

SEXUAL MINORITY STRESS AND PSYCHOLOGICAL RISK FOR NONSUICIDAL
SELF-INJURY: EXAMINATION OF A MEDIATIONAL MODEL

By

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ABSTRACT OF THE THESIS

Sexual Minority Stress and Psychological Risk for Nonsuicidal Self-Injury: An

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Sexual minorities consistently have been shown to be at greater risk for mental health problems and nonsuicidal self-injury (NSSI) behaviors, and this increased risk appears caused by both general psychological risk factors and sexual minority stressors. Most past research on NSSI in sexual minorities, however, has focused on youth populations and has studied general psychological risk factors and sexual minority stressors separately. The current study fills these gaps in the literature by examining NSSI in a sexual minority adult population, examining both general mental health variables and sexual minority stressors together in their relationship to NSSI. 388 adults, 303 of whom were sexual minorities, completed a computerized task to measure internalized homophobia as well as a variety of questionnaires about NSSI, mental health difficulties, and experiences of sexual minority stress. Results found that sexual minority adults were significantly more likely than exclusively heterosexual adults to have engaged in NSSI,

to have higher levels of NSSI behaviors, to experience higher levels of mental health problems (such as depression and emotion dysregulation), and to experience higher levels of sexual-orientation-based discrimination. Similarly, self-injuring sexual minority adults reported higher levels of mental health problems than non-self-injuring sexual minority adults. Regression analyses revealed that mental health problems predicted lifetime NSSI behaviors in sexual minority adults, but that sexual minority stressors did not. These findings suggest that NSSI remains a significant problem into adulthood for sexual minorities and that addressing general mental health problems via clinical intervention and prevention programs might work to decrease this population's increased risk.

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I. Introduction

Sexual minority populations have long faced significant physical and mental health disparities. When compared to heterosexual individuals, lesbian, gay, bisexual, and queer (LGBQ; an umbrella term often used to describe anyone who falls outside of an exclusively heterosexual identity) individuals are significantly more likely to experience anxiety, depression, and substance abuse problems (King et al., 2008; Cochran & Mays, 2000; Bostwick, Boyd, Hughes, & McCabe, 2010; Operario et al., 2015; Ueno, 2010). They also report higher levels of general mental health difficulties, such as emotion dysregulation (Hatzenbuehler, McLaughlin, & Nolen-Hoeksema, 2008), lower self-esteem (Plöderl & Fartacek, 2005), and social isolation (Eisenberg & Resnick, 2006; Hatzenbuehler, 2009; Ploderl & Fartacek, 2005). More recently, research has shown that sexual minorities experience particularly high rates of nonsuicidal self-injury (NSSI) when compared to their heterosexual counterparts (Batejan Batejan, Jarvi, & Swenson, 2014).

NSSI, defined as the purposeful destruction of body tissue without suicidal intent (Klonsky & Muehlenkamp, 2007), includes many types of self-injurious behaviors (e.g., cutting, burning, or hitting oneself) and is associated with a variety of negative interpersonal and emotional consequences (Asarnow et al., 2011; Klonsky, 2009). It is a significant public health concern that has gained increasing recognition in recent decades (Klonsky, Muehlenkamp, Lewis, & Walsh, 2011). Notably, NSSI is also associated with substantially increased risk for subsequent suicide attempts (Guan, Fox, & Prinstein, 2012; Asarnow et al., 2011), increasing the importance of research being dedicated to understanding the risk factors that predict NSSI's onset and maintenance.

A substantial amount of research has focused on identifying correlates and risk factors for NSSI. Previous studies have found that NSSI appears particularly related to internalizing symptoms, such as depression, (Hilt, Cha, & Nolen-Hoeksema, 2008; Gollust, Eisenberg, & Golberstein, 2008), rumination (Selby, Franklin, Carson-Wong, & Rizvi, 2013; Hilt, Cha, & Nolen-Hoeksema, 2008), and emotion dysregulation (Gratz & Roemer, 2004; Brickman, Ammerman, Look, Berman, & McClosky, 2004). Additionally, borderline personality disorder (BPD) and its related symptoms (e.g., impulsivity, emotion dysregulation, interpersonal difficulties, and self-concept or identity disturbance) have regularly been associated with NSSI throughout research literature and clinical practice (Muehlenkamp, Ertelt, Miller, & Claes, 2011; Brickman, Ammerman, Look, Berman, & McClosky, 2004; Selby, Kranzler, Fehling, & Panza, 2015). Yet, there are some inconsistent findings in the field, few constructs predict NSSI as well as past NSSI behaviors, and more research is needed to fully understand why people begin to hurt themselves on purpose (Fox et al., 2015). The field's overall poor understanding of NSSI, its predictors, and its prevention and treatment is particularly alarming when considering NSSI in sexual minority individuals due to their significantly increased risk.

