that they have a bigendered identity which was deemed as adequate to analyze as a separate group while 53 people identified as genderqueer. In addition, 2-spirited people were kept as their own group since they may experience biphobia differently than people with other gender identities. In total, 23 people identified as 2-spirited.

In regard to re-coding, trans man was re-coded as man and trans woman was re-coded as woman because that is the gender they currently experience biphobia as. This is a limitation because it assumes that trans people are read as those genders by other people which may not be the case. However, it may also be possible that cis-gender people (people whose gender corresponds with their sex at birth) do not pass as the gender that they identify as. It is conceivable that trans people may experience biphobia differently than people with other gender identities but there were not enough trans identified people to analyze as a separate category for trans men and trans women. Crossdressers were not re-coded because everyone who selected crossdresser also selected another category and there was not an adequate amount of people who identified as crossdressers to analyze as a separate group. Two participants did not select any of the given options but wrote-in that they are masculine in presentation and experience that privilege so they were re-coded as men. Four participants responded only as another option that was not given (undefined, questioning, vamp, agendered) and could not be re-coded into any of the above broader categories so they were re-coded based on their sex at birth. This is a limitation because it is impossible to know how these people are read by others and how they may experience biphobia based on their gender. However, there were not enough people to have a separate category for additional gender identities and they did not select any other gender identities; therefore, their sex at birth was the most information available.

Income-to-needs ratio

Income-to-needs ratio was calculated by dividing the midpoint of each category for

household income given as an option in the survey under the question "What was your combined household income before taxes last year?" by the number of people supported by that household income which was a write-in response. This method was used by Winkleby and Cubbin (2003) because the same household income may provide more resources for a small family compared to a large family, therefore, it is important to take into consideration family size. A value of $134,900 was used as the midpoint for the household income category of "Greater than $100,000" because that was the average income for the top 10% of Canadians based on the 2011 National Household Survey (Statistics Canada, 2013). Income was then re-categorized into 3 groups for descriptive purposes. The first income-to-needs category ranges from $1,000 to $12,500 per person because $1,000 was the minimum ratio and $12,500 was the 25th percentile. The second category ranges from $12,501 to $35,000 per person which was the 25th to 75th percentile and the third category ranges from $35,001 to $134,900 per person which was the 75th percentile to the maximum income-to-needs ratio. The categorical version of the income-to-needs ratio was used for descriptive purposes only. Income-to-needs ratio (continuous) was considered a confounder because lower income has been associated with anxiety (Meng & D'Arcy, 2012) and more harassment and rejection (Lehavot & Simoni, 2011). The continuous income-to-needs ratio was rescaled in the analyses by dividing the ratio by 1000 as the variances were too large and the model would not converge (L. K. Muthén, 2011).

Relationship status

Relationship status was determined by the check-all-that-apply question "Which best describes your current relationship status?" and the options given were "single and wish to be partnered", "single and wish to stay that way", "divorced", "dating", "married/partnered", "married/partnered and dating", "married/partnered and play with others", "multiple casual relationships", "multiple committed relationships", "one primary partner and at least one casual", "separated", "widowed", and "other". This variable was then re-coded into three categories: no committed partners, one committed partner, and multiple committed partners. One committed partner comprised of the option "married/partnered" while multiple committed partners included the option "multiple committed relationships". The category of no committed partner included people who responded "single and wish to stay that way" or "single and wish to be partnered" as well as people who wrote in options such as "single with no preference". This was based on

underlying differences in potential social support which has been found to be associated with anxiety (Bauermeister et al., 2010; Hughes, Szalacha, & McNair, 2010; Masini & Barrett, 2008; Meng & D'Arcy, 2012; B. Mustanski, Newcomb, & Garofalo, 2011). Additionally, relationship status may be related to biphobia. For example, someone with multiple committed partners may experience more biphobia because they may be seen as reinforcing stereotypes.

Childhood religiosity

Childhood religiosity was assessed by the question "How religious or faith-based was your upbringing?" Response options were in the form of a 5-point Likert scale ranging from "not at all" to "extremely". Religious upbringing is proposed to confound the relationship between biphobia and anxiety because high religiosity may increase anxiety if the religion is not accepting of their sexual orientation or it may increase anxiety if the person decides to leave the religious community and loses a source of social support and a method of coping (Ano & Vasconcelles, 2005; McConnell, Pargament, Ellison, & Flannelly, 2006; Pargament, Koenig, & Perez, 2000). Likewise, extreme religiosity may be associated with biphobia if the religion values heterosexism (Eliason, 1997).

Childhood religiosity was chosen as opposed to adult religiosity because childhood religiosity is more likely to affect someone's attitudes about bisexuality and potentially the internalization of those attitudes which may affect mental health. For example, a child raised with high religiosity of a religion that is not LGBTQ friendly may internalize biphobic or homophobic beliefs which may lead to more anxiety. Once someone reaches adulthood they may remain in religions which are not LGBTQ friendly because that is how they were raised or they may decide to leave religion or find a more LGBTQ friendly religion. It is unlikely that a bisexual adult would join a religion that is not LGBTQ friendly if they were previously in a LGBTQ-friendly religion or had no religion. Adult religiosity may either protect or lead to poor mental health depending on which group someone fits into, just as it could for children depending on the religion's views towards LGBTQ people. However, children do not usually have the choice to leave or change religions; rather the parents are usually the ones that determine the religion of the child.

Discrimination based on race/ethnicity and ability

In the *Risk & Resilience Study*, the Perceived Discrimination Scale (Forman, Williams, & Jackson, 1997) was used to measure discrimination and was modified to emphasize that this discrimination is based on biases. Another modification was the addition of the last two items forming the scale. This scale consists of two sections: major life events and every-day discrimination. In regard to major life events, participants were asked the following questions with respect to discrimination based on several different biases such as race/ethnicity, ability, gender, and sexual orientation: "Do you think you have ever been unfairly fired or denied a promotion?", "Do you think you have ever not been hired for a job for unfair reasons?", "Do you think you have ever been unfairly stopped, searched, question, physically threatened, or abused by the police?", "Do you think you have been unfairly discouraged by a teacher or advisor from continuing your education?", "Do you think you have ever been unfairly prevented from moving into a neighbourhood because the landlord or realtor refused to sell or rent you a house or apartment?", "Have you ever moved into a neighbourhood where neighbours made life difficult for you, your family, or friends?", "Have you ever been prevented from participating in or made to feel unwelcome at a cultural or social event?", and "As an adult, have you ever experienced violence or harassment?". If they responded yes to these questions then they were able to select multiple options for what they felt this bias was based upon. These options included "Your age or perceived age", "Your bisexuality", "Your gender identity", "Your income level/social class", "Your level of ability", "Your perceived sexual orientation", "Your physical appearance", "Your race/ethnicity", "Your relationship status", "Your relationship structure", "Your religion", "Your sex", and "Something else about you".

In regard to everyday experiences of discrimination, participants were asked the following questions: "In your day-to-day life, how often are you treated with less courtesy than other people?", "In your day-to-day life, how often are you treated with less respect than other people?", "In your day-to-day life, how often do you receive poorer service than other people at restaurants or stores?", "In your day-to-day life, how often do people act as if you are not smart?", "In your day-to-day life, how often do people act as if they are afraid of you?", "In your day-to-day life, how often do people act as if you are dishonest?", "In your day-to-day life, how often do people act as if they are better than you are?", and "In your day-to-day life, are you ever

threatened or harassed?". Participants were able to select one of the options given including "Never", "Hardly ever", "Not too often", "Fairly often", or "Very often". If they did not select never then participants were able to select from the options previously mentioned to describe what this bias was based upon. Responses were then summed to obtain a total PDS score. In the *Risk & Resilience Study*, this scale demonstrated good internal reliability with Cronbach's alphas of 0.8578 and 0.8524, raw and standardized respectively.

The two options of interest as possible moderators include discrimination based on race/ethnicity and discrimination based on level of ability. Therefore, this scale was re-coded to obtain separate scores for (1) total discrimination attributed to race/ethnicity and (2) total discrimination attributed to level of ability. This was done by summing responses for all of the questions based on race/ethnicity and all of the questions based on level of ability where higher scores indicate more experiences of discrimination. These variables were considered as possible moderators of secondary interest because experiences of biphobia may overlap with experiences of racism and ableism and biphobia may be perceived differently by people who also experience discrimination based on other identities that they hold (Ochs, 1996). It is also possible that racialized people and people with disabilities may experience more anxiety as a result of increased discrimination (Davies & Jones, 2013). Of note, discrimination based on race is a different construct than race since people who identify as white may also experience incidents of discrimination based on race, as was the case in the *Risk & Resilience Stud*y. There is also variation in levels of discrimination experienced within racialized groups. However, a limitation of this is asking people to attribute their experiences of discrimination to one of multiple aspects of their identity which is difficult (Bowleg, 2008).

These two biases attributed to discrimination were selected while the options "age", "bisexuality", "gender", "income", "sexual orientation", "appearance", "relationship structure", "relationship status", "sex", and "religion" were not because they are largely being addressed through other variables in the survey as described above. For example, age, gender, income, relationship status/structure, and religion are being included as confounders. Neither discrimination based on bisexuality nor discrimination based on sexual orientation were included as moderators because the main exposure of interest is biphobia, a different measure that includes discrimination based on bisexual peoples' sexual orientation. In addition, gender was

chosen to be included as a moderator rather than sex at birth because the research largely shows that bisexual men may experience biphobia differently than bisexual women and not everyone may present as their sex at birth. Finally, discrimination based on appearance was not included as a moderator because there is very little research that supports that bisexual people experience biphobia differently based on appearance (e.g. weight, height, tattoos) although this may be possible.

4.3. Data analysis

This section of the thesis will describe data quality including missing data, normality and outliers, and multicollinearity as well as descriptive statistics, weighting, and structural equation modelling (SEM).

4.3.1. Missing data, normality, and multicollinearity

Missing data

The outcome scale for anxiety (OASIS) was coded to include only participants that answered all five items that make up the scale. Overall, 95% of participants answered all of the items and the remainder of participants generally missed only one item. The outcome scale for PTSD (PCL-C) was coded to include only those respondents that completed at least 80% of the scale items. In total, 96% of participants completed at least 80% of the items for the PCL-C. The scale was then re-scaled by dividing their total PCL-C score by the number of items they answered based on recommendations by Ruggiero et al. (2003).

Similarly, for the IIGCS and the PLGBTQIA being considered as moderators, participants were required to answer at least 80% of items to be included in the analyses. This was done for scales that did not have directions for how to handle missing data in the reference articles. This was done because when fewer components of the scale are answered, the resulting value is a poor estimator of the correct value and has a larger variance than values based on answers using all components. Generally, less than 10% of participants were missing more than 80% of items within each scale. The scales that did have instructions were re-coded based on the authors' recommendations. Specifically, the ABES was considered usable by the authors only when 80% of the items were completed (Brewster & Moradi, 2010).

In M*plus* 7.11 (L. K. Muthén & Muthén, 2013) by default all observations are used despite missing values for estimating dependent (endogenous) variable parameters by assuming observations are missing at random, however, this is not the case for independent (exogenous) variables (B. O. Muthén & Muthén, 2012). If there are any missing values for any of the independent variables in the model then that person's data are not used (listwise deletion). Therefore, in order to include the total sample in the analyses, multiple imputation was used. Multiple imputation is preferred over listwise deletion in SEM because listwise deletion results in smaller sample sizes and less power, less precise estimates, and biased results if data are not missing completely at random whereas multiple imputation takes into consideration random variation in the imputed values, incorporates uncertainty into the standard errors, and maintains the original sample size (Acock, 2005; Alf, Larsen, & Lorenz, 2009; Allison, 2003; Schreiber, Nora, Stage, Barlow, & King, 2006). Multiple imputation was performed in M*plus* 7.11 (L. K. Muthén & Muthén, 2013) with the DATA IMPUTATION command generating 20 imputed datasets to ensure accurate estimates (Alf et al., 2009).

Normality and outliers

Normality was estimated in SAS 9.3 (SAS Institute Inc., 2011) by using PROC UNIVARIATE which provides univariate kurtosis values for the observed variables. It was found that all variables had kurtosis values close to zero indicating normality except for discrimination based on race (kurtosis=9.271) and discrimination based on ability (kurtosis=10.561). These variables are highly kurtotic towards the lower values on the scale with most people having never experienced racial discrimination or discrimination based on ability. Due to this, these variables were re-coded as binary variables: having ever experienced discrimination based on race (or ability) and never having experienced discrimination based on race (or ability).

Outliers were examined using M*plus* 7.11 (L. K. Muthén & Muthén, 2013) by using the SAVEDATA option which provided Mahalanobis distance values and p-values (Wicklin, 2012). Influential observations were also examined with Cook's D parameter estimates (Jensen & Ramirez, 1998). This was done prior to examining the models and included all variables. Several outliers were found based on these methods; however, these outliers were chosen to remain in the analyses despite potential for improvements in model fit. This is because some outliers, for

example, were considered outliers because they had much higher scores than average on the biphobia subscales. By not including these people important variability and information could be lost.

Multicollinearity

Multicollinearity among the independent variables was tested in SAS 9.3 (SAS Institute Inc., 2011) with a threshold variance inflation factor (VIF) of 5 based on literature supporting that this is the most appropriate threshold for covariance-based SEM (Kock & Lynn, 2012). No severe multicollinearity was found. A correlation matrix can be seen in Appendix D for more detail.

Table 3. Variance inflation factors (VIFs) for the independent variables

Variable	VIF
Age	1.263
Gender-Man	4.172
Gender-Woman	4.666
Gender-Bigendered	1.105
Gender-Genderqueer	1.457
Religious upbringing	1.071
Biphobia from the gay community	2.351
Biphobia from the straight community	2.491
Discrimination based on race	1.114
Discrimination based on ability	1.175
Income-to-needs ratio	1.191
One committed partner	1.266
Multiple committed partners	1.119
No committed partners	1.296
IIGCS	1.519
Volunteerism, advocacy, activism	1.246
PLGBTQIA	1.430

4.3.2. Descriptive statistics and weighting

Prevalence and 95% confidence intervals (CI) were weighted and calculated using Respondent-Driven Sampling Analysis Tool (RDSAT) 7.1 (Volz, Wejnert, Degani, & Heckathorn, 2013). These were calculated using 10,000 bootstrap re-samples and an enhanced data-smoothing algorithm. Weights were generated based on network size and differential

probability of recruitment using the RDSAT 7.1 (Heckathorn, 2002) individualized weights option and were then merged into M*plus* 7.11 (L. K. Muthén & Muthén, 2013) in order to weight the entire data set for additional analyses. With networked data, weights are specific to each variable. The models were weighted by the outcome which was the OASIS for the anxiety models and the PCL-C for the PTSD models.

4.3.3. Structural equation modelling

Structural equation modelling (SEM) is largely a confirmatory technique that can be used to confirm a pre-specified model that is based on theory and previous research. This model is confirmed for the data being tested through several different fit indices. Although this is often the primary use of SEM, it can also be used in an exploratory manner to develop a model that fits the data or to modify a pre-specified model to fit the data better (Byrne, 2012). SEM provides many useful statistical tools. Firstly, by using SEM it is possible to include not only measured or observed variables in the model (conventionally denoted as a rectangle) but also unobserved or latent variables (typically denoted as ellipses). Latent variables are considered to be un-measurable constructs such as anxiety, self-esteem, and motivation (K. A. Bollen, 2002; Byrne, 2012). These constructs may be and are often measured by validated scales. Within SEM, the components of the scales may be considered indicators of the latent variable and these indicators are measured variables that should be moderately positively correlated with each other to have internal consistency (K. Bollen & Lennox, 1991). They should be moderately correlated because they are measuring the same construct; therefore, as one indicator increases so should the others. Similarly, one may also use several questions that do not make up a scale as indicators to represent a construct and then test how well the items measure the construct. These indicators allow researchers to estimate a latent variable but do not allow an exact prediction (K. A. Bollen, 2002). The section of the model examining the relationship between the indicators and latent variable is tested using either confirmatory or exploratory factor analysis and is termed the measurement model.

In this thesis, anxiety is measured using the OASIS scale and the five questions that comprise the OASIS scale serve as indicators to represent the construct of anxiety. The factorial validity of these indicators for anxiety in Ontarian bisexuals will be tested in the measurement

model by using confirmatory factor analysis (CFA). Similar to the OASIS, the factorial validity of the PCL-C will be tested using CFA. Since this thesis is examining the effect of biphobia on PTSD in an exploratory manner, subsequent models will not include PTSD as a latent variable but as a measured item (PCL-C) due to sample size limitations (i.e. with PTSD as a latent variable there are too many free parameters to accurately estimate with a sample size of 405). In addition, this exploratory CFA will have a smaller ratio of participants to free parameters (~ 8:1) than the OASIS CFA (~26:1). This ratio is below the most often suggested required sample size to parameter ratio for accurate estimation (10:1) but above the minimum required sample size to parameter ratio (5:1) (see discussion below). The exposures of biphobia from the gay community and biphobia from the straight community will be included as measured items or scales as opposed to latent variables. This is for two reasons; firstly, there is not a large enough sample size to analyze the two subscales as latent variables because of the large number of items measuring each construct. Secondly, this scale was developed for use in bisexual populations and has been validated in two bisexual populations with high internal reliability (Brewster & Moradi, 2010). This is in contrast to the OASIS and PCL-C which have not been specifically validated in bisexual populations. Additionally, the ABES demonstrated high internal reliability in the *Risk & Resilience Study*.

