NEGATIVE SOCIAL INTERACTIONS AFFECT THE RELATIONSHIP BETWEEN SEXUAL ORIENTATION AND MENTAL HEALTH FOR CANADIANS

by

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ABSTRACT

Canadians who identify as non-heterosexual experience higher rates of mental illness than those who identify as heterosexual, which is often misconstrued to be a direct result of sexual orientation; however, minority stress theory (MST) suggests that increased social negativity could be the cause. Using the 2012 Canadian Community Health Survey – Mental Health (CCHS-MH), I tested the application of the MST on a sample of approximately 19,000 Canadians aged 20 years and older. I discovered that negative social interactions mediated the relationship between sexual orientation and various mental health and substance use disorder outcomes. In addition, the meditational ability of negative social interaction differed when childhood maltreatment was included as a covariate. Lastly, sex-based differences revealed that females reported a greater health penalty for their non-heterosexual identity than males. Overall, the current results suggest that a substantial component of the sexual orientation-mental health relationship is influenced by poor social exchanges.

Keywords: Lesbian-Gay-Bisexual, negative social interactions, mental health, substance use disorder, Minority Stress Theory

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List of Symbols and Abbreviations

α – In this thesis, this symbol represents the relation between sexual orientation and negative social interactions. Not to be mistaken with α as an indicator of Type I error rate.
β – In this thesis, this symbol represents the relation between negative social interactions and mental health/substance use disorder outcome
τ – In this thesis, this symbol represents the relation between sexual orientation and mental health/substance use disorder outcome
τ' – In this thesis, this symbol represents the total mediation relationship involving all variables of interest (i.e., sexual orientation, negative social interactions, and mental health/substance use disorder outcome)

AUC – Area Under the Curve
CCHS-MH – Canadian Community Health Survey – Mental Health
DIS – Diagnostic Interview Schedule
DSM – Diagnostic and Statistical Manual
GAD – Generalized Anxiety Disorder
ICD – International Classification of Disease
K10 – Kessler Psychological Distress Scale
LGB – Lesbian-Gay-Bisexual
LGBT – Lesbian-Gay-Bisexual-Transgender
LGBTQ - Lesbian-Gay-Bisexual-Transgender-Queer
MDE – Major Depressive Episodes
MHC-SF – Mental Health Continuum – Short Form
MHE – Mental Health Experiences
MST – Minority Stress Theory
NSI – Negative Social Interactions scale
NSMHWB - National Survey of Mental Health and Well Being
PMH – Positive Mental Health
PNCQ – Perceived Need for Care Questionnaire
SDT – Social Dominance Theory
SPS-10 – Social Provisions Scale short-form
SST – Social Stress Theory
SRMH – Self-Rated Mental Health
SUD – Substance Use Disorder
WHO-CIDI – World Health Organization version of the Composite International Diagnostic Interview

Negative social interactions affect the relationship between sexual orientation and mental health for Canadians

Mental health consists of one's emotional, psychological, and social wellbeing (Westerhof & Keyes, 2010). In recent years, there has been an increase in both awareness of and concern for mental health in Canada, with campaigns such as "Bell Let's Talk" and "Stop The Stigma" becoming mainstream. One aspect of mental health is mental illness. According to the DSM-5, mental illness is defined as a pattern of significant impairment in one or more areas of daily function (American Psychiatric Association, 2013). Current statistics indicate that 20% of Canadians will experience some form of mental illness in their lifetime, a figure that has been relatively consistent for almost two decades (Health Canada, 2002; Ottawa Public Health, 2018; Statistics Canada, 2013). Despite efforts to raise public awareness and 'normalize' mental illness, Canadians continue to struggle. In 2011 alone, Canada spent $50 billion on mental health care (Ottawa Public Health, 2018), and by 2015 approximately five million Canadians (i.e., one in seven people) reported utilizing health services specifically for their mental illness (Government of Canada, 2015). Intrinsically, as the rates of mental illness increase, so too will economic expenditures and wait times to see licensed professionals. Therefore, it is necessary to determine which groups may be at a disproportionate risk for mental health adversity in order to proactively address the needs of these vulnerable groups. Although the pervasiveness of mental illness fluctuates based on individual factors including race (Wu et al., 2003); gender (Tjepkema, 2008); immigrant and refugee status (Pumariega et al., 2005); and socioeconomic status (Folsom et al., 2005), being of a minority status has consistently remained a predictor of poor mental health (Herek, 2007; Stinchcombe et al., 2018).

Although minority status is often equated with *visible* minorities, this perspective is a parochial viewpoint of the concept given that *invisible* minorities experience similar difficulties. One such underexplored minority within Canada is a group of individuals who identify with a non-heterosexual sexual orientation.

1.1 Sexual Orientation and Mental Health

1.1.1 Sexual Orientation

A minority is defined as an individual or group who is in some way subordinate compared with those of a dominant social group (e.g., Caucasians in Canada versus those who identify as heterosexual in this dominant group). These individuals are often singled out in society as the recipients of stigmatizing and discriminatory remarks and actions. Although many minority individuals thrive, others struggle in the face of marginalization (Gonzales & Henning-Smith, 2017; Herek & Garnets, 2007; Jorm et al., 2002; Ploderl & Tremblay, 2015; Steele et al., 2009). This ostracism has been implicated as a factor in the unreasonably high rates of mental health disparities experienced by various minority groups (e.g., religious, ethnic, racial; Baams et al., 2015; Lick et al., 2013; Meyer, 2003; Pitonak, 2017). Although minorities are disproportionally affected by societal adversity, some minorities experience these inequities to a greater degree. One of these more greatly affected groups is sexual minorities.

Defining who classifies as a sexual minority is intrinsically complex. Difficulties arise when scholars attempt to conceptualize all individuals who identify as a sexual minority using one overarching designation (Galupo et al., 2014). Researchers tend to use a somewhat reductionist approach and classify sexual minorities as simply those who are “non-heterosexual”. Although individuals belonging to the Lesbian-Gay-

Bisexual-Transgender (LGBT) community are given a predominant focus (Rodrigues et al., 2017), the term sexual minority encompasses all people whose identification varies from the dominant cis-gendered (i.e., those identifying with the gender they were assigned at birth) heterosexual discourse portrayed in society (McGeeney & Harvey, 2015; Mink et al., 2014; Mizzi & Walton, 2014; Pitonak, 2017; Spencer & Patrick, 2009). Use of the term sexual minority fosters a sense of inclusivity by embracing individuals whose identity does not fit the common LGBT lexicon used predominantly in Western societies (Mizzi & Walton, 2014).

Germane to the discussion on sexual minority status and self-representation is the differentiation between sexual orientation and gender identity. Oftentimes, these concepts become misconstrued, but sexual orientation and gender identity are fundamentally independent of one another (Roselli, 2017). *Sexual orientation* deals with romantic or sexual attraction towards another individual, whereas *gender identity* defines personal identification (i.e., who you wish you to be romantically or sexually active with versus who you identify as and know yourself to be; American Psychological Association, 2012). Misconceptions appear to arise when discussing transgender individuals. Currently, the term transgender is used as an umbrella term to describe individuals whose behaviour and gender expression differs from societal expectations (Moleiro & Pinto, 2015). Individuals who are transgender can be straight, lesbian, gay, or bisexual, but being transgender is how they *identify*, and is not defined by their sexual orientation (Pinto & Moleiro, 2015).

An additional point of complexity for those identifying as a sexual minority is the issue of visibility. Although members of a visible minority group (i.e., physical, racial, ethnic) are easily recognized, those who are part of an invisible minority group

(i.e., religious, intellectual, sexual, mentally ill) must acknowledge their status to *become* visible. Individuals who identify as LGBT often fall into this invisible minority category as they are not physically discernable from individuals in the majority (Clair et al., 2005; Nakkeeran & Nakkeeran, 2018; Pitonak, 2017). Therefore, reporting as a sexual minority requires an individual to both recognize and categorize their gender identity and sexual status, with some even contending that disclosure is optional (Balsam et al., 2013; Spencer & Patrick, 2009). Thus, prevalence statistics likely underestimate the number of individuals who are sexual minorities (Coffman et al., 2017; Robertson et al., 2018). Although non-disclosure may seem advantageous in terms of "blending in", it also means that these individuals could assimilate into their respective community without protection or support from their peers (Spencer & Patrick, 2009), although this may not be true in all circumstances.

Since homosexuality became de-pathologized in the 1970s in North America, individuals who identify as a sexual minority have struggled to gain acceptance and to be awarded the same privileges as those who identify as heterosexual. This struggle has made sexual minority group members exceptionally vulnerable to prohibitive discrimination, victimization, stigmatization, and marginalization (Almeida et al., 2009; Burgess et al., 2007; Chakraborty et al., 2011; Everett et al., 2016; Meyer, 1995; Meyer, 2003). Despite society's progression in accepting members of sexual minority groups, there continues to be a devaluation of non-heteronormative identities. Reports indicate that as many as 80% of those who identify as a sexual minority experience some form of harassment (Katz-Wise & Hyde, 2012), most typically verbal harassment (Herek et al., 2002). A 2010 study found nearly 40% of participants who identified as a sexual

minority experienced past year discrimination due *exclusively* to their sexual orientation (McCabe et al., 2010). In 2014, Statistics Canada reported that those identifying as a sexual minority were twice as likely to experience violent victimization (Simpson, 2018). Since that time, members of sexual minority groups continue to face hardships. In 2017, the U.S. Federal Bureau of Investigations reported 1,130 hate crimes committed against members of sexual minority groups, which constituted 15.75% of all hate crimes committed that year (Federal Bureau of Investigation, 2017). Canadian data echoes these findings, as a reported 10% of Canadian hate crimes in 2017 were directed towards individuals who identify with a non-heterosexual orientation (Statistics Canada, 2017). Despite the notion of Western ideals of progressivism, these figures suggest that there is much work to be done to improve the lives of those who identify as a sexual minority. Although attitudes have begun to shift towards increased inclusivity, sexual minority group members continue to experience adverse social encounters, which can leave these individuals vulnerable to a variety of health inequalities, including mental health.

1.1.2 Relationship with Mental Health

The social, cultural, and political barriers encountered by those identifying as a sexual minority can directly compromise physical and mental health (Balsam et al., 2013; Bostwick et al., 2010; Bränström, 2017; Cochran et al., 2003; Nakkeeran & Nakkeeran, 2018; Ploderl, & Tremblay, 2015; Stinchcombe et al., 2018). Substantial research has documented poor health outcomes among members of sexual minority groups. Specifically, people identifying as a sexual minority have poorer physical health than those who identify as heterosexual, including heightened rates of asthma (Lick et al., 2013); cardiovascular disease (Bränström et al., 2016); and chronic health conditions

(Cochran & Mays, 2012). However, the area that has garnered the most attention is mental health. Importantly, findings suggest that sexual orientation is *independently* associated with mental wellbeing (Bertera, 2005; Pakula & Shoveller, 2013), implying that those who identify as sexual minorities likely face distinctive factors that contribute to this difference in vulnerability. For these reasons, sexual orientation has been implicated as a social determinant of health (Logie, 2012).

Regarding mental health in particular, adults who identify as a sexual minority are at a greater risk for mental illness (Herek & Garnets, 2007; King et al., 2008; Lick et al., 2013; Meyer, 2003; Mink et al., 2014; Ploderl & Tremblay, 2015) and report lower psychological wellbeing (Cochran et al., 2003; Saewyc, 2007; Spencer & Patrick, 2009). Notably, these adult mental health inequalities occur throughout childhood (Hafeez et al., 2017; Kelleher, 2009) and adolescence (Dunbar et al., 2017; Goldbach et al., 2014). The observation of mental health difficulties across the lifespan demonstrates the pervasiveness of such hardships for those who identify as a sexual minority and highlights the importance of studying this population to better understand how and why these disparities occur.

1.1.3 Substance Use, Dependence, and Abuse

Substance use in North America is growing rapidly. The Inter-American Drug Abuse Control Commission (2019) reported that the only substance in systematic decline is the use of tobacco. Use of alcohol, cannabis, inhalants, cocaine, opioids, and abuse of prescription drugs are all on the rise (Inter-American Drug Abuse Control Commission, 2019). Substance use, dependence, and abuse remain an ongoing struggle for many individuals, but appear particularly salient among those who identify as a

sexual minority (Cochran et al., 2003). Studies have confirmed a higher prevalence of substance use/abuse among people who identify as a sexual minority (Branstrom, 2017; Burgess et al., 2007; Chaney & Brubaker, 2012; Cochran et al., 2000; Kerr et al., 2015; Kerridge et al., 2017; Talley et al., 2009), with the largest disparities reported for women who identify as non-heterosexual (Drabble et al., 2005; McCabe et al., 2013) and for youth (Marshal et al., 2008; Rosario et al., 2009).

To further examine the issue of substance use/abuse among those who identify as a sexual minority, it is necessary to determine what kinds of substances individuals who identify as non-heterosexual use and whether these individuals use, or misuse, these substances to a greater degree than those who identify as heterosexual. Sexual minority group members display augmented rates of use of alcohol (King et al., 2008), marijuana (Russell et al., 2002), cocaine (Corliss et al., 2010; Hughes & Eliason, 2002), hallucinogens (Cochran et al., 2004), ecstasy (Newcomb et al., 2014), and methamphetamine (Kerr et al., 2015). Although this list is not exhaustive, it demonstrates that substance use/abuse is widespread and diverse within this community. Given that substance use can profoundly affect society at the individual, institutional, and societal level (Newcomb et al., 2014), this issue should be further explored.

Although there are numerous circumstances that can lead an individual to substance use, a common theme that emerges in the literature is that socialization among sexual minority groups often occurs in contexts (i.e., gay/lesbian bars and clubs) in which substance use is more widespread (Baiocco et al., 2010; Feinstein et al., 2017; Robinson, 2015). Compounded with their heightened exposure to discriminatory and heterosexist encounters, those who identify as a sexual minority are left more susceptible

to substance misuse. Studies have continuously demonstrated a positive association between stigmatizing or difficult social situations and substance use/abuse, including alcohol abuse (Kerridge et al., 2017; Slater et al., 2017), risky drinking (Bloomfield et al., 2011; Wilson et al., 2016), cannabis use/abuse (Cochran et al., 2004; McCabe et al., 2009; Skinner, 1994), and illicit drug use/abuse (Dentato, 2012; Hughes & Eliason, 2002). Indeed, McCabe and colleagues (2010) found that those identifying as a sexual minority had a four times greater risk of substance use/abuse than those who identify as heterosexual (McCabe et al., 2010).

Problematic substance use has been linked to chronic stress (Meyer, 2003; Pearlin et al., 2005). Sinha (2001) explored the link between stress and drug abuse by reviewing available empirical evidence. Her research demonstrated that stress, in addition to substance use, acts to both motivate and perpetuate addictive behaviour. Additionally, researchers suggest that the accumulation of hardships among those who identify as a sexual minority makes them particularly ill equipped to tolerate and adjust to future stressful incidents (Brady & Sinha, 2005). Therefore, some people identifying as sexual minorities may use substances as a coping strategy to combat the stress they face when identifying with a particular sexual orientation (Hatzenbuehler, 2009). Chronic stress may also cause a deficit in healthy emotional regulation among those who identify as a sexual minority (Newcomb et al., 2014). Persons of a sexual minority group may think that drugs or alcohol can alleviate their emotional distress and create a more positive state of wellbeing, at least temporarily (Rosario et al., 2009; Sinha, 2001). However, this maladaptive pattern of substance abuse that stems from stressors can adversely affect psychological health. Unsurprisingly, the risk factors that pre-dispose

individuals who identify as sexual minorities to substance use/abuse problems also enhance their likelihood of being diagnosed with a mental illness.

1.1.4 Mental Illness

Mental illness currently affects a substantial proportion of North Americans (Kohn et al., 2018; Peter, 2017), but those who identify as a sexual minority bear a disproportionate burden of this inequality (Pakula, Shoveller, et al., 2016; Saewyc, 2011; Veenstra, 2011). Discrimination and stigmatization are often directed towards those of a sexual minority identity; because of this heightened exposure to negative social experiences, those identifying as sexual minorities experience chronic stress and personal devaluation (Meyer, 2003), which leaves them vulnerable to mental illness. Specifically, sexual minority group members are almost three times more likely to have a mood disorder than those who identify as heterosexual (Pakula & Shoveller, 2013), including elevated rates of bipolar disorder, anxiety, and depression (Bostwick et al., 2010; Branstrom, 2017; Kerridge et al., 2017). Although rates of bipolar diagnosis among those identifying as a sexual minority are higher than individuals identifying as heterosexual, there is no clear reason as to why this is the case. It may be that heteronormative judgments resonate with those who identify as a sexual minority and cause excessive rumination over their sexual orientation (i.e., internalized homophobia). This persistent negativity may exacerbate the onset of bipolar disorder for those with a predisposition for development of this disorder (Herek & Garnets, 2007). That is, heightened stress may activate this biological vulnerability more readily based on the diathesis stress model of mental disorders (Colodro-Conde et al., 2018). However, no clear or direct linkages have been made between these two phenomena.

Members of a sexual minority group also face disproportional rates of generalized anxiety disorder (GAD) compared to those who identify as heterosexual (Branstrom, 2017; Chakraborty et al., 2011; Kerridge et al., 2017; King et al., 2008; Jorm et al., 2002; Oswalt & Wyatt, 2011; Ploderl & Tremblay, 2015). Contrary to bipolar disorder, this association intrinsically makes sense when incorporating the social context of an individual. Faced with stigma, scrutiny, and discrimination, those identifying as sexual minorities may feel exposed and vulnerable in their social environments. This expectation of negativity may contribute to the development of worry or anxiety about social rejection in future encounters, thereby degrading the individual's mental wellness by chronic worry. This link between GAD and the concern of rejection has been supported by the literature, with a specific association being established between societal discrimination and social anxiety (Campo-Arias et al., 2017; Feinstein et al., 2012; Mahon, 2017). Additionally, Griffin and colleagues (2018) examined the link between stress and anxiety among LGBT individuals and discovered that discriminatory experiences contribute to heightened levels of anxiety. In fact, discrimination can cause those who identify as a sexual minority to negatively value their own sexual orientation (Griffin et al., 2018; Math & Seshadri, 2013). This internalized homophobia is most strongly correlated with symptoms of anxiety (Newcomb & Mustanski, 2010).

1.1.5 Psychological Wellbeing

Given that people who identify as a sexual minority face stigmatizing social environments and higher rates of formal diagnosis of substance use/abuse and mental illness, it is unsurprising that their general psychological wellbeing also suffers (Cochran et al., 2003). The pervasive negativity experienced by individuals who identify as a

sexual minority erodes their self-esteem and fosters a sense of internalized shame about their sexual orientation (aptly named internalized homophobia, Meyer, 2003). These unpleasant interpersonal and intrapersonal encounters reduce social integration and increase exposure to stress (Hsieh, 2014). Consequently, people identifying as a sexual minority report a higher perceived need for care (e.g., professional treatment or mental health counseling; Burgess et al., 2007; Grella et al., 2011), lower levels of positive mental health (Peter, 2017; Spencer & Patrick, 2009), and heightened levels of distress (Cochran et al., 2003; Dunbar et al., 2017; Gonzales & Henning-Smith, 2017; Hsieh, 2014; McAleavey et al., 2011; Swim et al., 2009).

Adding to the complexities of poorer psychological wellbeing among people from sexual minority groups are the difficulties they face within the healthcare system. Members of sexual minority groups recognize that they have a greater need for care and actively seek out treatment (particularly geared towards their mental health) at a greater rate than those who identify as heterosexual (Cochran et al., 2003; Mays, & Cochran, 2001; Simeonov et al., 2015); however, individuals who identify as a sexual minority frequently report worse mental health experiences than those who identify as heterosexual, predominantly due to the stigma surrounding both their sexual orientation and their mental illness (Colpitts, & Gahagan, 2016; Goins & Pye, 2013). These poorer experiences are concerning for several reasons. First, healthcare systems are designed to serve the masses, leaving minorities at risk of receiving noncontextualized service (Colpitts & Gahagan, 2016; Gahagan & Subirana-Malaret, 2018; Nakkeeran & Nakkeeran, 2018). Clinicians and public health officials have begun to recognize that members of sexual minority groups have unique healthcare needs (Mayer et al., 2008;

McCabe et al., 2013), but the system still needs to catch up and begin the provision of more inclusive services. Second, many individuals identifying as sexual minorities delay seeking medical care for fear of being 'outed' or needing to report their sexual orientation to a health care practitioner. This fear creates concern for prejudice and discrimination and can deter individuals from seeking help altogether (Lick et al., 2013; Quinn et al., 2015) or make them feel invisible (Everett & Mollborn, 2014). Given that intake forms are created using a heteronormative lens, often omitting options that pertain to those identifying as a sexual minority, the fear of needing to disclose sexual orientation may deter individuals from seeking support for their health problems. This apprehension of disclosure emphasizes the need for cultural sensitivity in both the healthcare system and with health resources so that minority groups do not feel ostracized in what is an already vulnerable context. Overall, the health care environment can be tricky to navigate for members of sexual minority groups (Colpitts & Gahagan, 2016; Gahagan & Subirana-Malaret, 2018; Lick et al., 2013; Quinn et al., 2015; Silberholz et al., 2017).

Given their difficulties within care systems, it is important to assess how individuals who identify as sexual minorities view the state of their physical and mental health. Interestingly, members of sexual minority groups report similar self-perceived physical health as those who identify as heterosexual (i.e., good/somewhat healthy), but their self-rated mental health is consistently lower than people who identify as heterosexual (Axelsson et al., 2013; Burgess et al., 2007; Fredriksen-Goldsen et al., 2012; Gonzales & Ehrenfeld, 2018; Hughes, 2017; Ketz & Israel, 2001; Tjepkema, 2008). Although it is encouraging that people identifying as a sexual minority view their

physical health in a positive light, more attention needs to be directed towards this mental health disparity.

When considering the physical and mental health of individuals who identify as a sexual minority, it is imperative to recognize how health relationships influence one another. Sexual minority individuals with poorer self-rated general health have been found to consistently have a higher perceived need for care and higher self-reported mental illness (Burgess et al., 2007) and seek out treatment within the healthcare system more frequently than those who identify as heterosexual (Dunbar et al., 2017). However, healthcare systems can create anxiety and distress (Quinn et al., 2015) by generating anticipated (or realized) stigmatization and discrimination (Colpitts & Gahagan, 2016). Within the international literature, these poorer states of mental health are related to heightened substance use/abuse (Goldbach et al., 2014; King et al., 2008), which suggests that Canada may not be immune to these connections

1.2 Sexual Orientation and Mental Health in Canada

1.2.1. Measurement

According to Statistics Canada, the LGB community embodies 3.0% of the nation's population (Statistics Canada, 2018), thereby demonstrating that individuals who identify as a sexual minority represent both a numerical and social minority (as a point of comparison, 4.3% of the Canadian population is Aboriginal). Until recent years, because of this low prevalence, Canadian health research rarely focused on the needs of this population. This neglect may be due to methodological biases, such as not asking participants to self-report their sexual orientation, or difficulties surveying a large enough sample to generate statistically meaningful results as a function of sexual orientation status, even if researchers did gather this information. Although it is

impossible to know the exact prevalence of Canadian sexual minority group members experiencing mental illness, it is important to develop greater awareness of the proportion of individuals currently experiencing these issues. In light of the methodological barriers to researching this topic, researchers have sought out alternative means to study this vulnerable population.

Population based surveys provide an opportunity to take a snapshot of Canada at a given moment and assess estimates of mental health issues. Given that many mental illnesses may be underdiagnosed in Canada, these population surveys can highlight where the largest disparities lie, and which sub-populations of individuals are disproportionately at risk for privation. Since 2003, Statistics Canada has been using a single-item sexual orientation question on two of their large national surveys (Canadian Community Health Survey and the General Social Survey). From that time, Canadian researchers have used this data, with much success, to emphasize various health inequalities experienced by individuals identifying as sexual minorities (Brennan et al., 2010; Pakula, Carpiano, et al., 2016; Pakula & Shoveller, 2013; Pakula, Shoveller, et al., 2016; Peter, 2017; Scott et al., 2016; Steele et al., 2009). Importantly, these data have provided an opportunity for researchers to explore the relations between sexual orientation and mental health outcomes. Canadian researchers using this type of population-based survey data can directly explore meaningful and representative associations between sexual orientation and mental illness. Additionally, when these large-scale surveys use validated measures to assess mental health outcomes, methodological rigour is enhanced and can assure researchers that the results of the survey are an accurate reflection of the health dimension being assessed.

Although use of a national population-based survey seems ideal, this type of investigation places constraints upon researchers, particularly with the questions being asked to gather the data. An example of this constraint can be seen when researching sexual orientation. Sexual orientation identification is often constrained by only providing LGB options, leaving out the option to select transgender. Although this limited identification may not seem ideal at first, it is important to note that large population-based surveys are assessing *sexual orientation* and not *gender identity*. Oftentimes, these concepts become misconstrued and what appears to be a limitation is, in fact, an entirely different construct (Roselli, 2017). It is unfortunate that studies assessing sexual orientation mistakenly reference LGBT, rather than just LGB. However, one of the key strengths of the Canadian Community Health Survey is that it assesses sexual orientation by *exclusively* exploring the LGB population. There is hope that detailing the difference between sexual orientation and gender identity on such a large-scale survey can clarify the concepts for those wishing to perform future investigations.

1.2.2 Canadian Findings

Examining Canadian sexual minority health data presents a unique opportunity for researchers. Canadian residents are afforded universal healthcare, the country holds a more liberal attitude towards individuals who identify as sexual minorities, and there are elevated rates of legal protection of sexual minorities compared to other countries, including anti-discrimination laws and same-sex marriage laws (Andersen & Fetner, 2008; Hunt & Eaton, 2007; Martin et al., 2018). Given these facts, it would be logical to infer that Canadians who identify as a sexual minority would be considered “healthier”

than those who live in less progressive countries and that the data would reflect this trend. However, Canadian data echoes the findings of international studies.

Despite the more positive and inclusive atmosphere of the country, members of Canadian sexual minority groups face a disproportionate rate of mental and physical health inequities when compared to those who identify as heterosexual (Bostwick et al., 2010; Brennan et al., 2010; Ferlatte et al., 2015; Logie et al., 2017; Pakula & Shoveller, 2013; Pakula, Carpiano, et al., 2016; Steele et al., 2009; Stinchcombe et al., 2018). Although some Canadian institutions successfully implemented strategies to reduce the burden of social injustices faced by those identifying as a sexual minority in the past five to ten years (e.g., the "Out in School" program used in some British Columbia schools; Burk et al., 2018; the *Education Act* in Ontario; Taylor et al., 2016; the *Public School's Act* in Manitoba; Taylor et al., 2016), these approaches have not become universal as they fall under provincial jurisdiction, meaning that they vary from province to province (Taylor et al., 2016). Therefore, it is possible that these implementations are not equally successful and may not result in widespread improvements in physical and mental health outcomes for those who identify as a sexual minority. Further evaluation of these inclusion strategies is required to assess both short-term and long-term impacts, as in many instances mental health vulnerabilities appear to persist. For example, a 2018 study using data from the Canadian Longitudinal Study on Aging discovered that those identifying as a sexual minority are at risk for a variety of health issues, including heavy drinking, cancer, mood disorders, and anxiety (Stinchcombe et al., 2018). Importantly, these mental health disparities for members of sexual minority groups persist despite heightened levels of protection and acceptance. Having legal protection is a positive, but does not preclude individuals who identify as a sexual minority from experiencing

subpar everyday experiences. It is not about special treatment, but rather *equal* treatment and this reality is still evolving in Canada.

Variations in health outcomes between individuals identifying as a sexual minority and heterosexual exist and it is necessary to examine where these inequalities lie. Canadians belonging to a sexual minority group have higher rates of GAD (MacLeod et al., 2015; Tjepkema, 2008), mood disorders (Ottawa Public Health, 2018; Pakula, Shoveller, et al., 2016), heavy/risky drinking (Patten et al., 2015; Steele et al., 2009), illicit drug use/abuse (Martin et al., 2006; Ross et al., 2014), life stress (Pakula & Shoveller, 2013), poor self-rated mental health (Brennan et al., 2010; Stinchcombe et al., 2018), and lower positive mental health (Peter, 2017). Unsurprisingly, these same individuals also were found to have a higher perceived need for professional care and report negative experiences within the healthcare system (Colpitts & Gahagan, 2016; Gahagan & Subirana-Malaret, 2018). Although the Canadian healthcare system provides free mental health services, clinics are often overwhelmed with patients and have long wait times (Kowalewski et al., 2011). These extended waits may cause individuals to select private care options instead. However, private clinics can be costly and unattainable for some individuals, meaning that their mental health issues are not swiftly addressed (Steele et al., 2006). Adding to this pressure, some Canadian health care workers do not feel equipped to treat members of the sexual minority population due to insufficient training, which can lengthen wait times even further (House of Commons Canada, 2019). Insufficient training and longer wait times may present an explanation as to why individuals identifying as sexual minorities report similar physical health to those who identify as heterosexual, whereas their mental health is notably poorer.

Two recent studies conducted in Atlantic Canada assessed the mental health experience of individuals who identify as sexual minorities. Colpitts and Gahagan (2016) explored LGBTQ health within Nova Scotia and discovered that a large proportion of people identifying as a sexual minority who were accessing care reported negative experiences with the health care system. The main issues surrounded the heteronormative, gender-binary language used on forms, the fear of disclosing sexual orientation, and a general lack of knowledge of LGBTQ issues by healthcare providers (Colpitts & Gahagan, 2016). Additionally, Gahagan and Subriana-Malaret (2018) mirrored several of the above findings in a province-wide online survey in Nova Scotia. Individuals identifying as a sexual minority once again reported that they were uneasy about health care providers' cultural competence surrounding LGBTQ-health issues and that such issues may contribute to the poorer reported health of sexual minority group members. Interestingly, their study also examined the view of the health care providers themselves. Approximately 50% of primary healthcare workers did recognize that LGBTQ health concerns are different from those of people who identify as heterosexual; however, nearly 60% of those same workers disclosed that they had never received training in cultural competence regarding those concerns (Gahagan & Subriana-Malaret, 2018). These studies detail how disparities continue to occur in the present day, even though a large proportion of Canadians have adopted a more liberal stance on sexual orientation.

Individuals who identify as a sexual minority experience both an overall increase in mental illness and a decrease in psychological wellness, which can persist despite the wealth of political and legal rights afforded within Canada. Of major interest to researchers are the driving forces behind the strong association of poorer mental health

and identification as a non-heterosexual. Problematically, disentangling the origin of these issues is difficult, as social factors may exacerbate the relationship between sexual orientation and adverse mental health outcomes.

1.3 Social Factors Affecting Mental Health

Psychological wellness is influenced by social factors, with much research focusing on the role of social support. Social support positively influences psychological health by promoting healthy coping strategies and acting as a stress buffer during hardships (Cohen & Wills, 1985; Durden et al., 2007; Fyrand, 2010; Thoits, 2011; Uchino et al., 2012). However, minorities typically face greater social isolation and have smaller social networks than people identifying as heterosexual do and, therefore, suffer from reduced access to social support (Balsam et al., 2013; Hsieh, 2014; Pakula, Carpiano, et al., 2016; Williams et al., 2005). Additionally, individuals identifying as a sexual minority have a higher incidence of adverse life events (Balsam et al., 2013). They encounter victimization, stigmatization, and discrimination more frequently than those who identify as heterosexual and must learn how to navigate predominantly heteronormative societies. Although enhancing social support is a proactive and productive element of wellness (Uchino et al., 2012), scholars need to better understand how negative social factors impact the sexual minority population. Bringing to light the nature of the social negativity faced by those who identify as a sexual minority, and the impact such hardships play on their mental wellbeing, may allow research to progress into a new avenue of interest and inform strategies that would promote stronger social support systems for members of sexual minority groups. Thus, given that social support tends to be sparse among people who identify as a sexual minority, and that social negativity seems commonplace for this minority group, investigating the impact of

negative social interactions may give rise to findings that could improve the everyday life of sexual minority group members.

1.3.1 Negative Social Interactions

Negative social interaction is a multidimensional construct. Scholars collectively define negative social interactions as unpleasant or insensitive social encounters characterized by a multitude of unwanted factors, including bullying, rejection, criticism, the invasion of privacy, and disagreements (Bertera, 2005; Brooks & Dunkel-Schetter, 2011; Krause, 2007). In fact, Rook (1998) proposed four distinct categories of negative social interactions: rejection and neglect, unwanted advice from others, failure of others to provide instrumental support in times of need, and insensitive behaviours (Rook, 1998). She argued that each category of negative social interaction corresponds to a form of positive social exchange, whose absence affects mental wellbeing in a different way.

Rook's (1998) four categories of negative social interactions correspond to four categories of positive social exchange that Newsom and colleagues (2003; 2005) found to impact physical and mental health: companionship, informational support, instrumental support, and emotional support, respectively. Companionship with others encourages increased self-esteem, a sense of belonging, and reprieve from minor stressors (Amati et al., 2018). Lack of companionship (or a feeling of social isolation) therefore reduces the ability to cope with stress and has been associated with increased depression, infection, and mortality (Cornwell & Waite, 2009). Informational support provides assistance in problem solving (Langford et al., 1997), and its absence reduces the ability to cope with adversities (Rook, 1998). Instrumental support functions to provide an individual with concrete assistance during times of need, such as physical

comfort or financial help (Langford et al., 1997). An absence of instrumental support reduces the ability to handle hardships, both physically and financially (Langford et al., 1997). Finally, emotional support provides an individual with empathy, love, and trust, and fosters a sense of acceptance (Malecki & Demaray, 2003). An absence of emotional support has been connected to an increased incidence of psychological distress, mortality, and faster disease progression (Reblin & Uchino, 2008; Thoits, 2011; Uchino, 2006). Overall, informational, instrumental, and emotional support are key in helping an individual recover from a disruptive life event (Rook, 1998), whereas companionship helps to foster a sense of unity with fellow peers. Therefore, all constructs impact wellbeing, whereas their absence contributes to a sense of inadequacy when dealing with stressful life events (Rook, 1998).