Although the literature is consistent in its conclusions that sexual minority populations are at increased risk for NSSI, it is limited in a number of ways. First, most studies that have found increased rates of NSSI in sexual minority populations have focused on youth and young adults (Tsypes, Lane, Paul, & Whitlock, 2015; Whitlock, et al., 2011; Walls, Laser, Nickels, & Wisneski, 2010; Serras, Saules, Cranford, & Eisenberg, 2010; Sornberger, Smith, Toste, & Heath, 2013). While NSSI has sometimes been viewed as a problem largely exclusive to youth (Selby, Kranzler, Fehling, & Panza,

2015), growing evidence suggests that NSSI is a relatively stable behavior that can persist into adulthood (Moran et al., 2012; Bjärehed, Wångby-Lundh, & Lundh, 2012). Sexual minority adults particularly appear to be at higher risk of suicide and self-injury than the general population (King and colleagues, 2008), and more research on NSSI in this population is needed.

Second, most research on NSSI in sexual minorities has focused on individuals who actively identify as LGBTQ. Sexual minority status and sexual identity, however, can be divided into three separate dimensions: sexual orientation identification, sexual attraction, and sexual behavior. Past research shows that it is relatively common for an individual to report discordance between the three dimensions (such that an individual, for example, may report same-gender attraction yet still identify as heterosexual; LGB Youth Sexual Orientation Measurement Work Group, 2003). Furthermore, previous studies have shown that there is increased risk for self-injury in men and women who report same-gender attraction (Skegg, Nada-Raja, Dickson, Paul, & Williams, 2003) and same-gender sexual behavior (Wichstrøm & Hegna, 2003), regardless of explicit sexual orientation identification. As most research does not include comprehensive assessments of the different sexual identity dimensions, it is important for future research to study the relationship between NSSI and sexual minority status in more nuanced ways. In sum, NSSI is a significant public health concern in sexual minorities, yet there remains a significant dearth of research on why sexual minorities are at greater risk for NSSI and how exactly this risk is conferred.

Possible Explanations for NSSI Disparities in Sexual Minority Populations

A substantial amount of research suggests that LGBTQ people's higher rates of

NSSI are connected to their higher rates of mental health problems. As previously discussed, emotion dysregulation, depression, and substance abuse have been associated with NSSI (Gollust, Eisenberg, & Golberstein, 2008; Brickman, Ammerman, Look, Berman, & McClosky, 2004; Gratz & Roemer, 2004; Serras et al., 2010); and sexual minorities seem to be at particular risk for all of these mental health difficulties (King et al., 2008; Hatzenbuehler, McLaughlin, & Nolen-Hoeksema, 2008). Furthermore, while very limited research has examined BPD specifically in sexual minorities, research suggests that sexual minorities also face increased general risk for personality disorders (Bolton & Sareen, 2011). Therefore, the elevated rate of NSSI in sexual minorities appears consistent with the population's increased risk for impulsive behaviors and mental health difficulties. Even if higher rates of mental disorders fully accounted for sexual minorities' increased rates of NSSI, however, general NSSI risk factors remain poorly understood, and the LBGQ population's high rates of psychopathology still need more precise explanation. Various researchers have suggested that the disparities in both mental illness and NSSI can be explained by risk factors that are unique to sexual minorities. The majority of this work is grounded in Meyer's Minority Stress Model (Meyer, 1995).

The Minority Stress Model. The Minority Stress Model, as proposed by Meyer (1995, 2003a), posits that the mental health disparities found in LGBQ people are due to the fact that sexual minorities are persistently subjected to unique *minority stress*. Minority stress comprises the specific stressors faced by people “who are in a disadvantaged social position because they require adaptation to an inhospitable social environment, such as the LGB person's heterosexist social environment” (Frost & Meyer,

2009, p. 97). These stressors include both distal stressors (e.g., general factors in an individual's environment, such as broad societal persecution of sexual minorities) and proximal stressors (e.g., intrapersonal reactions to and experiences with sexual minority identity, such as internalized disgust of non-heterosexual practices) that result in stigmatization and psychological pressure. Originally, Meyer (1995) proposed that there were three primary minority stressors: internalized homophobia, perceived discrimination, and experienced discrimination (discussed in more detail below). This model has expanded in the past two decades, and researchers have examined the impact of minority stress on many mental health outcomes in LGBTQ people.