A second advantage of SEM is that it accounts for measurement error (both random and systematic). It also allows for residual error, or error resulting from predicting dependent (endogenous) variables from independent (exogenous) variables because it is unlikely that the exogenous variable completely predicts the endogenous variable (Byrne, 2012). As a result, it has been stated that SEMs are less-restrictive regression equations (Ditlevsen, Christensen, Lynch, Damsgaard, & Keiding, 2005). Byrne (2012) explains that SEMs estimate these errors whereas regressions assume that errors in the independent variable are non-existent conditional on an observed value. M*plus* 7.11 (L. K. Muthén & Muthén, 2013) includes the variances for the exogenous latent variables and assumes that the exogenous variables are not associated with the residual error and that there is no covariance between the measurement errors, both of which are important assumptions for SEM (Byrne, 2012).

Generally, SEMs have been described as a series of regression equations (Multivariate Data Analysis, 2010). Byrne (2012) explains that each equation summarizes a series of

regression equations that include the impact of all variables (latent and observed) on one variable. As a result, the coefficients calculated for one-way directional arrows can be interpreted as regression coefficients and the coefficients calculated for two-way non-directional arrows are correlation coefficients (Gallion & Scheperle, 2008). These correlation and regression coefficients comprise two of the parameters of the model. The third type of parameter are the variances of the exogenous variables (MacCallum, 1995). To accurately estimate these parameters, a somewhat arbitrary sample size of ten participants per parameter has been recommended but a ratio of five participants per parameter has also been suggested as adequate (Bentler & Chou, 1987). This thesis has a sufficient sample size (n=405) to test the specified models. This part of the model that examines the relationships between latent variables or between latent and observed variables (excluding indicator variables) is termed the structural model. In order to obtain the estimates, iterative methods such as maximum likelihood are used until the model is converged (Hoyle, 1995). For clustered samples, M*plus* 7.11 uses maximum likelihood with robust standard errors (MLR) which are calculated using a sandwich estimator (Asparouhov & Muthén, 2005).

An additional requirement that must be met in order to test and interpret the model is to have an over-identified model. Byrne (2012) and MacCallum (1995) explain that over-identification occurs when there are more data points than parameters to estimate, resulting in positive degrees of freedom which allow the model to be rejected. Only in this case is the model considered meaningful. Conversely, a model that is just-identified perfectly matches the data (i.e. there is a unique solution for the parameter estimates) and plausibility cannot be determined since there are no degrees of freedom and the model can never be rejected (Byrne, 2012; MacCallum, 1995). This occurs when there are an equal number of data points and parameters to estimate (Byrne, 2012). If the model is under-identified (i.e. cannot be estimated) then the model parameters cannot be interpreted; this occurs because the number of parameters exceeds the number of data points (MacCallum, 1995). This is because in an under-identified model, different estimates can define the same model; in other words, the estimates are arbitrary and cannot be evaluated due to lack of constancy (Byrne, 2012). Byrne (2012) explains that it is equivalent to trying to determine a unique value for X and Y when given X+Y=15. This occurs when the parameters to estimate exceed the data points (Byrne, 2012). Byrne (2012) and MacCallum (1995) explain that there are two necessary conditions for over-identification;

establishing scales for the latent variables and ensuring that the number of unknown parameters is not larger than the measured variable variances and covariances (data points), both of which have been established in this thesis. The latent variable scale is automatically established in M*plus* 7.11 (L. K. Muthén & Muthén, 2013) by fixing one of the indicator variable values to one (Byrne, 2012).

Since this thesis is using data collected through RDS, it is important to consider clustering and weighting the data. Stapleton (2006) describes the importance of taking clustering into consideration. Stapleton (2006) explains that SEM conventionally assumes the data were obtained from simple random sampling; therefore, clustered data will underestimate the standard error, may lead to improper rejection of the model, and may lead to estimates that seem to be statistically significant but are not . Weighting is important to consider because there is an unequal probability of selection, as there is when using RDS. M*plus* 7.11 (L. K. Muthén & Muthén, 2013) uses pseudomaximum likelihood methods which can be used with models that include latent variables Therefore, this thesis will take into consideration clustering and weighting when estimating the model parameters.

Finally, moderation will be tested by using additive scale interaction terms multiplying the moderator by the independent variables (biphobia from the gay community and biphobia from the straight community) (Klein & Moosbrugger, 2000; L. K. Muthén & Muthén, 2012). Gender identity, discrimination based on race/ethnicity, and discrimination based on ability will be tested first to determine if they are moderators. If they are not found to be moderators then they will be included in the models as potential confounders. Following this, models including the main potential moderators of interest (LGBTQ community identification and involvement, positive bisexual identity, and volunteering/advocacy/activism) will be tested while controlling for confounding.

CHAPTER 5: RESULTS

5.1. Descriptive statistics

The networked bisexual population of Ontario is estimated to be primarily young (age 16-34), mostly assigned female sex at birth, and largely residing in Metropolitan Toronto (refer to Table 4for the demographics being described). All of the estimates are for the networked bisexual population of Ontario, otherwise stated, interpretation is limited to people attracted to more than one sex and/or gender who are connected to at least one other person who falls within this definition of attraction. In addition, the majority of bisexuals are estimated to have completed some or all of their college or university education (65.2%), 31.7% are students, and 42.3% are employed full time.. In regard to relationship status, the population is similarly divided between single (35.6%, 95% CI: 28.9, 44.0) and married or partnered (39.0%, 95% CI: 30.5, 46.8) statuses with slightly fewer people dating (22.7%, 95% CI: 17.2, 29.0) and with multiple partners (22.2%, 95% CI: 16.9, 27.7). These relationship statuses were determined from a "check all that apply" series of questions so it is possible that someone may be married or partnered and have multiple partners.

Furthermore, the majority of bisexuals are estimated to identify as monogamous (57.1%), identify their gender as "woman" (64.2%), and identify as white either alone or in combination with another identity (85.2%). In regard to household income, the population is estimated to be fairly evenly distributed among income categories ranging from less than $10,000 to over $100,000. When the number of people being supported was taken into account to form the income-to-needs ratio, it was found that 59.0% of bisexuals are estimated to have an income range of greater than $12,500 to $35,000 per person in the household. It was also found that the majority of bisexuals were raised in non-religious to somewhat religious families (27.9% for not at all religious, 22.0% for a bit religious, and 19.3% for somewhat religious).

In regard to health outcomes, when weighted OASIS outcomes for the networked bisexual population of Ontario were calculated, the mean OASIS score was found to be 5.8 (95% CI: 5.1, 6.5, range: 0-18) and the percent of people with a possible anxiety disorder based on a cut-off value of greater or equal to eight was found to be 30.9% (95% CI: 23.7, 37.7). Furthermore, the mean PCL-C score was found to be 32.5 (95% CI: 30.6, 34.4, range: 17-77) and

the percent of people with possible PTSD was found to be 10.8% (95% CI: 6.2, 15.2) based on the more conservative cut-off value (PCL-C ≥ 50). Additionally, it was found that 14.5% (95% CI: 9.8, 19.1) of bisexuals are estimated to be currently living with a disability or chronic illness based on the question "Are you currently living with a physical disability or chronic illness (whether diagnosed or not)?" When examining biphobia from the straight community, the average score was found to be 36.6 (95% CI: 34.6, 38.7, range: 15-94). Similarly, for biphobia from the gay community, the average value was 30.8 (95% CI: 28.5, 33.1, range: 16-95) when weighted and adjusted for clustering. Values for men were found to be similar to women. For biphobia from the straight community, men had a mean score of 35.5 (95% CI: 31.2, 39.8) while women had a mean score of 37.8 (95% CI: 35.2, 40.5). Slightly lower levels were found for biphobia from the straight community. The average score for men was 29.7 (95% CI: 26.1, 33.3) and the average score for women was 32.2 (95% CI: 29.2, 35.2).

In regard to positive bisexual identity, the average score was 87.1 (95% CI: 84.7, 89.4, range: 23-120). For identification and involvement with the LGBTQ community, the average score was 7.1 (95% CI: 6.8, 7.4, range: 3.00-14.75). When considering discrimination other than biphobia, it was found that 23.3% (95% CI: 17.1, 31.0) of bisexuals have experienced racial discrimination and 37.4% (95% CI: 30.5, 45.1) have experienced discrimination based on ability. Finally, it was found that 39.3% (95% CI: 33.7, 49.3) of bisexuals are estimated to be engaged in volunteerism, advocacy, or activism.

Table 4. Descriptive statistics of the networked bisexual population of Ontario (N=405)

	N	Weighted %	Weighted 95% CI
Age			
16-24	99	33.6	(23.0, 44.8)
25-34	177	41.3	(32.6, 51.2)
35-44	79	15.1	(8.5, 22.2)
45-54	34	7.2	(2.6, 12.0)
55+	12	2.8	(0.2, 8.3)
Sex at birth			
Female	302	69.7	(60.2, 77.5)
Male	103	30.3	(22.6, 39.8)
Intersex	4	0.6	(0.0, 1.7)
Gender identity*			
Woman	261	64.2	(55.9, 73.0)
Man	101	27.7	(20.4, 35.9)
Genderqueer	53	6.6	(3.5, 9.7)
2-spirited	23	3.2	(1.2, 5.0)
Trans man	19	1.7	(0.7, 2.9)
Bigendered	17	2.8	(1.2, 4.7)
Crossdresser	9	1.5	(0.5, 2.9)
Trans woman	5	0.5	(0.1, 1.2)
Another option not given[a]	17	4.7	(1.4, 8.9)
Gender identity (collapsed)			
Woman	266	66.2	(58.1, 74.7)
Man	110	30.5	(22.7, 39.0)
Genderqueer	53	6.6	(3.5, 9.7)
Bigendered	17	2.8	(1.2, 4.7)
2-spirited	23	3.2	(1.2, 5.0)
Region of Ontario			
Eastern Ontario	67	21.8	(11.6, 33.5)
Central Ontario	52	15.3	(8.2, 21.4)
Metropolitan Toronto	212	45.8	(34.0, 56.9)
Southwestern Ontario	51	12.5	(5.7, 22.5)
Northern Ontario	16	4.6	(1.9, 9.1)
Education			
High school or less	38	15.2	(7.4, 19.2)
Some or completed trade school or apprenticeship	9	1.3	(0.3, 2.9)
Some or completed college or university	242	65.2	(59.0, 74.0)
Some or completed graduate or professional education	113	18.3	(13.3, 25.1)

Employment*			
Full time	156	42.3	(34.3, 49.9)
Part time	101	27.2	(21.0, 35.4)
Self-employed	65	13.6	(8.7, 19.2)
Student	133	31.7	(24.5, 39.8)
Not employed	31	6.1	(3.1, 9.9)
Underemployed	60	12.7	(9.0, 17.4)
On disability	29	5.1	(2.3, 8.4)
Caring for children	18	7.2	(2.5, 12.3)
Homemaker	9	2.6	(0.6, 5.9)
Looking for work	55	12.7	(8.4, 17.7)
Retired	4	0.6	(0.0, 1.8)
Household income			
Less than $10,000	39	9.0	(5.4, 14.4)
$10,000 to $19,999	68	16.0	(11.2, 21.7)
$20,000 to $29,999	56	12.1	(7.8, 17.1)
$30,000 to $39,999	41	11.7	(6.5, 17.5)
$40,000 to $59,999	67	18.1	(11.8, 25.3)
$60,000 to $79,999	52	14.7	(9.3, 21.3)
$80,000 to $100,000	28	9.3	(4.5, 14.5)
Greater than $100,000	43	9.0	(4.4, 13.7)
Income-to-needs ratio			
≤ $12,500/person	106	27.4	(20.4, 35.3)
> $12,500 to $35,000/person	209	59.0	(51.2, 67.7)
> $35,000 to $134,900/person	77	13.6	(7.4, 18.9)
Relationship status*			
Single	110	35.6	(28.9, 44.0)
Divorced	7	2.7	(0.3, 2.8)
Dating	111	22.7	(17.2, 29.0)
Married/partnered	108	30.6	(23.0, 38.9)
Married/partnered and dating	33	3.6	(2.0, 5.5)
Married/partnered and play with others	63	9.0	(5.6, 12.9)
Multiple casual relationships	47	6.8	(4.1, 9.5)
Multiple committed relationships	31	4.5	(2.0, 7.2)
One primary partner and at least one casual	48	5.8	(3.8, 8.3)
Separated	12	1.6	(0.4, 3.0)
Widowed	1	0.5	(0.0, 0.9)
Relationship status (collapsed)			
No committed partners	110	35.6	(28.9, 44.0)
One committed partner	108	30.6	(23.0, 38.9)
Multiple committed partners	31	4.5	(2.0, 7.2)

Relationship identity*			
Open relationship or marriage	117	22.1	(16.1, 28.0)
Swinger	23	4.7	(1.6, 7.2)
Kinky, BDSM, or fetish	155	27.7	(21.3, 33.9)
Monogamous	174	57.1	(49.9, 63.8)
Polyamorous	168	26.0	(19.5, 31.5)
Polysexual	65	10.3	(6.9, 14.1)
Another option not given[b]	27	7.2	(4.0, 11.5)
Racial, ethnic, or cultural identity*			
White	349	85.2	(78.0, 90.5)
Aboriginal/First Nations	38	6.3	(3.2, 10.6)
Black	21	7.6	(2.6, 13.5)
South Asian	10	1.7	(0.4, 3.4)
Latin American	9	3.4	(0.8, 7.5)
Chinese	7	1.5	(0.4, 3.0)
Another option[c]	30	7.6	(3.7, 12.7)
Childhood religiosity			
Not at all	84	27.9	(20.6, 35.1)
A bit	88	22.0	(16.5, 28.3)
Somewhat	72	19.3	(13.8, 26.3)
Fairly	60	15.9	(10.1, 22.1)
Quite	46	9.4	(6.1, 12.7)
Extremely	24	5.5	(2.9, 8.5)

*Participants could select more than one option so totals may be larger than 100%

[a] Other gender identities provided in the write-in option that were not provided in the survey included identities such as: female-man, femme, dyke, female but more neutral, questioning, undefined, vamp, agendered, masculine but not gender identified, and fairy.

[b] Other relationship types provided in the write-in option that were not provided in the survey included types such as: not identified with a label, pansy, non-monogamous, not sure, sapiosexual, someone wanting another type of relationship other than the one they are currently in, curious, fluid, Bonobo, and cuckold capable.

[c] The "Another option" category includes those categories with less than seven people (Arab, Filipino, Japanese, Korean, Southeast Asian, and West Asian). It also includes people who did not identify as any of the above groups or as an additional group that was not an option (largely people who identified as Jewish).

5.2. Structural equation models

The following sections will discuss several SEM models which will primarily be divided by the outcome of interest. This section will begin with models that examine the relationship between biphobia and anxiety. These will include crude models, models including confounders and interactions, and models examining the main moderators of interest. Similarly, this will be followed by the exploratory models that examine the relationship between biphobia and PTSD symptoms as well as the potential moderators of this relationship.

5.2.1. Anxiety as an outcome

Measurement model

Before testing any structural equation models examining the relationship between biphobia and anxiety, the measurement model was tested. This was done in order to examine the validity of using the OASIS scale to measure anxiety in a bisexual sample. Previously, this scale had not been tested for use in bisexual populations. In this confirmatory factor analysis (CFA) model, the final sample size was 391 with 14 people missing data on all outcome variables. There were 15 parameters estimated. When considering model fit, the root mean square error of approximation (RMSEA) was 0.117 (90% CI: 0.081, 0.158), the comparative fit index (CFI) was 0.935, the Tucker-Lewis index (TLI) was 0.871, and the standardized root mean square residual (SRMR) was 0.044. The SRMR indicated good fit and the CFI approached good fit (where good fit is considered ≥ 0.95); however, the RMSEA and TLI did not indicate good fit between the model and the observed data (Schreiber et al., 2006).

Hooper, Coughlan, and Mullen (2008) explain that it is not uncommon to find poor fit between the model and the data when using SEM and that good fit does not always make theoretical sense (see Appendix B for more details about model fit). Therefore, this measurement model may be a satisfactory fit for the sample. Other studies have found the OASIS to be a valid measure of anxiety in college students (Norman et al., 2006) and clinical samples (Campbell-Sills et al., 2009) but it may be improved for use in bisexual populations. It is not possible to know if modifications to this scale that improve fit will also make theoretical sense until it is undertaken using exploratory factor analysis. This thesis is limited to CFA so no

modifications in this scale will be performed for the subsequent analyses. Therefore, this scale may be valid for use in this population but has the potential for improvements.

In addition, correlations between the indicators making up the latent construct of anxiety were examined. It was found that all of the indicators were moderately correlated with each other (correlations ranged from 0.508 to 0.677). This is good as they are measuring the same construct (K. Bollen & Lennox, 1991). The standardized parameter estimates and their standard errors for this CFA model can be seen below in Figure 6.