In addition to understanding negative social interactions in general, researchers have examined their impact on overall physical and mental wellbeing. Scholars have found a link between the incidence of negative social interactions and poor health, contending that exposure to negative social circumstances is associated with a decrease in mental wellbeing (Bertera, 2005; Harada et al., 2018; Lakey et al., 1994; Rook, 1984; Smith & Ingram, 2004). These forms of adverse situations cause a reduction in self-esteem (Lakey et al., 1994) and an increase in mood disorders (Bertera, 2005; Yanos et al., 2001), anxiety (Lincoln, 2000), dysfunctional attitudes (Lakey et al., 1994), and psychological distress (Harada et al., 2018). Additionally, the experience of a higher frequency of negative social interactions is correlated with lower ratings of subjective quality of life (Rosenfield & Wenzel, 1997). Although the link between poorer health and the frequency of negative social interactions has emerged, one question many researchers have pondered is *how* exactly these interactions influence mental and

physical wellbeing. The examination of human socialization can provide some explanation for this phenomenon.

Socialization is predominantly beneficial because it creates opportunities for receiving emotional support and generates a sense of belonging (Hsieh, 2014); however, socialization also can have adverse consequences. Throughout their lifetime, people can experience a greater number of positive social situations than negative ones, which leads to an expectancy of positivity in social exchanges (Rook & Pietromonaco, 1987). As a result, when negative social interactions occur, the preconceived notion that life is orderly, predictable, and just, is shattered. Consequently, these deleterious interactions are directly linked to poorer psychological wellness (Edwards et al., 2010; Harada et al., 2018; Ingram et al., 2001). Interestingly, negative social interactions are more predictive of mental health outcomes than positive social interactions (Bertera, 2005; Harada et al., 2018; Lincoln, 2000; Rook, 1984; Schuster et al., 1990). Social psychologists have tried to explain this phenomenon by reasoning that individuals weigh negative information more heavily than positive information (Hodges, 1974). The compounding accumulation of negative exchanges can be detrimental to one's health. In fact, frequent negative social interactions have been correlated with an increase in GAD (Krause, 2007), psychological distress (Lincoln, 2000), and mood disorders (Yanos et al., 2001), as well as a decrease in positive mental health (Lakey et al., 1994) and self-rated health (Walen & Lachman, 2000).

Minority groups (i.e., ethnic, racial, socioeconomic) experience a wider array of social adversities than non-minority groups (Begeny & Huo, 2018; Jackson, 2005; Mulia & Zemore, 2012; Slopen et al., 2016) and are often the recipients of both perceived and

objective discrimination that is directly attributed to their minority status (Begeny & Huo, 2018). This increased incidence of social adversity causes an unequal distribution of health risks (Jackson, 2005), resulting in poorer health (Begeny & Huo, 2018; Williams et al., 2003). Minorities experience a greater incidence of physical and mental health problems, including, but not limited to, alcohol abuse (Mulia & Zemore, 2012), psychological distress (Kaholokula et al., 2017), and high blood pressure (Williams et el., 2003). Importantly, this concept of poorer physical and mental health can apply to minorities in general, or to specific minority groups.

Sexual minority group members experience a higher incidence of social adversities, often as a direct result of their sexual orientation (Yildiz, 2018). The discrimination, prejudice, and stigmatization experienced by this population are inherently stressful and can result in a thwarted sense of belongingness (Baams et al., 2015). Individuals who identify as a sexual minority feel alienated from members of their social network, including family, friends, and those in their community, due to higher prevalence of family rejection (Hafeez et al., 2017), verbal and physical harassment (Skerrett et al., 2016), social devaluation (Logie et al., 2017), and social incongruence (Meyer, 1995). In addition, those identifying as sexual minorities also experience a bevy of microaggressions (i.e., intentional or non-intentional verbal and non-verbal insults and derogatory messages based solely on a marginalized group membership) within predominantly heteronormative societies (Seelman et al., 2017; Sue, 2010). These experiences act to reduce self-esteem, promote the notion of 'otherness', and increase levels of stress.

Currently, Canadian literature investigating negative social interactions is scant. Findlay (2017) determined that negative interactions were deleterious to mental health in

her sample of Canadian adolescents and emerging adults, noting that her participants had a heightened risk of depression and suicidal ideation. However, Findlay's study was limited as she only sampled Canadians aged 15 to 24 and failed to exclusively investigate sexual minority group members. Given that few Canadian researchers have explored the impact of negative social experiences on the mental wellbeing, it is unsurprising that research in this area that specifically examines individuals who identify as a sexual minority is also limited. Despite the limited investigation of the relationship between negative social interactions and mental wellness among LGB individuals, some scholars have partially investigated this association. In another study, Scott and colleagues (2016) specifically examined the relationship between negative social interactions and depression within the Canadian LGB community. They discovered a positive correlation between negative social interactions and the prevalence of major depressive disorder. Overall, these emerging Canadian findings are supportive of the adverse impact that negative social interactions have on the wellbeing of Canadian sexual minority group members, but several gaps exist.

1.4 The Interplay Between Social Factors and Mental Health

Given the tenacious connection between sexual orientation and mental health, it is necessary to consider *why* this relationship exists. When considering the interplay between social adversities and mental health concerns, the influence of the social environment on the health of those identifying as a sexual minority becomes apparent. The notion of "otherness" has arisen as a dominant precursor for social disparities among individuals identifying as sexual minorities (Johnsrud & Sadao, 1998).

Understanding the factors that contribute to this social hierarchy is necessary to understand how and why these individuals face widespread prejudice.

The notion of group classification is well-established in sociology and social psychology (Allport, 1954; Turner, 2010). When asked to define or describe themselves to others, individuals typically convey to which group they belong (i.e., gender, social class, race, nationality). These select memberships are known as one's "ingroups" (Noel et al., 1995). First expounded upon by Allport (1954) in his classic book *The Nature of Prejudice,* ingroups were presented as a fundamental cornerstone of psychological development. Ingroups serve to enhance self-esteem and perpetuate a sense of belonging. These ingroup attachments allow individuals to feel bonded to a larger social collective and help shape one's social identity (Allport, 1954). Together, these groups promote social positivity. However, ingroups also can foster favouritism and prejudice, and lead members to devalue individuals from external social groups, known as "outgroups" (Allport, 1954; Dasgupta, 2004; Oakes & Turner, 1980). Such processes underlie prejudice and discrimination against outgroups.

Social Dominance Theory (SDT) has been used to explain why outgroups face a disproportionate amount of prejudice and oppression. SDT, first proposed by Sidanius and Pratto (1999), details the construction of society as a hierarchy of social groups. According to this theory, individuals of various social groups (known as arbitrary-set groups) are afforded a differential amount of privilege and discrimination is imposed on upon these groups at institutional and individual levels (Sidanius & Pratto, 1999). This unequal division of privilege allows certain groups to emerge as dominant, whereas others remain subordinate. Among these subordinate factions, intergroup discrimination has been noted among individuals who identify as a sexual minority (Pratto et al., 2006).

Most social ingroups view individuals who identify as a sexual minority as an outgroup, and those who identify as heterosexual show outgroup bias towards sexual minority group members (Banse et al., 2001). Therefore, members of a sexual minority group face various forms of oppression and marginalization within society. Understandably, these experiences of social negativity perpetuate the feeling of otherness and cause an undue amount of stress (Meyer, 1995; 2003).

In addition to SDT, stress researchers have discovered both individual and social stressors that can affect wellbeing (Schneiderman et al., 2008; Stockdale et al., 2007). Researchers propose that those who identify as a sexual minority experience an array of stressful social situations (e.g., stigmatization, discrimination, and victimization) that can negatively impact their psyche (Baams et al., 2015; Lick et al., 2013; Kelleher, 2009; Pitonak, 2017). The compounding stress leaves them vulnerable to addiction, mental illness, and psychological torment (Meyer, 2003). Consequently, several theories have been proposed to explain this observed set of findings. The following section will detail three predominant theories that help explain how social circumstances deeply affect the wellbeing of sexual minority group members. Although these theories are not mutually exclusive, they detail different elements of the sexual orientation-mental health relationship.

1.4.1 Social Stress Theory

Social Stress Theory (SST), an extension of the original stress theory proposed by Hans Selye (1956) and later refined by Lazarus and Folkman (1984), provides a useful framework to explore the influence of environmental conditions on health. SST views social conditions and interactions as major sources of stress. When social circumstances are negative, individuals must learn how to adapt their lives to cope with

such adversity. As these stressors accumulate, individuals become less able to adapt and tolerate the unpleasant experiences. This resulting inability to restructure becomes a risk factor for physical and mental health issues (Allison, 1998; Aneshensel, 1992; Brady & Sinha, 2005; Meyer, 1995). SST also extends its construct to examine the societal conditions of various social groups. It posits that individuals of disadvantaged or marginalized social groups (e.g., based on ethnicity, race, socioeconomic status, gender, sexual orientation) have a greater exposure to stressful situations and fewer resources to help them cope (Dentato, 2012), and the chronic wear-and-tear of such privations can lead to mental illness. Although SST can touch on some of the issues experienced by those who identify as sexual minorities, it does not capture their entire experience. SST focuses on the personal relationships and environmental circumstances of minority groups but fails to broaden its scope to capture additional facets of daily living that could contribute to subpar mental health (e.g., intrapersonal conflicts, societal heterosexist attitudes).

1.4.2 Syndemic Theory

Syndemic theory, first proposed by Singer in the 1990's, views health problems holistically (i.e., intrapersonal, interpersonal, and societal) rather than in isolated domains (Singer, 1994; 1996; 2009). Syndemic theory posits that health disparities are mutually reinforcing and often arise from social injustices. This theory lends itself nicely to the sexual minority population (Logie et al., 2017). Individuals who identify as a sexual minority experience a cluster of adverse internal, external, and psychosocial issues. These individuals struggle not only with the negative views imposed on them by society, but also with the internal struggles they face when coming to terms with their

sexual orientation. Notably, these issues are co-occurring and act to compound already existing stressors. These undesirable conditions are salient to the understanding of the poorer mental health of sexual minority group members. Syndemic theory suggests that it is not one particular aspect of negativity that affects wellbeing, but rather the entirety of one's lived experience. It highlights that elevated rates of mental health inequities are the product of personal struggles, inadequate social support (Skerrett et al., 2016), and excessive discriminatory experiences (Yildiz, 2018).

1.4.3 Minority Stress Theory

The Minority Stress Theory (MST), first proposed by Meyer (1995; 2003), is a specific embodiment of both SST and Syndemic theory. Arguably, there is strong conceptual overlap between SST, Syndemic theory, and MST, but when viewed in isolation, MST seems to better encapsulate the experience of individuals who identify as a sexual minority. Both SST and Syndemic theory insinuate applicability to members of sexual minority groups, but neither has been specifically tailored to address the issues of this subpopulation. This better representation is due, in part, to the fact that MST proposes a form of chronic social stress that is uniquely experienced by members of a marginalized or oppressed minority group, known as 'minority stress'. In fact, MST is the leading framework for conceptualization of negative experiences and issues within the sexual minority community (Herek & Garnets, 2007).

Meyer (1995; 2003) argued that although individuals identifying as sexual minorities experience the same sorts of common stressors as anyone else, they are also subject to unique and chronic adverse issues associated with their social status and identity. This heightened exposure to negative social attitudes compounds any existing distress and further impacts those who feel ostracized from societal norms in the first

place. The structural, interpersonal, and individual level experiences of stigma encountered by those who identify as sexual minorities increases exposure to discriminatory interactions (Everett et al., 2016). These hostile social environments foster chronic stress and heighten distress for sexual minority group members as they navigate a predominantly heterosexist society. Given those realities, minority stress could be viewed as unavoidable.

In the initial proposal of MST, Meyer (1995) outlined three key processes involved in the creation of minority stress. These stressors, ranging on a continuum from objective stressors to subjective stressors, include: 1) prejudicial events unlike those experienced by the dominant cultural group (i.e., people identifying as heterosexual or Caucasian); 2) expectations of discrimination and rejection, which necessitate increased vigilance and, thus, depletion of a sizeable amount of energy and resources to cope; and, 3) the internalization of society's negative attitudes (i.e., internalized homophobia), wherein the individual begins to ruminate about the implications of their own homosexual desires. These distal (i.e., indirect) and proximal (i.e., direct) stressors act to contribute to, and explain, mental health disparities faced by minority groups.

MST has been predictive of many mental health issues among individuals identifying as sexual minorities. Scholars contend that experiences with minority stress increase susceptibility to mental illness (Burns et al., 2018; Spencer & Patrick, 2009) and heighten levels of distress in general (Mays & Cochran, 2001; Meyer, 2003; Szymanski, 2005; Williams et al., 2005). Moreover, MST predicts substance use/abuse among those identifying as a sexual minority (McCabe et al., 2010; Ronksley et al., 2011; Rosario et al., 2001; Slater et al., 2017; Willoughby et al., 2010).

The current study focused on MST, but its connections with the broader SST and Syndemic theory were recognized. MST distinguishes itself from both theories, however, by directly articulating the relevance of a minority identity in the stress process. Importantly, MST implicates social stress and negative social interactions as the proverbial 'mediator' in the relationship between sexual orientation and mental health disparities. This mediator role was a critical point of examination in the present study.

1.5 Gaps in the Literature

1.5.1 Theoretical Rationales

To date, numerous studies have focused on the mental health of individuals who identify as a sexual minority, but several gaps exist. First, although SST, Syndemic theory, and MST account for the poorer mental health of sexual minority group members, these theoretical constructs are typically presented post-hoc to provide a rationalization for research findings. A lack of a priori examination has been particularly true of MST. Functionally, when a negative association is found between sexual orientation and mental health, researchers then attribute the results to MST rather than predicting this relationship from the onset. This explanatory use of MST means that relatively few studies have explored an *a priori* test of this theory. By simply acknowledging MST as a posteriori explanation, researchers are limiting the development of knowledge pertaining to the origin of the sexual orientation-health relationship. If MST is indeed a valid explanation for the sexual orientation-health relationship, then this association should manifest in an anticipatable manner and it should attenuate when including negative social experiences in the model. A priori testing of this model allows for more efficient testing of its hypotheses, components, and mechanisms; thus, this approach will be used in the current study.

1.5.2 Examination of Social Factors

Another issue arising from the research concerns the measurement of social factors. Current literature shows a lack of consistency in both the operationalization and measurement of social constructs, making comparisons between studies intrinsically difficult (Lincoln, 2000). This issue of ambiguity is particularly true of negative social interactions. Negative social interactions are difficult to assess as researchers use a variety of names to describe this construct. In a critical review, Lincoln (2000) noted that there were upwards of seventeen different ways to describe negative social interactions, including use of measurements that tap into constructs like social network stressors, problematic social interactions, and negative social exchanges to name a few. Due to this variety, it is difficult to synthesize the existing research base and some studies may not be viewed as relevant depending on how the construct was operationalized. Although many negative social interaction-related concepts examine virtually identical social constructs, it is confusing for readers and researchers alike.

In addition to issues of measuring and defining negative social interactions, few academic studies have explored the impact of these adverse exchanges on the sexual orientation-health relationship. Despite evidence that negative social interactions adversely impact the wellbeing of those who identify as a sexual minority, there has been minimal investigation as to whether these exchanges *explain* the antagonistic relationship between sexual orientation and health. The strongest evidence for this connection came from Bertera (2005), who examined the role of positive and negative social support in the prevalence of mental health issues using a national sample of Americans. Social negativity was found to be a strong predictor of mental health adversity, including mood disorders and anxiety; however, Bertera did not explore this

association among sexual minority group members and failed to use a validated measure of social negativity. In a tangential set of findings, Harada and colleagues (2018) examined the impact of positive and negative social interactions in a sample of Japanese adults. They discovered that negative encounters had a more potent effect on mental health than did positive ones, but once again those identifying as sexual minorities were not highlighted (Harada et al., 2018). In the most compelling study, Woodford and colleagues (2014) explored the impact of heterosexism (i.e., blatant victimization and LGBTQ microaggressions) on LGBQ college students. They found that students who identified as a sexual minority experienced a higher level of heterosexism, and that these negative social exchanges adversely affected their level of self-acceptance and psychological distress. Additionally, they used an *a priori* approach to investigate MST. Woodford and colleagues (2014) used the logic of MST to specifically examine whether minority students (i.e., gender and race) experienced higher rates of heterosexism. Results demonstrated the negative consequences of discrimination and microaggressions (i.e., negative social interactions) on individuals who identify as sexual minorities (Woodford et al., 2014). Although their study used validated measures, data were generated from a convenience sample and was conducted using American participants, which limits its role in the broader discussion on LGB-health in Canada.

1.5.3 Canadian Data

Among Canadian research, the work of Scott and colleagues (2016) examined the relationship between sexual orientation, negative social interactions, and depression. Using the 2012 Canadian Community Health Survey – Mental Health version, researchers used binomial logistic regression analyses to explore the relationship between sexual orientation and depression on Canadians 15 years of age and older. The

results were stratified by sexual orientation (i.e., heterosexual, homosexual, bisexual) and by biological sex, and controlled for a range of sociodemographic variables (age, employment status, perceived physical health, race/ethnicity, education, marital status, and income). Results indicated that sexual minority group members had a higher prevalence of major depressive episodes (MDE). After controlling for known risk factors, including social support and negative social interactions, there was no difference in the prevalence of MDE for those identifying as heterosexual and homosexual. However, those identifying as bisexual did show an increased prevalence of MDE, but no differences existed between sexes. Although this research contained all components of interest, it stopped short of exploring mediation effects (Scott et al., 2016). Additionally, the lack of difference in MDE prevalence after controlling for social factors may indicate that these elements play a role in affecting the mental health of Canadians who identify as a sexual minority. Therefore, the current study seeks to pursue mediation to further examine its influence on mental health.

Although Canada has made great strides in the inclusion and acceptance of those who identify as sexual minorities, there is no evidence that these gains buffer the deleterious effects of discrimination, marginalization, and stigma (Brennan et al., 2010; Colpitts & Gahagan, 2016; Pakula, Shoveller et al., 2016). Notably, the concerns encountered by sexual minority group members have proven not to be an isolated issue. Research on LGB individuals worldwide has validated Canadian findings and studies have shown increased incidence of mental health disturbances among sexual minority group members in the United States (Bostwick et al., 2010), England (Chakraborty et al., 2011), New Zealand (Fergusson et al., 1999), and Sweden (Branstrom, 2017). Those identifying as non-heterosexual were twice as likely to experience anxiety (Bostwick et

al., 2010), 1.8 times more likely to experience a depressive episode (Chakraborty et al., 2011), and 6.3 times more likely to have suicidal behaviour (Fergusson et al., 1999) than respondents who identify as heterosexual. Overall, these studies noted higher rates of mental illness and pointed to minority stressors, such as prejudice or victimization, as contributing factors.

Although several studies have examined various nuances of the sexual orientation-mental health relationship and its association to both negative social interactions and MST, no known study has included all areas of interest (i.e., sexual orientation, mental health, negative social interactions, MST, and mediation). This lack of investigation represents an obvious gap in knowledge: knowing that individuals who identify as sexual minorities report poorer mental health while concurrently experiencing an array of adverse social encounters may suggest that mental health issues are impacted by subpar social experiences. Although there is a lack of data to speak of causal paths, it can be theorized that adverse health outcomes are a byproduct of subpar social experiences. Moreover, a pilot study by Barry and colleagues (in press) indicated that negative social interactions partially mediated the relationship between sexual orientation and both depression and satisfaction with life in a nationally representative sample of Canadians who identify as LGB. This finding supports the potential of similar results for other mental health outcomes. Examining the link between sexual minority status and mental health, while not novel, is necessary to highlight gaps in the needs of this vulnerable group, especially as it may offer insight into theoretical causal mechanisms.

1.6 The Current Study

The current study examined the prevalence of mental health disparities among Canadians who identify as sexual minorities and by explicitly testing the application of MST. The current study aimed to add to the literature by exploring the potentially mediating impact of negative social interactions on a variety of mental health outcomes for Canadians who identify as part of a sexual minority group. MST contends that identifying as a sexual minority enhances the experiences of stigma and discrimination. MST also suggests that such negative social encounters cause poorer mental health among those who identify as sexual minorities. Therefore, the present study employed a meditational analysis to test MST directly using a sample of Canadians who identify as sexual minorities. I hypothesized that negative social interactions would mediate the relationship between sexual orientation and both mental health issues and mental health experiences for a sample of LGB Canadians. In Canada, the most prevalent types of mental illnesses are mood disorders (Ottawa Public Health, 2018), so particular interest will be given in this study to bipolar disorder (i.e., bipolar I, bipolar II, and hypomania) and GAD, as depression was previously investigated by Barry and colleagues (in press) using the same dataset.

To summarize, research has demonstrated that individuals who identify as sexual minorities report poorer overall health than individuals identifying as heterosexual (Bostwick et al., 2010; Branstrom, 2017; Kerridge et al., 2017). The literature also establishes that this vulnerable group reports higher levels of discrimination than dominant groups (Meyer, 2003; Yildiz, 2018) and that this discrimination leads to poorer health (Edwards et al., 2010; Harada et al., 2018; Ingram et al., 2001). The inference here is that the LGB-health relationship is a product of discrimination. This

inference fits well with existing theories of discrimination and health (such as the MST) and is a logical extension of the literature. The general research question asked in the current study was as follows: how much of the LGB-mental health relationship is explainable via discrimination? To assess this relationship, I looked at a series of mental health and substance use outcomes, including bipolar disorder, psychological distress, generalized anxiety disorder, mental health experiences in the face of stigma, perceived health, perceived need for care, self-rated mental health, positive mental health, alcohol abuse/dependence, illicit drug abuse/dependence, and illicit drug use.

2. Method

2.1 Participants and Data

All participants (n = 19,010) for the present study were drawn from the 2012 Canadian Community Health Survey – Mental Health version (CCHS-MH). The CCHS-MH is a national, population-based survey that provides cross-sectional data on Canadians who are fifteen years of age or older. The data were collected between January 2 and December 31 of 2012 using a multistage, random cluster sampling design (response rate of 68.9%). This three-stage design proceeded as follows: 1) geographical areas in Canada were divided into clusters and several were randomly selected; 2) random households were selected within each geographical cluster; and 3) one individual over the age of 15 was randomly selected per household. Although full-time members of the Canadian Armed Forces, residents of the territories, clientele living in institutions (e.g., inpatient hospitals, correctional centers), and persons living in Indigenous settlements (i.e., reserves) were not included in the 2012 CCHS-MH sampling frame, these exclusions comprised fewer than 3% of the target population

(Statistics Canada, 2013). Readers can refer to the CCHS-MH User Guide for further information on the interview process and participant selection (Statistics Canada, 2013).

To be included in the current study, individuals must have answered all covariates of interest and at least one outcome of interest. To maintain the continuous nature of these data, individuals who do not respond to all questions or who answered questions with "I don't know" or "Refused to answer" were excluded from the current study. Thus, complete case data was used. Additionally, all participants must be 20 years of age or older. This minimum age limit was selected for two reasons. First, I wanted to avoid ethical concerns that may come from conducting research where children served as participants. Second, I wanted to ensure that participants had less fluctuation in the classification of their sexual identity. From pre-teenage years to puberty, individuals are exploring their sexual orientation and what their identity means to them (Glover & Galliher, 2009). As these individuals get older and move through adolescence, they undergo a period of identity formation (Erikson, 1968; Rosario et al., 2011). By early adulthood, and throughout adulthood, these individuals become more certain of their identity (Wood et al., 2018). Although fluidity in self-reported sexual orientation does exist at any age (Mock & Eibach, 2012; Ott et al., 2011), this outcome tends to be more stable and consistent in adulthood (Savin-Williams et al., 2012; Schwartz et al., 2013). Some studies have noted this greater fluidity in sexual orientation among youth relative to adults. For example, a longitudinal study found that 43% of youth changed how they classified their sexual orientation over the course of only 12 months (Rosario et al., 2011).

Since its release, the 2012 CCHS-MH has been used by researchers to aid in the comprehension of the prevalence and impact of mental illness in Canada, such as

depression (Findlay, 2017; Fowler et al., 2013; Knoll & MacLennan, 2017; Scott et al., 2016); psychological distress (Caron & Liu, 2011); alcohol use (Pakula, Shoveller, et al., 2016); and suicidality (Findlay, 2017). The CCHS-MH contained numerous mental health variables and its focused content cycle for 2012 (i.e., mental health specific) was created to highlight emerging health issues during that time frame (Statistics Canada, 2013), which proved to be particularly useful for the current study.

2.2 Measures

All measures for the current study came directly from the 2012 CCHS-MH (Statistics Canada, 2013). For mental health variables, I focused solely on symptoms that occurred during the past 12-months, so that measures of social experiences existed within the same timeframe. This decision was made to provide a current view of mental health and social experiences, rather than a historical view to which specific time reference of occurrence would not be known.

Covariates

There are a wide range of variables that relate to sexual orientation, negative social interactions, and mental health outcomes, which were examined in the context of the current study. These variables include sex (male, female), age, marital status (married, common-law, widowed, divorced/separated, and single), ethnic minority status (Caucasian or other), province, education (less than high school, high school, some post-secondary, post-secondary), and personal income (<$10,000; $10,000-19,999; $20,000-29,999; …>$150,000).

Social Support. Numerous studies have implicated social support as a protective factor for mental illness (Axelsson et al., 2013; Dickinson & Adams, 2014; Gahagan & Subirana-Malaret, 2018; Hsieh, 2014; Knoll & MacLennan, 2017; Lyons et al., 2013;

Puyat, 2013; Spencer & Patrick, 2009). However, Barry and colleagues (in press) found that social support did not mediate the relationship between sexual orientation and depression or satisfaction with life. Nevertheless, given its importance in the literature, I included it as a covariate in the current study.

Childhood Maltreatment. The CCHS-MH explored the number of types of childhood maltreatment experienced prior to age 16 using a series of six questions, each detailing a form of psychological, physical, or sexual maltreatment (e.g., "How many times did an adult slap you on the face, head or ears or spank you with something hard to hurt you?"). The questions explored the *frequency* of experienced maltreatment. Respondents answered the questions on a 5-point Likert scale ranging from 1 (*Never*) to 5 (*More than 10 times*). For simplicity, I combined the six outcomes into a single variable to form a sum rating across items to generate an overall frequency score for the experience of childhood maltreatment (Cronbach's $\alpha = .79$). Specifically, the scores from each question were summed to a minimum score of 6 (representing no childhood maltreatment) and a maximum score of 30; higher overall scores indicated greater frequency of childhood maltreatment events. The total score was then rescaled to range from 0-24 for ease of interpretation.

Negative social interactions (NSI)

The frequency of exposure to negative social interactions (NSI) was measured using the Negative Social Interactions scale (Krause, 1995; 2005; 2007; Newsom et al., 2005). Negative social interactions were assessed via use of four questions: 1) How often have you felt that others made too many demands on you?; 2) How often have you felt that others were critical of you and things you did?; 3) How often have you felt that

others did things that were thoughtless or inconsiderate?; and 4) How often have you felt that others acted angry or upset with you? Each question had a maximum score of 3, and used a Likert-type scale to assess the degree to which participants had experienced negative social interactions (i.e., 0 = Never, 1 = Every once in a while, 2 = Fairly often, 3 = Very often). These scores were summed to a maximum score of 12, with higher overall scores indicating greater exposure to NSI (Statistics Canada, 2011).

The overall internal reliability of the NSI scale in the current study was good (Cronbach's $\alpha = .81$). Although not extensively validated, the NSI has been used to measure the impact of unpleasant social experiences in a variety of groups, including Japanese adults (Harada et al., 2018) and the elderly (Krause, 2007). The NSI has discriminant validity with respect to anticipated support among the elderly (Krause, 2007; Newsom et al., 2005); however, no validation study has been conducted with the general population. Nevertheless, other researchers using CCHS-MH data have included NSI in their studies (Findlay, 2017; Scott et al., 2016) and did not find it to pose a limitation to their design.

Sexual Orientation

The 2012 CCHS-MH measured the sexual orientation of respondents by asking the question "Do you consider yourself to be: 1) heterosexual? (sexual relations with people of the opposite sex); 2) homosexual, that is lesbian or gay (sexual relations with people of your own sex); or 3) bisexual? (sexual relations with people of both sexes)" (Statistics Canada, 2011). To meet Statistics Canada data release guidelines, sexual orientation (i.e., LGB) was coded as 0 (*Heterosexual*) and 1 (*Non-heterosexual*). Importantly, this variable measured the proportion of Canadians who *self-identified* as belonging to a sexual minority group. Self-identification as a sexual minority is the most

specific form of measurement of sexual identity (Dean et al., 2000). Furthermore, single-item questions assessing sexual orientation are commonly used in research (e.g., Branstrom, 2017; Burns et al., 2018; Gorman et al., 2015; Kerridge et al., 2017), and this form of self-report measurement has been a reliable measure in past studies (Schrimshaw et al., 2006).

2.2.1 Mental Health Variables

The questions in the 2012 CCHS-MH that assessed mental health (including bipolar disorder, substance abuse or dependence, and GAD) were derived from the World Health Organization version of the Composite International Diagnostic Interview (WHO-CIDI, 1998; Pearson et al., 2013). The WHO-CIDI is a standardized diagnostic instrument for the assessment of mental disorders based on the Diagnostic and Statistical Manual (DSM) of Mental Disorders-IV criteria (Wittchen, 1994). The CIDI was originally developed by the WHO in 1990 as an expansion of the Diagnostic Interview Schedule (DIS), which was created with support from the National Institute of Health (Robins et al., 1981). The DIS relied too heavily on DSM criteria, and the WHO wanted to allow for cross-national comparative research (Kessler & Ustun, 2004). Therefore, the CIDI was developed to incorporate both DSM diagnostic criteria and international standard diagnostic criteria from the International Classification of Disease (ICD; World Health Organization, 1990). Although the CIDI was initially developed to incorporate the DSM-III criteria, the WHO-CIDI 3.0 (which was used by Statistics Canada in the 2012 CCHS-MH) was released in 1998 and was based on DMS-IV criteria (Haro et al., 2006; Kessler et al., 2004). The area under the curve (AUC, a measure of classification precision that is not influenced by disorder prevalence) has been used to assess the concordance of the WHO-CIDI with DSM-IV criteria. Past research supports the

validity of the interview schedule for diagnostic accuracy for a variety of mental health disorders (Janca et al., 1992; Wittchen et al., 1994), including bipolar disorder, GAD, and substance use disorders.

Although primarily intended for use in epidemiology, the WHO-CIDI assessment tool is now being extensively used for various clinical and research purposes (Wittchen et al., 1991; Wittchen, 1994). This interview tool relies almost exclusively on respondent's self-report data and can be reliably administered by non-clinicians after a short training period (Wittchen et al., 1991). The WHO-CIDI provides information on the symptomology of mental health issues and seeks to evaluate symptom severity (Wittchen, 1994). The WHO-CIDI also has been validated in several languages and is used in a variety of cultural settings, demonstrating its validity across both languages and cultures (Wittchen et al., 1991).

Bipolar Disorder. The 2012 CCHS-MH measured bipolar disorder using questions derived from the WHO-CIDI classification of bipolar disorder (World Health Organization, 1990). The CCHS-MH survey provided an omnibus bipolar classification, which grouped all respondents who met criteria for bipolar I, bipolar II, and hypomania into a single category. Generally, bipolar disorder classification was defined as 7 days of hyperbolic feelings of either an irritable or elevated mood, accompanied by a combination of the following symptoms: decreased need for sleep, enhanced or exaggerated self-confidence, racing thoughts, being more talkative than what is typical, an increase in pleasure-seeking activities, and/or unnecessary spending. Respondents were classified as having bipolar disorder if they met the lifetime criteria for bipolar and had an episode of either bipolar I, bipolar II, or hypomania in the 12 months prior to the

survey. For simplicity, I altered the original coding scheme 1 (*Yes*) and 2 (*No*) to become 0 (*No*) and 1 (*Yes*).

The WHO-CIDI has good test-retest reliability (κ in the range .60-.80) for bipolar disorder classification (Wittchen, 1994). Additionally, the CIDI has demonstrated excellent concordance with DSM-IV criteria for bipolar disorder (AUCs .90-1.00, Haro et al., 2006). The CIDI classification of bipolar disorder also has good procedural and clinical validity when tested by clinicians in psychiatric patients (Janca et al., 1992).

Psychological Distress. Psychological distress was measured using the Kessler Psychological Distress (K10) scale (Kessler et al., 2003), whose ten questions were derived from an existing screening scale for depression and distress that contained 612 questions (Kessler et al., 2002). The K10 is a measure of psychological distress symptoms (Easton et al., 2017). Participants were asked how frequently they experienced symptoms of psychological distress (e.g., "During the past month, about how often did you feel so nervous that nothing could calm you down?"). In total, respondents were asked 10 questions each rated on a 5-point Likert scale ranging from 1 (*All of the Time)* to 5 (*None of the* time). Responses were then reverse coded and rescaled to range from 0 (*None of the time*) to 4 (*All of the time*) for easier interpretation. Responses were totaled so that psychological distress was rated on a continuous scale with scores ranging from 0 to 40, with higher scores indicating greater distress.

The K10 had strong internal reliability in the current study (Cronbach's $\alpha = .86$). Additionally, the K10 exhibits good convergent validity, as demonstrated with the World Health Organization Disability Assessment Scale ($r = .67$). The K10 has been validated in several different languages (Easton et al., 2017; Pereira et al., 2019) and is

adapted for use in different groups, including Indigenous populations (Bougie et al., 2016) and military personnel (Sampasa-Kanyinga et al., 2018).