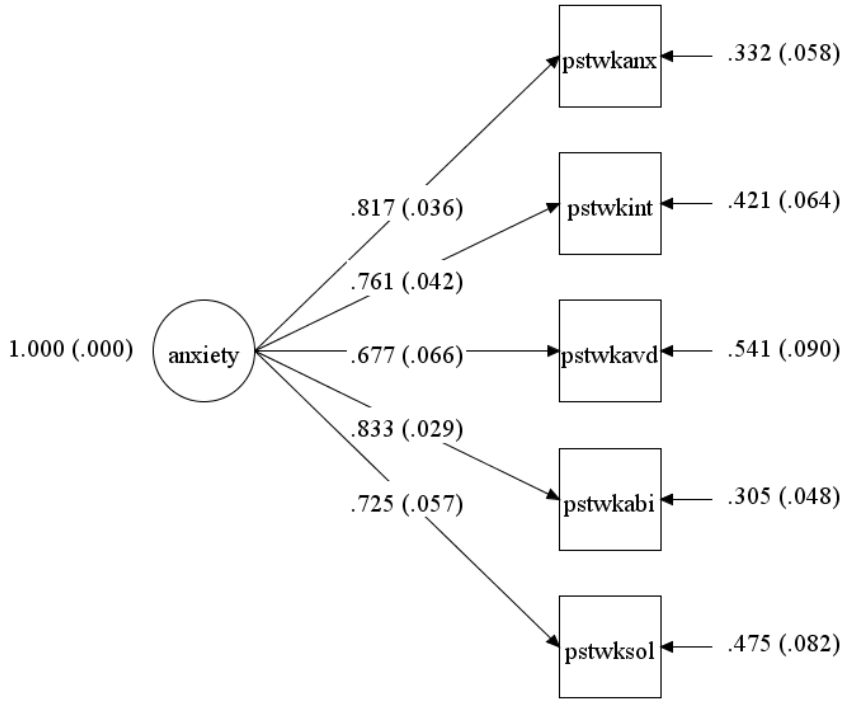

Figure 6. Standardized parameter estimates for the latent construct anxiety: confirmatory factor analysis

Pstwkanx: In the past week, how often have you felt anxious?
Pstwkint: In the past week, when you have felt anxious, how intense or severe was your anxiety?
Pstwkavd: In the past week, how often did you avoid situations, places, objects, or activities because of anxiety or fear?
Pstwkabi: In the past week, how much did your anxiety interfere with your ability to do things you needed to do at work, at school, or at home?
Pstwksol: In the past week, how much has anxiety interfered with your social life and relationships?

In the above diagram of the CFA model, or measurement model, the standardized factor loading parameter estimates (estimates in the middle of the figure) can be interpreted as standardized regression coefficients explaining the relationship between anxiety and the indicators of anxiety. For example, for every standard deviation increase in anxiety, interference of one's social life because of anxiety increases by 0.725 (possible range of 0-5), holding all other indicators constant. In order for these indicators to be a good measure of anxiety, they should have factor loadings of the same magnitude (Garrett-Mayer, 2006). In this model the standardized factor loadings range from 0.725 to 0.833 which indicates that they are roughly the same magnitude and all represent similar amounts of the construct anxiety. Secondly, the residual variances (estimates at the far right of the figure) indicate the reliability of the indicators (Schreiber et al., 2006). For example, PstWkAvd has the highest reliability (0.541) and PstWkAbi has the lowest (0.305). This translates into, for example, the construct anxiety accounting for 54.1% of the variance in past week avoidance because of anxiety (PstWkAvd). The estimate at the far left of the figure represents the variance of the latent construct anxiety which is set to one when standardized. Despite some contradictory findings within the fit indices, the factor loadings and correlations between the indicators demonstrate that these indicators are a good measure of anxiety. Therefore, this measurement model may be a valid way to measure the construct anxiety for the bisexual population of Ontario.

Testing biphobia subscales on anxiety

The first SEM model was the crude model testing the relationship between biphobia from both the gay and straight community on anxiety. This model adjusted for clustering and was weighted but did not take into consideration confounders or interactions. The final sample size was 391 with 14 people missing data on all outcome variables. There were 17 parameters estimated. The chi-square value was 41.035 (13 *df*, $p<0.005$). The RMSEA was 0.074, the CFI was 0.937, the TLI was 0.903, and SRMR was 0.039. All of these fit indices suggest good fit except for the CFI and TLI which approach the cut-off for good fit between the model and the observed data (Schreiber et al., 2006). The standardized coefficients and standard errors for this SEM model can be seen in Figure 7. Overall, the R^2 for the latent variable in this model was 0.055. Otherwise stated, 5.5% of the variance in anxiety was explained by the variables in the model (L. K. Muthén, 2008). This small R^2 indicates that there are other variables not in this model that account for the majority of the variance in anxiety.

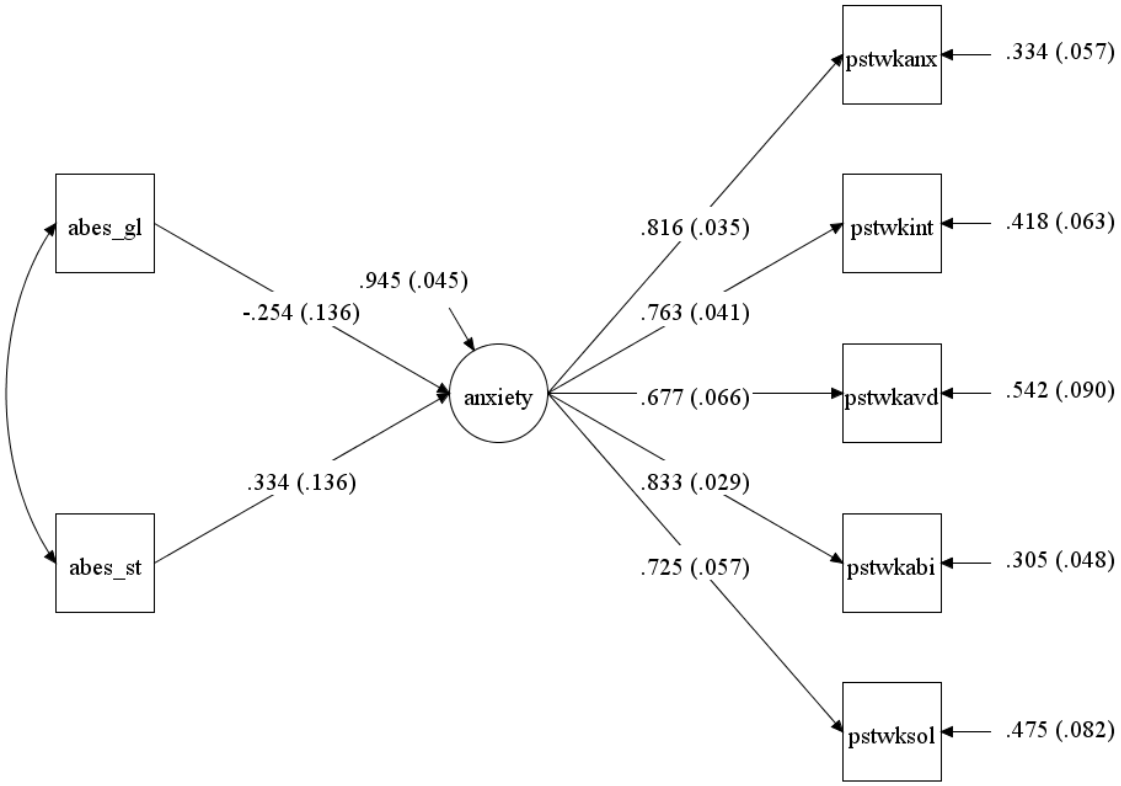

Figure 7. Standardized structural equation model (SEM) of the effect of biphobia on anxiety

In the above figure, PstWkAnx-PstWkSol are indicators of anxiety. Anxiety is a latent variable representing the overall level of anxiety severity and impairment. ABES_GL is biphobia from the gay community and ABES_St is biphobia from the straight community. The parameter estimates in the above figure are standardized ($\bar{x}$ =0, SD=1) with standard errors in parentheses. The relationship between biphobia from the straight community and anxiety was statistically significant at $p<0.05$ whereas the coefficient representing the relationship between biphobia from the gay community and anxiety (β= -0.254, p=0.062) approached statistical significance. These estimates can be interpreted as regression coefficients. Therefore, it is shown that for one standard deviation increase (1 SD=14.2717) on the ABES straight subscale (possible range of 17-102, responses ranged from 15-94), anxiety increases on average by 0.334 (possible range of 0-25, responses ranged from 0-18) holding biphobia from the gay community constant. In this model, the residual variance for anxiety, or amount left unexplained, is 0.945 (SE=0.045).

When this relationship was unstandardized, it was found that for every one-unit increase in the ABES straight subscale (possible range of 17-102, responses ranged from 15-94), anxiety increases on average by 0.020 (possible range of 0-25, responses ranged from 0-18) holding biphobia from the gay community constant. This can be translated into, for example, every 20 increases on the ABES straight subscale increasing anxiety on average by 0.40, holding biphobia from the gay community constant. Overall this is a small but statistically significant effect as anxiety has the potential to range from 0 to 25. This effect, despite being statistically significant, is likely not clinically significant. Biphobia from the gay community remained not statistically significant in predicting anxiety. However, these two sources of biphobia were found to be correlated with a value of 0.711 indicating moderate positive correlation. These relationships were also unadjusted for confounding.

Testing gender identity and discrimination as potential moderators

When gender identity, discrimination based on race/ethnicity, and discrimination based on ability were tested as moderators (while adjusted for possible confounders), it was found that the only significant moderating effect was for bigendered people and for 2-spirited people when interacting with biphobia from the straight community (Figures 8-10). It was found that biphobia from the gay community's effect on anxiety decreased by 0.076 for bigendered people compared to people who are not bigendered. When taking into consideration the crude estimate for the relationship between biphobia from the gay community and anxiety, this results in a total estimate of -0.091 for bigendered people (Figure 9). Conversely, it was found that biphobia from the straight community's effect on anxiety increased by 0.072 for bigendered people compared to people who are not bigendered resulting in a total estimate of 0.092 for bigendered people when taking into consideration the crude estimates (Figure 8). For 2-spirited people, biphobia from the straight community's effect on anxiety increased by 0.080 compared to people who are not 2-spirited, resulting in a total estimate of 0.100 for 2-spirited people when taking into consideration the crude estimate for biphobia from the straight community (Figure 10). As a result of these findings, for the subsequent models all other gender identities and discrimination based on race or ability are considered confounders while bigendered gender identity will be considered a moderator.

Table 5. Interactions between biphobia subscales, gender identity, and discrimination

Interaction term		Unstandardized estimate	Standard error	p-value
Biphobia from the gay community	Gender identity			
	Bigendered	-0.087	0.033	0.009*
	Genderqueer	-0.019	0.015	0.210
	Man	-0.003	0.015	0.830
	Woman	0.004	0.014	0.797
	2-spirited	-0.056	0.038	0.142
	Discrimination			
	Race/ethnicity	-0.012	0.015	0.429
	Ability	0.011	0.015	0.441
Biphobia from the straight community	Gender identity			
	Bigendered	0.082	0.034	0.017*
	Genderqueer	0.010	0.016	0.557
	Man	-0.001	0.015	0.963
	Woman	-0.003	0.014	0.822
	2-spirited	0.080	0.034	0.017*
	Discrimination			
	Race/ethnicity	0.008	0.014	0.559
	Ability	-0.017	0.016	0.307

*denotes significant p-values at $p \leq 0.05$

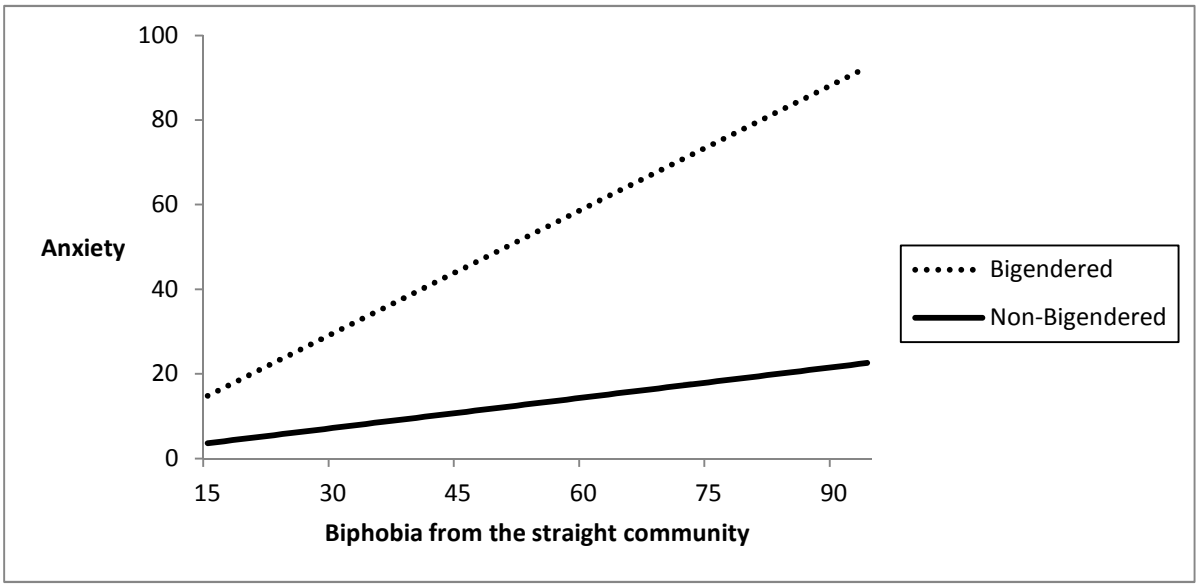

Figure 8. Standardized interaction between biphobia from the straight community and bigendered gender identity, adjusted

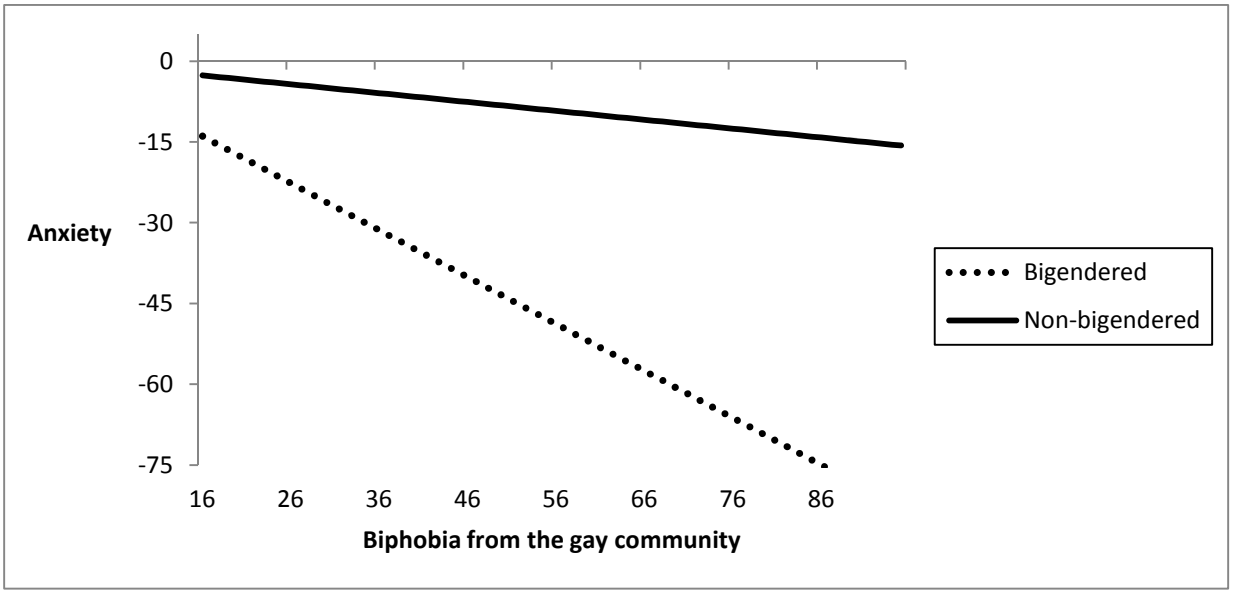

Figure 9. Standardized interaction between biphobia from the gay community and bigendered gender identity, adjusted

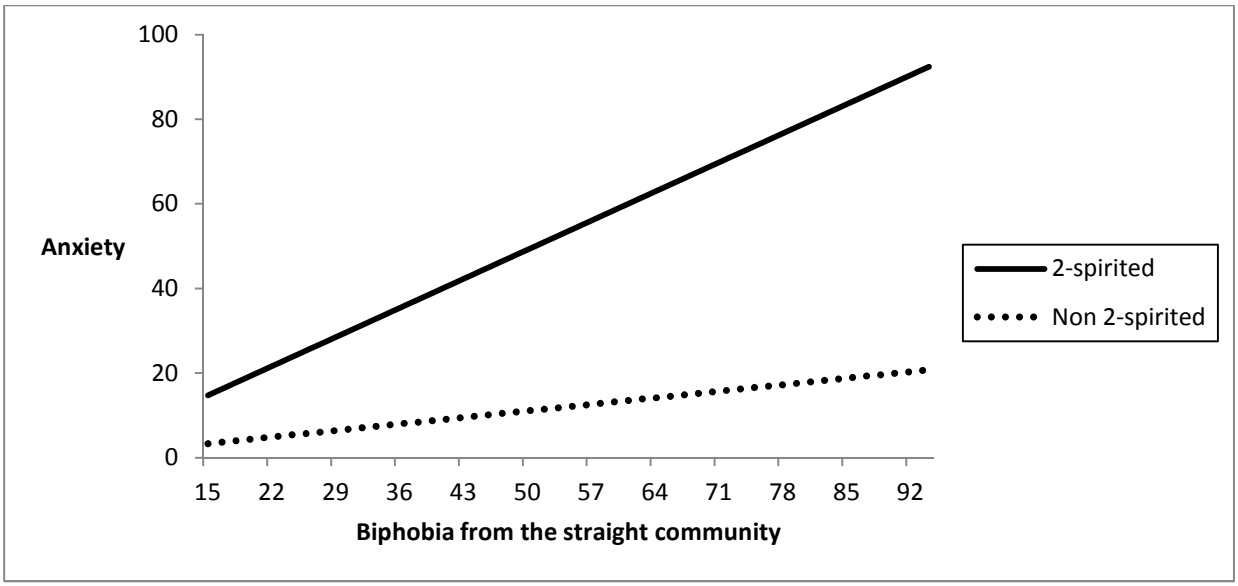

Figure 10. Standardized interaction between biphobia from the straight community and 2-spirited gender identity, adjusted

Including confounders and gender identity interactions

For this model, the final sample size was 391 with 14 people missing data on all of the outcome variables. There were 33 parameters estimated. The chi-square value was 153.623 (77 *df*, p<0.005). The RMSEA was 0.050, the CFI was 0.890, the TLI was 0.857, and the SRMR was 0.027. The chi-square, RMSEA, and SRMR indicate good fit between the model and the observed data while the CFI and TLI do not (Schreiber et al., 2006). The unstandardized and standardized coefficients as well as standard errors for the SEM model can be seen in Table 4. The significant standardized parameter estimates as well as the main exposures of interest are illustrated in Figure 11. Overall, the R^2 for the latent variable in this model was 0.251. Otherwise stated, 25.1% of the variance in anxiety was explained by the variables in the model (L. K. Muthén, 2008). The R^2 is greatly increased from the crude model but still indicates that there are other variables that may explain the variance in anxiety that are not included in the model.

In this model, the relationship between biphobia from the straight community and anxiety is not statistically significant and the relationship between biphobia from the gay community and anxiety can only be seen among bigendered people (Figure 12) For every increase in biphobia from the gay community (possible range of 17-102 when no missing responses, responses ranged from 16-95), anxiety decreases on average by 0.063 (possible range of 0-25, responses ranged from 0-18) for bigendered people, holding all other variables constant. This can be converted into, for example, a 20 point increase on the ABES subscale for biphobia from the gay community decreasing anxiety on average by 1.26 for bigendered people, holding all other variables constant. This is a fairly small effect as anxiety using the OASIS scale has the potential to range from 0 to 25 although in our sample responses ranged from 0 to 18.

In addition, it can be seen in the table below that the only other statistically significant unstandardized parameter estimate was discrimination based on race. These estimates are interpreted as regression coefficients. Specifically, it was found that for people who have experienced racial discrimination, anxiety increases on average by 0.374 compared to people who have not experienced discrimination based on race, holding all other variables constant.

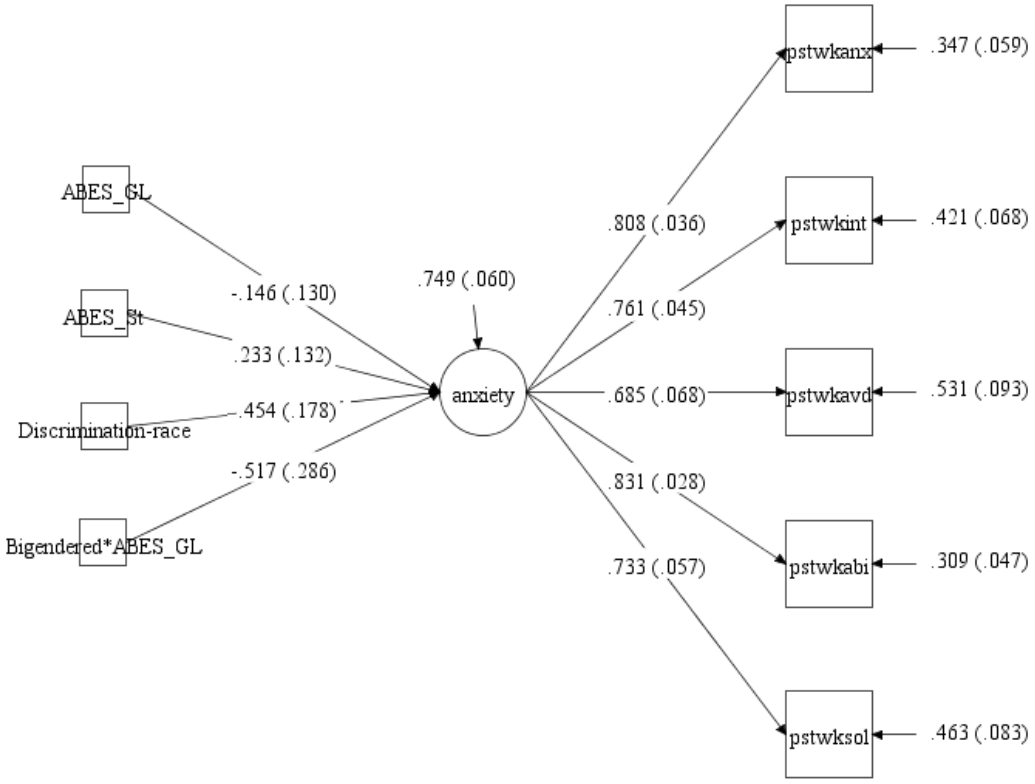

Figure 11. Standardized parameter estimates (SE) of interest, adjusted

Note. Only statistically significant estimates are included in the figure in addition to estimates for ABES_GL and ABES_St, despite their statistical significance. Standardization[2] was STDYX for continuous variables and STDY for categorical variables. STDYX standardizes estimates using the variances of the continuous latent variable as well as the background variables while the STDY standardizes the estimates using the variances of the continuous latent variable only. L. K. Muthén and Muthén (2012) state that STDYX standardization should be used for continuous variables and STDY standardization should be used for categorical variables.

[2] Both standardized and unstandardized estimates are given throughout this thesis. The advantage of standardization is that all continuous variables are on the same scale - unstandardized estimates keep variables in their original scale. A disadvantage of standardization is that discrete/categorical variables cannot be standardized. By convention, SEM reports standardized results; however, unstandardized results were also included as they are more directly interpretable.

Table 6. SEM parameter estimates, including confounders and gender identity moderators

Parameter	Unstandardized estimate (SE)	p-value	Standardized estimate (SE)[+]	p-value
Measurement model estimates				
PstWkAnx	1.000 (0.000)	--	0.808 (0.036)	<0.0001*
PstWkInt	0.865 (0.126)	<0.0001*	0.761 (0.045)	<0.0001*
PstWkAvd	0.830 (0.105)	<0.0001*	0.685 (0.068)	<0.0001*
PstWkAbi	1.053 (0.096)	<0.0001*	0.831 (0.028)	<0.0001*
PstWkSol	0.772 (0.095)	<0.0001*	0.733 (0.057)	<0.0001*
Structural model estimates				
ABES_St	0.014 (0.008)	0.072	0.233 (0.132)	0.077
ABES_GL	-0.008 (0.007)	0.258	-0.146 (0.130)	0.261
Gender-Genderqueer	0.294 (0.176)	0.094	0.357 (0.215)	0.097
Gender-2-spirited	-0.374 (0.648)	0.564	-0.454 (0.785)	0.563
One committed partner	0.177 (0.150)	0.240	0.215 (0.184)	0.242
Multiple committed partners	0.292 (0.202)	0.150	0.354 (0.244)	0.146
Religious upbringing	-0.094 (0.129)	0.465	-0.173 (0.235)	0.462
No committed partners	-0.260 (0.147)	0.077	-0.316 (0.167)	0.058
Age	-0.012 (0.007)	0.086	-0.155 (0.092)	0.093
Gender-Man	-0.026 (0.270)	0.925	-0.031 (0.328)	0.925
Gender-Woman	0.014 (0.262)	0.957	0.017 (0.319)	0.957
Income-to-needs ratio/1000	0.000 (0.000)	0.709	-0.028 (0.074)	0.710
Discrimination-race	0.374 (0.159)	0.019*	0.454 (0.178)	0.011*
Discrimination-ability	0.006 (0.494)	0.991	0.007 (0.602)	0.991
Gender-Bigendered	0.018 (0.644)	0.978	0.021 (0.782)	0.979
Bigendered*ABES_GL	-0.063 (0.032)	0.049*	-0.517 (0.286)	0.071
Bigendered*ABES_St	0.048 (0.034)	0.159	0.440 (0.325)	0.176
2-spirited*ABES_St	0.030 (0.016)	0.070	0.285 (0.161)	0.076
Residual variances				
PstWkAnx	0.359 (0.050)		0.347 (0.059)	
PstWkInt	0.368 (0.058)		0.421 (0.068)	
PstWkAvd	0.527 (0.058)		0.531 (0.093)	
PstWkAbi	0.336 (0.059)		0.309 (0.047)	
PstWkSol	0.348 (0.042)		0.463 (0.083)	
Anxiety	0.507 (0.099)		0.749 (0.060)	

[+] Standardization was STDYX for continuous variables and STDY for categorical variables.
* denotes significant p-values at $p \leq 0.05$

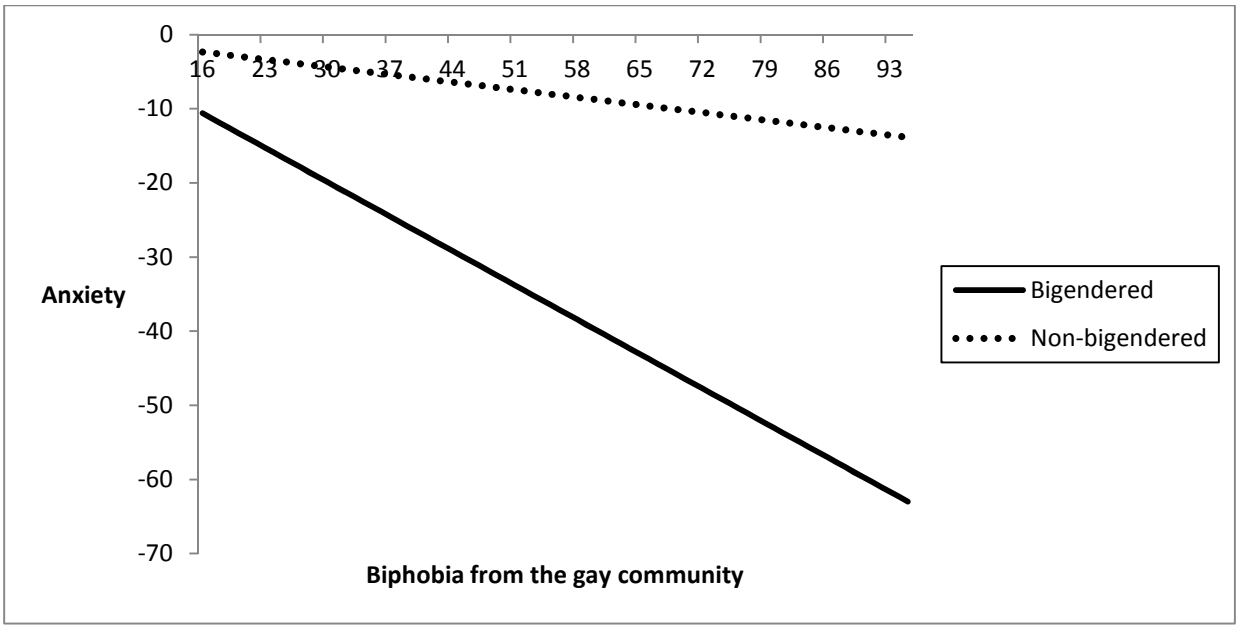

Figure 12. Standardized interaction between biphobia from the gay community and bigendered gender identity, adjusted and including gender identity moderators

Identification and involvement with the LGBTQ community as a moderator

The final sample size was 391 with 14 people missing data on all of the outcome variables. There were 41 parameters estimated. The chi-square value was 192.034 (109 *df*, $p<0.005$), the RMSEA was 0.044, the CFI was 0.891, the TLI was 0.860, and the SRMR was 0.021. The chi-square, RMSEA, and SRMR indicate good fit between the model and the observed data while the CFI and TLI does not (Schreiber et al., 2006). The unstandardized and standardized coefficients as well as standard errors for the SEM model can be seen in Table 7 and the statistically significant standardized parameter estimates as well as non-statistically significant estimates for biphobia are illustrated in Figure 13. The R^2 for the latent variable in this model was 0.282, or 28.2% of the variance in anxiety was explained by the variables in the model.

When identification and involvement with the LGBTQ community was added to the model, the relationship between biphobia and anxiety became non-significant for all gender identities. There was also no moderating effect found for identification and involvement with the LGBTQ community on the relationship between biphobia and anxiety.

Of note, it can be seen in the table below that the only statistically significant unstandardized parameter estimates were age and discrimination based on race or ethnicity. Specifically, for every increase in age, anxiety decreases on average by 0.015, holding all other variables constant. As well, for people who have experienced discrimination based on race, anxiety increases on average by 0.360 compared to people who have not experienced discrimination based on race, holding all other variables constant.

Table 7. SEM paramater estimates, identification and involvement with the LGBTQ community as a moderator

Parameter	Unstandardized estimate (SE)	p-value	Standardized estimate (SE)[+]	p-value
Measurement model estimates				
PstWkAnx	1.000 (0.000)	--	0.812 (0.036)	<0.0001*
PstWkInt	0.860 (0.123)	<0.0001*	0.760 (0.045)	<0.0001*
PstWkAvd	0.825 (0.106)	<0.0001*	0.684 (0.068)	<0.0001*
PstWkAbi	1.049 (0.095)	<0.0001*	0.832 (0.029)	<0.0001*
PstWkSol	0.766 (0.096)	<0.0001*	0.730 (0.057)	<0.0001*
Structural model estimates				
ABES_St	-0.001 (0.025)	0.969	-0.016 (0.413)	0.969
ABES_GL	0.016 (0.026)	0.541	0.279 (0.452)	0.538
Gender-Genderqueer	0.304 (0.180)	0.091	0.368 (0.220)	0.094
Gender-2-spirited	0.294 (1.321)	0.824	0.354 (1.596)	0.824
One committed partner	0.172 (0.155)	0.268	0.207 (0.189)	0.271
Multiple committed partners	0.326 (0.201)	0.105	0.394 (0.241)	0.102
Religious upbringing	-0.117 (0.132)	0.376	-0.214 (0.238)	0.367
No committed partners	-0.232 (0.146)	0.112	-0.281 (0.167)	0.092
Age	-0.015 (0.008)	0.042*	-0.197 (0.099)	0.046*
Gender-Man	0.038 (0.262)	0.884	0.046 (0.316)	0.885
Gender-Woman	0.101 (0.254)	0.692	0.122 (0.310)	0.695
Income-to-needs ratio/1000	0.000 (0.003)	0.992	0.001 (0.074)	0.992
Discrimination-race	0.360 (0.157)	0.022*	0.435 (0.176)	0.013*
Discrimination-ability	0.116 (0.513)	0.821	0.140 (0.619)	0.821
Gender-Bigendered	-0.124 (1.423)	0.931	-0.148 (1.721)	0.931
Bigendered*ABES_GL	-0.035 (0.217)	0.873	-0.281 (1.782)	0.875
Bigendered*ABES_St	0.033 (0.212)	0.875	0.300 (1.931)	0.877
2-spirited*ABES_St	-0.022 (0.044)	0.620	-0.209 (0.423)	0.622
IIGCS	0.054 (0.078)	0.486	0.132 (0.188)	0.480
IIGCS*ABES_GL	-0.003 (0.003)	0.258	-0.601 (0.526)	0.253
IIGCS*ABES_St	0.002 (0.003)	0.517	0.345 (0.531)	0.516
IIGCS*Bigendered	0.061 (0.204)	0.766	0.091 (0.311)	0.770
IIGCS*2-spirited	-0.205 (0.217)	0.344	-0.371 (0.398)	0.352
Bigendered*IIGCS*ABES_GL	-0.003 (0.029)	0.919	-0.211 (2.100)	0.920
Bigendered*IIGCS*ABES_St	0.001 (0.028)	0.959	0.110 (2.164)	0.959
2-spirited*IIGCS*ABES_St	0.009 (0.006)	0.113	0.690 (0.448)	0.124
Residual variances				
PstWkAnx	0.353 (0.049)		0.341 (0.059)	
PstWkInt	0.370 (0.059)		0.423 (0.069)	
PstWkAvd	0.528 (0.059)		0.532 (0.093)	
PstWkAbi	0.335 (0.059)		0.308 (0.048)	
PstWkSol	0.351 (0.041)		0.467 (0.083)	
Anxiety	0.490 (0.093)		0.718 (0.060)	

[+] Standardization was STDYX for continuous variables and STDY for categorical variables.