Generalized Anxiety Disorder (GAD). The 2012 CCHS-MH measured GAD with modified questions derived from the WHO-CIDI (World Health Organization, 1990). GAD was defined as a pattern of persistent or frequent worry and anxiety over several activities or events throughout a minimum 6-month period. Measured symptoms included sleep disturbance (restless, unsatisfying sleep; or difficulty falling asleep or staying asleep), being easily fatigued, muscle tension, headaches, restlessness or feeling keyed up or on edge; excessive sweating, palpations, and shortness of breath, irritability, difficulty concentrating, and various gastrointestinal symptoms. Respondents who met criteria for GAD in the past 12 months were those who: 1) met the CCHS-MH/WHO-CIDI criteria for lifetime GAD; 2) had an episode of generalized anxiety that lasted at least 6 months of the 12 months prior to the survey; and 3) experienced clinically significant distress or impairment in occupational, social, or other areas of functioning. This classification of GAD was used to assess whether respondents met or fail to meet the criteria for GAD in the 12 months prior to the survey. For simplicity, I altered the original coding scheme 1 (*Yes*) and 2 (*No*) to become 0 (*No*) and 1 (*Yes*).

The WHO-CIDI has good test-retest reliability ($\kappa = .78$) for GAD in clinical samples (Wittchen et al., 1994). Additionally, the CIDI has excellent concordance with DSM-IV criteria for GAD (AUC= .88; Haro et al., 2006; Kessler et al., 2013) and effective procedural and clinical validity when tested by clinicians in psychiatric patients (Janca et al., 1992).

Mental Health Experiences in the Face of Stigma (MHE). Mental health experiences were assessed using the Impact Scale of the Inventory of Stigmatizing

Experiences (Stuart et al., 2005). This scale measured the psychosocial impact of stigma among those with reported mental health issues, specifically with regard to the overall impact of negative opinions and unfair treatment received by the participant due to their emotional or mental health problems during the 12 months prior to the survey. The survey provided six questions, each rated on a 10-point Likert scale ranging from 0 (*Not Affected*) to 10 (*Severely Affected*). Questions examined six aspects of daily living: 1) family life; 2) romantic life; 3) work or school life; 4) financial situation; 5) housing situation; and 6) health care for physical problems. The scores were summed to provide a maximum score of 60, with higher scores reflecting a greater impact of stigmatizing experiences.

The Impact Scale of the Inventory of Stigmatizing Experiences has demonstrated excellent overall internal reliability in the current study (Cronbach's $\alpha = .90$). The impact scale also showed high reliability (Cronbach's $\alpha = .91$) when previously tested in a sample of psychiatric outpatients (Stuart et al., 2005). The impact scale has good content validity and fair construct validity (Wei et al., 2018). In addition, the impact scale has been adapted for use in the Korean population (Lee et al., 2015) and translated into several other languages (Vasquez et al., 2011).

Perceived Health. Perceived health is an indicator of a respondent's overall health status. According to Statistics Canada, respondents were informed that "health" included the absence of disease or injury, overall physical and mental health, as well as social wellbeing (Statistics Canada, 2013). Perceived health was assessed through a single survey question by which the respondent judged their status on a single rating scale. Participants were asked the following question: "In general, would you say your health is: 1) Excellent; 2) Very Good; 3) Good; 4) Fair; or 5) Poor?" Responses were

rated on a 5-point Likert scale, ranging from 0 (*Poor*) to 4 (*Excellent*), where higher scores indicated greater perceived health. Importantly, this was a subjective measure of a respondent's overall health status (Statistics Canada, 2011).

Single-item self-report measures of health have been used since the 1950s with much success (Streib et al., 1958). Several studies have analyzed the relationship between perceived health and clinical measures of health status. These single-item self-report measures demonstrate high predictive and concurrent validity (Zajacova & Dowd, 2011), as demonstrated by their association with measures of various aspects of health, including major depression (Hoff et al., 1997), stress (Mawani & Gilmour, 2010), and anxiety (Kim et al., 2011). Additionally, single-item self-report health measures demonstrate good test-retest reliability (Cronbach's $\alpha = .81$; Atroszko et al., 2015).

Perceived Need for Care. The 2012 CCHS-MH measured perceived need for care with questions from the Perceived Need for Care Questionnaire (PNCQ), which was designed by Meadows for the National Survey of Mental Health and Well Being (NSMHWB) in Australia (2000). Questions for perceived need for care in the CCHS-MH focused on four types of help, including medication; counseling or therapy; information about the problems, treatments, or available services; and 'other' types of help. Answers were grouped into one of the four categories listed above and then classified based on the four levels of perceived need for mental health care in the past 12 months, as per Meadows and colleagues (2000): 1 (*No Perceived Need*), 2 (*All Perceived Needs Fully Met*), 3 (*Perceived Needs Partially Met*), and 4 (*Perceived Needs Not Met*).

The PNCQ has demonstrated acceptable inter-rater reliability ($\kappa = .62$) overall (Meadows et al., 2000). The PNCQ has been adapted for use in other countries and subpopulations around the world (van Beljouw et al., 2010). This scale has demonstrated convergent validity with the mood subscale of the Patient Perceived Continuity for Patients who see Multiple Providers, which is a tool used to measure the perceived need for mental health services (McCusker et al., 2017). Moreover, the PNCQ has made a substantial contribution to the assessment of epidemiological and health research (Meadows et al., 2000).

Self-Rated Mental Health (SRMH). SRMH described the participant's personal view of their mental health status. This variable was used as a flag for other mental health disorders, including depression, mania, and GAD. This variable was measured using a single-item question assessed on a continuous scale, ranging from 0 (*Poor*) to 4 (*Excellent*), higher scores indicating better self-rated mental health. Self-rated mental health is often assessed using a single-item question on surveys and is one of the most widespread methods of assessment (Ahmad, 2014; Bowling, 2005).

Positive Mental Health (PMH). The 2012 CCHS-MH measured PMH using the Mental Health Continuum – Short Form (MHC-SF; Keyes, 2002; 2009), a shortened version of the original Mental Health Continuum – Long Form developed by Keyes (2002; 2005). The MHC-SF consisted of 14 questions that were used to classify a respondent as having flourishing, moderate, or languishing mental health. However, the 2012 CCHS-MH provided a derived variable that was used to assess a respondent's combined emotional wellbeing and positive functioning. This continuous variable rated the respondents PMH on a scale ranging from 0-70, with higher scores indicating greater positive mental health.

In the current study, the shortened version of the MHC showed excellent internal reliability overall (Cronbach's α = .89), as well as for each of its 3 components: emotional wellbeing (α = .83), psychological wellbeing (α = .83), and social wellbeing (α = .74). Additionally, the MHC-SF is correlated with other validated measures of wellbeing, including the Satisfaction With Life Scale (r = .49) and has good convergent and discriminant validity (Lamers et al., 2011). The MHC-SF also has been adapted for use among various cultures (e.g., Guo et al., 2015).

2.2.2 Substance Use Disorder Variables

The current study assessed substance use disorders based on WHO-CIDI classification criteria (Haro et al., 2006), which was created using the DSM-IV. It is important to clarify that variation exists between the DSM-IV and DSM-5 criteria for substance use. According to the DSM-IV, individuals could be classified as having an issue with abuse or with dependence for alcohol and drug use. Those who met the criteria for drug dependence would not receive a diagnosis of abuse for that same class of substance (Substance Abuse and Mental Health Services Administration, 2016). However, according to the DSM-5, the distinction between substance abuse and dependence have been eliminated and an individual is instead diagnosed with substance use disorder (SUD; Substance Abuse and Mental Health Services Administration, 2016). This change in diagnostic criteria is important to clarify as the classification of an individual with either abuse or dependence in the current study relied on the WHO-CIDI, and therefore used the DSM-IV classification. However, it is recognized that this classification would not apply directly to the DSM-5 criteria of today.

Alcohol Abuse or Dependence. The questions in the 2012 CCHS-MH that assessed alcohol abuse or dependence were derived from the WHO-CIDI (1990).

Alcohol consumption levels were used by Statistics Canada as an assessment tool. Participants who met the following criteria received a series of follow-up questions regarding alcohol abuse or dependence: 1) drank at least 12 drinks per year; 2) drank at least once a week during the year in which they reported drinking the most and; 3) if they drank less than once a week, the participant must have had a minimum of 3 drinks on the days that they did drink.

For the purpose of the present study, alcohol *dependence* was defined as individuals who reported experiencing at least three symptoms of alcohol dependence within the 12 months prior to the interview (e.g., increased consumption, attempts to quit, tolerance, withdrawal, reduced activities, time lost, continued drinking), and who displayed a maladaptive pattern of alcohol use (i.e., three or more symptoms occurring at any time in those same 12 months).

For the current study, alcohol *abuse* was defined as individuals who did not meet the criteria for alcohol dependence, but instead experienced at least one of the four symptoms of alcohol abuse during the 12 months prior to the interview (e.g., failure to fulfill major role obligations, hazardous use of alcohol, legal problems, and continued use of alcohol, despite social or interpersonal problems).

For the purpose of the present study, alcohol abuse and alcohol dependence were examined using a grouping variable. Respondents were classified as having alcohol abuse or dependence if they meet the criteria for either condition in the 12 months prior to the survey. For simplicity and intuitive scoring, I altered the original coding scheme 1 (*Yes*) and 2 (*No*) to become 0 (*No*) and 1 (*Yes*). The WHO-CIDI has good test-retest reliability (Kappa range: .60-.80) for alcohol abuse or dependence (Wittchen, 1994). Additionally, the CIDI has substantial concordance with DSM-IV criteria for alcohol

abuse and dependence (AUCs.80-.90, Haro et al., 2006). The CIDI has good procedural and clinical validity when tested by clinicians in psychiatric patients (Janca et al., 1992).

Illicit Drug Abuse or Dependence. Items from the WHO-CIDI were used to assess the 12-month prevalence of drug use, abuse, and dependence independently from cannabis use, abuse, and dependence. Of note, those with single-time use of a drug were not considered for further questioning. Additionally, to reduce respondent burden, the 2012 CCHS-MH only asked follow-up questions a maximum of two times: once in relation to cannabis and once for all other illicit drugs combined.

Respondents who met the criteria for lifetime illicit drug dependence and who experienced at least one symptom of drug abuse or dependence in the 12 months prior to the interview were classified as having illicit drug *dependence*. Lifetime drug dependence was characterized by experiencing a minimum of three symptoms of drug dependence (e.g., increased consumption, tolerance, withdrawal, reduced activities, continued use, attempts to quit, loss of time), while simultaneously presenting with a maladaptive pattern of drug use (i.e., three or more symptoms that occur within the same 12-month time frame).

Drug *abuse* was operationalized independently from dependence. Respondents who met the criteria for lifetime drug abuse and experienced a minimum of one symptom of drug abuse or drug dependence during the 12 months prior to the interview were classified as having illicit drug abuse. Lifetime drug abuse was characterized by experiencing at least one symptom of drug abuse while simultaneously failing to meet the criteria for lifetime drug dependence.

For the purpose of the current study, illicit drug dependence and abuse were examined using a grouping variable. This classification of illicit drug abuse or dependence was used to assess whether respondents met or failed to meet the criteria in the 12 months prior to the survey. For simplicity, I reversed the original coding scheme from 1 (*Yes*) and 2 (*No*) to 0 (*No*) and 1 (*Yes*).

In addition to illicit drug abuse or dependence, the current study specifically examined illicit drug use (excluding cannabis use) among those who identified as a sexual minority to gain insight into the potential coping mechanisms associated with negative social experiences. This variable examined whether respondents used either illicit drugs or medicine in a non-medicinal fashion in the past 12 months. For simplicity, I altered the original coding scheme 1 (*Yes*) and 2 (*No*) to become 0 (*No*) and 1 (*Yes*).

The WHO-CIDI has good test-retest reliability (Kappa = .72) for drug abuse or dependence (Wittchen, 1994). Additionally, the CIDI has substantial concordance with DSM-IV criteria for drug abuse and dependence (AUCs .60-.70, Haro et al., 2006). The CIDI has good procedural and clinical validity when tested by clinicians in psychiatric patients (Wittchen, 1984).

Cannabis Use, Abuse, or Dependence. Items from the WHO-CIDI were used by Statistics Canada to assess the 12-month prevalence of cannabis use, abuse, and dependence independently from other illicit drug use, abuse, and dependence. The WHO-CIDI has excellent test-retest reliability ($\kappa = .83$) for cannabis use, abuse, or dependence (Wittchen, 1994). Prior to 2012, the CCHS-MH required only two uses of cannabis for respondents to be screened into the drug abuse and dependence follow-up questions. However, the CCHS-MH chose to increase their consumption-screening

threshold for the cannabis dependence questions in their 2012 version, as previous iterations revealed no participants able to attain the earlier recommendation. Therefore, respondents for the 2012 CCHS-MH were required to report a minimum of 50 lifetime uses of cannabis to be screened for further questioning. Those with single-time use of cannabis were not considered for further questioning.

Lifetime cannabis *dependence* was characterized by experiencing a minimum of three symptoms of drug dependence (e.g., increased consumption, tolerance, withdrawal, reduced activities, continued use, attempts to quit, loss of time), while simultaneously presenting with a maladaptive pattern of drug use (i.e., 3 or more symptoms that occur within the same 12-month time frame). In the present study, respondents who met the criteria for lifetime cannabis dependence and experienced at least one symptom of drug abuse or dependence in the 12 months prior to the interview were classified as having cannabis dependence.

Cannabis *abuse* was operationalized independently from dependence. Lifetime cannabis abuse was characterized by having experienced at least one symptom of drug abuse while simultaneously failing to meet the criteria for lifetime drug dependence. Respondents who met the criteria for lifetime cannabis abuse and experienced a minimum of one symptom of drug abuse or drug dependence during the 12 months prior to the interview were included in this study.

For the purpose of the current study, cannabis dependence and cannabis abuse were examined using a grouping variable. This classification of cannabis abuse or dependence was used to assess whether respondents met or failed to meet the criteria in the 12 months prior to the survey. For simplicity, I altered the original coding scheme 1

(*Yes*) and 2 (*No*) to become 0 (*No*) and 1 (*Yes*). In addition to the examination of cannabis abuse or dependence, the current study specifically examined cannabis use among those who identified as sexual minorities to gain insight into the potential coping mechanisms associated with negative social experiences. This variable assessed whether a respondent had used cannabis or hashish in the past 12 months and excluded those who had used only once in their lifetime. For simplicity, I altered the original coding scheme from 1 (*Yes*) and 2 (*No*) to 0 (*No*) and 1 (*Yes*).

The WHO-CIDI did not specifically examine cannabis abuse or dependence independently from drug abuse and dependence, so all psychometric properties were assumed from the general drug category. The WHO-CIDI has good test-retest reliability (Kappa range: .60 - .80) for drug abuse or dependence (Wittchen, 1994). Additionally, the CIDI has substantial concordance with DSM-IV criteria for drug abuse and dependence (AUC in range .60-.70; Haro et al., 2006). The CIDI has good procedural and clinical validity when tested by clinicians in psychiatric patients (Wittchen, 1984).

Overall Drug Abuse/Dependence. To get a general sense of the overall drug abuse/dependence of non-heterosexually identifying Canadians, I also examined a combined metric that assessed overall 12-month drug abuse/dependence. This measure included cannabis abuse and dependence (unlike the drug abuse/dependence measure above). The overall drug abuse/dependence variable assessed whether a participant met the 12-month CCHS-MH/WHO-CIDI criteria for drug abuse or drug dependence, including cannabis abuse and dependence. Given that there were only a small number of respondents with a non-heterosexual identity, I chose to include this variable in case the individual variables of illicit drug abuse/dependence and cannabis abuse/dependence had too few respondents to produce statistically significant results or displayed issues of data

sparsity. For simplicity, I altered the original coding scheme from 1 (*Yes*) and 2 (*No*) to 0 (*No*) and 1 (*Yes*).

2.3 Procedure

All analytic plans were subject to restrictions put in place by Statistics Canada. Statistics Canada acts as a steward of the CCHS-MH data and has strict guidelines for researchers who intend to use those data to ensure data security. For this reason, I became a deemed employee of Statistics Canada and was required to conduct all analyses at a secure data repository. Additionally, all data had to meet specific criteria to ensure participant confidentiality and prevent reverse-engineering the identity of a respondent. Accordingly, Statistics Canada required a minimum number of participants (i.e., 15) for each variable examined and discouraged the use of certain statistical procedures, including simple means testing and simple regression. These restrictive practices prevented the current study from analyzing specific sexual minority factions (e.g., lesbian, gay, and bisexual groups separately), as well as combinations of Canadian minorities (e.g., racial minorities and sexual minorities combined).

2.4 Data Analysis

2.4.1 Conceptual Framework

The structure of the MST lent itself nicely to a straightforward mediation question (Baron & Kenny, 1986) because it posits that 'the relationship between *X* (i.e., sexual orientation) and *Y* (i.e., mental health) can be explained by a third variable *M* (i.e., negative social interactions)'. In the current study, I investigated whether the relationship between sexual orientation and poor mental health could be explained by adverse or hostile social encounters. The examination of these hypotheses contained the following features, coinciding with the typical assessment of a mediation model:

1. Sexual minority orientation would be statistically associated with poorer health (τ).
2. Sexual minority orientation would be statistically associated with higher levels of negative social interactions (α).
3. Negative social interactions would be statistically associated with poorer health (ß).
4. The relationship between sexual orientation and poorer health would become attenuated when negative social interactions were simultaneously considered within the model (τ').

To be included as a potential mediator, negative social interactions was required to show a significant relationship with sexual orientation (α). These values largely did not vary across all models; thus, these later relations were given minimal attention in the results as this necessary condition was *always* met (except for female sex-based regression models).

2.4.2 Analytic Approach and Hypotheses

All analyses for the current study were conducted in a secure data repository using Stata 15. My approach used bootstrapped weighting for models to evaluate linear and logistic mediation. All regression models produced by Statistics Canada contained probability weighting to 'de-bias' the sample. For a more comprehensive technical description of weighting and statistical requirements, please refer to the Statistics Canada User Guide (Statistics Canada, 2013).

I individually tested each mental health variable using the same analytical approach for each variable. The independent variable was sexual orientation, the dependent variable was the specific mental health problem in question, and the mediating variable

was negative social interactions. I used both hierarchical logistic regression (for categorical variables) and hierarchical linear regression (for continuous variables) to examine the association between sexual orientation, mental health problems, and negative social interactions. In all cases, I inputted the same sequence of predictors and was interested in the same outcomes. Although I had directional hypotheses for each hypothesis, all data analyses were evaluated using an $\alpha = .05$.

In **Block 1**, I regressed the criterion variable (e.g., alcohol abuse or dependence, bipolar disorder, cannabis abuse or dependence, cannabis use, drug abuse or dependence, drug use, GAD, distress, mental health experiences, perceived health, perceived need for care, positive mental health, and self-rated mental health) onto covariates (i.e., sex, age, marital status, income, education, minority status, province, social support, and childhood experiences) to account for variability associated with predictors.

In **Block 2**, I regressed these same outcome variables onto the block of covariates, adding sexual orientation status to the model. To determine whether sexual orientation improved the predictive ability of the model, I examined either the odds ratio or the regression coefficients depending on use of either a logistic or linear regression model, respectively. For analyses to continue past this stage, sexual orientation status was required to significantly improve the predictive ability of the model.

H1: After controlling for the covariates, sexual orientation was expected to positively predict alcohol abuse or dependence, bipolar disorder, cannabis abuse or dependence, cannabis use, distress, drug abuse or dependence, drug use, generalized anxiety disorder, mental health

experiences, and perceived need for care, and negatively predict perceived health, positive mental health, and self-rated mental health (τ).

In **Block 3**, I regressed these same outcome variables onto covariates and sexual orientation, and I added negative social interaction scores into the model. For analyses to continue past this stage, the negative social interactions variable was required to significantly improve the predictive ability of the model. To determine whether negative social interactions played a significant mediating role in the relationship between sexual orientation and mental health, the odds ratio or regression coefficient value (path τ') of the mediation model needed to be significantly smaller than that of the model when the mediator was not present (path τ).

H2: After controlling for covariates and sexual orientation, NSI was expected to positively predict alcohol abuse or dependence, bipolar disorder, cannabis abuse or dependence, cannabis use, distress, drug abuse or dependence, drug use, generalized anxiety disorder, mental health experiences, and perceived need for care in the first set of analyses. Further, NSI was expected to negatively predict perceived health, positive mental health, and self-rated mental health in the second set of analyses (β).

H3: With the inclusion of NSI, the relationship between sexual orientation status and mental health outcomes was expected to attenuate (τ'). The statistical significance of this attenuation was assessed with an Aroian z-test. The Aroian z-test is a version of the Sobel test, which is used to assess the significance of a mediation effect for large data

samples (Preacher & Hayes, 2008). The Aroian version of the Sobel test is recommended as it has fewer unnecessary assumptions and works well with datasets with a sample size larger than 50 (Baron & Kenny, 1986; MacKinnon et al., 1995).

2.4.3 Exploratory Analyses

In the current study, I was also interested in exploring the impacts of childhood maltreatment and biological sex on mental health and substance use disorder outcomes for Canadians who identify as sexual minorities. Childhood experiences have been found to shape adult relationships (Fletcher & Schurer, 2017; Kelley, 1986). In particular, chronic adverse childhood involvements are associated with a lack of coping in children, which may increase their vulnerability to mental health experiences, psychological distress, and mental illness in adulthood (Kong, 2018; Knoll & MacLennan, 2017). Adverse childhood experiences include exposure to physical, sexual, or psychological neglect and abuse, as well as general maltreatment from caregivers, such as a deprivation of basic human needs or prolonged parental absenteeism (Fletcher & Schurer, 2017). Individuals who identify as LGB report as much as four times more physical and sexual abuse than those who identify as heterosexual (Roberts et al., 2013; Zou & Andersen, 2015), which leads to diminished physical and psychological wellbeing (particularly in women; Alvy et al., 2013). Because of the clear theoretical relevance, but unclear research on how childhood maltreatment may impact the proposed mediational models of the current study, I explored all models without childhood maltreatment included as a covariate and compared these findings to the data that included childhood maltreatment (see Appendix A).

Sexual minority populations are heterogeneous and likely have variety in *how*

they experience negative social interactions and health outcomes. In addition to running hierarchical regression models for each outcome individually, I ran a hierarchical regression for all linear models (i.e., psychological distress, perceived health, perceived need for care, self-rated mental health, and positive mental health) but broke the results down by sex (i.e., male and female). I was interested in: 1) If mediation was present for males and females separately, and 2) If males' and females' mediational pathways (i.e., α, β, τ, and τ') differed from each other. To address my second interest, I conducted an equivalency analysis to determine whether male and female respondents experienced their mental health disparities similarly or differently. All sex-based mediational models were assessed with and without childhood maltreatment as a covariate, and all results can be found in Appendix B.

3. Results

According to the 2012 CCHS-MH data, and the current study's stated inclusion criteria, 2.23% of respondents (n = 425) identified as non-heterosexual, whereas the remaining 97.77% of respondents were of a heterosexual orientation (n = 18,585). Please note that the number of participants has been rounded to the nearest five in accordance with Statistic Canada guidelines. Table 1 provides the sociodemographic characteristics of respondents. This table is purely descriptive as bivariate inferential comparisons (i.e., one predictor and one outcome) are prohibited when using Statistics Canada data. Despite this limitation, the current study had large statistical power, so sizeable differences could reasonably be assumed to be statistically significant. Table 1 is subdivided to delineate between total participants, respondents who self-identified as heterosexual, and respondents who self-identified as non-heterosexual. Respondents who identified as heterosexual were evenly split between males (49.2%) and females

(50.8%), whereas participants who identified as non-heterosexual had notably more male respondents (57.1%) than female respondents (42.9%). The average age for those who identified as non-heterosexual (M = 36.88 years, SD = 13.82) was substantially lower than that of those who identified as heterosexual (M = 46.32 years, SD = 17.22).

The descriptive data indicates that respondents who identified as heterosexual were most likely to be married or have a common-law partner (64.1%), whereas those who identified as non-heterosexual were most likely to report being single (52.7%). Moreover, respondents who identified as non-heterosexual reported a comparable amount of social support as those who identified as heterosexual, but a higher level of negative social interactions (M = 3.80, SD = 2.70) than heterosexual identifying persons (M = 2.69, SD = 2.25). This finding provided a good indication that the ß pathways would be supported in the upcoming mediational models. Finally, participants who identified as non-heterosexual reported a larger incidence of childhood maltreatment than their heterosexually identified peers (M = 1.99, SD = 3.60 vs. M = 4.02, SD = 5.35, respectively), which was consistent with the literature (Jun et al., 2010; Zou & Andersen, 2015).

Lastly, respondents who identified as non-heterosexual reported a higher incidence of mental illness in the past 12 months than those who identified as heterosexual, including (respectively) bipolar disorder (3.4% vs. 1.4%), generalized anxiety disorder (7.0% vs. 2.3%), and psychological distress (M = 8.51, SD = 6.91 vs. M = 5.06, SD = 5.23). These respondents also displayed poorer overall mental wellness, respectively reporting lower levels of positive mental health (M = 50.83, SD = 13.33 vs. M = 54.55, SD = 10.58), self-rated mental health (M = 2.55, SD = 1.01 vs. M = 2.84, SD = 0.91), and perceived health (M = 2.59, SD = 1.00 vs. M = 2.74, SD = 0.96) when

compared to respondents who identified as heterosexual. Therefore, it was unsurprising that respondents who identified as non-heterosexual also reported a higher perceived need for care (M = 1.66, SD = 0.87) than heterosexually identifying respondents (M = 1.24, SD = 0.60). Lastly, respondents who identified as non-heterosexual had a greater incidence of substance use and substance use disorders as compared to respondents who identified as non-heterosexual. Respectively, non-heterosexual identifying respondents had a higher incidence of illicit drug use (20.7% vs. 5.9%) and cannabis use (35.7% vs. 10.8%) than heterosexual identifying respondents, and had a higher likelihood of substance use disorders, including alcohol abuse/dependence (14.3% vs. 2.9%), illicit drug abuse/dependence (3.2% vs. 0.5%), and cannabis abuse/dependence (5.2% vs. 1.1%).

3.1 Analysis and Presentation of Results

Hierarchical regression analyses were used to examine the relationship between sexual orientation and all outcomes, as well as the mediating influence of negative social interactions. The same set of analyses were conducted for each mental health outcome or substance use disorder outcome. For brevity, I have omitted reporting the α-pathway for each model as it represents the relationship between sexual orientation and negative social interactions, which remained relatively consistent across outcomes. However, the α-value for each outcome can be found in its respective table and figure. All outcomes had $n \sim 19{,}000$, however exact values could not be presented due to concerns for privacy from Statistics Canada. All models displayed adequate VIF values (i.e., values ranging between 1 to 4). Unfortunately, I was unable to investigate Generalized Anxiety Disorder (GAD) due to data sparsity, which affected the bootstrapping process. I also was unable to examine any regression models for mental health experiences in the face

of stigma due to a limited number of participant responses.

After conducting all regression analyses, I then performed an exploratory analysis to examine the impact of childhood maltreatment on each outcome (see Appendix A). Lastly, I explored whether the mediational models described above varied as a function of sex (i.e., male and female; see Appendix B).

3.2 Results for Mental Health Outcomes

3.2.1. Bipolar Disorder

I regressed bipolar disorder onto sociodemographic variables in Block 1, $F(15, 500) = 14.70$, $p < .001$. Bipolar disorder was more prevalent among those who had lower levels of social support, OR = 0.87, $p < .001$, 95% CI [0.84, 0.90], and a higher incidence of childhood maltreatment, OR = 1.11, $p < .001$, 95% CI [1.08, 1.15]. Next, I regressed sexual orientation in Block 2, $F(1, 500) = 0.24$, $p = .622$. I found that sexual orientation was a non-significant predictor of bipolar disorder, $t = -.49$, $p = .622$, OR = 0.84, 95% CI [0.41, 1.70], $d = 0.10$. This failure of sexual orientation to predict bipolar disorder indicated that a meditational analysis was not appropriate in this case as the τ-pathway was non-significant (see Table 2 and Figure 1). These results indicated that Canadians who identify as non-heterosexual do not experience significantly greater odds of having bipolar disorder when compared to Canadians who identify as heterosexual.

3.2.2 Psychological Distress

Next I examined the relationship between sexual orientation and psychological distress. To do so, I regressed psychological distress onto sociodemographic variables in Block 1, $F(15, 500) = 96.61$, $p < .001$, $R^2 = .188$, and added sexual orientation in Block 2, $F(1, 500) = 25.71$, $p < .001$, $R^2 = .191$, $\Delta R^2 = .003$. Sexual orientation was a significant positive predictor of psychological distress, $t = 5.07$, $p < .001$, $b = 2.18$, 95%

CI [1.34, 3.03], Hedges' $g = 0.41$. This finding supports previous American research suggesting that individuals who identify as non-heterosexual experience increased levels of psychological distress compared to those who identify as non-heterosexual (Przedworski et al., 2015; Woodford et al., 2014) and places this finding within a Canadian context. Lastly, I regressed psychological distress onto NSI in Block 3, $F(1, 500) = 492.91$, $p < .001$, $R^2 = .276$, $\Delta R^2 = .085$. I found that NSI was a positive predictor of psychological distress, $t = 22.20$, $p < .001$, $b = 0.76$, 95% CI [0.69, 0.82].

There was a substantial decrease in the relationship between sexual orientation and psychological distress when NSI was included in the model, $z_{\text{Aroian}} = 2.57$, which was initially expected. This reduction accounted for 15.8% of the relationship and the coefficient for sexual orientation remained significant, $t = 4.51$, $p < .001$, $b = 1.84$, 95% CI [1.04, 2.64], Hedge's $g = 0.35$ (see Table 3 and Figure 2). Overall, NSI mediated 15.8% of the relationship between sexual orientation and psychological distress.

3.2.3 Perceived Health

I regressed perceived health onto sociodemographic variables in Block 1, $F(15, 500) = 79.06$, $p < .001$, $R^2 = .119$. I discovered that individuals who were widowed/divorced/separated, $b = -0.08$, $p = .05$, $SE = 0.03$, and those who were single, $b = -0.11$, $p < .001$, $SE = 0.03$, reported lower perceived health than those who were married or had a common-law partner. Additionally, when compared to those with less than a high school education, all individuals with higher amounts of education reported greater perceived health (e.g., completed a post-secondary education, $b = 0.31$, $p < .001$, $SE = 0.03$). Then I added sexual orientation in Block 2, $F(1, 500) = 5.31$, $p = .022$, $R^2 = .119$, $\Delta R^2 = .001$. As expected, sexual orientation was a significant negative predictor of perceived health, $t = -2.30$, $p = .022$, $b = -0.15$, 95% CI [-0.26, -0.00], Hedges' $g = 0.15$.

Lastly, perceived health was regressed onto NSI in Block 3, $F(1, 500) = 41.31$, $p < .001$, $R^2 = .126$, $\Delta R^2 = .007$, and results indicated that NSI was a negative predictor of perceived health, $t = -6.43$, $p < .001$, $b = -0.04$, 95% CI [-0.05, -0.02]. This relationship was both significant, and in the expected direction. Overall, there was a substantial decrease in the relationship between sexual orientation and perceived health when NSI was included in the model, $z_{\text{Aroian}} = -2.37$. The coefficient for sexual orientation remained significant, $t = -2.02$, $p = .044$, $b = -0.13$, 95% CI [-0.26, - 0.00], Hedge's $g = 0.15$ (see Table 4 and Figure 3), and in total, NSI mediated 12.1% of the relationship between perceived health and sexual orientation.

3.2.4 Perceived Need for Care.

Next I examined perceived need for care. Perceived need for care was regressed onto sociodemographic variables in Block 1, $F(15, 500) = 39.49$, $p < .001$, $R^2 = .100$. Interestingly, females, $b = -0.14$, $p < .001$, $SE = 0.01$, and Caucasians, $b = -0.16$, $p < .001$, $SE = 0.02$, reported a significantly higher perceived need for care than males or minority individuals. I then regressed sexual orientation in Block 2, $F(1, 500) = 33.24$, $p < .001$, $R^2 = .105$, $\Delta R^2 = .005$ and discovered that sexual orientation was a significant positive predictor of perceived need for care, $t = 5.77$, $p < .001$, $b = 0.33$, 95% CI [0.22, 0.45], Hedges' $g = 0.54$. Lastly, I regressed perceived need for care onto NSI in Block 3, $F(1, 500) = 147.21$, $p < .001$, $R^2 = .137$, $\Delta R^2 = .032$. The results indicated that NSI was a positive predictor of perceived need for care, $t = 12.13$, $p < .001$, $b = 0.05$, 95% CI [0.04, 0.06]. The inclusion of NSI to the model substantially decreased the initial relationship between sexual orientation and perceived need for care, $z_{\text{Aroian}} = 2.53$, while the coefficient for sexual orientation remained significant, $t = 5.27$, $p < .001$, $b = 0.31$, 95% CI [0.19, 0.43], Hedge's $g = 0.50$ (see Table 5 and Figure 4). Overall, NSI

mediated 7.3% of the relationship between sexual orientation and self-reported perceived need for care.

3.2.5. Self-Rated Mental Health (SRMH)

I regressed self-rated mental health onto sociodemographic variables in Block 1, $F(15, 500) = 67.90$, $p < .001$, $R^2 = .124$, and added sexual orientation in Block 2, $F(1, 500) = 7.10$, $p = .008$, $R^2 = .125$, $\Delta R^2 = .001$. Sexual orientation was a statistically significant negative predictor of self-rated mental health, $t = -2.66$, $p = .008$, $b = -0.18$, 95% CI [-0.32, -0.05], Hedges' $g = 0.20$. This finding mirrors the literature, which consistently reports sexual minority individuals as having poorer self-rated mental health (Axelsson et al., 2013; Veldhuis et al., 2017). Importantly, this finding broadens our understanding of this topic within Canada. Lastly, I regressed self-rated mental health onto NSI in Block 3, $F(1, 500) = 161.58$, $p < .001$, $R^2 = .156$, $\Delta R^2 = .031$. I found that NSI was a negative predictor of self-rated mental health, $t = -12.71$, $p < .001$, $b = -0.08$, 95% CI [-0.09, -0.07]. The inclusion of NSI in the model significantly decreased the relationship between sexual orientation and self-rated mental health. As can be seen in Table 6 and Figure 5, NSI mediated 19.6% of the relationship between sexual orientation and self-rated mental health. This reduction in effect was significant, $z_{\text{Aroian}} = -2.52$.