* denotes significant p-values at $p \leq 0.05$

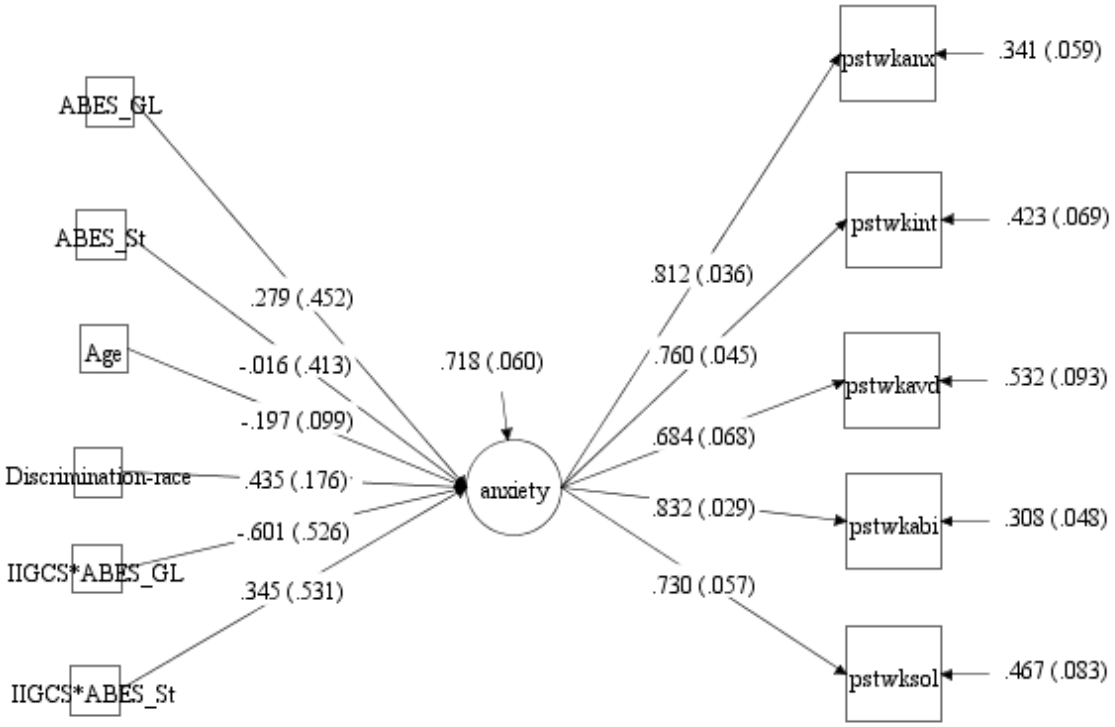

Figure 13. Standardized parameter estimates (SE) of interest, identification and involvement with the LGBTQ community as a moderator

Note. Only statistically significant estimates are included in the figure in addition to estimates for ABES_GL, ABES_St, and the interaction terms between IIGCS and the ABES subscales, despite their statistical significance as they are the main variables of interest. Standardization was STDYX for continuous variables and STDY for categorical variables.

Positive bisexual identity as a moderator

In this model the final sample size was 391, 14 people were missing data on all of the outcome variables, and there were 41 parameters estimated. The chi-square value was 212.030 (109 *df*, p<0.005), the RMSEA was 0.049, the CFI was 0.871, the TLI was 0.834, and the SRMR was 0.023. The chi-square, RMSEA, and SRMR indicated good fit between the model and the observed data whereas the CFI and TLI did not (Schreiber et al., 2006). The unstandardized and standardized coefficients as well as standard errors for the SEM model can be seen in Table 8. The statistically significant standardized parameter estimates and the not statistically significant estimates for biphobia and the interaction between biphobia and positive bisexual identity can be seen in Figure 14. The R^2 for the latent variable in this model was 0.305, or 30.5% of the variance in anxiety was explained by the variables in the model.

In this model, the relationship between biphobia and anxiety remained not statistically significant. The two-way interactions between positive bisexual identity (PLGBTQIA) and biphobia from the straight or gay community were rescaled by dividing the interaction term by 100. This was done because the variances were too large and the model would not converge (L. K. Muthén, 2011). Overall, it was found that positive bisexual identity does not appear to have a moderating effect on the relationship between biphobia and anxiety in this model.

The only statistically significant unstandardized parameter estimates were genderqueer gender identity and discrimination based on race. For genderqueer people, anxiety increases on average by 0.422 compared to non-genderqueer people, holding all other variables constant. For people who have experienced discrimination based on race or ethnicity, anxiety increases on average by 0.334 compared to people who have not experienced discrimination based on race or ethnicity, holding all other variables constant.

Table 8. SEM paramater estimates, positive bisexual identity as a moderator

Parameter	Unstandardized estimate (SE)	p-value	Standardized estimate (SE)[+]	p-value
Measurement model estimates				
PstWkAnx	1.000 (0.000)	--	0.807 (0.035)	<0.0001*
PstWkInt	0.860 (0.125)	<0.0001*	0.756 (0.046)	<0.0001*
PstWkAvd	0.837 (0.105)	<0.0001*	0.690 (0.067)	<0.0001*
PstWkAbi	1.050 (0.093)	<0.0001*	0.828 (0.028)	<0.0001*
PstWkSol	0.780 (0.096)	<0.0001*	0.740 (0.057)	<0.0001*
Structural model estimates				
ABES_St	-0.024 (0.048)	0.620	-0.400 (0.800)	0.617
ABES_GL	0.039 (0.057)	0.492	0.683 (0.986)	0.488
Gender-Genderqueer	0.422 (0.188)	0.025*	0.513 (0.229)	0.025*
Gender-2-spirited	-0.027 (1.810)	0.988	-0.035 (2.201)	0.987
One committed partner	0.123 (0.142)	0.386	0.150 (0.173)	0.388
Multiple committed partners	0.289 (0.187)	0.122	0.352 (0.224)	0.116
Religious upbringing	-0.114 (0.118)	0.337	-0.209 (0.215)	0.329
No committed partners	-0.189 (0.147)	0.199	-0.230 (0.172)	0.182
Age	-0.012 (0.006)	0.060	-0.152 (0.081)	0.062
Gender-Man	-0.046 (0.237)	0.847	-0.056 (0.288)	0.847
Gender-Woman	0.053 (0.224)	0.812	0.065 (0.273)	0.812
Income-to-needs ratio/1000	-0.001 (0.003)	0.633	-0.035 (0.074)	0.635
Discrimination-race	0.334 (0.154)	0.030*	0.406 (0.176)	0.021*
Discrimination-ability	0.084 (0.444)	0.850	0.102 (0.540)	0.850
Gender-Bigendered	0.772 (1.443)	0.593	0.191 (1.395)	0.593
Bigendered*ABES_GL	-0.163 (0.181)	0.368	-1.337 (1.515)	0.377
Bigendered*ABES_St	0.218 (0.174)	0.209	1.988 (1.625)	0.221
2-spirited*ABES_St	-0.085 (0.061)	0.163	-0.815 (0.589)	0.167
PLGBTQIA (IA)	-0.011 (0.014)	0.425	-0.179 (0.222)	0.421
PLGBTQIA*ABES_GL/100	-0.059 (0.062)	0.342	-0.969 (1.009)	0.337
PLGBTQIA*ABES_St/100	0.047 (0.050)	0.351	0.802 (0.847)	0.344
PLGBTQIA*Bigendered	-0.016 (0.015)	0.293	-0.290 (0.283)	0.304
PLGBTQIA*2-spirited	-0.003 (0.021)	0.895	-0.057 (0.443)	0.897
Bigendered*IA*ABES_GL	0.0012 (0.002)	0.408	1.290 (1.610)	0.423
Bigendered*IA*ABES_St	-0.002 (0.002)	0.274	-1.760 (1.672)	0.293
2-spirited*IA*ABES_St	0.001 (0.001)	0.078	0.980 (0.563)	0.082
Residual variances				
PstWkAnx	0.356 (0.050)		0.348 (0.057)	
PstWkInt	0.372 (0.060)		0.428 (0.069)	
PstWkAvd	0.524 (0.058)		0.524 (0.092)	
PstWkAbi	0.344 (0.059)		0.315 (0.047)	
PstWkSol	0.343 (0.043)		0.453 (0.084)	
Anxiety	0.487 (0.091)		0.695 (0.061)	

[+] Standardization was STDYX for continuous variables and STDY for categorical variables.
* denotes significant p-values at $p \leq 0.05$

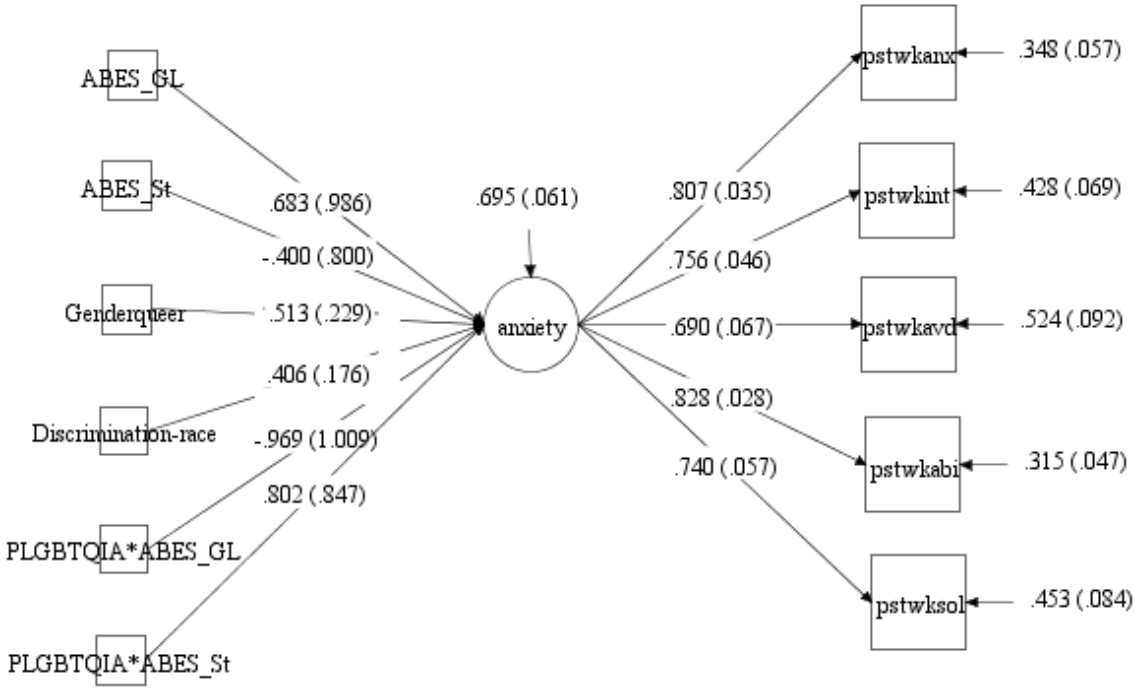

Figure 14. Standardized parameter estimates (SE) of interest, positive bisexual identity as a moderator

Note. Only statistically significant estimates are included in the figure in addition to estimates for ABES_GL, ABES_St, and the interaction terms between PLGBTQIA and the ABES subscales, despite their statistical significance as they are the main variables of interest. Standardization was STDYX for continuous variables and STDY for categorical variables.

Volunteering, advocacy, and activism as a moderator

In this model the final sample size was 391, 14 people were missing data on all of the outcome variables, and a total of 41 free parameters were estimated. The chi-square value was 205.442 (109 *df*, p<0.005), the RMSEA was 0.047, the CFI was 0.878, the TLI was 0.844, and the SRMR was 0.021. The chi-square, RMSEA, and SRMR indicate good fit between the model and the observed data but the CFI and TLI do not (Schreiber et al., 2006). The unstandardized and standardized coefficients as well as standard errors for the SEM model can be seen in Table 9. Likewise, the standardized statistically significant estimates with their standard errors can be seen in Figure 15. The estimates for biphobia are also illustrated despite being not statistically significant as they are the main exposures of interest. The R^2 for the latent variable in this model was 0.300. Otherwise stated, 30.0% of the variance in anxiety was explained by the variables in the model.

In this model, the relationship between biphobia and anxiety remained not statistically significant for bigendered bisexuals. There was a significant relationship between biphobia from the straight community and anxiety for non-bigendered bisexuals who are engaged in volunteering, advocacy, or activism (Figure 16). The relationship between biphobia from the gay community and anxiety remained not statistically significant for non-bigendered people.

Out of secondary interest, the only statistically significant unstandardized parameter estimates were discrimination based on race and volunteering for people who have not experienced biphobia (this is not of interest, thus will not be described). This is similar to the previous models. For people who have experienced discrimination based on race, anxiety increases on average by 0.378 compared to people who have not experienced discrimination based on race, holding all other variables constant.

Table 9. SEM paramater estimates, volunteering, advocacy, or acitivism as a moderator

Parameter	Unstandardized estimate (SE)	p-value	Standardized estimate (SE)[+]	p-value
Measurement model estimates				
PstWkAnx	1.000 (0.000)	--	0.807 (0.036)	<0.0001*
PstWkInt	0.862 (0.125)	<0.0001*	0.757 (0.046)	<0.0001*
PstWkAvd	0.833 (0.104)	<0.0001*	0.686 (0.067)	<0.0001*
PstWkAbi	1.057 (0.093)	<0.0001*	0.832 (0.028)	<0.0001*
PstWkSol	0.778 (0.094)	<0.0001*	0.737 (0.056)	<0.0001*
Structural model estimates				
ABES_St	-0.029 (0.020)	0.144	-0.495 (0.325)	0.128
ABES_GL	0.003 (0.021)	0.868	0.059 (0.355)	0.867
Gender-Genderqueer	0.347 (0.183)	0.058	0.422 (0.224)	0.059
Gender-2-spirited	1.155 (1.891)	0.541	1.409 (2.306)	0.541
One committed partner	0.135 (0.143)	0.346	0.164 (0.176)	0.350
Multiple committed partners	0.210 (0.200)	0.293	0.256 (0.244)	0.293
Religious upbringing	-0.113 (0.127)	0.374	-0.207 (0.229)	0.367
No committed partners	-0.187 (0.133)	0.159	-0.227 (0.153)	0.139
Age	-0.012 (0.007)	0.099	-0.150 (0.092)	0.103
Gender-Man	0.072 (0.295)	0.806	0.088 (0.359)	0.806
Gender-Woman	0.119 (0.282)	0.672	0.145 (0.346)	0.674
Income-to-needs ratio/1000	-0.001 (0.003)	0.766	-0.022 (0.075)	0.766
Discrimination-race	0.378 (0.154)	0.014*	0.461 (0.172)	0.007*
Discrimination-ability	0.074 (0.487)	0.880	0.090 (0.593)	0.879
Gender-Bigendered	-1.139 (1.809)	0.529	-1.389 (2.190)	0.526
Bigendered*ABES_GL	-0.129 (0.138)	0.350	-1.059 (1.163)	0.363
Bigendered*ABES_St	0.103 (0.130)	0.427	0.941 (1.206)	0.435
2-spirited*ABES_St	0.035 (0.042)	0.406	0.339 (0.409)	0.408
Volunteering (VAA)	-0.837 (0.389)	0.031*	-1.019 (0.420)	0.015*
VAA*ABES_GL	-0.008 (0.012)	0.520	-0.241 (0.374)	0.520
VAA*ABES_St	0.028 (0.012)	0.020*	0.935 (0.379)	0.014*
VAA*Bigendered	0.281 (1.080)	0.795	0.343 (1.307)	0.793
VAA*2-spirited	-0.601 (1.104)	0.587	-0.733 (1.345)	0.586
2-spirited*VAA*ABES_St	-0.015 (0.030)	0.607	-0.225 (0.439)	0.609
Bigendered*VAA*ABES_GL	0.053 (0.090)	0.553	0.590 (1.000)	0.555
Bigendered*VAA*ABES_St	-0.029 (0.084)	0.733	-0.376 (1.104)	0.733
Residual variances				
PstWkAnx	0.362 (0.049)		0.349 (0.057)	
PstWkInt	0.373 (0.059)		0.427 (0.069)	
PstWkAvd	0.526 (0.057)		0.529 (0.092)	
PstWkAbi	0.344 (0.057)		0.307 (0.046)	
PstWkSol	0.344 (0.041)		0.457 (0.082)	
Anxiety	0.472 (0.085)		0.700 (0.061)	

[+] Standardization was STDYX for continuous variables and STDY for categorical variables.

* denotes significant p-values at $p \leqslant 0.05$

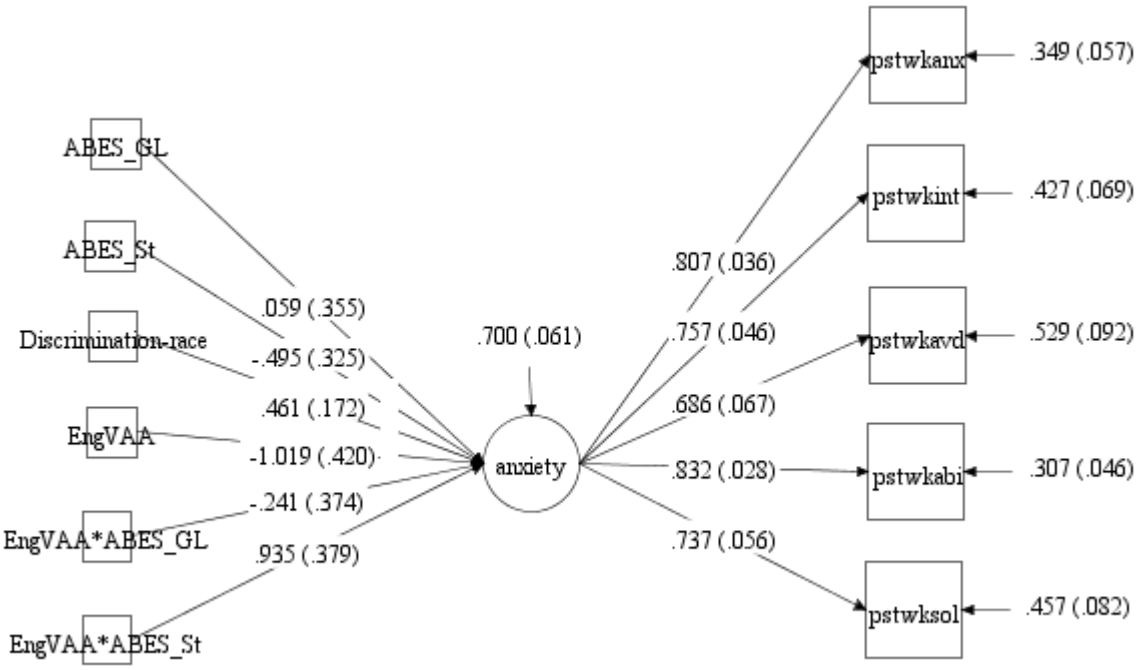

Figure 15. Standardized parameter estimates (SE) of interest, volunteering, advocacy, or activism as a moderator

Note. Only statistically significant estimates are included in the figure in addition to estimates for ABES_GL, ABES_St, and the interaction terms between EngVAA (volunteering, advocacy, or activism) and the ABES subscales, despite their statistical significance as they are the main variables of interest. Standardization was STDYX for continuous variables and STDY for categorical variables.

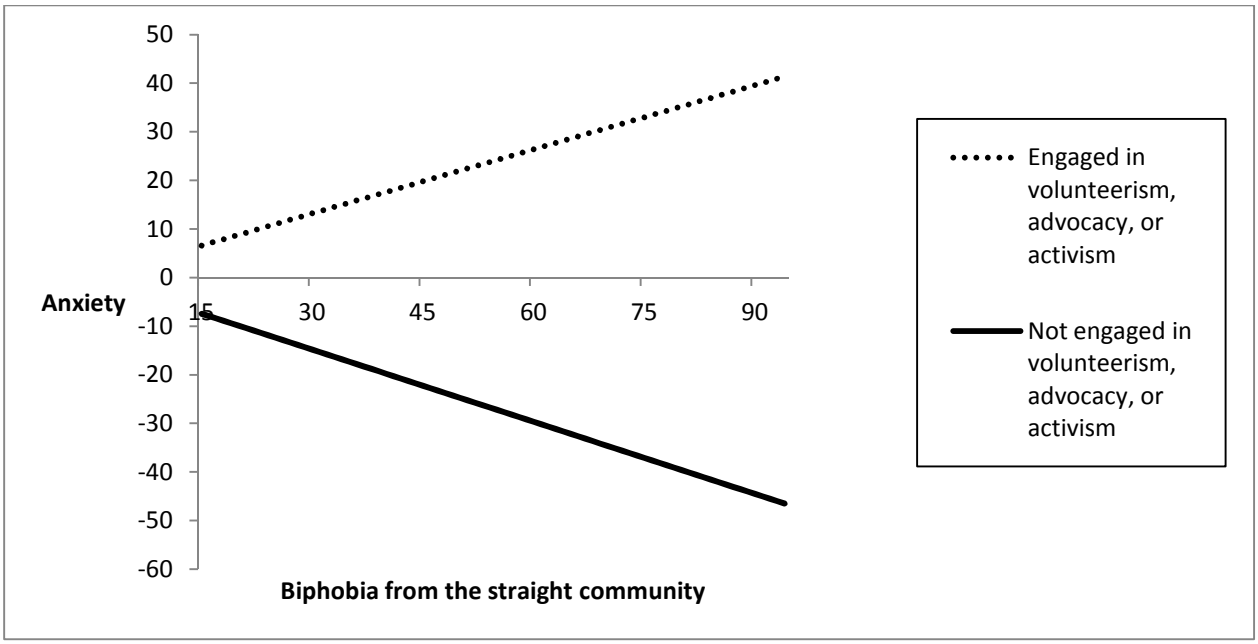

Figure 16. Standardized interaction between biphobia from the straight community and volunteering/advocacy/activism for non-bigendered bisexuals, anxiety as an outcome

5.2.2. Posttraumatic stress symptoms as an outcome

Measurement model

Before the relationship between biphobia and PTSD symptoms was examined, the PCL-C was tested using CFA. This allowed a more in depth view of how well the PCL-C measures the construct PTSD for bisexual people since previously this scale had not been tested for use in bisexual populations. In this CFA model, the final sample size was 391, 14 people were missing data on all outcome variables, and there were 51 parameters estimated. In regard to model fit, the RMSEA was 0.081 (90% CI: 0.073, 0.090), the CFI was 0.726, the TLI was 0.687, and the SRMR was 0.087. The RMSEA indicated good fit between the model and the observed data but the CFI, TLI, and SRMR did not (Schreiber et al., 2006). Therefore, this scale may not accurately measure PTSD symptoms in bisexual populations. Since this analysis is exploratory and the scale does not appear to measure PTSD symptoms well for this population, the relationship between biphobia and PTSD symptoms will not be examined. The standardized parameter estimates and their standard errors for this CFA model can be seen below in Figure 17.

In addition, Pearson correlations between the indicators within each subscale making up the latent construct PTSD symptoms were measured. It was found that the items in the re-experiencing subscale were positively and moderately correlated with each other based on Dancey and Reidy (2004)'s categorization (r=0.40 to 0.60) (Table 10). Conversely, there were several items in the avoidance scale that had weak correlations (r<0.40) based on this same categorization. These items included "loss of interest in the things you used to enjoy", "trouble remembering important parts of a stressful experience from the past", and "feeling as if your future will somehow be cut short" (Table 11). Similarly, the item "trouble falling or staying asleep" in the hyperarousal subscale had weak correlations with all other items in the subscale (Table 12). Weak correlations are unfavourable because they are measuring the same construct so the correlations between indicators should all be moderate and positive (K. Bollen & Lennox, 1991).

Table 10. Re-experiencing subscale Pearson correlations

Scale items	1	2	3	4	5
Repeated disturbing memories, thoughts, or images from a stressful experience from the past (1)	1.00000	0.55098	0.57824	0.59404	0.53251
Repeated, disturbing dreams of a stressful experience from the past (2)	--	1.00000	0.51307	0.47248	0.50893
Suddenly acting or feeling as if a stressful experience were happening again (3)	--	--	1.00000	0.61625	0.60151
Feeling very upset when something reminded you of a stressful experience (4)	--	--	--	1.00000	0.69333
Having physical reactions when something reminded you of a stressful experience from the past (5)	--	--	--	--	1.00000

Table 11. Avoidance subscale Pearson correlations

Scale items	1	2	3	4	5	6	7
Avoiding thinking about or talking about a stressful experience (1)	1.00000	0.66460	0.49049	**0.39472**	0.42897	0.51249	**0.30807**
Avoiding activities or situations because they remind you (2)	--	1.00000	0.45913	**0.39787**	0.44903	0.45823	**0.24824**
Trouble remembering important parts of a stressful experience from the past (3)	--	--	1.00000	**0.32182**	**0.29376**	**0.31748**	**0.23277**
Loss of interest in things you used to enjoy (4)	--	--	--	1.00000	0.70995	0.63322	0.51750
Feeling distant or cut off from other people (5)	--	--	--	--	1.00000	0.68365	0.53907
Feeling emotionally numb or unable to have loving feelings for those close to you (6)	--	--	--	--	--	1.00000	0.45411
Feeling as if your future will somehow be cut short (7)	--	--	--	--	--	--	1.00000

Bolded Pearson correlation coefficients are considered weak correlations based on previous categorization (Dancey & Reidy, 2004).

Table 12. Hyperarousal subscale Pearson correlations

Scale items	1	2	3	4	5
Trouble falling or staying asleep (1)	1.00000	**0.34743**	**0.36432**	**0.36751**	**0.30534**
Feeling irritable or having angry outbursts (2)	--	1.00000	0.58657	0.41756	0.48520
Having difficulty concentrating (3)	--	--	1.00000	0.47369	0.49021
Being super alert or watchful on guard (4)	--	--	--	1.00000	0.60203
Feeling jumpy or easily startled (5)	--	--	--	--	1.00000

Bolded Pearson correlation coefficients are considered weak correlations based on previous categorization (Dancey & Reidy, 2004).

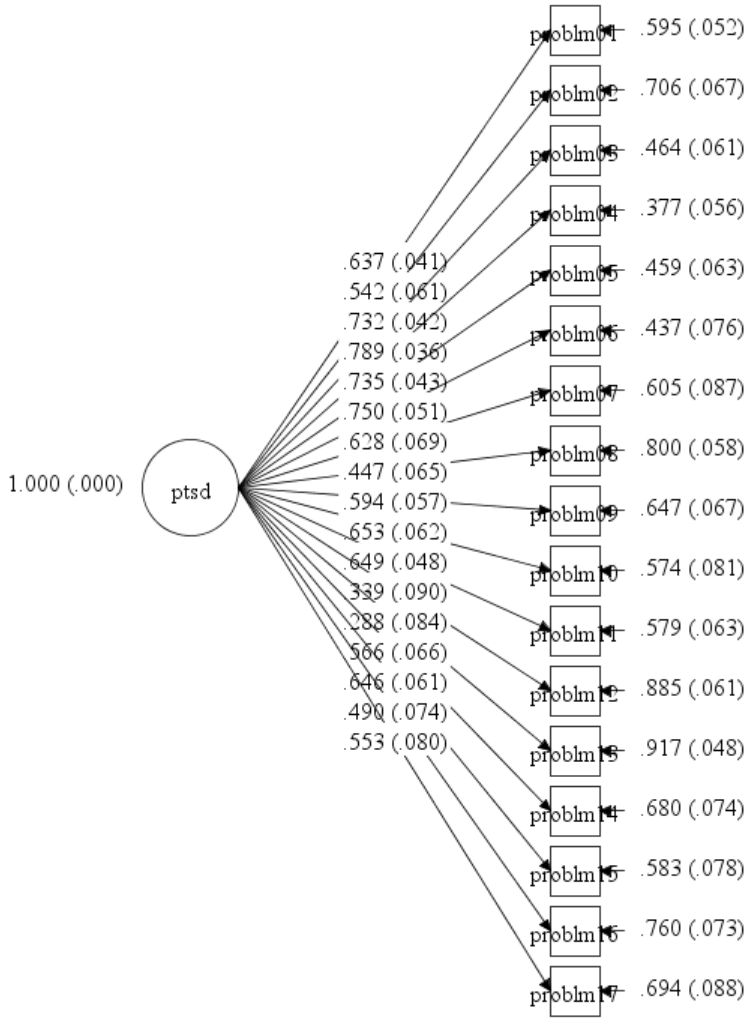

Figure 17. Standardized parameter estimates for the latent construct posttraumatic stress disorder symptoms: confirmatory factor analysis

Problm01: Repeated, disturbing memories, thoughts, or images of a stressful experience from the past
Problm02: Repeated, disturbing dreams of a stressful experience from the past
Problm03: Suddenly acting or feeling as if a stressful experience were happening again
Problm04: Feeling very upset when something reminded you of a stressful experience from the past
Problm05: Having physical reactions
Problm06: Avoiding thinking about or talking about a stressful experience from the past
Problm07: Avoiding activities or situations because they remind you of a stressful experience from the past
Problm08: Trouble remembering important parts of a stressful experience from the past
Problm09: Loss of interest in things that you used to enjoy
Problm10: Feeling distant or cut off from other people
Problm11: Feeling emotionally numb or being unable to have loving feelings for those close to you
Problm12: Feeling as if your future will somehow be cut short
Problm13: Trouble falling or staying asleep
Problm14: Feeling irritable or having angry outbursts
Problm15: Having difficulty concentrating
Problm16; Being super alert or watchful on guard
Problm17: Feeling jumpy or easily startled

In the above diagram, the standardized factor loading parameter estimates (estimates in the middle of the figure) can be interpreted as standardized regression coefficients explaining the relationship between PTSD symptoms and the indicators of PTSD. For example, for every standard deviation increase in PTSD symptoms (1 SD=12.661), repeated disturbing memories, thoughts, or images of a stressful experience from the past (Problm01) increases by 0.637 (possible range of 1-5), holding all other indicators constant. In order for these indicators to be a good measure of PTSD symptoms, they should have factor loadings of the same magnitude (Garrett-Mayer, 2006). In this model the standardized factor loadings largely range from 0.542 to 0.789 indicating that they are mostly all of similar magnitude and all represent similar amounts of the construct posttraumatic stress symptoms. The slightly lower factor loadings of 0.447 (Problm08) and 0.490 (Problm16) are for the indicators 'trouble remembering important parts of a stressful experience from the past' and 'being super alert or watchful on guard', respectively. This indicates that these two indicators may represent PTSD symptoms less than the other indicators composing the PCL-C scale. In addition, there are two factor loadings that represent even less of the construct; 0.339 (Problm12) and 0.288 (Problm13) which are factor loadings for 'feeling as if your future will somehow be cut short' and 'trouble falling or staying asleep', respectively. This suggests that these indicators represent very little of the construct PTSD symptoms compared to the other indicators.

Furthermore, the residual variances (estimates at the far right of the figure) indicate the reliability of the indicators (Schreiber et al., 2006). For example, Problm13 has the highest reliability (0.917) and Problm04 has the lowest (0.377). This translates into, for example, the construct PTSD symptoms accounting for 91.7% of the variance in 'trouble falling or staying asleep' because of PTSD symptoms. The estimate at the far left of the figure represents the variance of the latent construct which is set to one when standardized. Based on this CFA which demonstrated poor fit, factor loadings that varied quite substantially in magnitude, weak correlations, and varying reliability, the PCL-C scale may not be an adequate way to measure PTSD symptoms for the bisexual population of Ontario.

CHAPTER 6: DISCUSSION

It is consistently shown in the literature that bisexuals are more likely to have problematic levels of anxiety than heterosexuals and gay and lesbian people. Additionally, there is some debate as to whether bisexuals are also at increased risk for PTSD. This population also faces unique stressors such as biphobia which have the potential to negatively affect one's health, including levels of anxiety and potentially PTSD. Examining the relationship between biphobia and anxiety/PTSD in bisexuals is important to help understand why this disparity in mental health exists. It is also essential to consider factors that may help reduce anxiety and/or PTSD after experiencing biphobia. Preventing biphobia from occurring in the first place is ideal; however, it is also important to find factors that help promote resilience. The three potential protective factors examined in this thesis are identification and involvement with the LGBTQ community, positive LGBTQ identity, and volunteering, advocacy, or activism.

6.1. Summary of main findings

6.1.1. Outcome and predictor variables

Using data from the *Risk & Resilience Study* survey, it was estimated that the networked bisexual population of Ontario is primarily young, mostly female at birth, mainly white either alone or in combination with other racial identities, largely monogamous, and principally resides in Metropolitan Toronto. Additionally, they have largely completed some or all of their college or university education and household incomes were fairly evenly distributed between <$10,000 to >$100,000. When health outcomes were examined, it was found that 30.9% (95% CI: 23.7, 37.7) of bisexuals possibly have an anxiety disorder. This prevalence is much higher than that found in the general population and is similar to findings in studies looking at anxiety in bisexual populations. In the Canadian population aged 12 and older, using data from the CCHS, a yearly prevalence of 4.7% for anxiety disorder was found (Meng & D'Arcy, 2012). Correspondingly, when using American data from the National Epidemiologic Survey on Alcohol and Related Conditions, it was found that bisexuals were 2.4 times more likely than heterosexuals to have an anxiety disorder in the past year (Bostwick et al., 2010).

Our findings are comparable to other studies examining anxiety in sexual minorities. For

example, Tjepkema (2008) calculated a prevalence of 25% in bisexual women and Brennan et al. (2010) found a prevalence 14% in bisexual men based on data from the CCHS; however, these rates are for mood or anxiety disorders. Based on these data, the prevalence of anxiety cannot be disaggregated from mood disorders. This is problematic as mood disorders are common; therefore, it is possible that our study found slightly higher or much higher levels of anxiety than studies using data from the CCHS. Nonetheless, a Canadian internet-based study found slightly higher rates of anxiety in bisexual men with 38% self-reporting problematic anxiety (Engler et al., 2011). The prevalence found in this thesis is also quite a bit higher than the prevalence previously found in studies for gay and lesbian populations. For example, Steele et al. (2009) found that 13% of lesbian women had a mood or anxiety disorder and Brennan et al. (2010) found that 16% of gay men reported a mood or anxiety disorder. Our findings suggest that bisexuals have more anxiety than gay and lesbian people despite not being able to attribute the previously mentioned prevalence specifically to anxiety disorders. This is especially true since mood disorders are common and our findings are greater than those combining anxiety and mood disorders.