3.2.6. Positive Mental Health (PMH)

Next, I examined the relationship between sexual orientation and positive mental health. When I regressed positive mental health onto sociodemographic variables in Block 1, $F(15, 500) = 112.39$, $p < .001$, $R^2 = .212$, I discovered that males reported higher positive mental health than females, $b = 0.63$, $p = .001$, $SE = 0.23$. Moreover, those who reported a greater amount of childhood maltreatment displayed diminished

positive mental health, b = -0.39, p < .001, SE = 0.04. Interestingly, those living in Atlantic Canada reported a significantly greater positive mental health status than those living in Quebec, b = -1.28, p < .001, SE = 0.36, or British Columbia, b = -1.20, p < .001, SE = 0.37. Second, I added sexual orientation in Block 2, $F(1, 500) = 5.27$, p =.022, R^2 = ..213, ΔR^2 = .001. As expected, sexual orientation was a significant negative predictor of PMH, t = -2.30, p = .022, b = -2.24, 95% CI [-4.16, -0.32], Hedges' g = 0.21. Finally, when I regressed positive mental health onto NSI in Block 3, $F(1, 500)$ = 235.71, p < .001, R^2 = .245, ΔR^2 = .031, I discovered that NSI was a significant negative predictor of positive mental health, t = -15.35, p < .001, b = -0.93, 95% CI [-1.05, -0.81]. Although the pattern was in the expected direction, the relationship between sexual orientation and positive mental health did not significantly change with the inclusion of NSI, t = -1.84, p = .067, b = -1.81, 95% CI [-3.74, -0.13], Hedge's g = 0.17 (see Table 7 and Figure 6). Therefore, NSI did not mediate the relationship between sexual orientation and positive mental health, which was unexpected.

3.3 Results for Substance Use Disorder Outcomes

3.3.1. Alcohol Abuse/Dependence

After examining all mental health variables, I shifted to focus on substance use disorder outcomes. First I examined the relationship between sexual orientation and self-reported alcohol abuse/dependence. I regressed alcohol abuse/dependence onto sociodemographic variables in Block 1, $F(15, 500) = 22.90$, p < .001, and found that males had a greater odd of self-reporting alcohol abuse/dependence when compared to women, OR = 3.11, p < .001, 95% CI [2.36, 4.08]. Next, sexual orientation was added in Block 2, $F(1, 500)$ = 15.40, p < .001. Sexual minority individuals reported significantly greater odds of alcohol abuse/dependence, t = 3.92, p < .001, OR = 3.09, 95% CI [1.76,

5.43], $d = 0.62$, which was consistent with the literature (Slater et al., 2017). I then regressed alcohol abuse/dependence onto NSI in Block 3, $F(1, 500) = 46.37$, $p < .001$. I found that NSI was a positive predictor of alcohol abuse or dependence, $t = 6.81$, $p < .001$, OR = 1.18, 95% CI [1.12, 1.24]. The addition of NSI to the model caused a reduction in the relationship between sexual orientation and self-reported alcohol abuse/dependence, $z_{\text{Aroian}} = 2.40$, and in total, this reduction accounted for 8.3% of the relationship. Importantly, the coefficient for sexual orientation remained significant, $t = 3.61$, $p < .001$, OR = 2.84, 95% CI [1.61, 5.01], $d = 0.58$ (see Table 8 and Figure 7). In total, NSI meditated 8.3% of the relationship between sexual orientation and self-reported alcohol abuse/dependence.

3.3.2. Illicit Drug Abuse/Dependence (Excluding Cannabis Abuse or Dependence)

After examining alcohol abuse/dependence, I examined the relationship between sexual orientation and illicit drug abuse/dependence, which excluded the use of cannabis. I regressed illicit drug abuse/dependence onto sociodemographic variables in Block 1, $F(15, 500) = 8.50$, $p < .001$. Unsurprisingly, those who reported a greater number of childhood maltreatments had a greater odds of having an abuse/dependence on illicit drugs, OR = 1.12, $p < .001$, 95% CI {1.07, 1.17]. In Block 2, I added sexual orientation, $F(1, 500) = 2.71$, $p = .100$, and found that sexual orientation did not significantly predict illicit drug abuse/dependence, $t = 1.65$, $p = 1.00$, OR = 2.02, 95% CI [0.87, 4.68], $d = 0.39$. Although this pattern was in the correct direction, the null finding was unexpected. Given that no relationship existed between sexual orientation and illicit drug abuse/dependence, use of a meditational analysis was inappropriate (see Table 9 and Figure 8). Overall, the results indicate that Canadians who identify as non-heterosexual experience a similar rate of illicit drug abuse or dependence than Canadians

who identify as heterosexual.

3.3.3. Illicit Drug Use (Excluding Cannabis Use)

It was not only important to examine illicit drug abuse/dependence among heterosexual and non-heterosexual Canadians, but also the rate of use of illicit substances. To explore this relationship, I regressed illicit drug use (excluding cannabis use) onto sociodemographic variables in Block 1, $F(15, 500) = 16.86$, $p < .001$, and added sexual orientation in Block 2, $F(1, 500) = 22.22$, $p < .001$. As anticipated, I found that sexual minority individuals reported significantly greater odds of using illicit drugs, $t = 4.71$, $p < .001$, OR = 2.69, 95% CI [1.78, 4.06], $d = 0.55$. In Block 3, I regressed illicit drug use onto NSI, $F(1, 500) = 43.22$, $p < .001$, and found that NSI positively predicted illicit drug use, $t = 6.57$, $p < .001$, OR = 1.14, 95% CI [1.10, 1.19]. Due to the significant reduction of the original relationship between sexual orientation and illicit drug use, $z_{\text{Aroian}} = 2.38$, I concluded that NSI mediated 7.7% of this relationship. The coefficient for sexual orientation remained significant, $t = 4.57$, $p < .001$, OR = 2.56, 95% CI [1.71, 3.84], $d = 0.52$ (see Table 10 and Figure 9), signifying that sexual minority Canadians self-report greater illicit drug use in comparison to heterosexually identified Canadians.

3.3.4 Cannabis Abuse/Dependence

Given that the illicit drug abuse/dependence and illicit drug use variables omitted cannabis, I thought it would be thoughtful to also examine the association between cannabis and sexual orientation. First, in Block 1, I regressed cannabis abuse/dependence onto sociodemographic variables, $F(15, 500) = 14.72$, $p < .001$, and added sexual orientation in Block 2, $F(1, 500) = 1.87$, $p = .172$. Just as with alcohol abuse/dependence, men were more likely to report higher odds of having a cannabis

abuse/dependence, OR = 3.51, $p < .001$, 95% CI [2.19, 5,62]. However, sexual orientation was not a significant positive predictor of cannabis abuse/dependence, $t = 1.37$, $p = .172$, OR = 1.68, 95% CI [0.80, 3.55], $d = 0.29$. Although this finding was in the expected direction, the non-significant finding was unexpected. This null finding indicated that a meditational analysis was not appropriate in this case, as there was no relationship between sexual orientation and cannabis abuse/dependence (see Table 11 and Figure 10). Overall, Canadians who identify as non-heterosexual experience similar odds of having cannabis abuse or dependence to those who identify as heterosexual.

3.3.5 Cannabis Use

Next, I explored cannabis use among Canadians who identify as heterosexual and non-heterosexual. I regressed cannabis use onto sociodemographic variables in Block 1, $F(15, 500) = 77.99$, $p < .001$, and discovered that minorities had a lower odds of using cannabis than Caucasians, OR = 0.27, $p < .001$, 95% CI [0.21, 0.34]. Furthermore, men displayed greater odds of cannabis use than women, OR = 2.51, $p < .001$, 95% CI [2.18, 2.89]. In Block 2, sexual orientation was added to the model, $F(1, 500) = 29.87$, $p < .001$. As expected, identifying as a sexual minority significantly predicted cannabis use, $t = 5.47$, $p < .001$, OR = 2.61, 95% CI [1.85, 3.69], $d = 0.53$. I then regressed cannabis use onto NSI in Block 3, $F(1, 500) = 30.86$, $p < .001$, and found that NSI was a positive predictor of cannabis use, $t = 5.56$, $p < .001$, OR = 1.10, 95% CI [1.06, 1.14]. There was a substantial decrease in the relationship between sexual orientation and cannabis use when NSI was included in the model, $z_{\text{Aroian}} = 2.32$. The coefficient for sexual orientation remained significant despite its attenuation, $t = 5.18$, $p < .001$, OR = 2.51, 95% CI [1.77, 3.55], $d = 0.51$ (see Table 12 and Figure 11), and overall, NSI mediated 5.7% of the relationship between sexual orientation and cannabis

use.

3.3.6 Overall Drug Abuse/Dependence (Including Illicit Drugs, Cannabis, and One-Time Cannabis Use)

Lastly, I thought it would be interesting to examine all forms of drug use using one measure, which allowed me to see if the results varied from the independent outcomes. In Block 1, I regressed overall drug abuse/dependence onto sociodemographic variables in Block 1, $F(15, 500) = 17.82$, $p < .001$, and added sexual orientation in Block 2, $F(1, 500) = 0.72$, $p = .398$. Given the results above, it was unsurprising that sexual orientation did not significantly predict overall drug abuse/dependence, $t = 0.85$, $p = .398$, OR = 1.34, 95% CI [0.68, 2.66], $d = 0.16$. However, the null result meant that a meditational analysis was not appropriate in this case (see Table 13 and Figure 12). These results indicated that Canadians who identify as non-heterosexual have similar odds of having overall issues with drug abuse/dependence than those who identify as heterosexual.

3.4 Summary of Results and Hypotheses

Using the results from the outcomes above, all three hypotheses were examined to determine whether their objectives were met in the current study. Please note that because GAD and mental health experiences in the face of stigma could not be examined, they were omitted from discussion here. Moreover, a comprehensive summary of all findings and support of hypotheses can be found in Table 14 and Table 15. Hypothesis 1 made two predictions: a) that sexual orientation would positively predict alcohol abuse/dependence, bipolar disorder, cannabis abuse/dependence, cannabis use, overall drug abuse/dependence, psychological distress, illicit drug use, and perceived need for care; and b) that sexual orientation would negatively predict

perceived health, positive mental health, and self-rated mental health. Overall, Hypothesis 1 was only partially supported. Only half of the variables displayed an expected result and it appeared that general health and mental health concerns were better predicted by sexual orientation than substance use concerns. Specifically, although bipolar disorder, illicit drug abuse/dependence, cannabis abuse/dependence, and overall drug abuse/dependence did not display an association with sexual orientation, perceived health, positive mental health, and self-rated mental health were all negatively predicted by sexual orientation.

Hypothesis 2 also made two predictions: after controlling for covariates and sexual orientation, a) NSI would positively predict bipolar disorder, psychological distress, alcohol abuse/dependence, cannabis abuse/dependence, cannabis use, illicit drug abuse/dependence, illicit drug use, and perceived need fort care; and b) NSI would negatively predict perceived health, positive mental health, and self-rated mental health. Again, Hypothesis 2 was only partially supported. Generally, the results were more supportive of mental health outcomes than substance use disorder outcomes. NSI positively predicted psychological distress alcohol abuse/dependence, cannabis use, illicit drug use, and perceived need for care. Despite these findings, NSI failed to predict many criterion variables in the expected direction (e.g., bipolar disorder, illicit drug abuse/dependence, cannabis abuse/dependence, and overall drug abuse/dependence).

Finally, Hypothesis 3 examined whether, with the inclusion of NSI, the relationship between sexual orientation and mental health outcomes would attenuate. Given its reliance on the two hypotheses above, it is unsurprising that Hypothesis 3 was only partially met. Specifically, negative social interactions mediated the association between identifying as a member of a sexual orientation minority and psychological

distress, perceived health, perceived need for care, self-rated mental health, alcohol abuse/dependence, and cannabis use. However, negative social interactions did not mediate the relationship between sexual orientation and bipolar disorder, positive mental health, illicit drug abuse/dependence, cannabis abuse/dependence, or overall drug abuse/dependence.

3.5 Results of Exploratory Analyses

The first exploratory analysis examined whether the mediational models differed based on the inclusion or exclusion of childhood maltreatment as a covariate. In general, findings did vary based on this inclusion/exclusion criteria. For the most part, the inclusion of childhood maltreatment as a covariate appeared to dampen the mediational ability of NSI, and in some cases eliminated the mediation all together. A clear summary of these results is presented in Appendix A. Overall, these results demonstrated that social encounters greatly influence the mental health of Canadians who identify as a sexual minority, and that childhood maltreatment may play a larger role than initially expected.

Second, there was interest in exploring how sexual orientation-mental health relationships and sexual orientation-substance use disorder relationships varied by biological sex. Here, only linear models were examined (i.e., psychological distress, perceived health, perceived need for care, self-rated mental health, and positive mental health). First, an equivalency analysis demonstrated that, in general, males and females seem to experience their mental health and substance use disorder adversities in an equivalent manner. The one exception to this was perceived need for care.

Next all mediation models were examined for males and females separately, and were broken down by the inclusion or exclusion of childhood maltreatment. First I

examined the male models. When childhood maltreatment was omitted from the model, NSI mediated the relationship between sexual orientation and both psychological distress and perceived need for care. These same two outcomes were also mediated when childhood maltreatment was included in the models; however, the meditational ability of NSI was smaller in this case. Second, I examined the female models. When childhood maltreatment was omitted from the model, NSI mediated the relationship between sexual orientation and all outcomes except for perceived health. Interestingly, no mediation models were examined for females when childhood maltreatment was included in the model because the α-pathway was non-significant. This result is fascinating, as it means that there is no significant association between being a lesbian/bisexual and negative social interactions. A clear summary of these results is presented in Appendix B.

4. Discussion

The purpose of the current study was to examine whether the relationship between sexual orientation and mental health and addiction outcomes among Canadians was mediated by the quality of social interactions. Specifically, I discovered that negative social interactions (NSI) mediated a sizeable portion of the relationship between sexual orientation and psychological distress (15.8%), perceived health (12.1%), perceived need for care (7.3%), self-rated mental health (19.56%), alcohol abuse/dependence (8.3%), illicit drug use (7.7%), and cannabis use (5.7%). However, NSI did not play a mediating role for bipolar disorder, positive mental health, illicit drug abuse/dependence, cannabis abuse/dependence, and overall drug abuse/dependence. An exploratory analysis highlighted the potential importance of reported childhood maltreatment on the relationship between sexual orientation and mental health outcomes,

as the presence of childhood maltreatment as a covariate reduced the mediational ability of NSI. Lastly, sex-based differences were examined, and it was found males and females are impacted differently by NSI, particularly when considering the presence or absence of childhood maltreatment.

Generally, I found that Canadians who identify as non-heterosexual experience diminished mental health compared to those who identify as heterosexual, but experience similar substance abuse/dependence (with the exception of alcohol abuse/dependence). Given the large sample size of the present study and the tendency for statistically significant results, I investigated effect size measures to assess the practical significance of each outcome. In doing so, I found that the mediation models for perceived health (Hedge's $g = 0.13$) and self-rated mental health (Hedge's $g = 0.16$) were not practically significant. Although these mental health outcomes do not have a large effect size, they may reflect a clinically significant change between groups (Campbell, 2005), as clinical significance examines whether group differences meaningfully impact the everyday lives of the respondents (Pintea, 2010). Unfortunately, both perceived health and self-rated mental health were assessed using a single self-report question, and not a clinical measure. Moreover, the data were cross-sectional, and thus did not allow for a therapeutic examination of two separate treatment groups. For these reasons, they will not be discussed at length below.

4.1 Confirmatory Findings

Generally, the current study found that Canadians who identify as non-heterosexual had higher odds of mental health adversity and substance use than those who identify as heterosexual. Although these findings mirror the literature in this area for people who identify as non-heterosexual (Bränström, 2017; Pakula, Shoveller, et al.,

2016; Ploderl & Tremblay, 2015; Stinchcombe et al., 2018), the link between mental health adversity and social experiences in this minority group remains unclear. Historically, mental illness was believed to arise from identifying as a sexual minority (Carr & Spandler, 2019; Smith, 2004). Today, however, adverse mental health issues among those identifying as a sexual minority are viewed in direct relation to the stigma that society *attaches to* their non-heterosexual identity rather than to group membership per se (Meyer, 1995; Nakkeeran & Nakkeeran, 2018; Yildiz, 2018). This shift in viewpoint demonstrates that social context plays a key role in the psychological wellbeing of members of sexual minority groups. The results of the current study support this new perspective by pointing to the mediating role of negative social interactions for Canadians identifying as non-heterosexual and provides evidence that negative social interactions are responsible for a significant proportion of the psychological disparities faced by this group relative to their heterosexual identifying counterparts.

In addition to the higher incidence of social adversity, the experiences of those who identify as a sexual minority are contingent upon the social climate, which is fluid. What this means is that the degree of social discrimination faced by those who identify as non-heterosexual is likely to fluctuate across circumstances. Although Canadians who identify as non-heterosexual are more visible today, they exist in a predominantly heteronormative environment and experience continued marginalization (e.g., a greater exposure to stigma, discrimination, prejudice, harassment). Heteronormativity refers to the dominant position of heterosexuality in society (Herz & Johansson, 2015). Individuals who identify with heterosexuality are viewed as ‘natural’ or ‘normal’ and

often move through society unquestioned and privileged. In comparison, those who do not fit into this normative system are marginalized (Herz & Johansson, 2015). The manifestation of these heteronormative viewpoints is known as heterosexism. Heterosexism leads to the oppression of non-normative identities and perpetuates the marginalization of those who identify as non-heterosexual (Morrison & Dinkel, 2012). Both concepts rely heavily on the cultural and political climate of a country (Smith, 2004), which is important as it highlights why American data may not be informative of Canadian social context influences.

Heteronormativity and heterosexism impact not only the mechanics of how society is run, but unduly influence the lived experience of members within a particular society. When discussing lived experience, people living in Canada and the United States cannot compare their experiences because these two countries, although similar in many veins, are socially and politically quite different. Canadians have been more progressive in their acceptance and protection of those who identify as non-heterosexual than Americans (Smith, 2004), but Canadian data continues to reveal disproportionate marginalization of non-heterosexual identities (Colpitts & Gahagan, 2016; Logie et al., 2017; Steele et al., 2009; Stinchcombe et al., 2018). It may be that this higher level of acceptance is not reflected in the lived experience of those who identify as non-heterosexual, or is simply *insufficient* in the degree to which it can effectively address the systematic and historical injustices experienced by the sexual minority community.

Even in Canada, self-identification as a sexual minority is difficult because it may be accompanied by an increase in unpleasant social experiences. According to the Social Dominance Theory of Sidanius and Pratto (1999), society is hierarchically

constructed into social groups. Canadians who identify as sexual minorities fall into a subordinate societal group, and thereby receive an unequal distribution of privilege as compared to the dominant social group (which, for our purpose, are those who identify as heterosexual). This subordinate position is responsible for systematic, institutional, and individual level discrimination (Pratto et al., 2006). Over time, the perpetuation of this socially undesirable position creates oppression, prejudice, and discrimination among members of this social class. The results of the current study support this notion by detailing how Canadians who identify as non-heterosexual report a higher incidence of negative social interactions and childhood maltreatment, and a lower incidence of social support than those who identify as heterosexual. Collectively, what the present research demonstrates is that those identifying as sexual minorities are vulnerable to the pressures of society and experience more social adversity than those who identify as heterosexual. However, the average age for those who identified as non-heterosexual (M = 36.88 years, SD = 13.82) in the current study was substantially lower than that of those who identified as heterosexual (M = 46.32 years, SD = 17.22). This age discrepancy may be a manifestation of generational norms and the shift towards a broader acceptance of non-heterosexuality within Canada (although it is unclear from the current study).

Although individuals who identify as non-heterosexual experience greater social negativity, it is unclear whether that negativity is uniquely associated with their sexual orientation, or whether there are other factors at play. The Social Stress Theory of Lazarus and Folkman (1984) adds to Social Dominance Theory by examining social interactions specifically. By viewing social interactions as a major source of stress, Social Stress Theory articulates how marginalized social groups experience a greater exposure to stress and fewer resources to cope, thereby degrading their mental wellbeing

(Dentato, 2012); a finding supported by the greater psychological distress reported among those identifying as a sexual minority in the current study relative to heterosexual identifying individuals. The inclusion of both personal relationships and environmental circumstance to describe heightened levels of stress enhances Social Stress Theory's ability to capture additional facets of daily living (e.g., heteronormativity and heterosexism) that can contribute to poorer mental health. Therefore, it was not surprising to find that negative social interactions and adverse mental health outcomes had a significant small/moderate relationship with one another in the current study. For example, negative social interactions were correlated with heightened drug use, more psychological distress, and a greater perceived need for care among Canadians who identified as a sexual minority. Although Social Stress Theory did align with some findings in the current study, it failed to encapsulate the entire lived experience of sexual minority group members.

By contrast, the Syndemic Theory of Singer (1994; 1996; 2009) summarizes a holistic view of health problems, capturing the elements of both Social Dominance Theory and Social Stress Theory. Under the Syndemic theoretical lens, health problems are viewed as arising from social injustice and are considered mutually reinforcing, which seems fitting when considering sexual minority group members. Individuals who identify as non-heterosexual face not only internal struggles of self-concept, but also external aggressions from society and these factors exacerbate pre-existing distress. Syndemic Theory proposes that it is the entire lived experience of the individual that influences overall physical and mental health, thereby highlighting why people who identify as non-heterosexual may experience poorer health than those who identify as heterosexual. However, this theory only *insinuates* applicability to members of sexual

minority groups. It is for this reason that Minority Stress Theory (MST) has become the leading framework to describe the social and environmental experiences of those who identify as non-heterosexual, and why the goal of the current study was to test the applicability of the MST within the Canadian population.

The MST of Meyer (1995; 2003) details how minority groups face chronically high levels of discrimination, prejudice, and marginalization within society. Importantly, Meyer suggested that chronically difficult situations produce high levels of stress that, over time, erode wellbeing. This distinction is important and suggests that it is the culmination of not only negative social experiences, but also one's individual experience as a minority in a dominant society that exacerbates health disparities. What this theory suggests is that a non-heterosexual identity and poor social experiences have a multiplicative effect on psychological wellbeing, rather than an additive effect expressed by the other theories (i.e., Social Dominance Theory, Social Stress Theory, and Syndemic Theory). MST claims that discriminatory experiences compound already existing distress to further ostracize members of an already vulnerable community. Meyer therefore claimed that being non-heterosexual causes a greater experience of stress (e.g., due to negative social interactions), which then contributes to poorer overall health.

By accounting for negative social interactions in the current study, the relationship between mental health adversity and a non-heterosexual identity was attenuated, providing an indication that mental health issues are partially a reflection of social exchanges. Although there are likely several other factors that contribute to the poor health of those identifying as non-heterosexual (e.g., lack of access to care, poorer quality of care due to stigma, healthcare worker insensitivity to the unique needs of this

population, higher rates of sexually-transmitted diseases and obesity, HIV/AIDS; Hafeez et al., 2017), the finding that negative social interactions play a significant role in the mental health experiences of Canadian sexual minorities is critical. This finding implies that being a member of a socially identifiable outgroup is likely not intrinsically positive or negative, but rather depends on how society evaluates that group identity, and whether membership in that group enacts barriers to social participation. Indeed, those who identify as non-heterosexual face several societal barriers, including, but not limited to, discriminatory remarks, physical violence, familial and peer rejection, and internalized homophobia, all of which make it difficult to exist in a predominantly heteronormative culture (Hafeez et al., 2017; Logie et al., 2017; Skerrett et al., 2016; Seelman et al., 2017; Sue, 2010). The findings of the current study were consistent with what one would expect if being non-heterosexual was associated with social barriers.

Generally, the findings of the current study fit with the literature and confirm several aspects of preexisting theories (i.e., Social Dominance Theory, the Social Stress Theory, and Syndemic Theory). Canadians who identified as non-heterosexual had greater levels of psychological distress (consistent with Social Stress Theory) and greater social adversity (consistent with Social Dominance Theory), which lead to greater mental health deficits (consistent with Syndemic Theory). Given that this particular social group reports a disproportionate amount of mental health adversity, this finding was expected. More specifically, individuals who identified with a non-heterosexual orientation were found to be three times more likely to experience GAD. Given the hardships of navigating a predominantly heteronormative society as an invisible minority, these individuals may fear the repercussions that accompany identification with this subordinate social group. Given this suboptimal social position, it

was unsurprising that Canadians who identified as non-heterosexual were nearly twice is likely to report psychological distress. These social factors also played a role in the reduced mental health reported by this population. Given the complexities that accompany identification as a sexual minority, these findings provide evidence that Canadians who identify as non-heterosexual suffer, likely *due* to their marginalized social position.

Consistent with the literature (Chaney & Brubaker, 2012; Kerr et al., 2015; King et al., 2008; Slater et al., 2017), those who identified as non-heterosexual in the present study experienced a higher incidence of illicit drug use and alcohol abuse/dependence. McCabe et al. (2010) found that Americans identifying as a sexual minority were four times more likely to engage in substance abuse. The current study supported this previous research in a Canadian context by discovering that this vulnerable group had a five times greater risk of alcohol abuse/dependence in this Canadian population-based sample. Moreover, Canadians who identified as a sexual minority reported four times more illicit drug use and three times more cannabis use than those who identified as heterosexual, again findings that align with the literature focused on sexual minorities (Cochran et al., 2004; McCabe et al., 2009; Russell et al., 2002; Skinner, 1994). Given that non-heterosexually-identifying Canadians also reported a higher incidence of negative social interactions and increased psychological distress, the heightened substance use may be attributed to unhealthy coping mechanisms for both sexual orientation groups. However, faced with persisting heteronormative ideologies, sexual-minority identifying individuals may use substances as a way of dampening their intense psychological and social adversities. Although this form of coping has proven

ineffective (Pollard et al., 2017; Sinha, 2001), this option may be viewed as an easy or last resort when someone has potentially lost adaptive forms of coping (e.g., family support, good peer groups, inclusive physical or mental health care).

One important aspect of the current study was that it examined not only adverse mental health outcomes, but also positive mental health. Results indicated that effects were more consistent for negative mental health and more variable for positive mental health. Intuitively, this makes a great deal of sense. Scholars emphasize that there is a social expectancy of positivity during socialization (Harada et al., 2018; Rook & Pietromonaco, 1987), which contributes to one's sense of belonging. When a negative social interaction occurs, it contradicts that preconceived expectation of positivity, which ultimately impacts mental health to a greater degree than a positive social exchange (Bertera, 2005; Harada et al., 2018; Lincoln, 2000). In fact, negative social interactions have been shown to significantly increase anxiety, psychological distress, and mood disorders in previous studies (Lakey et al., 1994; Walen & Lachman, 2000; Yanos et al., 2001); however, this previous research did not delineate participants based on sexual orientation. Given that sexual minorities typically face a greater degree of negative social interactions than those who identify as heterosexual (Yildiz, 2018), it was unsurprising that these adverse social exchanges lead to greater psychological distress, an increased perceived need for care, higher alcohol abuse/dependence, and greater illicit drug use among Canadians who identified as non-heterosexual in the current study. According to MST, negative social interactions are even worse when a person identifies as a sexual minority because those interactions are compounded by additional stressors that are linked to one's non-heterosexual orientation (e.g., microaggressions, discrimination in social settings, familial, social, or peer rejection).

Overall, the current study confirmed the applicability of the MST to the Canadian population of people who identify as non-heterosexual. Canadians who identified as sexual minorities reported higher levels of negative social interactions, and these poorer social exchanges mediated a substantial portion of their mental health and substance use adversities. This mediational capacity not only demonstrated that sexual minorities are unduly influenced by their social surroundings, but directly linked these forms of adversity to negative social interactions, a first within the Canadian literature. Taken together, the findings of the current study confirm the application of the MST to this specific subpopulation of Canadians, a finding that can be used to bring academic, social, and political attention to the difficulties faced by this marginalized group. Importantly, the inclusion of MST was imbedded into the design of the current research question development and data analytic plan rather than introduced *post-hoc* as has been usually the case in the literature referencing MST.

4.2 Novel Discoveries

The current study presented novel findings that further contribute to the body of knowledge on Canadians who identify as a sexual minority. First, I discovered that Canadians who identified as non-heterosexual were no more likely than those who identified as heterosexual to have bipolar disorder (i.e., Bipolar I and/or Bipolar II; OR = 1.32, 95% CI [0.72, 2.44]). Previous Canadian research has found that sexual minorities report a higher incidence of mood disorders (i.e., bipolar and depression; Pakula & Shoveller, 2013; Pakula, Shoveller, et al., 2016); however, such studies failed to examine bipolar disorder and depression separately. Although the current study found no statistically significant increase in bipolar disorder among this vulnerable group, a study by Barry and colleagues (in press) found a greater incidence of depression among

Canadians who identified as a sexual minority. It is possible that this discrepant finding is the result of a measurement issue tied to combining mood disorders into a single category vs separating them for specific analysis.

Bipolar disorder and depression share common characteristics. Both disorders have strong biological and genetic origins (Kerner, 2014; Vinnakota & Kaur, 2018), and both are dependent on the diathesis (Colodro-Conde et al., 2018; Power, 2005). The diathesis-stress model describes how environmental and social stressors interact with genetic or non-biological traits to trigger the onset of mental illness in vulnerable, or pre-disposed, individuals (Kemner et al., 2015). Negative social interactions are classified as a social stressor, and it is possible that these poor social exchanges may trigger the diathesis for both bipolar disorder and depression. Importantly, the current study only examined the impact of *negative social interactions* on relationship between sexual orientation and bipolar disorder. Although negative social interactions might activate the diathesis for those who identify as non-heterosexual, there could be other social factors that equally trigger the diathesis among those who identify as heterosexual (e.g., family environment, lack of social support, sleep irregularity; Power, 2005). The current study did not control for these external stressors, which could offer an explanation as to why no differential outcome was identified based on sexual orientation. Ultimately, negative social interactions could not be deemed a unique stress trigger or correlate of the diagnosis of bipolar disorder for those who identify as a sexual minority. It is possible that these poor social exchanges either occur in both groups to a similar degree, or they may be irrelevant all-together. Moreover, other forms of social stress could be more relevant to the diathesis stress model of bipolar disorder. More research is needed in this

area to allow a better comprehension of the mechanisms that impact bipolar disorder among Canadians who identify as non-heterosexual.

Another concern with the measurement of bipolar disorder was the fact that this diagnostic category could not differentially examine the influence of NSI on mania symptoms separately from depressive symptoms. This lack of examination could be important given that the mood cycle patterns associated with bipolar disorder could have been influenced by NSI as a social stressor. When depression was examined alone (and not as part of the bipolar diagnosis), it was clear that there was a difference in the influence of social factors (Barry et al., in press). In general, depression seems to be more strongly influenced by external factors than bipolar disorder. Epidemiological research estimates that between 30-40% of occurrences of depression involve a genetic factor (Nabeshima & Kim, 2013), meaning that a large portion (~60-70%) of this condition is vulnerable to environmental factors (as a point of comparison, approximately 85% of bipolar disorder cases involve a genetic factor; Guffin et al., 2003). Canadian men (Brennan et al., 2010) and women (Steele et al., 2009) who identify as non-heterosexual have an increased incidence of depression compared to those who identify as heterosexual. In addition, people with more severe depressive symptoms report a stronger reaction to negative social interactions than those with less severe symptoms (Steger & Kashdan, 2009). The combination of these factors likely explains a portion of why mood disorders are reported as more prevalent among Canadian sexual minorities (Pakula & Shoveller, 2013; Pakula, Shoveller, et al., 2016). It does not seem to be bipolar disorder per se that is driving this relationship, but rather the experience of depression.

A final novel finding of the present study is that it demonstrated that Canadians who identify as a sexual minority have overall worse mental health than heterosexual identifying persons, despite the country holding relatively liberal attitudes towards non-heterosexuality and the country's anti-discrimination and same-sex marriage laws. Although other Canadian studies have mirrored these inequities (Brennan et al., 2010; Ferlatte et al., 2015; Pakula, Carpiano, et al., 2016; Stinchcombe et al., 2018), the current study expanded upon this work by acknowledging that this group of individuals faces a higher rate of negative social exchanges, and examined these findings based on sex. In addition, results of the current study aligned with Atlantic Canadian findings (Colpitts & Gahagan, 2016; Gahagan & Subriana-Malaret, 2018) that suggest that Canadians who identify as non-heterosexual report a higher perceived need for care. This finding is important because it may show that non-heterosexually identifying Canadians not only have a heightened vulnerability to mental health and addiction concerns, but their need for support for recovery also may represent unique needs. These findings likely imply that the healthcare system does not fully grasp the full extent of non-heterosexual struggles within Canadian society, as the adoption of an MST lens is not apparent within this system.

4.3 Exploratory Analyses

4.3.1 Effects of Childhood Maltreatment

In the current study, differences emerged when childhood maltreatment was either included or excluded as a covariate in the regression models. The mediational ability of negative social interactions dampened with the inclusion of childhood maltreatment for all statistically significant outcomes (e.g., negative social interactions mediated 23.4% of the relationship between sexual orientation and psychological

distress before the inclusion of childhood maltreatment, and only 15.8% after its inclusion), with some significant relationships disappearing all together (e.g., illicit drug abuse/dependence and positive mental health). Conceptually, the assessment of childhood maltreatment and the assessment of negative social interactions are tapping into the same underlying idea of adverse social exchanges. Data from the 2012 CCHS-MH show a moderate correlation between these variables ($r = .31$, $p < .001$). This overlap in constructs could exist for several reasons.

First, it could be that individuals who have experienced greater amounts of maltreatment as children may be biased to perceive a larger portion of their social interactions as inherently negative. Studies of childhood abuse show that children internalize features of their early relationships and use these experiences to establish certain expectations of future relationships (Hawkins & Haskett, 2014). These children develop negative representations of both themselves and those around them (Hawkins & Haskett, 2014). For some, the effects of abuse or neglect in childhood can become chronic, and even debilitating, during adulthood (Knoll & MacLennan, 2017). Moreover, studies have shown that other forms of victimization (e.g., bullying) often co-occur during childhood and can further exacerbate the adverse effects of childhood maltreatment (Wang et al., 2010). Together, the impact of these events could be lasting and drastically impact wellbeing well into adulthood. An individual may therefore need to develop adaptive or protective coping mechanisms as a child, which could become counterproductive in adulthood, thereby degrading mental health. Given that respondents in the current study were reporting all outcomes based on the past twelve months, the attenuating effect of childhood maltreatment may insinuate that the maltreatment experienced by children who identify as a sexual minority impacted their

future mental health more profoundly than initially expected. What the current research highlights is that future studies should examine what happens to mental health outcomes when an individual who identifies as a sexually minority experiences mild, moderate, or chronic maltreatment in childhood.

Second, the overlap between constructs could indicate that childhood maltreatment may better serve as a potential *mediator* rather than simply a covariate. Childhood maltreatment has been previously explored as a potential mediator within the LGBTQ+ population. For example, Jun and colleagues (2010) explored the mediating effect of childhood abuse in sexual orientation disparities in tobacco and alcohol use and discovered that elevated rates of childhood abuse mediated both outcomes in women who identify as non-heterosexual. Furthermore, McLaughlin and colleagues (2012) used data from the National Longitudinal Study of Adolescent Health and discovered that exposure to childhood adversity explained approximately 20% of increased psychopathology in individuals who identified as LGB. Given that childhood maltreatment has been previously explored as a mediator within the context of sexual orientation, examination of this new role in a future/follow-up study is warranted, specifically with Canadians.

4.3.2 Differences Between Male and Female Respondents

Keeping the mediation models separated based on the inclusion and exclusion of childhood maltreatment, the current study also expanded on the differences between males and females. Although other Canadian studies often divide participants based on sexual orientation (i.e., gay, lesbian, bisexual; Burk et al., 2018; Pakula & Shoveller, 2013; Scott et al., 2016; Stinchcombe et al., 2018; Tjepkema, 2008), few have made

delineations based on sex (i.e., male/female, Brennan et al., 2010; Robinson, 2015; Steele et al., 2009). The current study made two unique contributions in this area.

First, with the inclusion of childhood maltreatment in the model, females who identified as lesbian or bisexual reported poorer health outcomes than males who identified as gay or bisexual (e.g., for psychological distress, $\tau_{female} = 2.64$ vs. $\tau_{male} = 1.77$). However, no meditational models could be examined for females because the relation between sexual orientation and negative social interactions (i.e., α-pathway) was not statistically significant. Given that the α-pathway for females was significant when childhood maltreatment was excluded, there is clearly something more complex occurring for lesbian/bisexual females. One explanation could be that females experience a higher level of childhood maltreatment than males (Alvy et al., 2013), which then unduly impacts their wellbeing in adulthood. Early exposure to victimization has previously explained sexual orientation disparities in a wide range of psychological outcomes (McLaughlin et al., 2012). The findings from the current study highlight the importance of exploring this relationship further within a Canadian context, particularly for females.

Another interesting finding of the current study was that negative social interactions accounted for a greater percentage of the relationship between sexual orientation and mental health adversity for males than it did for females (e.g., 36.40% of the relationship between sexual orientation and psychological distress was mediated for males, but only 14.22% for females); however, females reported a larger health penalty for being lesbian or bisexual than males did for being gay or bisexual, a finding that was not expected. Intuitively, these findings may seem represent the different levels of social acceptance of non-heterosexuality among men and women; however, studies in this area

are mixed (Worthen, 2012). Given this ambiguity, it is unlikely that differing social attitudes were solely responsible for the outcomes of the current study. Nevertheless, regardless of social acceptance, Canadian sexual minorities do face higher rates of discrimination and negative attitudes (Beagan et al., 2020).

Discrimination based on sexual orientation is rooted in a lack of acceptance (Rodgers, 2017); the resultant negativity directed towards sexual minority individuals comes from their lack of conformity to the dominant cultural values and gender roles held by society (Vincent et al., 2011). These negative views and discriminatory attitudes are directed towards both men and women (Herek et al., 2002; Moskowitz et al., 2010), but in differing ways. Men typically experience more overt forms of negativity (e.g., physical violence, verbal abuse; National Coalition of Anti-Violence Programs, 2009), whereas women experience more covert (or subtle) forms of negativity (e.g., whispering, exclusion; LaMar & Kite, 2010). Interestingly, these subtle forms of discrimination have been found to affect wellbeing more negatively than blatant forms of discrimination (Molero et al., 2017). It is possible that the covert forms of discrimination faced predominantly by women cause a greater incidence of internalized homophobia/homonegativity, which might explain why they show a larger health penalty for identifying as lesbian or bisexual. For example, a Canadian study on depression discovered that the association between depression and internalized homonegativity was larger for lesbian women than gay men, however the association between verbal insults and depression was larger for gay men than lesbian women (Morrison, 2011). In addition, women face a greater amount of discrimination as they are doubly marginalized (i.e., both a women and a sexual minority; Ro & Olson, 2020). Women tend to have a more emotion-focused coping style than men, and are more

responsive to negative information than men (Matud, 2004; Meyers-Levy & Loken, 2015). Although there is very limited research currently available on gender differences in perceived/actual discrimination among lesbian/bisexual women, the fact that women are more responsive to negative information may point to the reason why NSI mediated a smaller proportion of their mental health outcomes.

Men, on the other hand, showed a larger proportion of their mental health outcomes mediated by negative social interactions. Given that their coping style is less emotion-focused than women (Ro & Olson, 2020), it is possible that they may not adapt as readily to negative interactions. In addition, because men face more overt forms of discrimination, it is possible that their forms of negativity might have been better represented by the operationalization of the negative social interaction variable. For example, the NSI variable specifically asked about inconsiderate and angry actions that were directed towards the individual. It is possible that men associated a greater proportion of their discrimination as fitting with this criterion than women, who face more sexual and gender microaggressions.

4.4 Limitations

The current study was not without its limitations, all of which should be considered by readers when interpreting the findings. The first limitation was the use of archival data. The CCHS-MH survey was conducted in 2012 and, therefore, limited data only to the factors included in the initial questionnaire proposed by Statistics Canada. This methodological constraint narrowed the range of variables I was able to explore, all the while excluding other potential factors of interest (e.g., the inclusion of a broader range of sexual orientations, more questions on negative social interactions). Moreover, the CCHS-MH data were cross-sectional, which makes causal inferences impossible.

Ideally, longitudinal data would have been available. Longitudinal data would have potentially allowed the demonstration of temporal precedence of sexual orientation and negative social interactions and could have presented a stronger causal inference. Instead I relied on the generally accepted notion that being non-heterosexual leads to adverse social encounters, rather than the contrary (i.e., negative encounters leading to a change in sexual orientation).

A second limitation in the current study was the single-item question for sexual orientation, which was restricting. In this format, participants could only report whether they considered themselves to be heterosexual, gay, lesbian, or bisexual. Today, sexual orientation is more fluid than this rigid depiction of categories. In addition, there are several other types of sexual orientations in existence (e.g., pansexual, asexual, allosexual queer, demisexual, polyamorous, etc.). Furthermore, individuals may have sexual encounters with those of the same and/or opposite sex, but do not consider themselves as gay, lesbian, or bisexual. Therefore, a large proportion of people could have been missed when using this CCHS-MH measure. What could instead capture a larger pool of participants would be to differentiate between sexual orientation, sexual desire, and sexual behaviour. In this manner, researchers could examine the broader implications of social and mental health adversity on this group of individuals. Overall, the sexual orientation measure was limiting. Respondents would have had to comfortably accept their sexual orientation as non-heterosexual to come forward with such information. Oftentimes, individuals with this self-awareness are better psychologically adjusted than their peers (Meyer, 1995), meaning that the link between LGB and mental health may be larger than what was discovered in the present research.

A third limitation to the current study is the failure to examine sexual

orientations individually, rather than as a group. The literature shows that although gay and lesbian identifying individuals experience poorer mental health and social adversities, these disparities are felt to a greater degree in those who identify as bisexual. Bisexually identifying individuals have higher rates of anxiety, psychological distress, and substance misuse (Colledge et al., 2015; Persson & Pfaus, 2015). In addition, this group of individuals faces both internalized and externalized biphobia (i.e., an aversion or prejudice against people who identify as bisexual; Wandrey et al., 2015) and are often discriminated against based on perpetuating myths (e.g., bisexually is a phase, they are confused, they are more sexually promiscuous, they are unable to make up their minds; Bradford, 2004). Therefore, the poorer health outcomes in the current study could have been largely driven by bisexually-identifying persons, as those who identified as gay or lesbian may have been better psychologically adjusted. Future studies would benefit from running similar analyses and dividing the population by sexual orientation for clarity.

4.5. Implications and Directions for Future Research

4.5.1 Implications

Despite the limitations of the current study, CCHS-MH data was beneficial as it allowed the analysis of a nationally representative sample of participants who identified as non-heterosexual, thereby contributing to the knowledge of the mental wellbeing of Canadians who identify as a sexual minority. Additionally, this national representation of participants allowed the findings to be generalized to a broader group of Canadians, and the large sample size was meaningful as it allowed the inclusion of ~450 non-heterosexual individuals. Traditionally, this group of individuals has been under-represented in research due to the difficulties of recruitment, which may lead to

misrepresentations of their health and wellness needs. . By specifically focusing on a marginalized group, the current study allowed an expansion of the understanding of the vulnerabilities faced by marginalized Canadians. Not only did the current study highlight the disparities faced by this group, but it also highlighted the importance of social environments on mental wellbeing, specifically emphasizing negative social interactions as a key contributor to these inequalities. In addition, the current study supported the relevance of a variety of social theories (i.e., Social Dominance Theory, Social Stress Theory, Syndemic Theory) and directly tested the MST in a sample of non-heterosexually identifying Canadians, something that has not been done in the past.

Overall, the results from the current study aimed to bring awareness to the psychological adversities faced by Canadians who identify as sexual minorities. Such data helps to justify the allocation of funding and other resources towards preventative programs and unique healthcare services for this sub-population of Canadians. Having access to reliable data that is generalizable to the entire population facilitates the decision-making of policy makers and health care providers about the needs of those who identify as sexual minority in Canada. The current study also informed the theoretical understanding of the increased vulnerability to adverse mental health outcomes among Canadian sexual minorities. Not only did this study highlight disparities among those who identify as non-heterosexual, but it also alluded to differences among males and females and singled out childhood maltreatment as a potential accelerant in psychological health issues. The findings of the current study therefore offered insights into potential targets for changes.

4.5.2 Directions for Future Research

The current study highlighted areas where future research would be of benefit. I

found that negative social interactions mediated the relationship between sexual orientation and a variety of mental health/substance use disorder outcomes, which points to the importance of this mediator and the necessity for future research in this area. Negative social interactions have been largely understudied within a Canadian context, particularly their importance to the LGBTQ+ community. Future research would benefit from diving further into the ways in which negative social experiences impact the physical and psychological wellbeing of Canadians who identify as a sexual minority.

In addition, the current study found that females and males experience both their sexual orientation and overall wellbeing differently. Females were worse off in some cases and better off in others with regard to wellbeing. More research into the sex-based differences of sexual orientation and their impact on mental health could provide a better understanding of how internalized and realized homophobia impacts males and females individually. If findings were also broken down specifically by sexual orientation (i.e., lesbian, gay, bisexual, etc.), then results would be highly informative and generate more proactive means of addressing health needs for these specific subgroups of marginalized individuals.

The present study also indicated that childhood maltreatment matters to the wellbeing of individuals identifying as sexual minorities and warrants greater attention as an area of future research within this subgroup, especially with regard to its interactions with other vulnerability markers. Childhood adversity among Canadians who identify as non-heterosexual is indeed problematically affecting mental illness in adulthood, and there is a need to changes programs and services in order to target this vulnerability in childhood and prevent future hardships for already vulnerable individuals.

4.6 Conclusion

Overall, Canadian sexual minorities are marginalized within our society and face a variety of adverse influences, from negative social experiences to mental health difficulties. Although there are many well-adjusted minorities in this country, some Canadians who identify as non-heterosexuals fall vulnerable to social and personal hardships and experience poorer mental health. The current study demonstrated that negative social interactions operate as a partial mediator for the relationship between sexual orientation and a variety of mental health outcomes and substance use disorder outcomes, but also highlighted other factors contributing to this disparity (i.e., childhood maltreatment and biological sex). There is value in pursuing additional research on this topic to better understand the role of childhood maltreatment in influencing adult mental health in sexual minorities specifically, as well as separating findings to investigate whether identifying as a certain sexual orientation over another changes these health outcomes. Despite Canada's progressive establishment of legal and social rights for those who identify as a sexual minority, the findings of the current study show that these practices are unable to shield this vulnerable group from social health problems. The heterosexist ideologies practiced within our country are unlikely to dissipate, but more research in this area could serve to bring forth these issues in a boarder arena. The result of this enhanced exposure could help shape future policies and programs specifically targeted to improve both social and personal experiences for this group of Canadians.

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Table 1

Weighted descriptive statistics for continuous and categorical outcomes.

	Total Sample ***N* = 19,010**	**Heterosexual** ***N* = 18,585**	**Non-Heterosexual** ***N* = 425**
	M(SD) or %	***M(SD) or %***	***M(SD) or %***
Sex			
Male	49.4%	49.2%	57.1%
Female	50.6%	50.8%	42.9%
Age	46.12(17.21)	46.32(17.22)	36.88(13.82)
Income	8.30(13.01)	8.31(13.13)	8.21(6.58)
Marital Status			
Married/Common Law	63.5%	64.1%	39.0%
Widowed/Divorced/Separated	12.7%	12.8%	8.3%
Single	23.8%	23.2%	52.7%
Education			
Less Than High School	13.1%	13.2%	6.8%
High School	16.7%	16.6%	18.0%
Some Post-Secondary	6.8%	6.8%	11.6%
Post-Secondary	63.5%	63.5%	63.5%
Region			
Atlantic	6.9%	6.9%	8.5%
Quebec	24.2%	24.2%	25.2%
Ontario	39.0%	38.8%	39.5%
Prairies	16.9%	17.1%	10.9%
British Columbia	13.0%	12.9%	16.0%
Minority Status			
Caucasian	79.4%	79.4%	82.3%
Non-Caucasian	20.6%	20.6%	17.7%
NSI	2.70(2.26)	2.69(2.25)	3.80(2.70)
SPS-10	36.10(4.28)	36.11(4.26)	35.99(5.11)
Childhood Maltreatment	2.02(2.26)	1.99(3.60)	4.02(5.35)
Has Bipolar Disorder	1.4%	1.4%	3.4%
Psychological Distress	5.12(5.30)	5.06(5.23)	8.51(6.91)
Has Generalized Anxiety Disorder	2.4%	2.3%	7.0%
Perceived Health	2.74(0.96)	2.74(0.96)	2.59(1.00)
Perceived Need for Care	1.24(0.61)	1.24(0.60)	1.66(0.87)
Positive Mental Health	54.49(10.64)	54.55(10.58)	50.83(13.33)
Self-Rated Mental Health	2.83(0.92)	2.84(0.91)	2.55(1.01)
Has Alcohol Abuse or Dependence	3.1%	2.9%	14.3%
Has Illicit Drug Abuse or Dependence	0.6%	0.5%	3.2%
Uses Illicit Drug	6.2%	5.9%	20.7%
Has Cannabis Abuse or Dependence	1.2%	1.1%	5.2%
Uses Cannabis	11.2%	10.8%	35.7%

Note. The total number of respondents reflects only those who answered all questions of interest. SPS-10 = Social Provisions Scale short-form. NSI = Negative Social Interactions Scale.

Table 2

Logistic regression model for sexual orientation predicting bipolar disorder before (Block 2) and after (Block 3) the inclusion of Negative Social Interactions (NSI). Block 1 depicts covariates.

	OR/95% CI		
	Block 1	**Block 2**	**Block 3**
Constant	7.29 [1.59, 33.57]*	7.42 [1.61, 34.22]*	0.52 [0.10, 2.76]
Sex	1.10 [0.74, 1.64]	1.10 [0.74, 1.65]	1.34 [0.89, 1.99]
Age	0.97 [0.96, 0.98]***	0.97 [0.96, 0.98]***	0.98 [0.97, 0.99]**
Married (Base)			
Widowed/Divorced/Sep.	1.33 [0.77, 2.31]	1.34 [0.77, 2.31]	1.28 [0.69, 2.36]
Single	1.49 [0.93, 2.39]	1.50 [0.93, 2.42]	1.60 [0.97, 2.61]
Income	1.00 [1.00, 1.00]**	1.00 [1.00, 1.00]**	1.00 [1.00, 1.00]**
Minority	0.49 [0.27, 0.87]*	0.49 [0.27, 0.87]*	0.59 [0.32, 1.07]
Atlantic (Base)			
Quebec	0.65 [0.38, 1.10]	0.65 [0.38, 1.10]	0.78 [0.46, 1.33]
Ontario	1.04 [0.64, 1.69]	1.03 [0.63, 1.69]	0.95 [0.58, 1.55]
Prairies	1.14 [0.64, 2.02]	1.14 [0.64, 2.01]	1.08 [0.60, 1.93]
British Columbia	0.98 [0.56, 1.69]	0.97 [0.56, 1.69]	0.92 [0.52, 1.64]
Less than High School (Base)			
High School	1.32 [0.71, 2.46]	1.33 [0.71, 2.48]	1.39 [0.74, 2.61]
Some Post-Secondary	0.79 [0.40, 1.56]	0.79 [0.40, 1.57]	0.63 [0.28, 1.40]
Post-Secondary	1.29 [0.77, 2.17]	1.30 [0.77, 2.18]	1.17 [0.68, 2.02]
SPS-10	0.87 [0.84, 0.90]***	0.87 [0.84, 0.90]***	0.89 [0.86, 0.93]***
Childhood Maltreatment	1.11 [1.08, 1.15]***	1.11 [1.08, 1.15]***	1.06 [1.02, 1.10]**
Sexual Orientation		0.84 [0.41, 1.70]	0.83 [0.41, 1.66]
NSI			1.34 [1.26, 1.42]***
F-value		0.24	83.61***

Note. SPS-10 = Social Provisions Scale short-form. NSI = Negative Social Interactions Scale.
* $p < .05$, ** $p < .01$, *** $p < .001$

Table 3

Linear regression model for sexual orientation predicting psychological distress before (Block 2) and after (Block 3) the inclusion of Negative Social Interactions (NSI). Block 1 depicts covariates.

	B-Coefficient/Bootstrap Standard Error		
	Block 1	**Block 2**	**Block 3**
Constant	20.9/0.87***	20.84/0.87***	15.8/0.84***
Sex	-1.01/0.12***	-1.01/0.12***	-0.76/0.11***
Age	-0.05/0.00***	-0.05/0.00***	-0.03/0.00***
Married/Common Law (Base)			
Widowed/Divorced/Sep.	0.50/0.18**	0.50/0.18**	0.51/0.18**
Single	0.80/0.16***	0.74/0.16***	0.86/0.16***
Income	-0.01/0.01	-0.01/0.01	-0.01/0.01
Minority	-1.24/0.16***	-1.22/0.16***	-0.73/0.15***
Atlantic (Base)			
Quebec	0.15/0.16	0.16/0.15	0.56/0.15***
Ontario	-0.24/0.16	-0.23/0.16	-0.44/0.15**
Prairies	-0.09/0.16	-0.06/0.16	-0.26/0.14
British Columbia	-0.35/0.18*	-0.35/0.18*	-0.48/0.17**
Less than High School (Base)			
High School	-0.39/0.23	-0.40/0.23	-0.58/0.22**
Some Post-Secondary	0.41/0.29	0.40/0.29	0.02/0.30
Post-Secondary	-0.35/0.20	-0.37/0.19	-0.75/0.19***
SPS-10	-0.36/0.02***	-0.36/0.02***	-0.30/0.02***
Childhood Maltreatment	0.32/0.02***	0.31/0.02***	0.19/0.02***
Sexual Orientation		2.18/0.43***	1.84/0.41***
NSI			0.76/0.03***
F-change value	96.61***	25.71***	492.91***
R^2	.188	.191***	.276***
ΔR^2		.003	.085

Note. SPS-10 = Social Provisions Scale short-form. NSI = Negative Social Interactions Scale.
* $p < .05$, ** $p < .01$, *** $p < .001$

Table 4

Linear regression model for sexual orientation predicting perceived health before (Block 2) and after (Block 3) the inclusion of Negative Social Interactions (NSI). Block 1 depicts covariates.

	B-Coefficient/Bootstrap Standard Error		
	Block 1	**Block 2**	**Block 3**
Constant	1.34/0.12***	1.35/0.12***	1.61/0.12***
Sex	0.02/0.02	0.02/0.02	0.01/0.02
Age	-0.01/0.00***	-0.01/0.00***	-0.01/0.00***
Married/Common Law (Base)			
Widowed/Divorced/Sep.	-0.08/0.03*	-0.08/0.03*	-0.08/0.03*
Single	-0.11/0.03***	-0.11/0.03***	-0.11/0.03***
Income	0.00/0.00	0.00/0.00	0.00/0.00
Minority	0.06/0.03	0.06/0.03	0.03/0.03
Atlantic (Base)			
Quebec	0.14/0.03***	0.14/0.03***	0.12/0.03***
Ontario	0.06/0.03*	0.06/0.03*	0.07/0.03**
Prairies	0.04/0.03	0.04/0.03	0.05/0.03
British Columbia	0.07/0.03*	0.07/0.03*	0.08/0.03*
Less than High School (Base)			
High School	0.21/0.04***	0.21/0.04***	0.22/0.04***
Some Post-Secondary	0.16/0.05**	0.16/0.05**	0.18/0.05***
Post-Secondary	0.31/0.03***	0.31/0.03***	0.33/0.03***
SPS-10	0.04/0.00***	0.04/0.00***	0.04/0.00***
Childhood Maltreatment	-0.03/0.00***	-0.03/0.00***	-0.02/0.00***
Sexual Orientation		-0.15/0.06*	-0.13/0.06*
NSI			-0.04/0.01***
F-change value	79.06***	5.31*	41.31***
R^2	.119	.119*	.126***
ΔR^2		.000	.007

Note. SPS-10 = Social Provisions Scale short-form. NSI = Negative Social Interactions Scale.
* $p < .05$, ** $p < .01$, *** $p < .001$

Table 5

Linear regression model for sexual orientation predicting perceived need for care before (Block 2) and after (Block 3) the inclusion of Negative Social Interactions (NSI). Block 1 depicts covariates.

	B-Coefficient/Bootstrap Standard Error		
	Block 1	**Block 2**	**Block 3**
Constant	2.46/0.09***	2.45/0.09***	2.09/0.08***
Sex	-0.14/0.01***	-0.14/0.01***	-0.12/0.01***
Age	0.00/0.00***	0.00/0.00***	0.00/0.00***
Married/Common Law (Base)			
Widowed/Divorced/Sep.	0.03/0.02	0.03/0.02	0.03/0.02
Single	0.04/0.02*	0.03/0.02	0.04/0.02*
Income	0.00/0.00	0.00/0.00	0.00/0.00
Minority	-0.16/0.02***	-0.16/0.02***	-0.12/0.02***
Atlantic (Base)			
Quebec	-0.02/0.02	-0.02/0.02	0.01/0.02
Ontario	0.01/0.02	0.01/0.02	-0.01/0.02
Prairies	0.00/0.02	0.00/0.02	-0.01/0.02
British Columbia	0.05/0.02*	0.05/0.02*	0.04/0.02*
Less than High School (Base)			
High School	-0.02/0.02	-0.02/0.02	-0.03/0.02
Some Post-Secondary	0.06/0.04	0.06/0.04	0.03/0.04
Post-Secondary	0.04/0.02*	0.04/0.02*	0.02/0.02
SPS-10	-0.03/0.00***	-0.03/0.00***	-0.02/0.00***
Childhood Maltreatment	0.03/0.00***	0.03/0.00***	0.02/0.00***
Sexual Orientation		0.33/0.06***	0.31/0.06***
NSI			0.05/0.00***
F-change value	39.49***	33.24***	147.21***
R^2	.100	.105***	.137***
ΔR^2		.005	.032

Note. SPS-10 = Social Provisions Scale short-form. NSI = Negative Social Interactions Scale.
* $p < .05$, ** $p < .01$, *** $p < .001$

Table 6

Linear regression model for sexual orientation predicting self-rated mental health before (Block 2) and after (Block 3) the inclusion of Negative Social Interactions (NSI). Block 1 depicts covariates.

	B-Coefficient/Bootstrap Standard Error		
	Block 1	**Block 2**	**Block 3**
Constant	0.45/0.12***	0.46/0.12***	0.99/0.12***
Sex	0.13/0.02***	0.13/0.02***	0.11/0.02***
Age	0.00/0.00**	0.00/0.00**	0.00/0.00
Married/Common Law (Base)			
Widowed/Divorced/Sep.	-0.07/0.03*	-0.07/0.03*	-0.07/0.03*
Single	-0.09/0.03**	-0.08/0.03**	-0.1/0.03***
Income	0.00/0.00	0.00/0.00	0.00/0.00
Minority	0.20/0.03***	0.20/0.03***	0.15/0.03***
Atlantic (Base)			
Quebec	0.13/0.03***	0.12/0.03***	0.08/0.03**
Ontario	0.06/0.03*	0.06/0.03*	0.08/0.03**
Prairies	-0.01/0.03	-0.01/0.03	0.01/0.03
British Columbia	0.02/0.03	0.02/0.03	0.04/0.03
Less than High School (Base)			
High School	0.15/0.04***	0.15/0.04***	0.17/0.04***
Some Post-Secondary	0.11/0.05*	0.11/0.05*	0.15/0.05**
Post-Secondary	0.12/0.03***	0.12/0.03***	0.16/0.03***
SPS-10	0.06/0.00***	0.06/0.00***	0.05/0.00***
Childhood Maltreatment	-0.04/0.00***	-0.04/0.00***	-0.02/0.00***
Sexual Orientation		-0.18/0.07**	-0.15/0.07*
NSI			-0.08/0.01***
F-change value	67.90***	7.10**	161.58***
R^2	.124	.125**	.156***
ΔR^2		.001	.031

Note. SPS-10 = Social Provisions Scale short-form. NSI = Negative Social Interactions Scale.
* $p < .05$, ** $p < .01$, *** $p < .001$

Table 7

Linear regression model for sexual orientation predicting positive mental health before (Block 2) and after (Block 3) the inclusion of Negative Social Interactions (NSI). Block 1 depicts covariates.

	B-Coefficient/Bootstrap Standard Error		
	Block 1	**Block 2**	**Block 3**
Constant	15.05/1.36***	15.10/1.36***	21.22/1.38***
Sex	0.63/0.23**	0.64/0.23**	0.34/0.23
Age	0.06/0.01***	0.06/0.01***	0.03/0.01***
Married/Common Law (Base)			
Widowed/Divorced/Sep.	-0.94/0.33**	-0.93/0.33**	-0.92/0.35**
Single	-1.46/0.29***	-1.40/0.30***	-1.53/0.30***
Income	0.00/0.01	0.00/0.01	0.01/0.01
Minority	2.55/0.31***	2.53/0.31***	1.95/0.30***
Atlantic (Base)			
Quebec	-1.28/0.36***	-1.29/0.36***	-1.76/0.35***
Ontario	-0.08/0.33	-0.09/0.33	0.19/0.32
Prairies	-0.26/0.31	-0.29/0.31	-0.06/0.30
British Columbia	-1.20/0.37**	-1.21/0.37**	-1.09/0.35**
Less than High School (Base)			
High School	0.49/0.45	0.50/0.45	0.68/0.44
Some Post-Secondary	-0.73/0.55	-0.71/0.55	-0.34/0.55
Post-Secondary	0.14/0.37	0.15/0.37	0.59/0.37
SPS-10	1.04/0.03***	1.04/0.03***	0.97/0.03***
Childhood Maltreatment	-0.39/0.04***	-0.39/0.03***	-0.23/0.04***
Sexual Orientation		-2.24/0.98*	-1.81/0.98
NSI			-0.93/0.06***
F-change value	112.39***	5.27*	235.71***
R^2	.212	.213*	.245***
ΔR^2		.001	.031

Note. SPS-10 = Social Provisions Scale short-form. NSI = Negative Social Interactions Scale.
* $p < .05$, ** $p < .01$, *** $p < .001$

Table 8

Logistic regression model for sexual orientation predicting alcohol abuse/dependence before (Block 2) and after (Block 3) the inclusion of Negative Social Interactions (NSI). Block 1 depicts covariates.

	OR/95% CI		
	Block 1	**Block 2**	**Block 3**
Constant	0.11 [0.03, 0.50]**	0.10 [0.02, 0.46]**	0.03 [0.01, 0.14]***
Sex	3.11 [2.36, 4.08]***	3.12 [2.38, 4.10]***	3.38 [2.55, 4.48]***
Age	0.96 [0.95, 0.97]***	0.96 [0.95, 0.97]***	0.97 [0.96, 0.98]***
Married/Common Law (Base)			
Widowed/Divorced/Sep.	0.90 [0.58, 1.40]	0.90 [0.58, 1.41]	0.90 [0.57, 1.41]
Single	2.10 [1.53, 2.90]***	1.99 [1.45, 2.73]***	2.08 [1.52, 2.85]***
Income	1.00 [0.99, 1.01]	1.00 [0.99, 1.01]	1.00 [0.99, 1.01]
Minority	0.31 [0.21, 0.45]***	0.31 [0.21, 0.45]***	0.33 [0.23, 0.49]***
Atlantic (Base)			
Quebec	0.83 [0.58, 1.21]	0.86 [0.59, 1.24]	0.95 [0.66, 1.38]
Ontario	1.09 [0.77, 1.54]	1.11 [0.78, 1.57]	1.05 [0.74, 1.50]
Prairies	1.16 [0.80, 1.68]	1.20 [0.82, 1.74]	1.15 [0.80, 1.67]
British Columbia	1.26 [0.76, 2.08]	1.28 [0.77, 2.13]	1.24 [0.75, 2.04]
Less than High School (Base)			
High School	1.01 [0.65, 1.55]	0.99 [0.64, 1.53]	0.96 [0.62, 1.48]
Some Post-Secondary	1.18 [0.73, 1.92]	1.16 [0.72, 1.89]	1.05 [0.63, 1.75]
Post-Secondary	0.79 [0.53, 1.17]	0.76 [0.51, 1.13]	0.71 [0.48, 1.06]
SPS-10	0.98 [0.95, 1.02]	0.99 [0.95, 1.02]	1.00 [0.97, 1.03]
Childhood Maltreatment	1.08 [1.05, 1.11]***	1.07 [1.04, 1.10]***	1.04 [1.01, 1.08]*
Sexual Orientation		3.09 [1.76, 5.43]***	2.84 [1.61, 5.01]***
NSI			1.18 [1.12, 1.24]***
F-change value	22.90***	15.40***	46.37***

Note. SPS-10 = Social Provisions Scale short-form. NSI = Negative Social Interactions Scale.
* $p < .05$, ** $p < .01$, *** $p < .001$

Table 9

Logistic regression model for sexual orientation predicting illicit drug abuse/dependence (excluding cannabis) before (Block 2) and after (Block 3) the inclusion of Negative Social Interactions (NSI). Block 1 depicts covariates.

	OR/95% CI		
	Block 1	**Block 2**	**Block 3**
Constant	0.17 [0.01, 2.00]	0.15 [0.01, 1.81]	0.04 [0.00, 0.44]$^{\cdot\cdot}$
Sex	1.83 [1.11, 3.04]$^{\cdot}$	1.85 [1.11, 3.08]$^{\cdot}$	2.02 [1.19, 3.43]$^{\cdot\cdot}$
Age	0.95 [0.93, 0.97]$^{\cdot\cdot\cdot}$	0.95 [0.93, 0.97]$^{\cdot\cdot\cdot}$	0.96 [0.94, 0.98]$^{\cdot\cdot\cdot}$
Widowed/Divorced/Sep.	2.33 [1.11, 4.90]$^{\cdot}$	2.34 [1.11, 4.93]$^{\cdot}$	2.32 [1.07, 5.02]$^{\cdot}$
Single	2.60 [1.21, 5.58]$^{\cdot}$	2.49 [1.16, 5.33]$^{\cdot}$	2.59 [1.20, 5.57]$^{\cdot}$
Income	0.97 [0.93, 1.02]	0.97 [0.93, 1.02]	0.98 [0.93, 1.03]
Minority	0.40 [0.19, 0.85]$^{\cdot}$	0.40 [0.19, 0.85]$^{\cdot}$	0.43 [0.20, 0.93]$^{\cdot}$
Quebec	0.63 [0.30, 1.29]	0.64 [0.31, 1.32]	0.72 [0.35, 1.50]
Ontario	0.87 [0.42, 1.80]	0.88 [0.42, 1.82]	0.84 [0.40, 1.76]
Prairies	1.08 [0.51, 2.28]	1.10 [0.52, 2.32]	1.06 [0.50, 2.24]
British Columbia	1.02 [0.48, 2.17]	1.02 [0.48, 2.19]	1.02 [0.47, 2.20]
High School	2.02 [0.92, 4.43]	1.99 [0.90, 4.40]	1.95 [0.87, 4.34]
Some Post-Secondary	1.50 [0.57, 3.95]	1.49 [0.57, 3.92]	1.31 [0.49, 3.53]
Post-Secondary	0.92 [0.46, 1.85]	0.90 [0.44, 1.82]	0.83 [0.41, 1.69]
SPS-10	0.93 [0.89, 0.98]$^{\cdot\cdot}$	0.94 [0.89, 0.99]$^{\cdot}$	0.95 [0.91, 1.00]
Childhood Maltreatment	1.12 [1.07, 1.17]$^{\cdot\cdot\cdot}$	1.12 [1.06, 1.17]$^{\cdot\cdot\cdot}$	1.09 [1.02, 1.15]$^{\cdot\cdot}$
Sexual Orientation		2.02 [0.87, 4.68]	1.91 [0.83, 4.42]
NSI			1.19 [1.10, 1.28]$^{\cdot\cdot\cdot}$
F-change value	8.50$^{\cdot\cdot\cdot}$	2.71	18.02$^{\cdot\cdot\cdot}$

Note. SPS-10 = Social Provisions Scale short-form. NSI = Negative Social Interactions Scale.
$^{\cdot}$ $p < .05$, $^{\cdot\cdot}$ $p < .01$, $^{\cdot\cdot\cdot}$ $p < .001$

Table 10

Logistic regression model for sexual orientation predicting illicit drug use (excluding cannabis) before (Block 2) and after (Block 3) the inclusion of Negative Social Interactions (NSI). Block 1 depicts covariates.