Data from the United States demonstrated greater prevalence of lifetime anxiety disorder among bisexual women compared to lesbian women but not for bisexual men compared to gay men; 66.2% of bisexual women and 40.6% of bisexual men reported lifetime anxiety disorder compared to 48.4% of lesbian women and 45.8% of gay men (Bolton & Sareen, 2011). Overall, this study's prevalence is likely higher than our results due to it being for lifetime anxiety disorder whereas this thesis measured anxiety in the past two weeks. Another American study found that 20.3% of bisexual women, 9.2% of lesbian women, and 7.6% of heterosexual women had generalized anxiety disorder in the past year compared to 15.6% of bisexual men, 15.4% of gay men, and 5.9% of heterosexual men (S. D. Cochran & Mays, 2009). However, generalized anxiety disorder is a specific type of anxiety disorder so these results may be lower than our findings which may include broader symptoms of anxiety (Campbell-Sills et al., 2009). It is also unlikely that data from the United States is generalizable to bisexuals living in Ontario. Overall though, the prevalence found in this study supports the hypothesis that bisexuals experience significantly more problematic anxiety than the heterosexual population and largely the gay and lesbian populations.

In regard to PTSD, it was found that 10.8% (95% CI: 6.2, 15.2) of people possibly have PTSD based on the more conservative cut-off value (PCL-C ≥ 50). This proportion is similar if not somewhat lower than what Roberts et al. (2010) found in their population-based study using data from the National Epidemiologic Survey on Alcohol and Related Conditions. They found that 26% of bisexual women and 9% of bisexual men had PTSD compared to 18% of lesbians, 13% of gay men, 13% of heterosexual women, and 5% of heterosexual men (Roberts et al., 2010). However, these proportions are out of people who have experienced a potentially traumatic event. Similarly, a study using a convenience sample from business establishments found that 17% of bisexuals had PTSD (Alessi, Meyer, et al., 2013). This is in contrast to a Canadian study that found a prevalence of 2.4% in the general population for current PTSD (Van Ameringen et al., 2008). Therefore, this study supports the hypothesis that bisexuals are at greater risk for PTSD than the general population, and they may also be at greater risk than gay and lesbian people but this is unclear based upon the available data.

Furthermore, it was found that networked Ontarian bisexuals experienced on average low to moderate scores on the Anti-Bisexual Experience Scale (ABES) based on the possible range of values for each subscale (17-102). The average ABES score for the straight community subscale was 36.6 (95% CI: 34.6, 38.7) compared to 30.8 (95% CI: 28.5, 33.1) for the gay community subscale. Since all of the items on the scale represent biphobic attitudes or experiences, anyone who checked at least one of the options may be considered to have experienced biphobia. In addition, this scale is relatively new (published in 2010) and as a result there is very little literature for comparison. In her thesis, Lambe (2013) demonstrated comparable results among bisexual women in relationships when using the ABES. She illustrated that bisexual women experienced a mean score of 2.41 (SD=1.13) for biphobia from the gay community and a mean score of 2.58 (SD=1.01) for biphobia from the straight community which translates into mean scores of 40.97 and 43.86 for biphobia from the gay and straight community respectively when converting to the scoring method used in this thesis (Lambe, 2013).

When considering biphobia more generally, Garner (2008) reported that 33% of black bisexual men experienced biphobia with their family, with their friends, in the community, and in the workplace. However, this estimate may be low if not everyone recognizes biphobic experiences as biphobia. For instance, they may attribute negative experiences to other identities

that they hold. Several studies have also reported biphobia in regard to attitudes; for example, an older study found that 24% of heterosexual undergraduate students had very negative attitudes towards bisexual men and 20% had very negative attitudes towards bisexual women (Eliason, 1997). However, these attitudes have likely changed over the past 17 years.

In regard to potential protective factors, it was found that 39.3% (95% CI: 33.7, 49.3) bisexuals engaged in volunteering, advocacy, or activism. This is slightly lower than the general Canadian population. Specifically, Vézina & Crompton (2012) described that 47% of Canadians 15 years and older volunteered in 2010. Pertaining to positive identity, it was found that bisexuals had on average moderately positive bisexual identities based on the possible PLGBTQIA range of values (possible range: 24-120, $\overline{x}$: 87.060, 95% CI: 84.737, 89.382). This is consistent with findings that bisexuals have generally positive feelings about their sexual identity (Herek, Norton, Allen, & Sims, 2010). Specifically, Herek et al. (2010) showed that bisexual women scored 1.84 (95% CI: 1.63, 2.06) on the Identity Commitment and Community Identification (IHP) scale compared to bisexual men who scored 2.62 (95% CI: 1.88, 3.36) where higher scores (possible range of 0-5) indicate more negative feelings about sexual identity. This also demonstrates that bisexual men may have less positive identities than bisexual women.

Finally, it was estimated that bisexuals, on average, have low identification and involvement with the LGBTQ community based on the possible range of values in the IIGCS (possible range: 6-30, $\overline{x}$: 7.1, 95% CI: 6.8, 7.4). Additionally, given that levels of biphobia from the gay/lesbian community were found to be very similar to levels of biphobia from the straight community, the "LGBTQ" community may not necessarily be welcoming for bisexual people. This has been supported by Herek et al. (2010) who showed that 24.7% of bisexual women and 15.6% of bisexual men felt that membership in the LGBTQ community was important to their sense of self. In addition, the majority of bisexual participants (68.1% of women and 60.2% of men) stated that their membership in the LGBTQ community had very little to do with how they felt about themselves (Herek et al., 2010). Overall, bisexual participants demonstrated less community identification than gay men and lesbians (Herek et al., 2010). This has also been supported by Frost and Meyer (2012) who reported that bisexuals had less connectedness to the LGBT community than gay men and lesbians using a modified form of the Connectedness to the LGBT Community Scale.

6.1.2. Measurement models

When the measurement model for anxiety was tested using confirmatory factor analysis (CFA), it was found that the OASIS scale may be appropriate to use in bisexual populations. Overall, all of the factor loadings were of the same magnitude indicating that all of the indicators (or alternatively, all of the items forming the OASIS scale) represent similar amounts of the construct anxiety. They may also be considered strong because they ranged between 0.677 and 0.833. This is similar to the other two studies which have validated this scale (Campbell-Sills et al., 2009; Norman et al., 2006). In addition, all of the indicators were moderately correlated with each other to show that they are representing the same construct. There remains a level of uncertainty regarding the appropriateness of this scale for this sample; however, as some of the fit indices indicated good fit and some did not indicate good fit. This is especially problematic as the two indices that indicated poor fit were the CFI and RMSEA, currently two of the preferred indices of model fit in the literature (Hooper et al., 2008; Kenny, 2014). These indices are thought to perform better than some of the other indices such as the chi-square because they are less affected by sample size and the complexity of the model (Hooper et al., 2008; Kenny, 2014). Therefore, it is suggested that this measurement model is not a good fit for the observed data; however, more research should be done to examine this issue and to improve the scale for use in this population especially since it was found to have good and comparable factor loadings, internal reliability based on Cronbach's alphas, and correlated indices.

The OASIS has previously been validated twice - in a clinical and non-clinical sample. In a clinical sample of primary care patients referred for treatment of an anxiety disorder, the OASIS was shown to have strong factor loadings (all between 0.55 and 0.78), high internal consistency, and was correlated with overall measures of anxiety as well as measures that are specific to anxiety disorders (Campbell-Sills et al., 2009). This scale was originally created and validated in a sample of college students. It was found to have high internal reliability with Cronbach's alphas of 0.80, factor loadings of 0.71 to 0.77 for the first half of the sample and factor loadings of 0.70 to 0.79 for the second half of the sample, and good test-retest reliability (Norman et al., 2006). It was also shown to have excellent convergent validity with other scales measuring anxiety (e.g. Spielberger Trait Anxiety Questionnaire, Brief Symptom Inventory 18) and was positively correlated with scales measuring specific anxiety disorders (e.g. NEO-FFI

Neuroticism subscale, Mini-Social Phobia Inventory) (Norman et al., 2006). Despite these findings, they may not be generalizable to our sample of Ontarian bisexuals because not everyone is a college student or was referred for treatment of an anxiety disorder.

Additionally, it was found that the PCL-C may not be an adequate scale to measure PTSD symptoms in bisexual populations. When the items that form the PCL-C were tested using CFA to see how well they represent the construct PTSD, it was found that the factor loadings were not all similar in magnitude; there were several that had much lower factor loadings. This suggests that the items measuring PTSD are not equally representative. In addition, it was found that there are some weak correlations between some of the measures, particularly in the avoidance and hyperarousal subscales. This is unfavourable because they are supposed to be representing the same construct and should therefore be positively moderately correlated with each other. This may be in part due to the general nature of the items which could also be indicative of other mental health problems such as mood disorders. Additionally, the majority of the fit indices indicated poor fit between the model and the observed data. There are also several conceptual issues surrounding the PCL-C which will be discussed in the limitations section. Based on these findings, future research is needed to help modify this scale for use in bisexual populations especially as there are currently no scales designed for measuring PTSD symptoms in bisexual populations. The PCL-C is currently undergoing revisions by the National Center for PTSD to reflect changes in the DSM-V (U.S. Department of Veterans Affairs, 2013a), so this may be a good opportunity to also incorporate changes not suggested solely by the DSM-V.

These findings are in contrast to previous studies which have validated the PCL. Specifically, four studies have validated the original PCL which references severe trauma (e.g. war, car accidents, sexual assault) or clinical samples (Blanchard et al., 1996; Forbes, Creamer, & Biddle, 2001; Ventureyra, Yao, Cottraux, Note, & De Mey-Guillard, 2002; Weathers, Litz, Herman, Huska, & Keane, 1993) and one study has validated the PCL-C with a completely non-clinical sample (Ruggiero et al., 2003). This study used a sample of undergraduate psychology students and found that the items' correlations on the whole scale ranged from weak to moderate (0.22 to 0.69) but correlations were stronger within the subscales (Ruggiero et al., 2003). They also found high internal reliability with Cronbach's alphas greater or equal to 0.85 for each of the subscales and high test-retest correlations (Ruggiero et al., 2003). This scale also had high

convergent validity with the Impact of Event Scale and the Mississippi Scale for Combat-Related PTSD (Ruggiero et al., 2003). Since this scale has only been validated in American college students, results may not be generalizable to other groups, including bisexuals living in Ontario, Canada.

6.1.3. Main findings from the structural equation models for anxiety

When the relationship between biphobia and anxiety was examined without including confounders in the model, it was found that biphobia from the straight community had a small but statistically significant effect on anxiety. It was found that a 20 point increase on the biphobia straight subscale (ranges from 17-102 when no missing data, responses ranged from 15-94) increased anxiety on average by 0.40 (ranges from 0-25, responses ranged from 0-18). This was while controlling for biphobia from the gay community and overall is likely not clinically significant. When including confounders and gender identity moderators in the model, the effect of biphobia from the straight community on anxiety was not statistically significant and the effect of biphobia from the gay community on anxiety was only seen among bigendered people. Specifically, it was found that biphobia from the gay community decreased anxiety for bigendered people. This effect was fairly small in magnitude with a 20 point increase on the ABES subscale for biphobia from the gay community decreasing anxiety on average by 1.26 for bigendered people. Biphobia from the gay community was not expected to decrease anxiety and this finding cannot necessarily be explained. More research is needed to examine this relationship.

When identification and involvement with the LGBTQ community was added to the model as a moderator, the relationship between biphobia and anxiety remained not statistically significant for non-bigendered people but also became not statistically significant for bigendered people. This remained the same when positive bisexual identity was added to the model as a moderator. It also appears that identification and involvement with the LGBTQ community and positive bisexual identity do not have moderating effects on the relationship between biphobia and anxiety. The lack of significant findings for identification and involvement with the LGBTQ community may be related to the low internal reliability found for this scale in our sample; the IIGCS scale may not be measuring the concept very well. It is also possible that the small

variability for this measure affected the findings in that most people scored low on the scale, perhaps indicating that most people feel there is not a bisexual community to identify with or be involved with. Conversely, it was found that volunteering, advocacy, or activism may have a moderating effect on biphobia from the straight community and its relationship with anxiety for non-bigendered people. This interaction demonstrated that people with gender identities other than bigendered who are engaged in volunteering, advocacy, or activism experience more anxiety with higher levels of biphobia from the straight community. Conversely, non-bigendered bisexuals not engaged in volunteering, advocacy, or activism experienced less anxiety with more biphobia from the straight community. There may be a temporality issue in this relationship where people with more anxiety seek out opportunities for volunteering, advocacy, or activism as a form of coping. More research should be done in the future to further examine and clarify the role of volunteering, advocacy, or activism as a potential moderating factor in the relationship between biphobia and anxiety for bisexuals.

As a sensitivity analysis since many of the questions in the ABES scale depend on one's outness, models were also run controlling for outness as measured by the Mohr Outness Scale and the Savin-Williams Scale (Mohr & Fassinger, 2000; R. C. Savin-Williams, 1989). No differences were found between the models including outness and the models that did not include outness. Out of secondary interest, discrimination based on racial, ethnic, or cultural identity was consistently found to be related to higher levels of anxiety. This is not a surprising finding as discrimination has repeatedly been linked to anxiety.

6.2. Strengths and limitations

Strengths

There are several strengths and also several limitations in this thesis project. Firstly, this thesis used data collected through RDS which has been shown to reach populations considered unreachable through simple random sampling and is an improvement over convenience sampling. Secondly, this thesis uses data from a bisexual population which allows for the examination of within group differences and, unlike many previous studies; the data are not combined with those of gay and lesbian people which gives a clearer overview of bisexual peoples' mental health. Additionally, the data included a broad range of self-identified bisexuals

since people were able to identify as a related term other than bisexual (such as pansexual, queer, questioning) and complete the survey. Furthermore, the *Risk & Resilience Study* survey used many validated scales (e.g. ABES was validated in two bisexual samples) and Cronbach's alphas were calculated to demonstrate internal reliability within our sample. An additional strength is that the study was conducted as a CBR project which allowed community members and members from different organizations to contribute their knowledge and expertise.

Within this thesis, using SEM was advantageous over traditional regression. It allowed us to examine if the OASIS and PCL-C scales are appropriate for bisexual populations and allows for systematic and random error. This method also used multiple imputation which has been found to be advantageous over listwise deletion. Finally, this thesis as a whole examined the relationship between biphobia and anxiety as well as possible protective factors to enhance resilience. Very little previous research has examined this relationship despite research largely showing higher rates of anxiety in bisexual populations compared to heterosexual, gay, and lesbian populations. Additionally, discrimination is often cited as an important issue in the LGBTQ community affecting health; however as previously stated, little research has examined discrimination based on bisexual peoples' sexual orientation and its effect on anxiety.

Limitations

There are also several limitations throughout this project. Firstly, although RDS has been shown to be beneficial over convenience sampling, it is still unable to reach individuals who are completely isolated or are non-networked. This limits the generalizability to networked Ontarian bisexuals only. Furthermore, it is possible that some biases remain in the sample but there are no completely accurate population data available to compare the sample with. For example, using RDS samples compared to total population data in Uganda it was found that younger males with higher socioeconomic status were underrepresented in the RDS samples; however, they did find that the RDS samples were generally representative (McCreesh et al., 2012). RDS accounts for some over-recruitment but biases may remain in our sample if certain groups are better networked and are over-recruited by all groups. For example, 27.7% of bisexual people were found to identify as kinky, BDSM, or fetish; however, given the existence of extensive kink and fetish communities both online and in the real-world, it is likely that kinky bisexuals are better

networked. Where possible, our demographics were compared to data from the CCHS. Using combined data from 2003 and 2005, it was determined that our data was similar regarding education, racial or cultural identity, and marital status. Specifically, based on the CCHS, the majority of Canadian bisexuals have completed postsecondary education, identify as white, and are closely divided between married or common-law and single (never married) (Tjepkema, 2008). However, there were also several differences; in the CCHS there were more bisexual men in older age categories (i.e. over 35 years old) and more bisexual people fell into the low income quintile whereas our data showed that income was fairly evenly distributed between less than $10,000 to greater than $100,000 (Tjepkema, 2008). These differences may be related to time (i.e. the CCHS data is older) and location since the CCHS is a national survey and the *Risk & Resilience Study* was limited to Ontario. For example, some provinces may have lower incomes than Ontario.

An additional limitation is that the data are cross-sectional which limits causal inferences as temporality is difficult to establish. This issue was somewhat alleviated by using an outcome which measured anxiety in the past week, providing a more current measure for anxiety. Similarly, PTSD was measured in the last month. This is in contrast to the exposures which could have occurred over the lifetime. With survey questions, there is also the possibility that participants may interpret their experiences and the questions differently. For example, someone may not realize that they have experienced biphobia. To help alleviate this issue, several validated scales were used. Furthermore, survey questions are also subject to recall bias. For example, someone diagnosed with an anxiety disorder may be more likely to remember negative events such as discrimination if they feel that they are related to their anxiety levels.