	OR/95% CI		
	Block 1	**Block 2**	**Block 3**
Constant	0.54 [0.26, 1.11]	0.51 [0.25, 1.06]†	0.18 [0.08, 0.40]***
Sex	1.15 [0.96, 1.37]	1.14 [0.95, 1.37]	1.22 [1.01, 1.46]*
Age	0.99 [0.98, 0.99]***	0.99 [0.98, 0.99]***	0.99 [0.99, 1.00]*
Married/Common Law (Base)			
Widowed/Divorced/Sep.	1.35 [1.06, 1.71]*	1.34 [1.06, 1.70]*	1.34 [1.04, 1.73]*
Single	1.81 [1.43, 2.28]***	1.73 [1.37, 2.18]***	1.79 [1.42, 2.27]***
Income	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]
Minority	0.42 [0.32, 0.57]***	0.42 [0.32, 0.57]***	0.46 [0.34, 0.61]***
Atlantic (Base)			
Quebec	1.26 [0.98, 1.61]	1.28 [0.99, 1.63]	1.38 [1.08, 1.77]*
Ontario	0.85 [0.66, 1.10]	0.86 [0.66, 1.11]	0.82 [0.63, 1.06]
Prairies	0.97 [0.76, 1.26]	1.00 [0.77, 1.29]	0.96 [0.74, 1.24]
British Columbia	1.13 [0.85, 1.51]	1.14 [0.86, 1.52]	1.11 [0.83, 1.49]
Less than High School (Base)			
High School	0.96 [0.72, 1.28]	0.95 [0.71, 1.27]	0.92 [0.69, 1.23]
Some Post-Secondary	1.26 [0.88, 1.80]	1.25 [0.87, 1.79]	1.15 [0.81, 1.64]
Post-Secondary	0.95 [0.73, 1.24]	0.93 [0.72, 1.21]	0.87 [0.67, 1.14]
SPS-10	0.95 [0.93, 0.97]***	0.95 [0.93, 0.97]***	0.96 [0.94, 0.98]***
Childhood Maltreatment	1.09 [1.07, 1.11]***	1.08 [1.06, 1.11]***	1.06 [1.04, 1.09]***
Sexual Orientation		2.69 [1.78, 4.06]***	2.56 [1.71, 3.84]***
NSI			1.14 [1.10, 1.19]***
F-change value	16.86***	22.22***	43.22***

Note. SPS-10 = Social Provisions Scale short-form. NSI = Negative Social Interactions Scale.
† $p < .05$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 11

Logistic regression model for sexual orientation predicting cannabis abuse/dependence before (Block 2) and after (Block 3) the inclusion of Negative Social Interactions (NSI). Block 1 depicts covariates.

	OR/95% CI		
	Block 1	**Block 2**	**Block 3**
Constant	2.37 [0.36, 15.45]	2.18 [0.33, 14.52]	0.49 [0.06, 4.16]
Sex	3.51 [2.19, 5.62]***	3.53 [2.20, 5.67]***	3.92 [2.41, 6.37]***
Age	0.89 [0.87, 0.91]***	0.89 [0.87, 0.91]***	0.90 [0.87, 0.92]***
Married/Common Law (Base)			
Widowed/Divorced/Sep.	1.61 [0.69, 3.75]	1.61 [0.69, 3.75]	1.55 [0.66, 3.67]
Single	1.21 [0.72, 2.02]	1.18 [0.71, 1.96]	1.21 [0.72, 2.04]
Income	1.00 [0.98, 1.02]	1.00 [0.98, 1.02]	1.00 [0.98, 1.02]
Minority	0.37 [0.19, 0.71]**	0.37 [0.19, 0.71]**	0.39 [0.20, 0.75]**
Atlantic (Base)			
Quebec	0.72 [0.43, 1.21]	0.73 [0.44, 1.23]	0.83 [0.49, 1.39]
Ontario	0.61 [0.38, 0.99]*	0.62 [0.38, 1.00]	0.59 [0.37, 0.95]*
Prairies	0.63 [0.37, 1.06]	0.63 [0.38, 1.07]	0.61 [0.36, 1.03]
British Columbia	0.76 [0.43, 1.34]	0.77 [0.44, 1.35]	0.75 [0.42, 1.31]
Less than High School (Base)			
High School	0.92 [0.47, 1.77]	0.91 [0.47, 1.76]	0.88 [0.45, 1.71]
Some Post-Secondary	0.87 [0.39, 1.93]	0.87 [0.40, 1.93]	0.75 [0.34, 1.65]
Post-Secondary	0.79 [0.46, 1.34]	0.77 [0.45, 1.32]	0.71 [0.42, 1.23]
SPS-10	0.95 [0.92, 0.98]**	0.95 [0.92, 0.99]**	0.97 [0.93, 1.01]
Childhood Maltreatment	1.14 [1.11, 1.18]***	1.14 [1.10, 1.18]***	1.10 [1.06, 1.15]***
Sexual Orientation		1.68 [0.80, 3.55]	1.48 [0.72, 3.06]
NSI			1.21 [1.12, 1.31]***
F-value	14.72***	1.87	23.33***

Note. SPS-10 = Social Provisions Scale short-form. NSI = Negative Social Interactions Scale.
* $p < .05$, ** $p < .01$, *** $p < .001$

Table 12

Logistic regression model for sexual orientation predicting cannabis use before (Block 2) and after (Block 3) the inclusion of Negative Social Interactions (NSI). Block 1 depicts covariates.

	OR/95% CI		
	Block 1	**Block 2**	**Block 3**
Constant	0.87 [0.40, 1.87]	0.84 [0.39, 1.81]	0.43 [0.18, 1.00]$^{\cdot}$
Sex	2.51 [2.18, 2.89]$^{\cdot\cdot\cdot}$	2.52 [2.19, 2.90]$^{\cdot\cdot\cdot}$	2.63 [2.29, 3.02]$^{\cdot\cdot\cdot}$
Age	0.94 [0.93, 0.95]$^{\cdot\cdot\cdot}$	0.94 [0.93, 0.95]$^{\cdot\cdot\cdot}$	0.94 [0.94, 0.95]$^{\cdot\cdot\cdot}$
Married/Common Law (Base)			
Widowed/Divorced/Sep.	1.63 [1.27, 2.11]$^{\cdot\cdot\cdot}$	1.64 [1.27, 2.11]$^{\cdot\cdot\cdot}$	1.62 [1.24, 2.11]$^{\cdot\cdot\cdot}$
Single	1.91 [1.60, 2.29]$^{\cdot\cdot\cdot}$	1.86 [1.55, 2.22]$^{\cdot\cdot\cdot}$	1.90 [1.59, 2.27]$^{\cdot\cdot\cdot}$
Income	0.99 [0.98, 1.00]$^{\cdot}$	0.99 [0.98, 1.00]	0.99 [0.98, 1.00]$^{\cdot}$
Minority	0.27 [0.21, 0.34]$^{\cdot\cdot\cdot}$	0.27 [0.21, 0.35]$^{\cdot\cdot\cdot}$	0.28 [0.22, 0.36]$^{\cdot\cdot\cdot}$
Atlantic (Base)			
Quebec	0.79 [0.64, 0.98]$^{\cdot}$	0.80 [0.65, 1.00]$^{\cdot}$	0.86 [0.69, 1.06]
Ontario	1.01 [0.82, 1.24]	1.02 [0.83, 1.26]	0.99 [0.81, 1.22]
Prairies	0.82 [0.67, 1.00]	0.84 [0.68, 1.02]	0.82 [0.66, 1.00]
British Columbia	1.37 [1.09, 1.72]$^{\cdot\cdot}$	1.39 [1.11, 1.75]$^{\cdot\cdot}$	1.37 [1.09, 1.72]$^{\cdot\cdot}$
Less than High School (Base)			
High School	0.79 [0.60, 1.06]	0.78 [0.59, 1.05]	0.77 [0.57, 1.02]
Some Post-Secondary	0.98 [0.71, 1.35]	0.97 [0.70, 1.33]	0.92 [0.66, 1.27]
Post-Secondary	0.85 [0.67, 1.09]	0.83 [0.65, 1.07]	0.80 [0.63, 1.02]
SPS-10	1.00 [0.98, 1.02]	1.00 [0.98, 1.02]	1.01 [0.99, 1.03]
Childhood Maltreatment	1.08 [1.07, 1.10]$^{\cdot\cdot\cdot}$	1.08 [1.06, 1.10]$^{\cdot\cdot\cdot}$	1.06 [1.04, 1.08]$^{\cdot\cdot\cdot}$
Sexual Orientation		2.61 [1.85, 3.69]$^{\cdot\cdot\cdot}$	2.51 [1.77, 3.55]$^{\cdot\cdot\cdot}$
NSI			1.10 [1.06, 1.14]$^{\cdot\cdot\cdot}$
F-value	77.99$^{\cdot\cdot\cdot}$	29.87$^{\cdot\cdot\cdot}$	30.86$^{\cdot\cdot\cdot}$

Note. SPS-10 = Social Provisions Scale short-form. NSI = Negative Social Interactions Scale.
$^{\cdot}$ $p < .05$, $^{\cdot\cdot}$ $p < .01$, $^{\cdot\cdot\cdot}$ $p < .001$

Table 13

Logistic regression model for sexual orientation predicting over all abuse/dependence (including cannabis) before (Block 2) and after (Block 3) the inclusion of Negative Social Interactions (NSI). Block 1 depicts covariates.

	OR/95% CI		
	Block 1	**Block 2**	**Block 3**
Constant	0.97 [0.21, 4.54]	0.93 [0.20, 4.42]	0.24 [0.04, 1.37]
Sex	2.82 [1.94, 4.10]***	2.83 [1.95, 4.11]***	3.11 [2.11, 4.59]***
Age	0.92 [0.90, 0.94]***	0.92 [0.90, 0.94]***	0.92 [0.91, 0.94]***
Married/Common Law (Base)			
Widowed/Divorced/Sep.	2.10 [1.21, 3.64]**	2.10 [1.21, 3.64]**	2.02 [1.12, 3.62]*
Single	1.70 [1.11, 2.62]*	1.68 [1.09, 2.58]*	1.74 [1.13, 2.69]*
Income	0.99 [0.97, 1.02]	0.99 [0.97, 1.02]	1.00 [0.97, 1.02]
Minority	0.39 [0.23, 0.66]***	0.39 [0.23, 0.66]***	0.42 [0.25, 0.70]**
Atlantic (Base)			
Quebec	0.71 [0.45, 1.10]	0.71 [0.46, 1.11]	0.80 [0.52, 1.25]
Ontario	0.68 [0.45, 1.02]	0.68 [0.45, 1.02]	0.65 [0.43, 0.98]*
Prairies	0.70 [0.44, 1.11]	0.71 [0.44, 1.12]	0.68 [0.43, 1.08]
British Columbia	0.80 [0.49, 1.31]	0.81 [0.50, 1.32]	0.79 [0.49, 1.29]
Less than High School (Base)			
High School	1.04 [0.59, 1.82]	1.03 [0.59, 1.81]	1.00 [0.56, 1.76]
Some Post-Secondary	0.99 [0.51, 1.92]	0.98 [0.50, 1.92]	0.87 [0.44, 1.69]
Post-Secondary	0.75 [0.48, 1.19]	0.75 [0.47, 1.19]	0.69 [0.43, 1.10]
SPS-10	0.95 [0.93, 0.98]**	0.96 [0.93, 0.99]**	0.97 [0.94, 1.00]
Childhood Maltreatment	1.13 [1.10, 1.17]***	1.13 [1.09, 1.17]***	1.10 [1.06, 1.14]***
Sexual Orientation		1.34 [0.68, 2.66]	1.21 [0.63, 2.36]
NSI			1.19 [1.11, 1.27]***
F-value	17.82***	0.72	25.74***

Note. SPS-10 = Social Provisions Scale short-form. NSI = Negative Social Interactions Scale.
* $p < .05$, ** $p < .01$, *** $p < .001$

Table 14

Summary of results for sexual orientation predicting mental health outcomes, with negative social interactions as a mediator (with effect sizes).

	Mediational Path B-Coefficients/Bootstrap Standard Error				Effect Size		
Mental Health	**τ**	**A**	**β**	**τ'**	**τ**	**τ'**	**% Med.**
Bipolar Disorder ϕ	-0.013/0.027	0.033/0.013 *	0.344/0.038 ***	-0.013/0.025	$d = 0.10$	$d = 0.11$	
Psychological Distress	2.184/0.431 ***	0.454/0.175 **	0.757/0.034 ***	1.840/0.408 ***	$g = 0.41$	$g = 0.35$	15.8%
Perceived Health	-0.148/0.064 *	0.453/0.175 **	-0.039/0.006 ***	-0.130/0.064 *	$g = 0.15$	$g = 0.13$	12.1%
Perceived Need for Care	0.334/0.058 ***	0.456/0.175 **	0.054/0.004 ***	0.310/0.059 ***	$g = 0.54$	$g = 0.50$	7.3%
Self-Rated Mental Health	-0.184/0.069 **	0.452/0.175 **	-0.079/0.006 ***	-0.148/0.070 *	$g = 0.20$	$g = 0.16$	19.6%
Positive Mental Health ϕ	-2.244/0.977 *	0.469/0.181 **	-0.927/0.060 ***	-1.808/0.984	$g = 0.21$	$g = 0.17$	

	Mediational Path B-Coefficients /Bootstrap Standard Error				Effect Size		
Substance Use	**τ**	**A**	**β**	**τ'**	**τ**	**τ'**	**% Med.**
Alcohol Abuse/Dep.	0.084/0.021 ***	0.034/0.013 **	0.204/0.030 ***	0.077/0.021 ***	$d = 0.62$	$d = 0.58$	8.3%
Drug Abuse/Dep. ϕ	0.053/0.031	0.035/0.013 **	0.210/0.049 ***	0.047/0.031	$d = 0.39$	$d = 0.36$	
Drug Use	0.074/0.016 ***	0.034/0.013 **	0.167/0.025 ***	0.070/0.015 ***	$d = 0.55$	$d = 0.52$	7.7%
Cannabis Abuse/Dep. ϕ	0.039/0.029	0.034/0.013 **	0.236/0.049 ***	0.029/0.027	$d = 0.29$	$d = 0.22$	
Cannabis Use	0.072/0.013 ***	0.034/0.013 **	0.121/0.022 ***	0.068/0.013 ***	$d = 0.53$	$d = 0.51$	5.7%
Overall Drug Abuse/Dep ϕ	0.022/0.026	0.035/0.013 **	0.214/0.042 ***	0.014/0.025	$d = 0.16$	$d = 0.11$	

Note. Cohen's *d*/Hedges' *g* is interpreted as $d/g < 0.20$ (trivial), $0.20 \geq d/g < 0.50$ (small), $0.50 \geq d/g < 0.80$ (medium), and $d/g \geq 0.80$ (large). Cohen's *d* is provided for logistic outcomes while *g* is provided for continuous outcomes.

ϕ mediation model failed

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

Table 15

Summary of support for hypotheses for all mental health and substance use outcomes.

	Hypothesis Supported?		
	Hypothesis 1	**Hypothesis 2**	**Hypothesis 3**
Bipolar Disorder	Not Supported	Not Supported	Not Supported
Psychological Distress	Supported	Supported	Supported
Perceived Health	Supported	Supported	Supported
Perceived Need for Care	Supported	Supported	Supported
Self-Rated Mental Health	Supported	Supported	Supported
Positive Mental Health	Supported	Supported	Not Supported
Alcohol Abuse/Dependence	Supported	Supported	Supported
Illicit Drug Abuse/Dependence	Not Supported	Not Supported	Not Supported
Illicit Drug Use	Supported	Supported	Supported
Cannabis Abuse/Dependence	Not Supported	Not Supported	Not Supported
Cannabis Use	Supported	Supported	Supported
Overall Drug Abuse/Dependence	Not Supported	Not Supported	Not Supported

Note. The three hypotheses that were tested are presented here as a reminder for readers.
H1: Sexual orientation positively predicts mental health deficits and negatively predicts flourishing mental health (τ).
H2: Negative Social Interactions positively predict mental health deficits and positively predict flourishing mental health (τ').
H3: The inclusion of Negative Social Interactions attenuates the relationship between sexual orientation and mental health ($\tau' < \tau$)

Figure 1

Logistic mediation model for bipolar disorder.

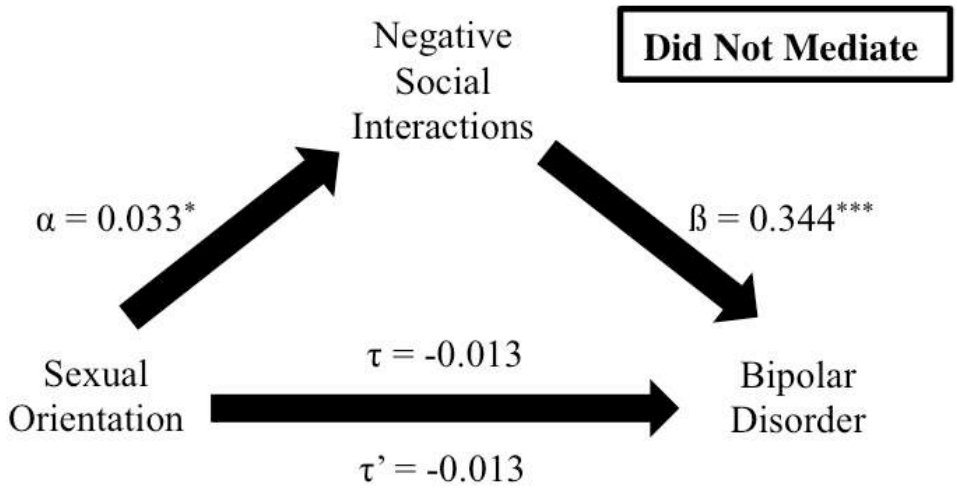


Figure 2

Linear mediation model for psychological distress.

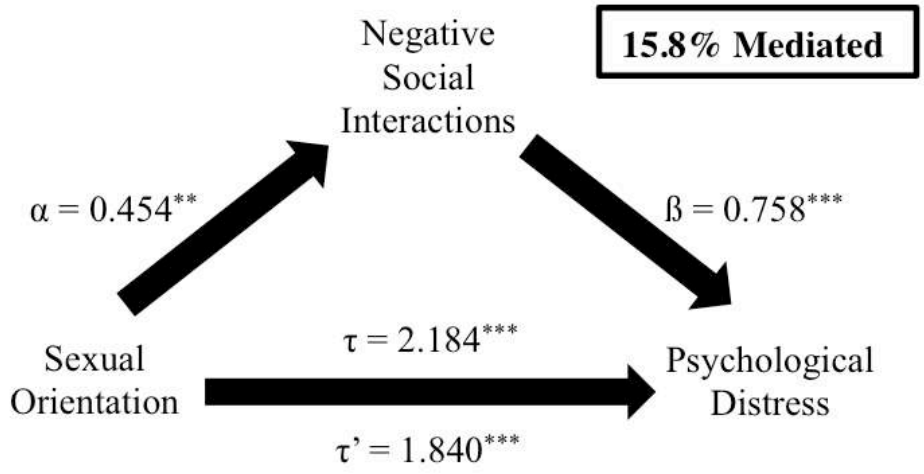


Figure 3

Linear mediation model for perceived health.

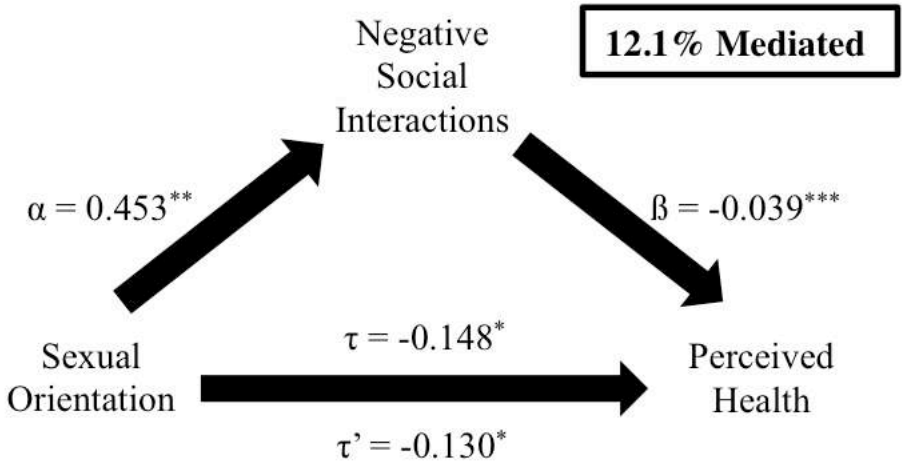


Figure 4

Linear mediation model for perceived need for care.

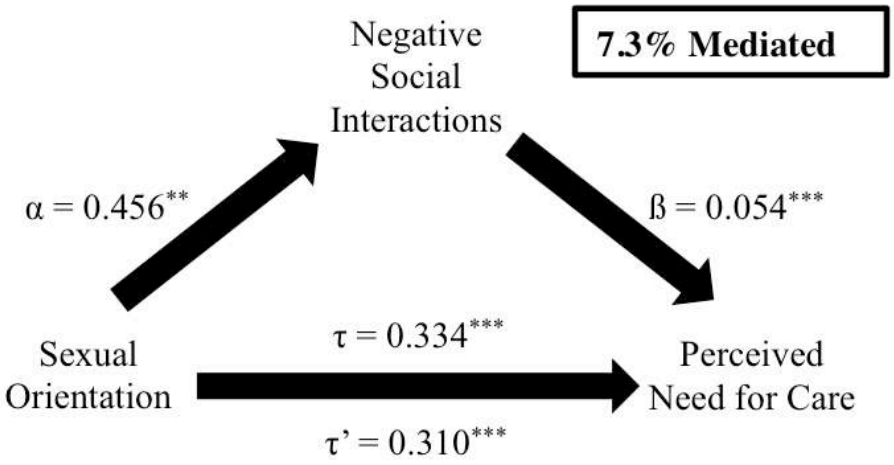


Figure 5

Linear mediation model for self-rated mental health.

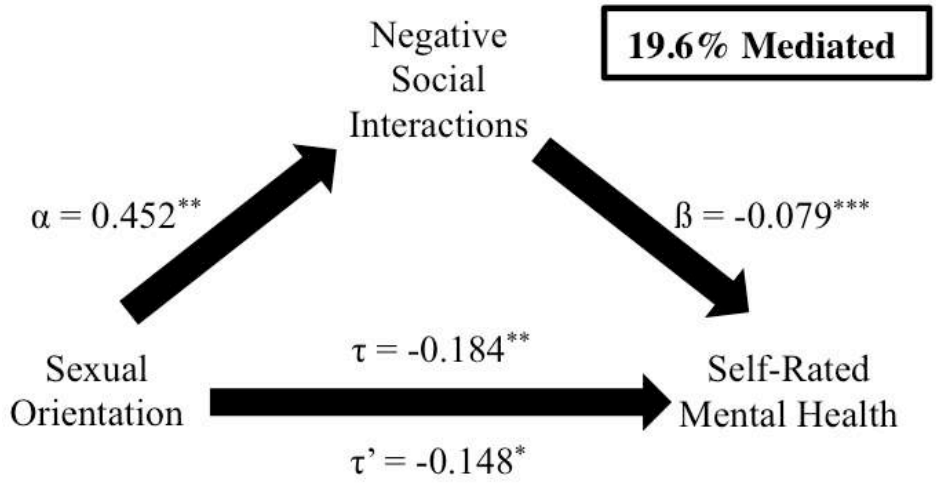


Figure 6

Linear mediation model for positive mental health.

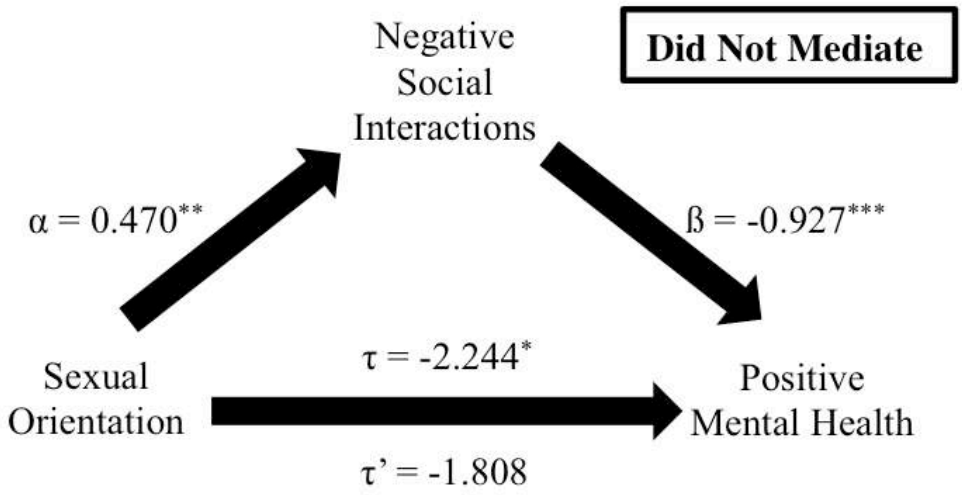


Figure 7

Logistic mediation model for alcohol abuse/dependence.

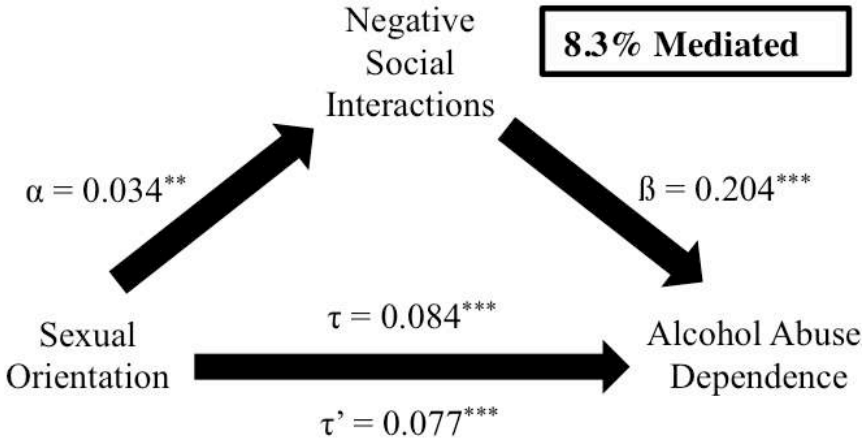


Figure 8

Logistic mediation model for illicit drug abuse/dependence (excluding cannabis).

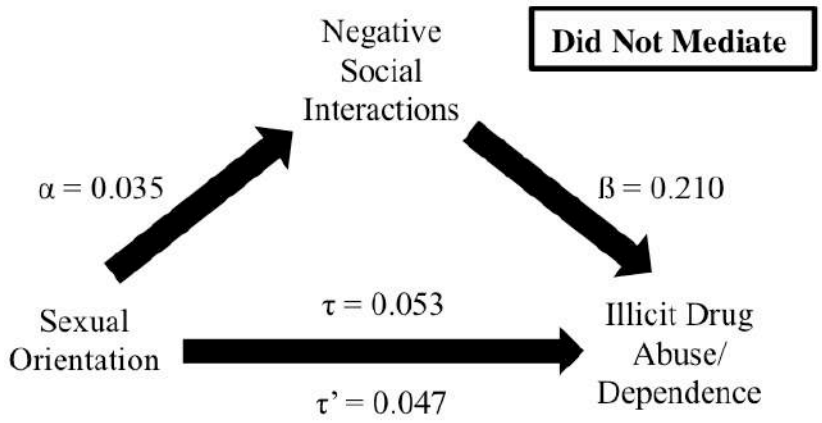


Figure 9

Logistic mediation model for illicit drug use.

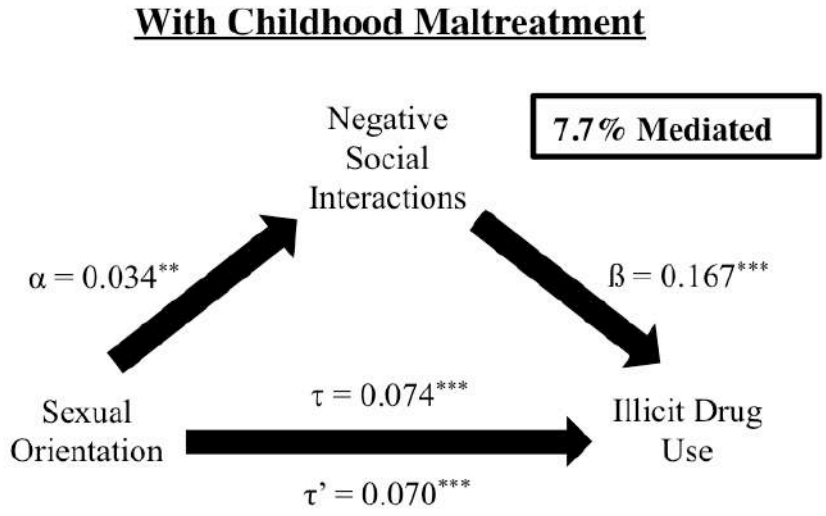


Figure 10

Logistic mediation model for cannabis abuse/dependence.

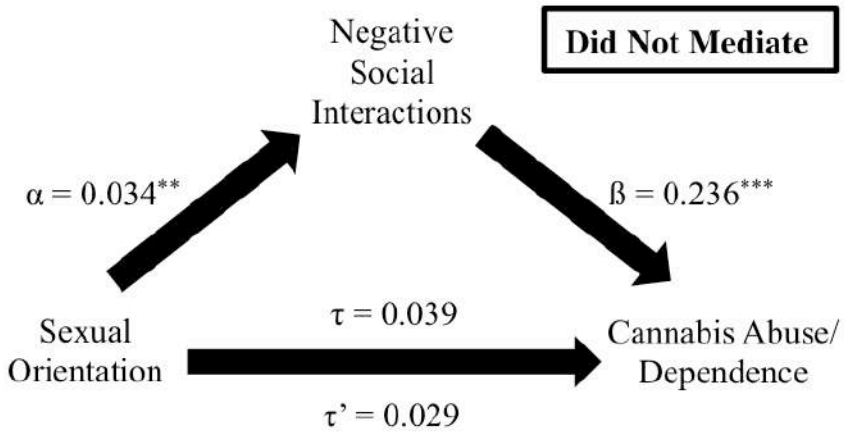


Figure 11

Logistic mediation model for cannabis use.

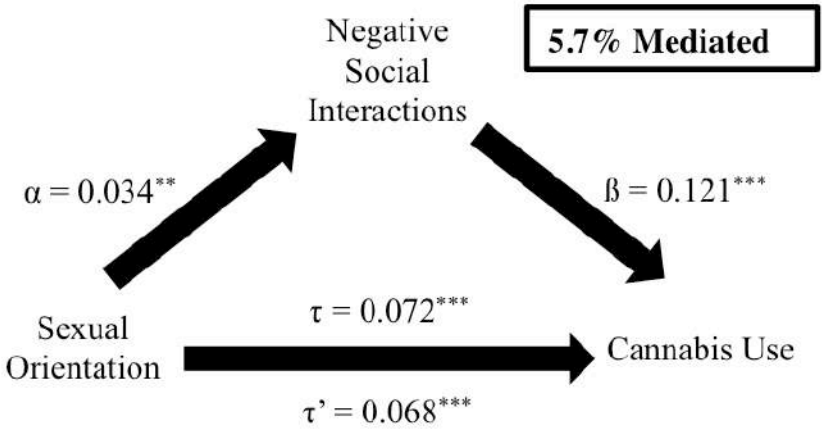
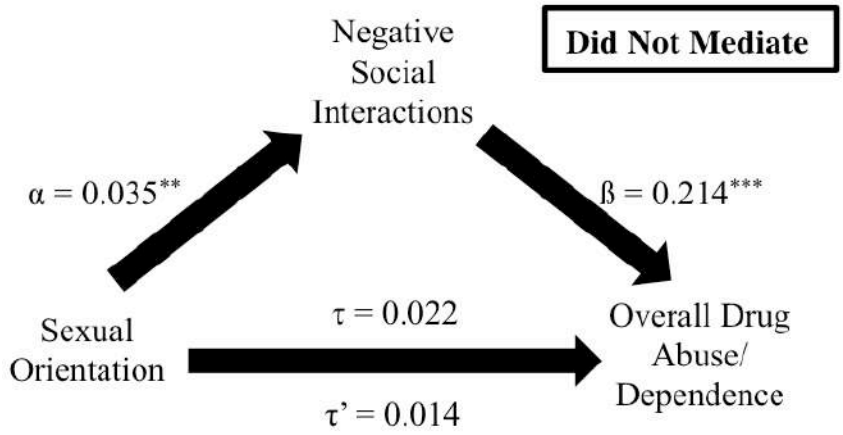


Figure 12

Logistic mediation model for overall drug abuse/dependence.



Appendix A

Results for all mediation models when childhood maltreatment was excluded as a covariate

The reason that childhood maltreatment was of interest in the current study is that it can potentially be viewed as a form of negative social interaction. In addition, individuals with a non-heterosexual identity often report greater social adversity as a child than those who identify as heterosexual (Alvy et al., 2013; Roberts et al., 2013). Because participants were asked to self-report mental health and substance use disorder in the past twelve months, I was curious what role, if any, childhood adversity played in affecting the relationship between sexual orientation and mental health in adulthood.

When childhood maltreatment was *omitted* as opposed to *included* within these analyses, negative social interactions mediated a greater proportion of the relationship between sexual orientation and alcohol abuse/dependence (14.0% vs. 8.3%), illicit drug abuse/dependence (14.0% vs. 8.3%), cannabis use (11.0% vs. 7.3%), psychological distress (23.4% vs. 15.8%), perceived health (18.9% vs. 12.1%), perceived need for care (12.4% vs. 7.3%), self-rated mental health (27.3% vs. 16.5%), and positive mental health (27.4% vs. non-significant mediation). In other cases, the mediational ability of negative social interactions disappeared when childhood maltreatment was included as a covariate (e.g., illicit drug abuse and positive mental health). These findings point to a larger role of childhood maltreatment than initially expected. More research is needed in this area to discover the specific impact of reported childhood maltreatment on the mental health and substance use of Canadian sexual minorities, and to examine its potential role as a mediator in the sexual orientation-mental health relationship. A

comprehensive display of the results of this exploratory analysis is presented in Tables 1A-11A and Figures 1A-5A on the following pages.

Table 1A

Summary of results for sexual orientation predicting bipolar disorder, with negative social interactions as a mediator.

	Odds Ratio/95% CI			
	Childhood Maltreatment Excluded		Childhood Maltreatment Included	
	Block 2	Block 3	Block 2	Block 3
Constant	18.54 [4.35, 79.03]***	0.6 [0.12, 2.98]	7.42 [1.61, 34.22]*	0.52 [0.10, 2.76]
Sex	1.07 [0.73, 1.56]	1.33 [0.90, 1.96]	1.10 [0.74, 1.65]	1.34 [0.89, 1.99]
Age	0.97 [0.96, 0.98]***	0.98 [0.97, 0.99]**	0.97 [0.96, 0.98]***	0.98 [0.97, 0.99]**
Married/C. Law (Base)				
Widowed/Divorced/Sep.	1.40 [0.82, 2.39]	1.37 [0.77, 2.43]	1.34 [0.77, 2.31]	1.28 [0.69, 2.36]
Single	1.41 [0.87, 2.29]	1.54 [0.93, 2.55]	1.50 [0.93, 2.42]	1.60 [0.97, 2.61]
Income	0.92 [0.88, 0.96]***	0.92 [0.88, 0.96]***	0.92 [0.88, 0.96]***	0.92 [0.88, 0.96]***
Minority	0.45 [0.26, 0.80]**	0.59 [0.33, 1.06]	0.49 [0.27, 0.87]*	0.59 [0.32, 1.07]
Atlantic (Base)				
Quebec	0.67 [0.40, 1.14]	0.81 [0.48, 1.38]	0.65 [0.38, 1.10]	0.78 [0.46, 1.33]
Ontario	1.10 [0.68, 1.77]	0.98 [0.61, 1.59]	1.03 [0.63, 1.69]	0.95 [0.58, 1.55]
Prairies	1.21 [0.68, 2.14]	1.10 [0.62, 1.96]	1.14 [0.64, 2.01]	1.08 [0.60, 1.93]
British Columbia	1.01 [0.58, 1.76]	0.93 [0.52, 1.66]	0.97 [0.56, 1.69]	0.92 [0.52, 1.64]
Less than High School (Base)				
High School	1.23 [0.68, 2.23]	1.36 [0.73, 2.54]	1.33 [0.71, 2.48]	1.39 [0.74, 2.61]
Some Post-Secondary	0.81 [0.43, 1.53]	0.65 [0.31, 1.37]	0.79 [0.40, 1.57]	0.63 [0.28, 1.40]
Post-Secondary	1.20 [0.73, 1.99]	1.13 [0.66, 1.94]	1.30 [0.77, 2.18]	1.17 [0.68, 2.02]
SPS-10	0.85 [0.83, 0.88]***	0.89 [0.86, 0.92]***	0.87 [0.84, 0.9]***	0.89 [0.86, 0.93]***
Sexual Orientation	1.32 [0.72, 2.44]	1.00 [0.53, 1.89]	0.84 [0.41, 1.70]	0.83 [0.41, 1.66]
NSI		1.39 [1.32, 1.46]***		1.34 [1.26, 1.42]***
F-change value	0.81	148.62***	0.24	83.61***

Note. SPS-10 = Social Provisions Scale short-form. NSI = Negative Social Interactions Scale. C. Law = Common Law.
*$p < .05$, **$p < .01$, ***$p < .001$

Table 2A

Summary of results for sexual orientation predicting psychological distress, with negative social interactions as a mediator.

	B-Coefficients/ Bootstrap Standard Error			
	Childhood Maltreatment Excluded		Childhood Maltreatment Included	
	Block 2	Block 3	Block 2	Block 3
Constant	22.53/0.89***	16.14/0.83***	20.8/0.87***	15.8/0.84***
Sex	-0.97/0.12***	-0.71/0.11***	-1.01/0.12***	-0.76/0.11***
Age	-0.05/0.00***	-0.02/0.00***	-0.05/0.00***	-0.03/0.00***
Married/C. Law (Base)				
Widowed/Divorced/Sep.	0.61/0.20**	0.58/0.18**	0.50/0.18**	0.51/0.18**
Single	0.63/0.16***	0.81/0.16***	0.74/0.16***	0.86/0.16***
Income	-0.01/0.01	-0.01/0.01	-0.01/0.01	-0.01/0.01
Minority	-1.40/0.16***	-0.77/0.15***	-1.22/0.16***	-0.73/0.15***
Atlantic (Base)				
Quebec	0.16/0.16	0.60/0.15***	0.16/0.15	0.56/0.15***
Ontario	-0.11/0.17	-0.40/0.15**	-0.23/0.16	-0.44/0.15**
Prairies	0.09/0.16	-0.20/0.15	-0.06/0.16	-0.26/0.14
British Columbia	-0.20/0.18	-0.42/0.17*	-0.35/0.18*	-0.48/0.17**
Less than High School (Base)				
High School	-0.42/0.24	-0.61/0.22**	-0.40/0.23	-0.58/0.22**
Some Post-Secondary	0.55/0.30	0.06/0.30	0.40/0.29	0.02/0.30
Post-Secondary	-0.36/0.20	-0.79/0.19***	-0.37/0.19	-0.75/0.19***
SPS-10	-0.39/0.02***	-0.31/0.02***	-0.36/0.02***	-0.30/0.02***
Sexual Orientation	2.78/0.46***	2.13/0.42***	2.18/0.43***	1.84/0.41***
NSI		0.85/0.03***		0.76/0.03***
F-change value	37.31***	683.75***	25.71***	492.91***
R^2	.146***	.261***	.191***	.276***
ΔR^2	.005	.115	.003	.085

Note. SPS-10 = Social Provisions Scale short-form. NSI = Negative Social Interactions Scale. C. Law = Common Law.
$^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

Table 3A

Summary of results for sexual orientation predicting perceived health, with negative social interactions as a mediator.

	B-Coefficients/ Bootstrap Standard Error			
	Childhood Maltreatment Excluded		Childhood Maltreatment Included	
	Block 2	Block 3	Block 2	Block 3
Constant	1.20/0.12***	1.57/0.12***	1.35/0.12***	1.61/0.12***
Sex	0.02/0.02	0.00/0.02	0.02/0.02	0.01/0.02
Age	-0.01/0.00***	-0.01/0.00***	-0.01/0.00***	-0.01/0.00***
Married/C. Law (Base)				
Widowed/Divorced/Sep.	-0.09/0.03**	-0.08/0.03**	-0.08/0.03*	-0.08/0.03*
Single	-0.10/0.03**	-0.11/0.03***	-0.11/0.03***	-0.11/0.03***
Income	0.00/0.00	0.00/0.00	0.00/0.00	0.00/0.00
Minority	0.07/0.03*	0.04/0.03	0.06/0.03	0.03/0.03
Atlantic (Base)				
Quebec	0.14/0.03***	0.11/0.03***	0.14/0.03***	0.12/0.03***
Ontario	0.05/0.03	0.07/0.03**	0.06/0.03*	0.07/0.03**
Prairies	0.03/0.03	0.05/0.03	0.04/0.03	0.05/0.03
British Columbia	0.06/0.04	0.07/0.03*	0.07/0.03*	0.08/0.03*
Less than High School (Base)				
High School	0.21/0.04***	0.22/0.04***	0.21/0.04***	0.22/0.04***
Some Post-Secondary	0.15/0.05**	0.18/0.05***	0.16/0.05**	0.18/0.05***
Post-Secondary	0.31/0.03***	0.33/0.03***	0.31/0.03***	0.33/0.03***
SPS-10	0.04/0.00***	0.04/0.00***	0.04/0.00***	0.04/0.00***
Sexual Orientation	-0.20/0.07**	-0.16/0.07*	-0.15/0.06*	-0.13/0.06*
NSI		-0.05/0.01***		-0.04/0.01***
F-change value	9.10**	74.38***	5.31*	41.31***
R^2	.109**	.121***	.119*	.126***
ΔR^2	.001	.012	.000	.007

Note. SPS-10 = Social Provisions Scale short-form. NSI = Negative Social Interactions Scale. C. Law = Common Law.
*$p < .05$, **$p < .01$, ***$p < .001$

Table 4A

Summary of results for sexual orientation predicting perceived need for care, with negative social interactions as a mediator.

	B-Coefficients/ Bootstrap Standard Error			
	Childhood Maltreatment Excluded		Childhood Maltreatment Included	
	Block 2	Block 3	Block 2	Block 3
Constant	2.60/0.09***	2.12/0.08***	2.45/0.09***	2.09/0.08***
Sex	-0.13/0.01***	-0.11/0.01***	-0.14/0.01***	-0.12/0.01***
Age	0.00/0.00***	0.00/0.00***	0.00/0.00***	0.00/0.00***
Married/C. Law (Base)				
Widowed/Divorced/Sep.	0.04/0.02*	0.04/0.02	0.03/0.02	0.03/0.02
Single	0.02/0.02	0.03/0.02*	0.03/0.02	0.04/0.02*
Income	0.00/0.00	0.00/0.00	0.00/0.00	0.00/0.00
Minority	-0.17/0.02***	-0.13/0.02***	-0.16/0.02***	-0.12/0.02***
Atlantic (Base)				
Quebec	-0.02/0.02	0.01/0.02	-0.02/0.02	0.01/0.02
Ontario	0.02/0.02	0.00/0.02	0.01/0.02	-0.01/0.02
Prairies	0.01/0.02	-0.01/0.02	0.00/0.02	-0.01/0.02
British Columbia	0.07/0.02**	0.05/0.02*	0.05/0.02*	0.04/0.02*
Less than High School (Base)				
High School	-0.02/0.02	-0.04/0.02	-0.02/0.02	-0.03/0.02
Some Post-Secondary	0.07/0.04	0.04/0.04	0.06/0.04	0.03/0.04
Post-Secondary	0.04/0.02*	0.01/0.02	0.04/0.02*	0.02/0.02
SPS-10	-0.03/0.00***	-0.03/0.00***	-0.03/0.00***	-0.02/0.00***
Sexual Orientation	0.39/0.06***	0.34/0.06***	0.33/0.06***	0.31/0.06***
NSI		0.06/0.00***		0.05/0.00***
F-change value	42.48***	213.82***	33.24***	147.21***
R^2	.079***	.126***	.105***	.137***
ΔR^2	.007	.047	.005	.032

Note. SPS-10 = Social Provisions Scale short-form. NSI = Negative Social Interactions Scale. C. Law = Common Law.
$^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

Table 5A

Summary of results for sexual orientation predicting self-rated mental health, with negative social interactions as a mediator.

	B-Coefficients/ Bootstrap Standard Error			
	Childhood Maltreatment Excluded		Childhood Maltreatment Included	
	Block 2	Block 3	Block 2	Block 3
Constant	0.25/0.12*	0.94/0.12***	0.46/0.12***	0.99/0.12***
Sex	0.13/0.02***	0.10/0.02***	0.13/0.02***	0.11/0.02***
Age	0.00/0.00**	0.00/0.00	0.00/0.00**	0.00/0.00
Married/C. Law (Base)				
Widowed/Divorced/Sep.	-0.08/0.04*	-0.08/0.03*	-0.07/0.03*	-0.07/0.03*
Single	-0.07/0.03**	-0.09/0.03**	-0.08/0.03**	-0.10/0.03***
Income	0.00/0.00	0.00/0.00	0.00/0.00	0.00/0.00
Minority	0.22/0.03***	0.15/0.03***	0.20/0.03***	0.15/0.03***
Atlantic (Base)				
Quebec	0.12/0.03***	0.08/0.03**	0.12/0.03***	0.08/0.03**
Ontario	0.04/0.03	0.07/0.03**	0.06/0.03*	0.08/0.03**
Prairies	-0.03/0.03	0.00/0.03	-0.01/0.03	0.01/0.03
British Columbia	0.00/0.03	0.03/0.03	0.02/0.03	0.04/0.03
Less than High School (Base)				
High School	0.15/0.04***	0.17/0.04***	0.15/0.04***	0.17/0.04***
Some Post-Secondary	0.09/0.05	0.14/0.05**	0.11/0.05*	0.15/0.05**
Post-Secondary	0.12/0.03***	0.16/0.03***	0.12/0.03***	0.16/0.03***
SPS-10	0.06/0.00***	0.05/0.00***	0.06/0.00***	0.05/0.00***
Sexual Orientation	-0.26/0.07***	-0.19/0.07**	-0.18/0.07**	-0.15/0.07*
NSI		-0.09/0.01***		-0.08/0.01***
F-change value	13.01***	236.24***	7.10**	161.58***
R^2	.103***	.147***	.125**	.156***
ΔR^2	.001	.044	.001	.031

Note. SPS-10 = Social Provisions Scale short-form. NSI = Negative Social Interactions Scale. C. Law = Common Law.
*$p < .05$, **$p < .01$, ***$p < .001$

Table 6A

Summary of results for sexual orientation predicting positive mental health, with negative social interactions as a mediator.

	B-Coefficients/ Bootstrap Standard Error			
	Childhood Maltreatment Excluded		Childhood Maltreatment Included	
	Block 2	Block 3	Block 2	Block 3
Constant	12.98/1.35***	20.76/1.37***	15.1/1.36***	21.2/1.38***
Sex	0.61/0.24*	0.29/0.23	0.64/0.23**	0.34/0.23
Age	0.06/0.01***	0.02/0.01***	0.06/0.01***	0.03/0.01***
Married/C. Law (Base)				
Widowed/Divorced/Sep.	-1.10/0.33**	-1.01/0.34**	-0.93/0.33**	-0.92/0.35**
Single	-1.27/0.30***	-1.47/0.30***	-1.40/0.30***	-1.53/0.30***
Income	0.00/0.01	0.01/0.01	0.00/0.01	0.01/0.01
Minority	2.76/0.31***	2.00/0.30***	2.53/0.31***	1.95/0.30***
Atlantic (Base)				
Quebec	-1.27/0.36**	-1.81/0.35***	-1.29/0.36***	-1.76/0.35***
Ontario	-0.24/0.33	0.14/0.31	-0.09/0.33	0.19/0.32
Prairies	-0.47/0.32	-0.13/0.30	-0.29/0.31	-0.06/0.30
British Columbia	-1.38/0.38***	-1.18/0.36**	-1.21/0.37**	-1.09/0.35**
Less than High School (Base)				
High School	0.55/0.45	0.73/0.44	0.50/0.45	0.68/0.44
Some Post-Secondary	-0.85/0.55	-0.38/0.54	-0.71/0.55	-0.34/0.55
Post-Secondary	0.16/0.37	0.65/0.37	0.15/0.37	0.59/0.37
SPS-10	1.07/0.03***	0.98/0.03***	1.04/0.03***	0.97/0.03***
Sexual Orientation	-3.02/1.01**	-2.19/1.01*	-2.24/0.98*	-1.81/0.98
NSI		-1.04/0.06***		-0.93/0.06***
F-change value	8.92**	323.73***	5.27*	235.71***
R^2	.196**	.239***	.213*	.245***
ΔR^2	.002	.043	.001	.031

Note. SPS-10 = Social Provisions Scale short-form. NSI = Negative Social Interactions Scale. C. Law = Common Law.
* $p < .05$, ** $p < .01$, *** $p < .001$

Table 7A

Summary of results for sexual orientation predicting alcohol abuse/dependence, with negative social interactions as a mediator.

	Odds Ratio/95% CI			
	Childhood Maltreatment Excluded		Childhood Maltreatment Included	
	Block 2	Block 3	Block 2	Block 3
Constant	0.16 [0.04, 0.74]*	0.03 [0.01, 0.16]***	0.10 [0.02, 0.46]**	0.03 [0.01, 0.14]***
Sex	3.06 [2.33, 4.02]***	3.36 [2.54, 4.45]***	3.12 [2.38, 4.10]***	3.38 [2.55, 4.48]***
Age	0.96 [0.95, 0.97]***	0.97 [0.96, 0.98]***	0.96 [0.95, 0.97]***	0.97 [0.96, 0.98]***
Married/C. Law (Base)				
Widowed/Divorced/Sep.	0.96 [0.61, 1.49]	0.94 [0.60, 1.47]	0.90 [0.58, 1.41]	0.90 [0.57, 1.41]
Single	1.96 [1.43, 2.70]***	2.08 [1.52, 2.85]***	1.99 [1.45, 2.73]***	2.08 [1.52, 2.85]***
Income	1.00 [0.99, 1.01]	1.00 [0.99, 1.01]	1.00 [0.99, 1.01]	1.00 [0.99, 1.01]
Minority	0.31 [0.21, 0.45]***	0.34 [0.23, 0.50]***	0.31 [0.21, 0.45]***	0.33 [0.23, 0.49]***
Atlantic (Base)				
Quebec	0.87 [0.60, 1.26]	0.97 [0.67, 1.41]	0.86 [0.59, 1.24]	0.95 [0.66, 1.38]
Ontario	1.16 [0.82, 1.63]	1.08 [0.76, 1.53]	1.11 [0.78, 1.57]	1.05 [0.74, 1.50]
Prairies	1.25 [0.86, 1.81]	1.17 [0.81, 1.70]	1.20 [0.82, 1.74]	1.15 [0.80, 1.67]
British Columbia	1.34 [0.80, 2.22]	1.26 [0.77, 2.08]	1.28 [0.77, 2.13]	1.24 [0.75, 2.04]
Less than High School (Base)				
High School	0.97 [0.63, 1.50]	0.95 [0.62, 1.47]	0.99 [0.64, 1.53]	0.96 [0.62, 1.48]
Some Post-Secondary	1.17 [0.73, 1.88]	1.05 [0.64, 1.74]	1.16 [0.72, 1.89]	1.05 [0.63, 1.75]
Post-Secondary	0.73 [0.49, 1.09]	0.69 [0.46, 1.04]	0.76 [0.51, 1.13]	0.71 [0.48, 1.06]
SPS-10	0.98 [0.94, 1.01]	1.00 [0.96, 1.03]	0.99 [0.95, 1.02]	1.00 [0.97, 1.03]
Sexual Orientation	3.54 [2.06, 6.08]***	3.03 [1.74, 5.26]***	3.09 [1.76, 5.43]***	2.84 [1.61, 5.01]***
NSI		1.20 [1.15, 1.26]***		1.18 [1.12, 1.24]***
F-change value	21.18***	67.35***	15.40***	46.37***

Note. SPS-10 = Social Provisions Scale short-form. NSI = Negative Social Interactions Scale. C. Law = Common Law.
* $p < .05$, ** $p < .01$, *** $p < .001$

Table 8A

Summary of results for sexual orientation predicting illicit drug abuse/dependence (excluding cannabis), with negative social interactions as a mediator.

	Odds Ratio/95% CI			
	Childhood Maltreatment Excluded		Childhood Maltreatment Included	
	Block 2	Block 3	Block 2	Block 3
Constant	0.36 [0.03, 4.62]	0.04 [0.00, 0.48]*	0.15 [0.01, 1.81]	0.04 [0.00, 0.44]**
Sex	1.80 [1.08, 2.98]*	2.01 [1.19, 3.39]**	1.85 [1.11, 3.08]*	2.02 [1.19, 3.43]**
Age	0.96 [0.94, 0.97]***	0.96 [0.95, 0.98]***	0.95 [0.93, 0.97]***	0.96 [0.94, 0.98]***
Married/C. Law (Base)				
Widowed/Divorced/Sep.	2.54 [1.22, 5.32]*	2.54 [1.19, 5.38]*	2.34 [1.11, 4.93]*	2.32 [1.07, 5.02]*
Single	2.39 [1.09, 5.23]*	2.53 [1.15, 5.56]*	2.49 [1.16, 5.33]*	2.59 [1.20, 5.57]*
Income	0.97 [0.93, 1.02]	0.98 [0.93, 1.03]	0.97 [0.93, 1.02]	0.98 [0.93, 1.03]
Minority	0.38 [0.18, 0.79]*	0.44 [0.20, 0.93]*	0.40 [0.19, 0.85]*	0.43 [0.20, 0.93]*
Atlantic (Base)				
Quebec	0.67 [0.32, 1.37]	0.77 [0.37, 1.59]	0.64 [0.31, 1.32]	0.72 [0.35, 1.50]
Ontario	1.00 [0.47, 2.12]	0.92 [0.43, 1.96]	0.88 [0.42, 1.82]	0.84 [0.40, 1.76]
Prairies	1.20 [0.57, 2.51]	1.11 [0.53, 2.34]	1.10 [0.52, 2.32]	1.06 [0.50, 2.24]
British Columbia	1.09 [0.51, 2.33]	1.07 [0.50, 2.30]	1.02 [0.48, 2.19]	1.02 [0.47, 2.20]
Less than High School (Base)				
High School	1.87 [0.87, 4.03]	1.96 [0.87, 4.42]	1.99 [0.90, 4.40]	1.95 [0.87, 4.34]
Some Post-Secondary	1.50 [0.59, 3.85]	1.39 [0.53, 3.64]	1.49 [0.57, 3.92]	1.31 [0.49, 3.53]
Post-Secondary	0.83 [0.41, 1.67]	0.81 [0.39, 1.68]	0.90 [0.44, 1.82]	0.83 [0.41, 1.69]
SPS-10	0.92 [0.87, 0.97]**	0.95 [0.90, 1.00]*	0.94 [0.89, 0.99]*	0.95 [0.91, 1.00]
Sexual Orientation	2.91 [1.41, 6.04]**	2.36 [1.11, 5.02]*	2.02 [0.87, 4.68]	1.91 [0.83, 4.42]
NSI		1.25 [1.17, 1.33]***		1.19 [1.10, 1.28]***
F-change value	8.30**	42.36***	2.71	18.02***

Note. SPS-10 = Social Provisions Scale short-form. NSI = Negative Social Interactions Scale. C. Law = Common Law.
*$p < .05$, **$p < .01$, ***$p < .001$

Table 9A

Summary of results for sexual orientation predicting cannabis abuse/dependence, with negative social interactions as a mediator.

	Odds Ratio/95% CI			
	Childhood Maltreatment Excluded		Childhood Maltreatment Included	
	Block 2	Block 3	Block 2	Block 3
Constant	5.05 [0.79, 32.24]	0.57 [0.07, 4.63]	2.18 [0.33, 14.5]	0.49 [0.06, 4.16]
Sex	3.27 [2.05, 5.21]***	3.76 [2.34, 6.03]***	3.53 [2.20, 5.67]***	3.92 [2.41, 6.37]***
Age	0.90 [0.88, 0.92]***	0.90 [0.88, 0.93]***	0.89 [0.87, 0.91]***	0.90 [0.87, 0.92]***
Married/C. Law (Base)				
Widowed/Divorced/Sep.	1.94 [0.89, 4.22]	1.86 [0.85, 4.08]	1.61 [0.69, 3.75]	1.55 [0.66, 3.67]
Single	1.15 [0.68, 1.93]	1.19 [0.71, 2.01]	1.18 [0.71, 1.96]	1.21 [0.72, 2.04]
Income	1.00 [0.98, 1.02]	1.00 [0.98, 1.02]	1.00 [0.98, 1.02]	1.00 [0.98, 1.02]
Minority	0.38 [0.20, 0.72]**	0.42 [0.22, 0.79]**	0.37 [0.19, 0.71]**	0.39 [0.20, 0.75]**
Atlantic (Base)				
Quebec	0.76 [0.45, 1.28]	0.87 [0.52, 1.48]	0.73 [0.44, 1.23]	0.83 [0.49, 1.39]
Ontario	0.70 [0.43, 1.13]	0.64 [0.40, 1.03]	0.62 [0.38, 1.00]	0.59 [0.37, 0.95]*
Prairies	0.69 [0.41, 1.15]	0.63 [0.38, 1.06]	0.63 [0.38, 1.07]	0.61 [0.36, 1.03]
British Columbia	0.81 [0.46, 1.42]	0.76 [0.44, 1.34]	0.77 [0.44, 1.35]	0.75 [0.42, 1.31]
Less than High School (Base)				
High School	0.85 [0.44, 1.63]	0.86 [0.44, 1.69]	0.91 [0.47, 1.76]	0.88 [0.45, 1.71]
Some Post-Secondary	0.85 [0.40, 1.82]	0.77 [0.37, 1.60]	0.87 [0.40, 1.93]	0.75 [0.34, 1.65]
Post-Secondary	0.67 [0.39, 1.13]	0.65 [0.38, 1.13]	0.77 [0.45, 1.32]	0.71 [0.42, 1.23]
SPS-10	0.93 [0.90, 0.97]***	0.96 [0.92, 1.00]*	0.95 [0.92, 0.99]**	0.97 [0.93, 1.01]
Sexual Orientation	2.37 [1.20, 4.68]*	1.79 [0.92, 3.48]	1.68 [0.80, 3.55]	1.48 [0.72, 3.06]
NSI		1.28 [1.19, 1.37]***		1.21 [1.12, 1.31]***
F-change value	6.24*	45.40***	1.87	23.33***

Note. SPS-10 = Social Provisions Scale short-form. NSI = Negative Social Interactions Scale. C. Law = Common Law.
*$p < .05$, **$p < .01$, ***$p < .001$

Table 10A

Summary of results for sexual orientation predicting cannabis use, with negative social interactions as a mediator.

	Odds Ratio/95% CI			
	Childhood Maltreatment Excluded		Childhood Maltreatment Included	
	Block 2	Block 3	Block 2	Block 3
Constant	1.33 [0.62, 2.86]	0.48 [0.21, 1.11]	0.84 [0.39, 1.81]	0.43 [0.18, 1.00] *
Sex	2.47 [2.14, 2.84] ***	2.62 [2.28, 3.01] ***	2.52 [2.19, 2.90] ***	2.63 [2.29, 3.02] ***
Age	0.94 [0.94, 0.95] ***	0.95 [0.94, 0.95] ***	0.94 [0.93, 0.95] ***	0.94 [0.94, 0.95] ***
Married/C. Law (Base)				
Widowed/Divorced/Sep.	1.75 [1.38, 2.21] ***	1.71 [1.33, 2.19] ***	1.64 [1.27, 2.11] ***	1.62 [1.24, 2.11] ***
Single	1.81 [1.52, 2.16] ***	1.87 [1.57, 2.24] ***	1.86 [1.55, 2.22] ***	1.90 [1.59, 2.27] ***
Income	0.99 [0.98, 1.00]	0.99 [0.98, 1.00] *	0.99 [0.98, 1.00]	0.99 [0.98, 1.00] *
Minority	0.27 [0.21, 0.34] ***	0.29 [0.22, 0.37] ***	0.27 [0.21, 0.35] ***	0.28 [0.22, 0.36] ***
Atlantic (Base)				
Quebec	0.81 [0.66, 1.00]	0.88 [0.71, 1.08]	0.80 [0.65, 1.00] *	0.86 [0.69, 1.06]
Ontario	1.07 [0.87, 1.31]	1.02 [0.83, 1.25]	1.02 [0.83, 1.26]	0.99 [0.81, 1.22]
Prairies	0.88 [0.71, 1.08]	0.84 [0.68, 1.03]	0.84 [0.68, 1.02]	0.82 [0.66, 1.00]
British Columbia	1.45 [1.16, 1.82] **	1.40 [1.12, 1.77] **	1.39 [1.11, 1.75] **	1.37 [1.09, 1.72] **
Less than High School (Base)				
High School	0.76 [0.57, 1.01]	0.75 [0.56, 0.99] *	0.78 [0.59, 1.05]	0.77 [0.57, 1.02]
Some Post-Secondary	0.97 [0.70, 1.33]	0.90 [0.66, 1.25]	0.97 [0.70, 1.33]	0.92 [0.66, 1.27]
Post-Secondary	0.80 [0.63, 1.01]	0.77 [0.61, 0.98] *	0.83 [0.65, 1.07]	0.80 [0.63, 1.02]
SPS-10	0.99 [0.97, 1.01]	1.01 [0.99, 1.02]	1.00 [0.98, 1.02]	1.01 [0.99, 1.03]
Sexual Orientation	3.04 [2.17, 4.24] ***	2.76 [1.96, 3.89] ***	2.61 [1.85, 3.69] ***	2.51 [1.77, 3.55] ***
NSI		1.14 [1.10, 1.17] ***		1.10 [1.06, 1.14] ***
F-change value	42.63 ***	59.10 ***	29.87 ***	30.86 ***

Note. SPS-10 = Social Provisions Scale short-form. NSI = Negative Social Interactions Scale. C. Law = Common Law.
* $p < .05$, ** $p < .01$, *** $p < .001$

Table 11A

Summary of results for sexual orientation predicting overall drug abuse/dependence, with negative social interactions as a mediator.

	Odds Ratio/95% CI			
	Childhood Maltreatment Excluded		Childhood Maltreatment Included	
	Block 2	Block 3	Block 2	Block 3
Constant	2.13 [0.44, 10.26]	0.28 [0.05, 1.55]	0.93 [0.20, 4.42]	0.24 [0.04, 1.37]
Sex	2.68 [1.86, 3.88]***	3.04 [2.08, 4.44]***	2.83 [1.95, 4.11]***	3.11 [2.11, 4.59]***
Age	0.93 [0.91, 0.94]***	0.93 [0.92, 0.95]***	0.92 [0.90, 0.94]***	0.92 [0.91, 0.94]***
Married/C. Law (Base)				
Widowed/Divorced/Sep.	2.37 [1.41, 4.01]**	2.30 [1.34, 3.94]**	2.10 [1.21, 3.64]**	2.02 [1.12, 3.62]*
Single	1.63 [1.05, 2.52]*	1.71 [1.10, 2.65]*	1.68 [1.09, 2.58]*	1.74 [1.13, 2.69]*
Income	0.99 [0.97, 1.02]	1.00 [0.97, 1.02]	0.99 [0.97, 1.02]	1.00 [0.97, 1.02]
Minority	0.39 [0.23, 0.65]***	0.43 [0.26, 0.72]**	0.39 [0.23, 0.66]***	0.42 [0.25, 0.7]**
Atlantic (Base)				
Quebec	0.74 [0.47, 1.15]	0.85 [0.54, 1.33]	0.71 [0.46, 1.11]	0.80 [0.52, 1.25]
Ontario	0.76 [0.50, 1.15]	0.70 [0.46, 1.05]	0.68 [0.45, 1.02]	0.65 [0.43, 0.98]*
Prairies	0.76 [0.48, 1.21]	0.71 [0.45, 1.13]	0.71 [0.44, 1.12]	0.68 [0.43, 1.08]
British Columbia	0.85 [0.53, 1.39]	0.82 [0.50, 1.32]	0.81 [0.50, 1.32]	0.79 [0.49, 1.29]
Less than High School (Base)				
High School	0.95 [0.55, 1.66]	0.97 [0.54, 1.73]	1.03 [0.59, 1.81]	1.00 [0.56, 1.76]
Some Post-Secondary	0.96 [0.51, 1.80]	0.87 [0.47, 1.63]	0.98 [0.50, 1.92]	0.87 [0.44, 1.69]
Post-Secondary	0.66 [0.42, 1.04]	0.64 [0.40, 1.02]	0.75 [0.47, 1.19]	0.69 [0.43, 1.10]
SPS-10	0.94 [0.91, 0.97]***	0.96 [0.93, 1.00]*	0.96 [0.93, 0.99]**	0.97 [0.94, 1.00]
Sexual Orientation	1.87 [1.00, 3.50]*	1.46 [0.79, 2.70]	1.34 [0.68, 2.66]	1.21 [0.63, 2.36]
NSI		1.25 [1.18, 1.33]***		1.19 [1.11, 1.27]***
F-change value	3.89*	53.98***	0.72	25.74***

Note. SPS-10 = Social Provisions Scale short-form. NSI = Negative Social Interactions Scale. C. Law = Common Law.
* $p < .05$, ** $p < .01$, *** $p < .001$

Figure 1A

Logistic mediation models for alcohol abuse/dependence with and without childhood maltreatment as a covariate.

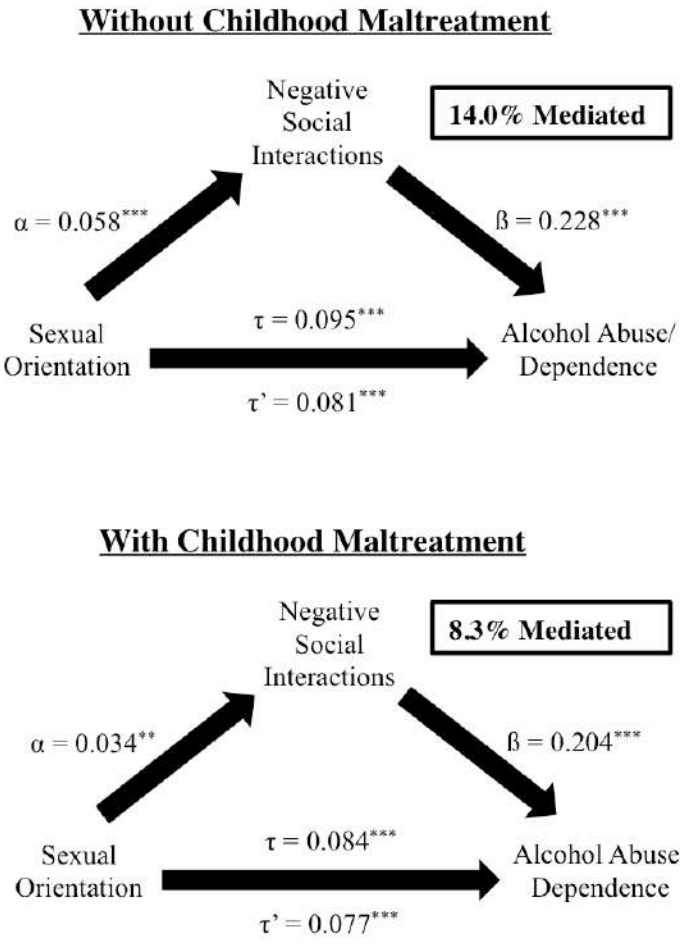


Figure 2A

Logistic mediation model for illicit drug abuse/dependence (excluding cannabis) with and without childhood maltreatment as a covariate.