There are also some limitations surrounding the scale used to measure PTSD symptoms in that the PCL-C scale was conceptualized to refer to one specific traumatic event. This was originally done because that is how PTSD is conceptualized in the *DSM-IV*; it is required to have been a life threatening event. This allows the scale to closely represent clinical diagnosis. The issue with this; however, as previously mentioned is that many (or even one) event that is not considered to be life threatening may lead to PTSD symptoms. This has been found in the scientific literature. It has also been shown that cumulative events that are not necessarily life threatening (e.g. racism) may lead to PTSD symptoms (Diaz et al., 2001; Williams, 2013).

Therefore, it may not be appropriate to frame this scale in reflection of one traumatic event. It is likely that bisexual people experience traumatic events such as discrimination more than once in their lives and there may be a cumulative effect from that exposure.

Finally, because this sample is composed only of bisexual people, comparisons cannot be made between bisexual people and gay, lesbian, and heterosexual people. This comparison may be necessary to see the effects of biphobia on anxiety and/or PTSD symptoms; it may not be ideal to examine this relationship by studying the variation within bisexual people. As Schwartz (1994) explained, characteristics of members of a group may not be the same as characteristics of a group. For example, bisexual people as a group may have higher levels of anxiety following biphobic experiences than gay people and heterosexual people, as groups, but bisexual people individually may not differ greatly in their levels of anxiety after experiencing biphobia. Although, it likely does not make sense to ask gay and heterosexual people about their experiences of biphobia since it is a bisexual-specific form of discrimination.

Finally, several factors related to resilience could not be included in this thesis because they were (a) not asked in the survey (e.g. personality factors) or (b) too large for the scope of a Master's thesis (e.g. self-care strategies, substance use). Similarly, controlling for sources of general stress (e.g. work stress and family stress) which are included in Meyer (2003)'s minority stress theory was beyond the scope of this thesis and variables needed for this analysis were not included in the data set. General stressors may be an uncontrolled source of confounding and may affect results. Therefore, the minority stress theory should not be dismissed as a potential explanation for the increased levels of anxiety found among bisexual people.

6.3. Implications

Future research should aim to improve the OASIS and PCL-C for use in examining the mental health of bisexual people. Exploratory factor analysis may suggest modifications to the OASIS and the PCL-C that improve model fit and their capacity to measure anxiety and PTSD symptoms more accurately for bisexual samples. Similarly, future research may examine how the PCL-C could be modified to better reflect the traumatic experiences of bisexual people. These include the ability to measure repetitive and cumulative (complex) trauma. Other factors that may be important to consider in the face of complex trauma include the age when the trauma

occurred, the relationship between the victim and the perpetrator, the duration of the trauma, the perceived seriousness, and social support at the time and after the trauma (Courtois, 2004; Roberts et al., 2010). These items are not currently addressed in the PCL-C but may be useful additions for use in populations that experience complex trauma such as bisexual populations. The PCL-C is currently undergoing revisions by the National Center for PTSD to reflect modifications in the definition and symptoms of PTSD from the DSM-IV to the DSM-V. This is a prime opportunity to further modify the PCL-C for use in other populations. These modifications may include further attention to particular items which were found to have small correlations and factor loadings as well as more conceptual modifications such as the inclusion of a measure of cumulative trauma, or changes that are not solely reflected in the DMS-V. These changes may provide a more valid measure of bisexual people's mental health for future analyses.

It is still possible that biphobia may be related to the disparity in levels of anxiety seen between bisexuals and gays, lesbians, and heterosexuals, although there are likely also other explanations. There are several possible reasons why no relationship was found between biphobia and anxiety. Only one scale was used to measure biphobia and traditionally, discrimination is very difficult to measure because people may not attribute their experiences of discrimination to a particular identity they hold or they may not recognize discriminatory events. Discrimination may be perceived differently depending on the intersection of one's identities which is difficult to capture quantitatively (for example, a discriminatory event may be attributed to race, gender, age, sexual orientation, religion, etc. and the bias that it was based upon may not be clear). Furthermore, attributing an experience to being bisexual is different than asking whether or not something happened. This attribution may be complicated when our sample does not completely identify as bisexual but did identify as attracted to more than one sex/gender. In the ABES development, all participants identified as bisexual, although they identified on a spectrum of bisexuality with 14% identifying as mostly heterosexual and 11% identifying as mostly lesbian or gay (Brewster & Moradi, 2010). From the qualitative interviews of the *Risk & Resilience Study* it was noticed by our interviewer that many people claimed not to experience biphobia but went on to describe experiences that they considered biphobic. Therefore, it is possible that people do not recognize biphobia in their lives, further complicating our ability to measure it quantitatively.

It is also possible that we expect high levels of discrimination directed at bisexuals as a group but that these expectations do not reflect personal experience. Moghaddam and Studer (1997) found that there is a tendency for people to report more discrimination directed at groups than at themselves. This effect also seemed to increase with the size of the group with people reporting more discrimination for larger groups than smaller groups (Moghaddam & Studer, 1997). This may lead to people reporting less discrimination directed at them individually while also reporting more discrimination directed at bisexuals as a group. Additional explanations may include people wanting to be sure that they experienced discrimination prior to reporting it as such (Sechrist & Delmar, 2009). People may be less likely to attribute their experiences to discrimination if they are unsure or if the discrimination is not explicit (Sechrist & Swim, 2008). This is problematic because discrimination is not always explicit. Finally, people may recognize their experiences as discrimination but may not announce them as such if they are trying to suppress thoughts of the incident (Sechrist & Swim, 2008) or do not want to be identified as a victim as it may have negative connotations such as helplessness (Peterson & Muehlenhard, 2004). It is also possible that there is no association between biphobia and anxiety, although, no evidence of effect does not mean no effect. These findings may also be a random effect or a quirk of our data. Finally, it may be that anxiety is more about the anticipation of discrimination than past experiences of discrimination, which suggests a temporality issue in this relationship. Despite these negative findings, biphobia may still be a possible contributor of anxiety and more research is needed to help understand its role and to improve our ability to measure discrimination quantitatively. Qualitatively, biphobia has been discussed as playing a critical role in bisexual people's mental health through the internalization of negative attitudes and beliefs (Ross et al., 2010) and more research is needed to understand how it impacts mental health symptoms such as anxiety.

It was also found that levels of anxiety are much higher in Ontarian bisexuals than in those seen in gay, lesbian, and heterosexual people in other studies. It is particularly important to promote resiliency development as it is unlikely that biphobia will completely disappear in the near future. Resiliency may be promoted in many different ways and more research is needed to clarify the roles of factors such as volunteerism and having a positive identity. However, with the negative findings of this study, it suggests that it is important to also consider other factors that may lead to high levels of anxiety in bisexual populations. It may be that bisexual people are

more impacted by invisibility and lack of community than overt discrimination but more studies are needed to examine these relationships. Other potential causes that may warrant further attention include external factors (e.g. physical assault, sexual assault, and historical trauma), intrapsychic factors (e.g. self-image, feeling conflicted about responsibilities, roles, spirituality, etc.) and relationship dynamics (e.g. level of support from partners, families, friends).

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Appendix A: Positive LGBTQ Identity Assessment

	Applies not very much	Somewhat applies	Applies about half the time	Applies a lot of the time	Applies almost all the time
a) I am honest with myself about my bisexual identity.					
b) Being bisexual has helped me find meaning in my life.					
c) I have learned important things about myself because of my bisexual identity.					
d) My bisexual identity and experiences give me a unique perspective on life.					
e) My bisexual identity leads me to question the status quo or norms more than others.					
f) My bisexual identity makes me more open to a variety of experiences.					
g) I have better relationships with my friends because I share my bisexual identity.					
h) I have better relationships with my family because I share my bisexual identity.					
i) I have a diverse chosen family.					

j) I can explore new ways of having relationships instead of following typical heterosexual patterns.					
k) I feel like an equal in relationships with a partner.					
l) I am free to explore experiences of physical intimacy.					
m) I am free to explore experiences of emotional intimacy.					
n) I have a sense of sexual freedom.					
o) I am more sensitive to prejudice and discrimination against others because of my bisexual identity.					
p) I speak out against prejudice and discrimination because of my bisexual identity.					
q) I can inspire other people to feel safe about expressing their gender/sexual identity.					
r) I feel a connection to the bisexual community.					
s) I feel a connection to the broader LGBTQ community.					
t) I feel supported by the bisexual community.					
u) I feel supported by the broader					

LGBTQ community.					
v) I appreciate the diversity of the LGBTQ community.					
w) I feel visible in the LGBTQ community.					
x) I feel a certain bond with LGBTQ people because of shared experiences.					

Appendix B: Structural equation modelling fit indices

Fit index	Properties*
Chi-square	-Most reasonable for models with 75-200 cases; when models have 400+ cases then it is almost always statistically significant. -Larger correlations in the model will result in poorer fit -Considered too liberal when variables are not normally distributed (especially kurtotic) -More complex models (more variables) tend to have larger chi-square values
Tucker Lewis Index (TLI)	-Relative fit index (compared to a null model where all measured variables are uncorrelated) -Depends on average size of correlations in the data -May not be informative if the RMSEA is 0.05 -Tends to worsen when more variables are added to the model
Comparative Fit Index (CFI)	-Relative fit index -Highly correlated with the Tucker Lewis Index -May not be informative if the RMSEA is 0.05 -Tends to worsen when more variables are added to the model -Performs well even with small sample size
Root Mean Square Error of Approximation (RMSEA)	-Absolute fit index (do not use a null model for comparison) -Tends to be biased (too large). This bias depends on having a small sample size and small degrees of freedom (df) (particularly small df). There is greater sampling error for small N and dfs which creates larger confidence intervals around the fit estimate. -Some have suggested cutoffs of 0.01 (excellent fit), 0.05 (good fit), 0.08 (mediocre fit), and 0.10 (poor fit) -Considered one of the most informative fit indices
Standardized Root Mean Square Residual (SRMR)	-Absolute fit index -Similar to RMSEA, tends to be too large for small sample sizes and small dfs -Will have lower values (better fit) when there are more parameters in the model and there is a large sample size

*References for this information include: (Hooper et al., 2008; Kenny, 2014).

The literature often recommends using several fit indices to provide an overall view of model fit. This is because each index has its advantages and disadvantages and may work differently under different conditions. In general it has been found that models with more variables tend to have poorer fit (Kenny, 2014). In addition, it has been explained that it is not uncommon to find poor fit due to the complexity of structural equation modelling (Hooper et al., 2008). Usually, the fit is improved by modifying the model; however, this is not always suggested. Additionally, the objectives of this thesis were to test models in a confirmatory way as opposed to exploratory. Furthermore, it has been suggested that by allowing fit indices to lead the research, the importance of theory testing is reduced (Hooper et al., 2008). For example, good fit does not necessarily mean that the model makes sense theoretically. In fact, some people disagree with using fit indices at all while others disagree with the cut-off values currently suggested in the literature (Hooper et al., 2008; Kenny, 2014).

Appendix C: Permissions for use of figures

Permission was not required to use Figure 1. Minority stress theory (Meyer, 2003) and Figure 5. Anti-Bisexual Experience Scale (Brewster & Moradi, 2010) in this thesis. The American Psychological Association has copyright for these sources and does not require permission to use figures unless more than three figures or tables are used from a journal article (American Psychological Association, 2014).

Permission to include Figure 2. A model of resilience in response to psychological trauma (Agaibi & Wilson, 2005) was obtained from SAGE Publication's Copyright Clearance Center (Figure 18).

Figure 18. Permission to use content from Agaibi and Wilson (2005)

Appendix D: Correlation Matrix

Table 13. Pearson correlation coefficients for independent variables, Part 1

Variable r **p-value**	1	2	3	4	5	6	7
ABES_St (1)	1.00	--	--	--	--	--	--
ABES_GL (2)	0.718 **<0.0001***	1.00	--	--	--	--	--
2-spirited (3)	0.068 **0.190**	0.042 **0.417**	1.00	--	--	--	--
Genderqueer (4)	0.109 **0.035***	0.143 **0.005***	0.221 **<0.0001***	1.00	--	--	--
One committed partner (5)	0.012 **0.812**	0.044 **0.397**	0.021 **0.675**	-0.035 **0.478**	1.00	--	--
Multiple committed partners (6)	-0.064 **0.212**	-0.022 **0.666**	0.050 **0.318**	0.081 **0.103**	-0.027 **0.594**	1.00	--
Religious upbringing (7)	0.086 **0.100**	0.090 **0.086**	0.051 **0.321**	0.037 **0.473**	0.030 **0.566**	0.023 **0.657**	1.00
No committed partners (8)	0.019 **0.718**	0.028 **0.588**	0.078 **0.118**	0.023 **0.645**	0.368 **<0.0001***	0.155 **0.002***	-0.023 **0.655**
Age (9)	-0.107 **0.039***	0.044 **0.396**	-0.026 **0.605**	-0.046 **0.358**	0.129 **0.010***	0.162 **0.001***	0.040 **0.440**
Man (10)	-0.077 **0.135**	-0.064 **0.216**	-0.007 **0.894**	0.042 **0.403**	-0.094 **0.059**	0.074 **0.138**	-0.038 **0.460**
Woman (11)	0.071 **0.171**	0.042 **0.418**	-0.183 **0.0002***	-0.261 **<0.0001**	0.094 **0.059**	-0.106 **0.034***	0.038 **0.460**
Income-to-needs ratio (12)	-0.153 **0.003***	-0.015 **0.773**	-0.088 **0.084**	-0.109 **0.032***	-0.078 **0.125**	0.026 **0.604**	-0.041 **0.433**
Racial discrimination (13)	0.107 **0.038***	0.100 **0.052**	0.050 **0.314**	0.059 **0.234**	-0.037 **0.460**	-0.018 **0.715**	0.147 **0.005***
Discrimination based on ability (14)	0.106 **0.040***	0.075 **0.148**	0.118 **0.024***	0.101 **0.043***	0.063 **0.204**	-0.015 **0.757**	0.104 **0.045***
IIGCS (15)	0.314 **<0.0001***	0.213 **<0.0001***	0.017 **0.740**	0.155 **0.003***	-0.071 **0.175**	0.085 **0.104**	0.015 **0.777**
PLGBTQIA (16)	0.185	0.086	-0.012	0.184	-0.007	0.113	0.018

	0.0004*	**0.102**	**0.817**	**0.0004***	**0.898**	**0.030***	**0.732**
Volunteer, advocacy, activism (17)	-0.126 **0.015***	-0.198 **0.0001***	-0.030 **0.559**	-0.081 **0.117**	-0.040 **0.444**	-0.053 **0.305**	-0.020 **0.695**
Bigendered (18)	0.028 **0.582**	0.039 **0.447**	0.534 **<0.0001***	0.101 **0.042***	0.041 **0.412**	-0.014 **0.780**	0.020 **0.697**

Bolded values indicate p-values, * signifies the p-value is significant at p≤0.05

Table 14. Pearson correlation coefficients for independent variables, Part 2

Variable r **p-value**	8	9	10	11	12	13	14
No committed partners (8)	1.00	--	--	--	--	--	--
Age (9)	0.124 **0.013***	1.00	--	--	--	--	--
Man (10)	-0.116 **0.020***	0.128 **0.011***	1.00	--	--	--	--
Woman (11)	0.043 **0.386**	-0.132 **0.008***	-0.826 **<0.0001***	1.00	--	--	--
Income-to-needs ratio (12)	-0.038 **0.454**	0.241 **<0.0001***	-0.027 **0.597**	0.063 **0.212**	1.00	--	--
Racial discrimination (13)	-0.145 **0.003***	0.065 **0.195**	0.053 **0.282**	-0.036 **0.468**	-0.083 **0.102**	1.00	--
Discrimination based on ability (14)	0.062 **0.215**	-0.040 **0.421**	-0.076 **0.129**	0.036 **0.471**	-0.079 **0.119**	0.163 **0.001***	1.00
IIGCS (15)	0.025 **0.630**	0.015 **0.783**	0.035 **0.501**	-0.073 **0.166**	-0.011 **0.830**	0.084 **0.110**	-0.012 **0.816**
PLGBTQIA (16)	0.168 **0.001***	0.065 **0.212**	-0.116 **0.026***	0.069 **0.187**	-0.022 **0.677**	0.043 **0.414**	-0.077 **0.137**
Volunteer, advocacy, activism (17)	-0.018 **0.726**	-0.172 **0.0009***	0.019 **0.720**	0.006 **0.912**	-0.084 **0.112**	-0.141 **0.006***	-0.090 **0.082**
Bigendered (18)	0.045 **0.369**	-0.029 **0.561**	-0.018 **0.723**	-0.161 **0.001***	-0.088 **0.081**	0.038 **0.451**	0.080 **0.110**

Bolded values indicate p-values, * signifies the p-value is significant at p≤0.05

Table 15. Pearson correlation coefficients for independent variables, Part 3

Variable r **p-value**	15	16	17	18
IIGCS (15)	1.00	--	--	--
PLGBTQIA (16)	0.458 **<0.0001***	1.00	--	--
Volunteer, advocacy, activism (17)	-0.366 **<0.0001***	-0.243 **<0.0001***	1.00	--
Bigendered (18)	-0.040 **0.444**	-0.015 **0.771**	0.023 **0.661**	1.00

Bolded values indicate p-values, * signifies the p-value is significant at $p \leq 0.05$

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