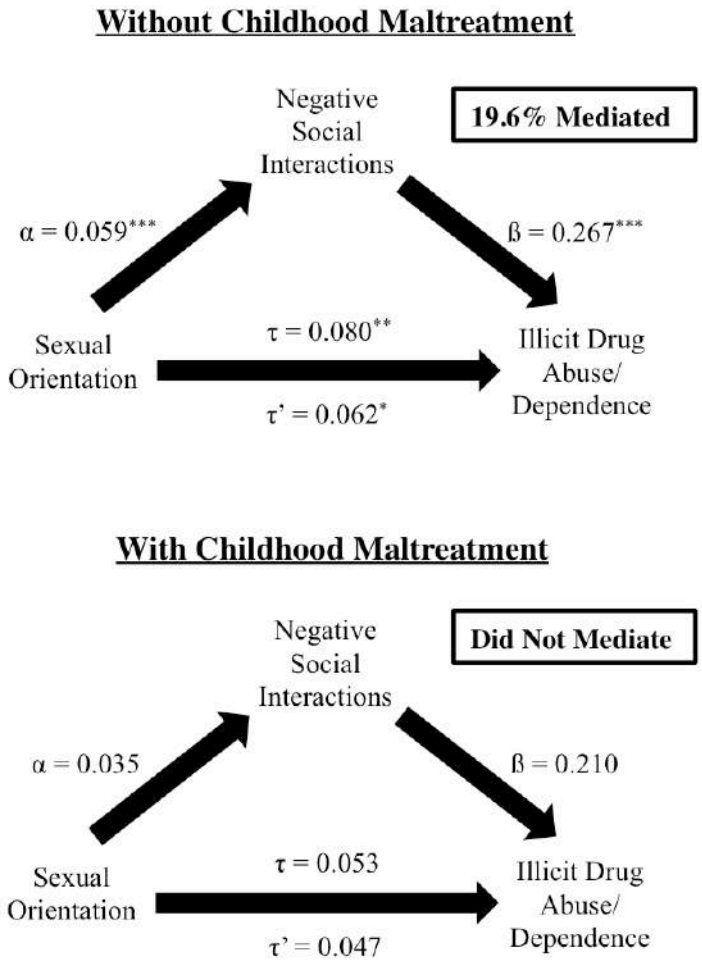


Figure 3A

Logistic mediation model for cannabis abuse/dependence with and without childhood maltreatment as a covariate.

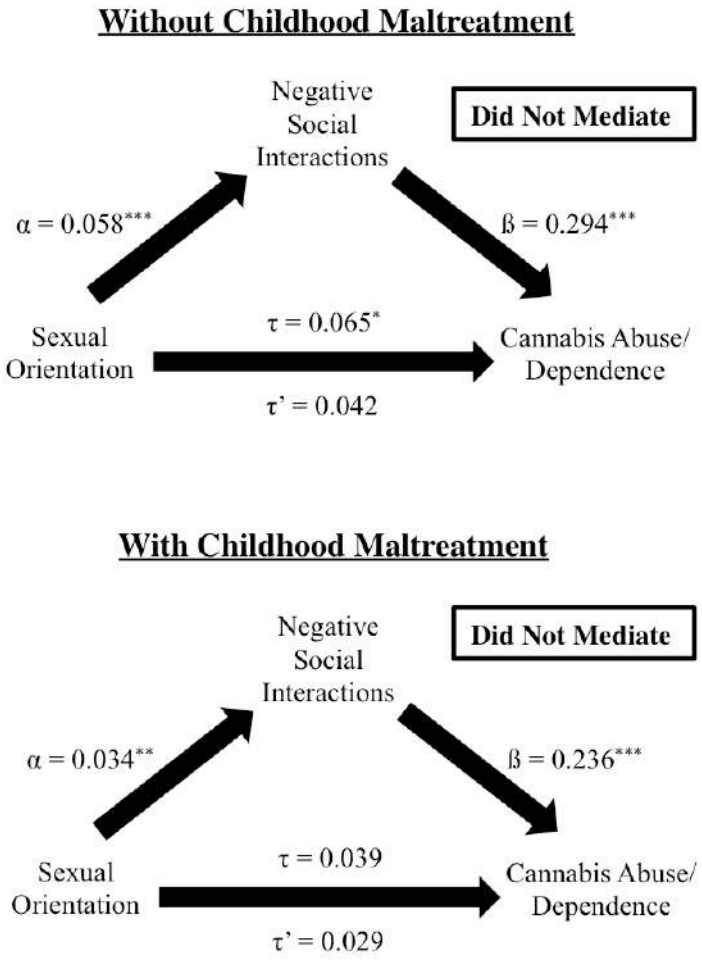


Figure 4A

Logistic mediation model for cannabis use with and without childhood maltreatment as a covariate.

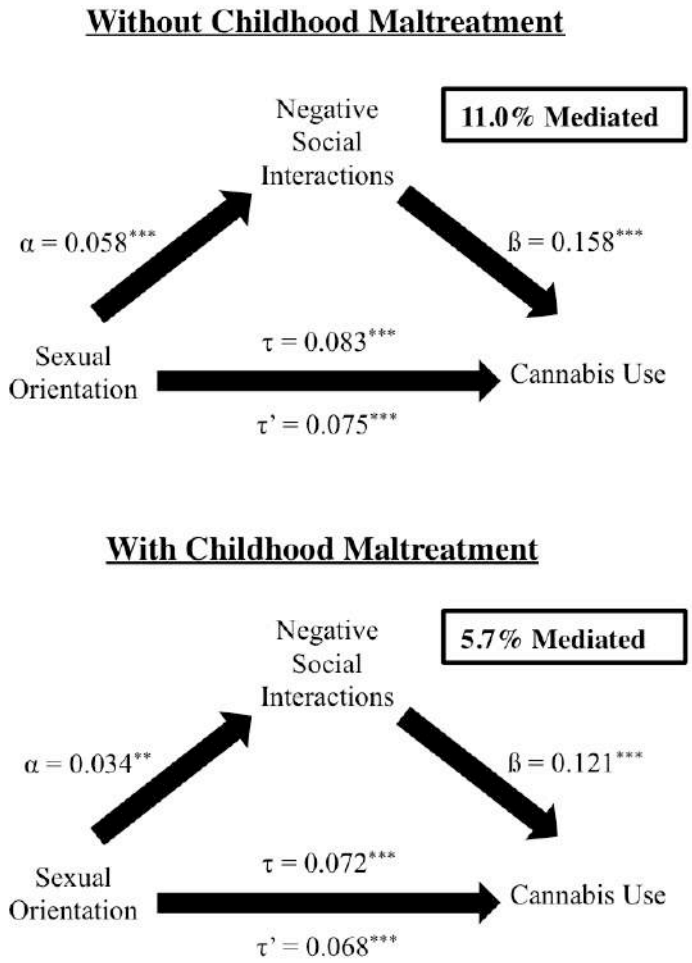
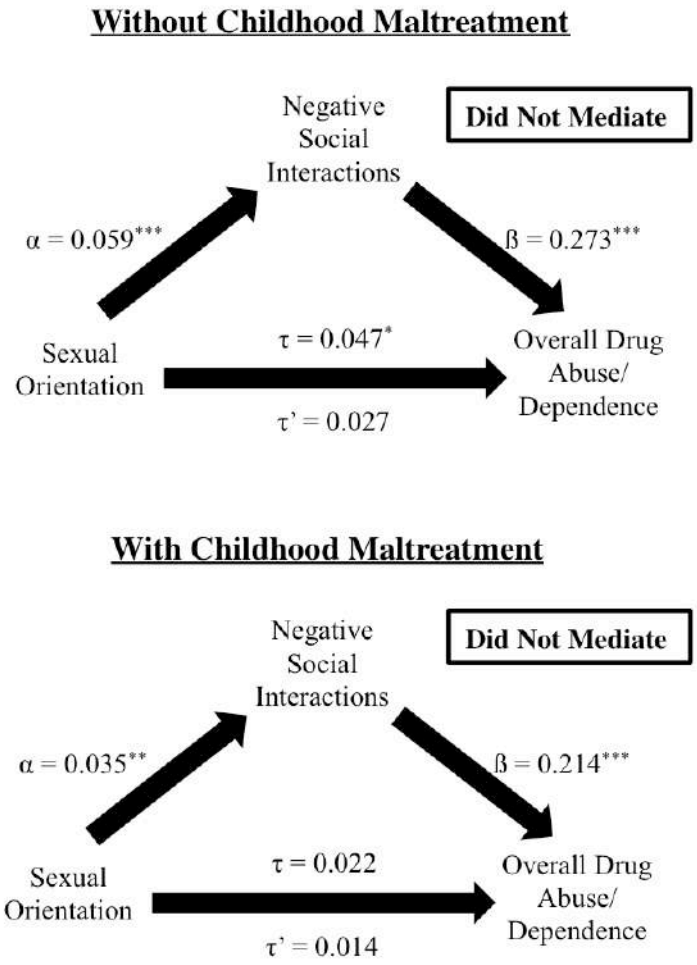


Figure 5A

Logistic mediation model for overall drug abuse/dependence with and without childhood maltreatment as a covariate.



Appendix B

Sex-based differences (i.e., male vs. female) for all outcomes investigated with and without the inclusion of childhood maltreatment as a covariate

After examining mediation model effects as a function of childhood maltreatment, all mental health outcomes were then analyzed separately for males and females. First, I separated male and female participants to investigate if negative social interactions served as a mediator between non-heterosexual identity and mental health/addiction outcomes. Analyses for females suggested that negative social interactions acted as a mediator for the relations between LGB-status and psychological distress, perceived need for care, self-rated mental health, and positive mental health. In contrast, analyses for males suggested that negative social interactions acted as a mediator only for the relations between LGB-status and psychological distress and perceived need for care. However, because mediational models are 'reliant' on *p*-values for progressing, I took the step of testing path equivalencies for male and female models. These results suggested that, although female models were more likely to demonstrate the requirements necessary for mediation, the pathways across male and female models (i.e., α, ß, τ, and τ') were overwhelmingly equivalent.

When childhood maltreatment was *excluded* as a covariate, males and females reported experiencing equivalent mental health challenges, except for perceived need for care for which males reported a greater need for care than females. When childhood maltreatment was *included* as a covariate, males and females again reported experiencing all mental health outcomes in an equivalent manner; however, negative social interactions mediated a greater proportion of these relationships for males than for

females. Interestingly, the mediational models could not be investigated for females given that the α-pathway was non-significant (i.e., there was no longer a statistically significant relationship between identifying as a lesbian/bisexual and negative social interactions). Overall, these findings suggest that the mental health of Canadians who identify as non-heterosexual is influenced by biological sex and negative social interactions, but also suggests that childhood maltreatment plays role in this relationship. A comprehensive display of the results of this exploratory analysis is presented in Figures 1B-5B on the following pages.

Figure 1B

Linear and sex-based mediation models for psychological distress with and without childhood maltreatment included as a covariate.

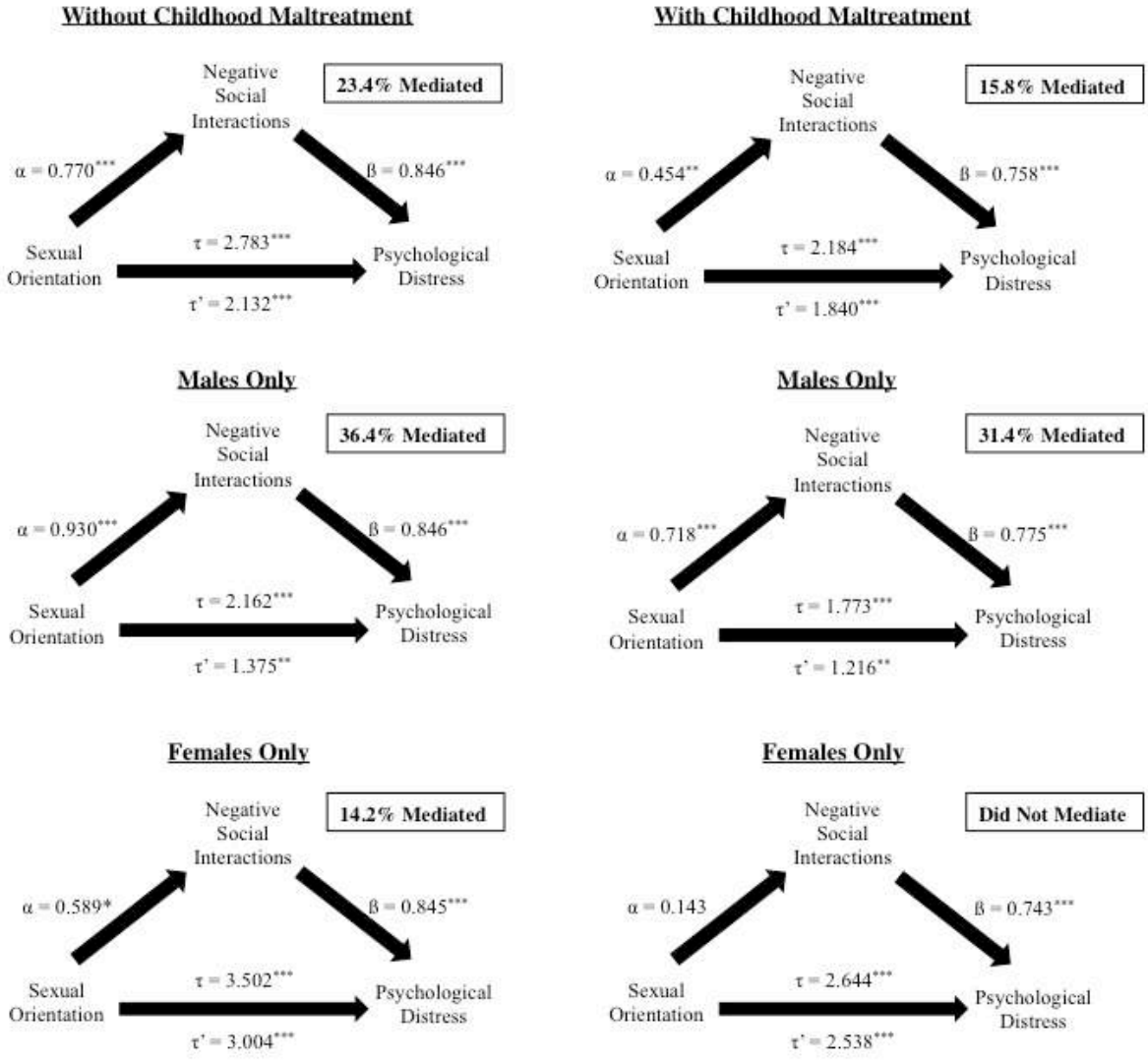


Figure 2B

Linear and sex-based mediation models for perceived health with and without childhood maltreatment included as a covariate.

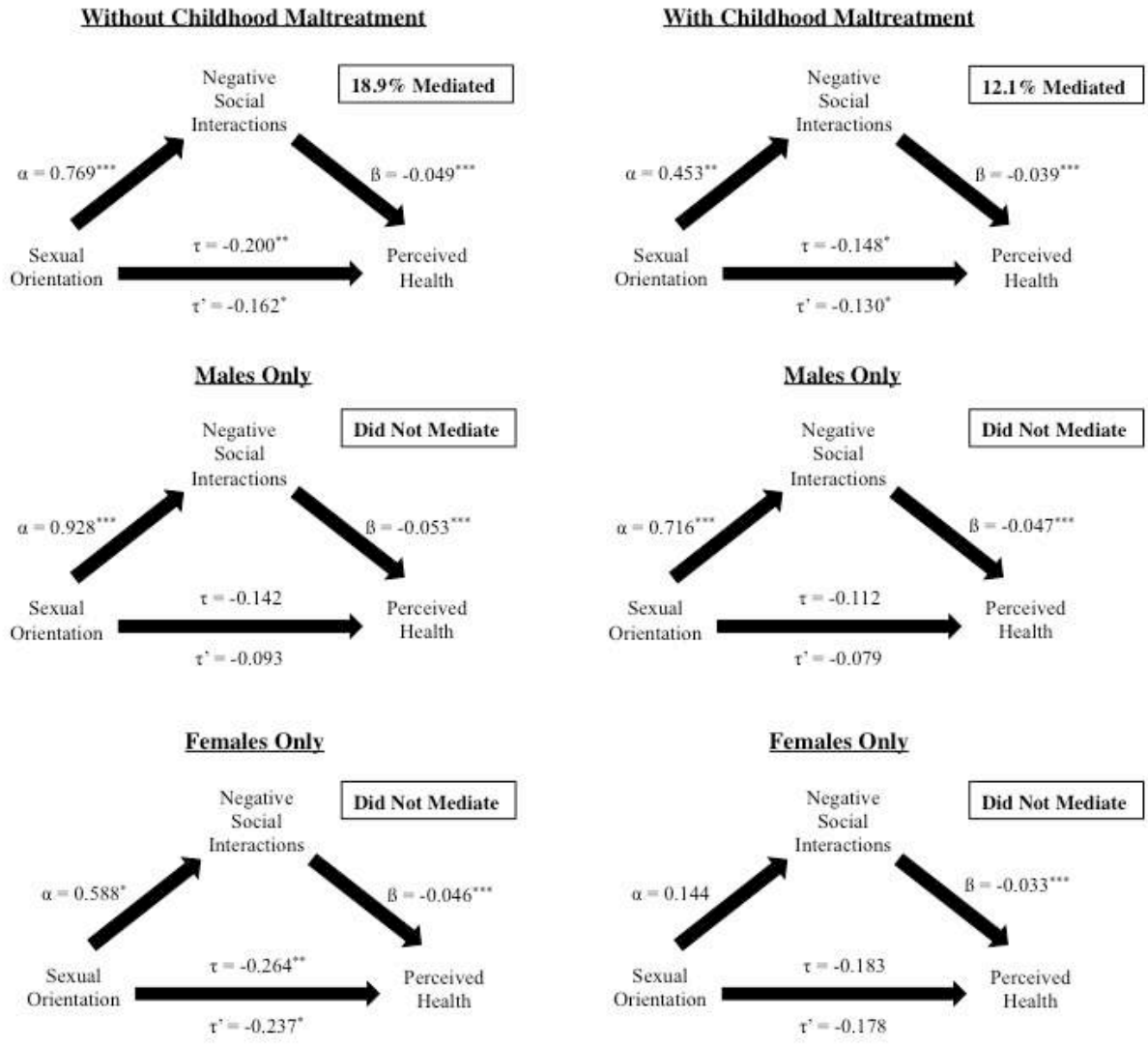


Figure 3B

Linear and sex-based mediation models for perceived need for care with and without childhood maltreatment included as a covariate.

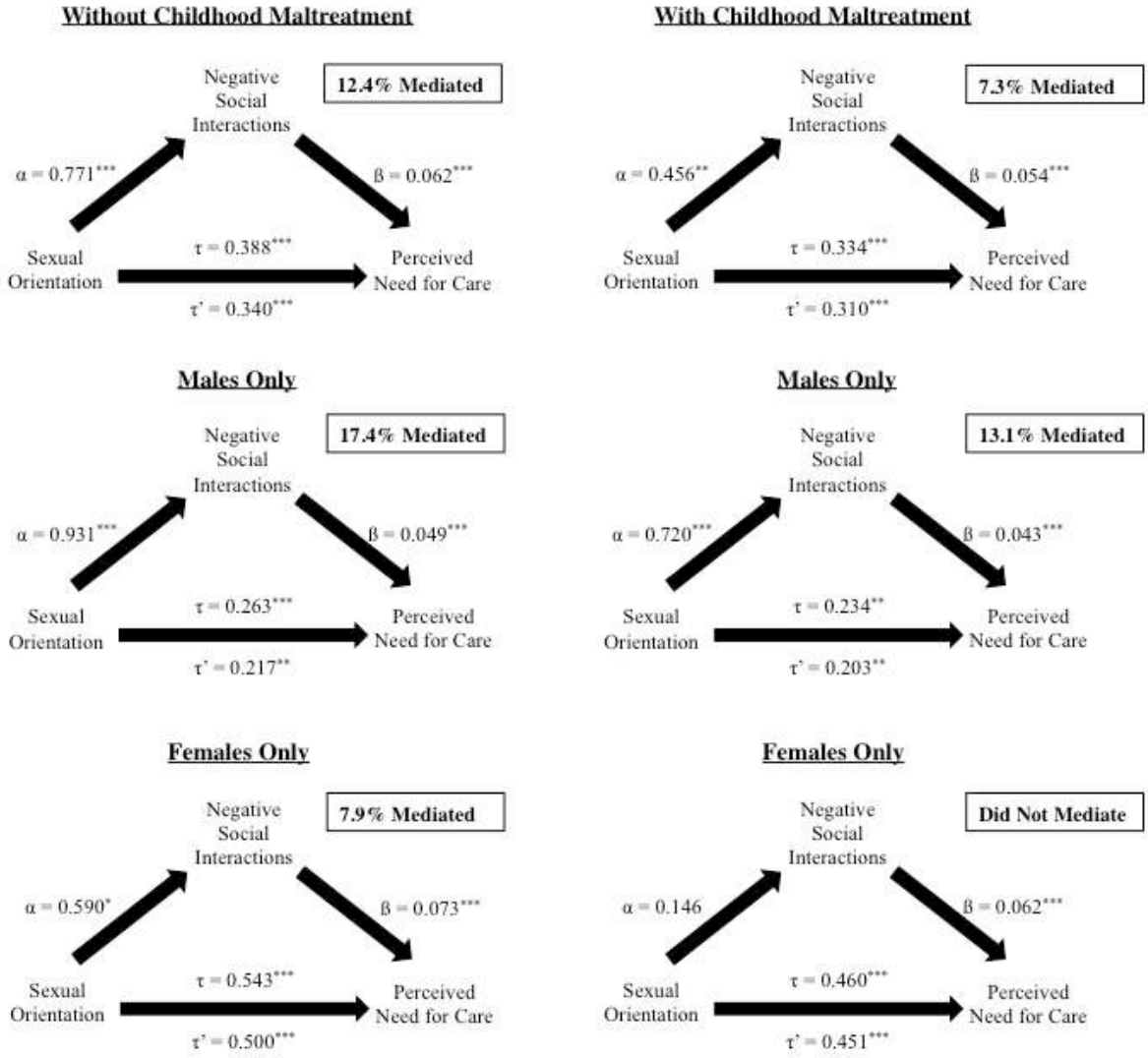


Figure 4B

Linear and sex-based mediation models for self-rated mental health with and without childhood maltreatment included as a covariate.

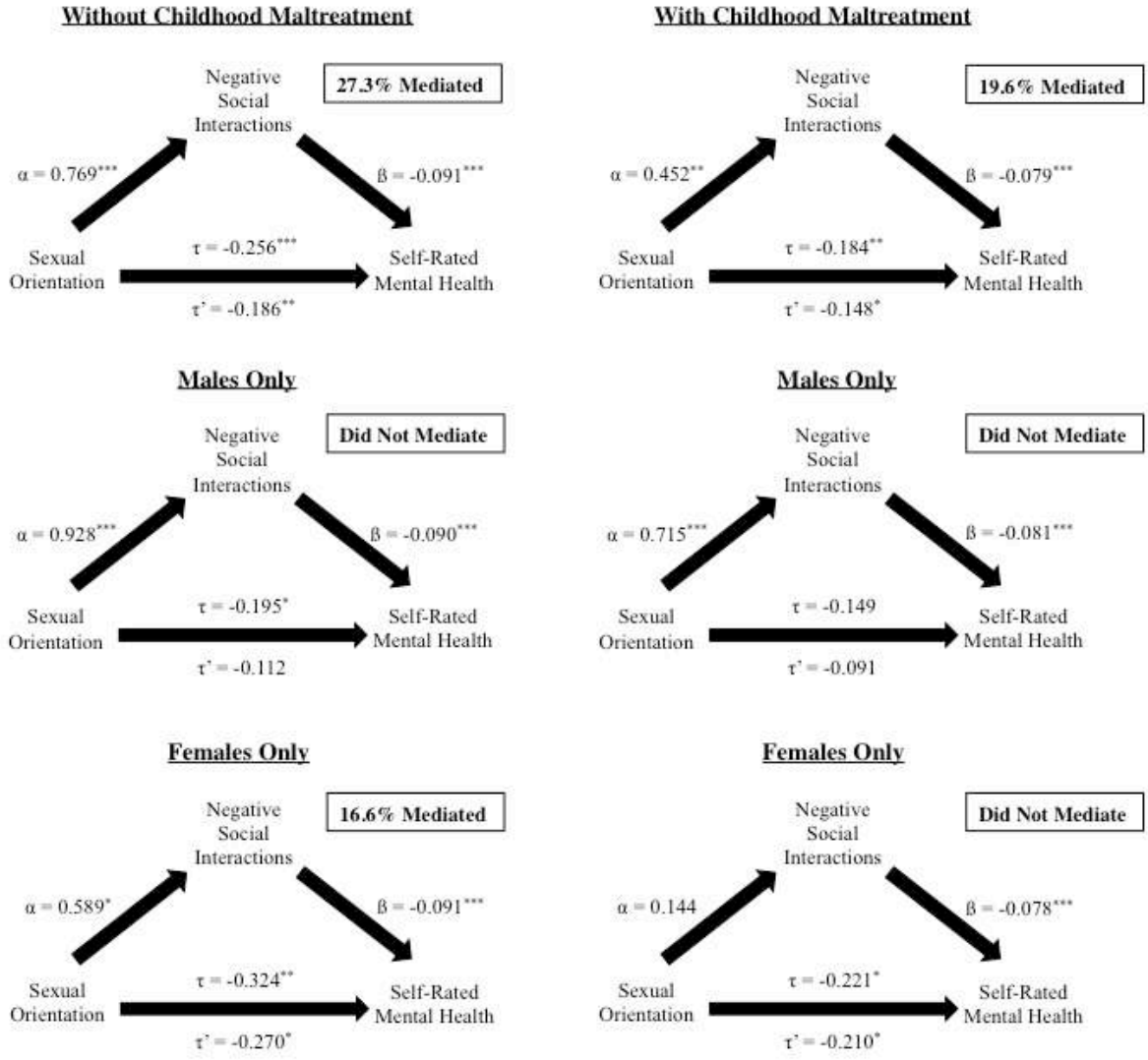
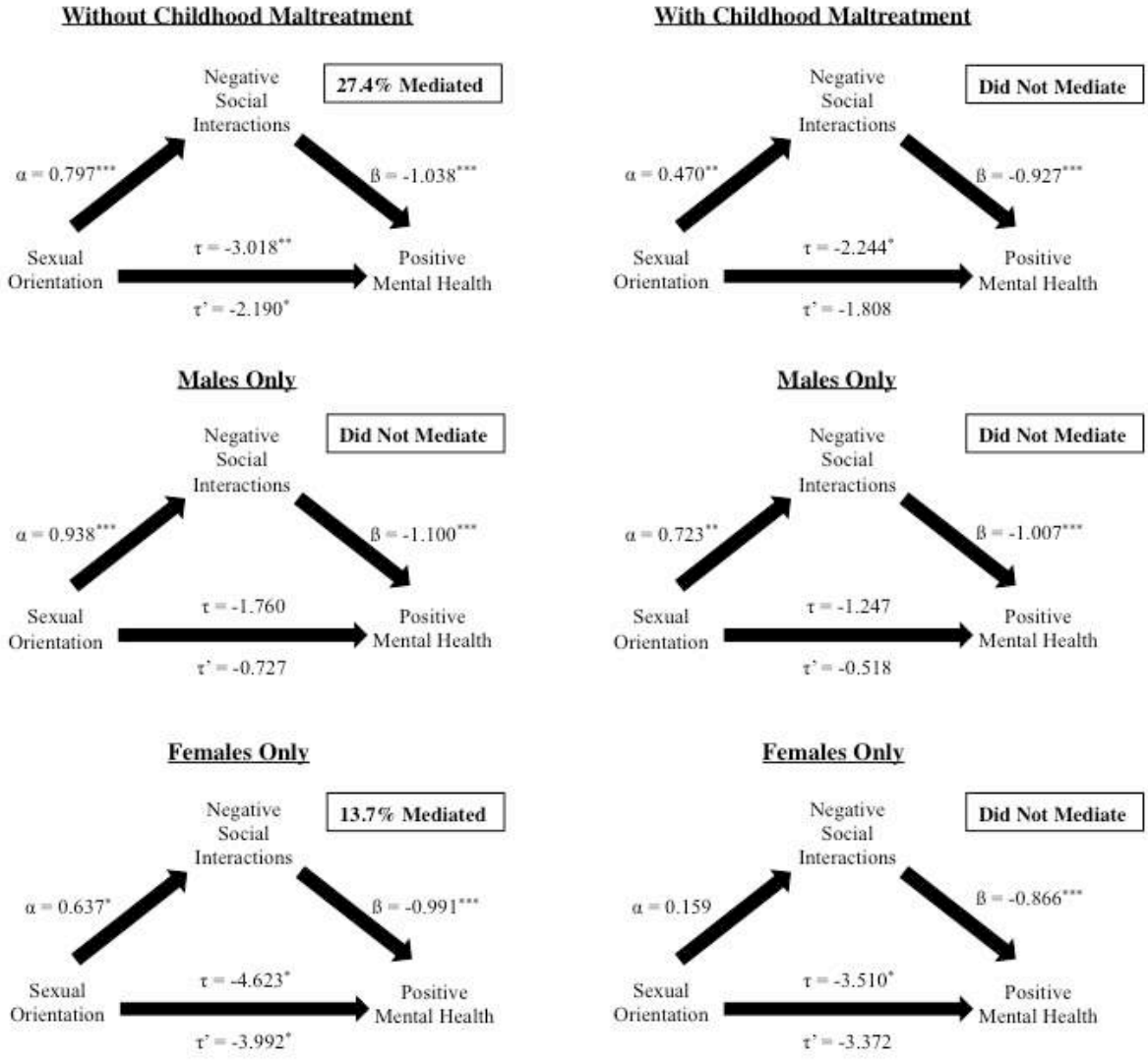


Figure 5B

Linear and sex-based mediation models for positive mental health with and without childhood maltreatment included as a covariate.



Curriculum Vitae

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Universities Attended: Queen's University, 2007-2009
McGill University, 2009-2012, BSc. (Physics & Physical Sciences)
University of Toronto / The Michener Institute, 2014-2016
University of New Brunswick (Saint John), 2017-2019, BA (Honours)
University of New Brunswick (Saint John), 2019-Present, M.A. Candidate

Publications (Manuscripts Submitted for Publication):

Barry, C., Speed, D., & Best, L. (*in press*). Negative social experiences mediate the relationship between sexual orientation and mental health. (Submitted to *Journal of Homosexuality,* May, 2019)

Speed, D., **Barry, C.**, & Cragun, R. (2019). With a little help from my (Canadian) friends: Social support mediates R/S-health relationship. (Submitted to *Social Science and Medicine*, September, 2019)

Conference Presentations:

Barry, C., Speed, D., & Best, L. (2020, May 27-30). Negative social interactions affect the relationship between sexual orientation and mental health for Canadians. Gimme-5 selected for presentation at the 81st Canadian Psychological Association Annual National Convention, Montreal, Quebec. (Conference cancelled due to COVID-19).

Barry, C., Speed, D., Best, L., & Campbell, M. A. (2020, March 13-15). Negative social interactions affect the relationship between sexual orientation and mental health for Canadians. Oral presentation selected for presentation at Crossroads Interdisciplinary Health Research Conference, Halifax, Nova Scotia. (Conference cancelled due to COVID-19).

Barry, C. & Speed, D. (2019, November 6-7). *Negative social interactions partially mediate the relationship between sexual orientation and mental health for Canadians*. Poster presentation selected for presentation at the New Brunswick Health Research Foundation Conference, Saint John, New Brunswick.

Barry, C., & Speed, D. (2019, October 25-27). *Negative social interactions partially mediate the relationship between sexual orientation and mental health for Canadians*. Poster presentation selected for presentation at the Canadian Research Data Center Network (CRDCN) Conference, Halifax, Nova Scotia.

Barry, C., Speed, D., & Best, L. (2019, June 14). *Negative social interactions partially mediate the relationship between sexual orientation and mental health for Canadians*. Poster presentation presented at the Interprofessional Health Research (iHR) Conference, Horizon Health Network, Saint John, NB.

Speed, D., **Barry, C.**, & Cragun, R. (2019, May 31-June 2). *Social support partially mediates the relationship between religion/spirituality and mental health for Canadians*. Poster session presented at the 80th Canadian Psychological Association Conference, Halifax, NS.

Barry, C., Speed, D., & Best, L. (2019, May 6-7). *Negative social interactions partially mediate the relationship between sexual orientation and mental health for Canadians*. Oral presentation presented at the Science Atlantic Psychology Conference, Mount Allison University, Sackville, NB.

Barry, C., Speed, D., & Best, L. (2019, March 21-22). *Negative social interactions partially mediate the relationship between sexual orientation and mental health for Canadians*. Poster presentation presented at the Graduate Research Conference, University of New Brunswick, Fredericton, NB.

Academic Awards:

Social Sciences and Humanities Research Council Award (2020)
New Brunswick Research Data Center (RDC) Conference Grant (2019)
School of Graduate Studies Travel Award (2019)
New Brunswick Innovation Foundation (NBIF) Tri-Council Award (2019)
Science Atlantic Psychology Conference – SSHRC Undergraduate Research Award for Best Oral Research Presentation (2019)
Barbara Elizabeth Fisher Founder Prize in Psychology (2018, 2019)
Erskine Ireland Carter Memorial Prize in Psychology (2018)
Elekta Radiation Therapy Scholarship (2016)
Queens University Entrance Scholarship (2007, 2008)