Minority Stress and Mental Health. The literature has largely substantiated the Minority Stress Model, showing associations between mental health problems and both proximal and distal minority stressors. The distal stressor *structural stigma* – which refers to “societal-level conditions, cultural norms, and institutional policies that constrain the opportunities, resources, and wellbeing of the stigmatized” (Hatzenbuehler & Link, 2014, p. 2) – has been found to be a risk indicator for general mental and physical health problems in sexual minority populations (Hatzenbuehler, 2014). For example, Hatzenbuehler and colleagues (2010) found that rates of mental illness in LGBTQ populations increased significantly in states when same-sex marriage bans had been enacted. This increased risk is likely due to the discrimination that structural stigma prompts, and experiencing explicit discrimination is significantly associated with higher levels of various mental health problems in sexual minorities (Mays & Cochran, 2001; Kelleher, 2009; Hershberger & D’Augelli, 1995). Furthermore, a recent daily diary study found that a variety of distal minority stressors were directly linked to proximate

increases in negative affect in sexual minority young adults (Mohr & Sarno, 2015).

Although distal stressors clearly impact the mental health of sexual minorities, one of the most studied stressors in the literature is the proximal stressor of internalized homophobia¹, which refers to “the gay [*sic*] person’s direction of negative social attitudes toward the self” (Meyer & Dean, 1998, p. 161). In the face of significant or consistent anti-LGBQ prejudice, sexual minority individuals may internally and unconsciously form self-denigrating or self-hating attitudes against LGBQ behavior, attraction, and identity. This internalized homophobia may persist regardless of how much time has passed since the individual came out publically with an LGBQ identity (Gonsiorek, 1988, Frost & Meyer, 2009), and it can have a negative impact on a sexual minority individual’s global self-concept and well-being (Frost & Meyer, 2009). Accordingly, past research has shown that internalized homophobia is associated with higher levels of emotion dysregulation (Hatzenbuehler, Dovidio, Nolen-Hoeksema, & Phills, 2009), depressive symptoms (Newcomb & Mustanski, 2010; Igartua, Gill, & Montoro, 2003; Herek, Cogan, Gillis, & Glunt, 1998), and general mental and physical illness (Berg, Munthe-Kaas, & Ross, 2015; Williamson, 2000).

Previous research suggests that internalized homophobia might predict mental health difficulties even if a sexual minority individual doesn’t overtly realize he or she holds such attitudes. Throughout social psychology literature, researchers have utilized

¹The term “internalized homophobia” has engendered controversy in the literature. Some argue that the term is too limited in its scope, seeming to linguistically exclude individuals who identify as bisexual/queer/questioning or individuals who engage in non-heterosexual behaviors while actively identifying as heterosexual. Additionally, some have argued that the term overly suggests that the core emotional experience of internalized homophobia is fear, while ignoring the importance of shame, guilt, anger, and disgust. (For reviews, see Herek [2004] or Williamson [2000].) Other terms, such as “internalized heterosexism” or “internalized sexual stigma” have been used and suggested in the literature. This project recognizes this debate, but utilizes the term “internalized homophobia” because it is the most widely used term in the literature.

the Implicit Association Test (IAT) to assess an individual's implicit attitudes (Greenwald, Poehlman, Uhlmann, & Banaji 2009). The IAT is a computerized task designed to assess implicit attitudes by measuring differences in response times when sorting words or images into emotionally valenced categories. When categories are created with the target concept representing identity concepts (e.g., heterosexuality versus homosexuality), the differential association denotes strength of an implicit bias against one of those identities (e.g., internalized homophobia). One study in LGB adults found that implicit internalized homophobia, as recorded through a homosexuality-focused IAT, was positively associated with rumination and distress, when explicit internalized homophobia, as recorded through a self-report measure, was not (Hatzenbuehler, Dovidio, Nolen-Hoeksema, & Phillips, 2009). While there are some areas of contradiction or uncertainty, the literature on mental health and minority stressors largely supports Meyer's Minority Stress Model.

Minority Stress and NSSI. Preliminary research supports the notion that the Minority Stress Model can be applied to NSSI and self-injury broadly defined. Hatzenbuehler (2011) found that structural stigma (operationalized using social environment characteristics such as the number of school policies in the local school districts that explicitly protected LGBTQ students) had a significant impact on the likelihood that sexual minority youth would report suicide attempts in the past year. Relatedly, sexual minority victimization and discrimination have been associated with higher rates of NSSI (Liu & Mustanski, 2012; DeCamp & Bakken, 2015; Muehlenkamp, Hily, Ehlinger, & McMillan, 2015; Blosnich & Bossarte, 2012). Other studies have discovered that sexual minority individuals seem to face the biggest risk for self-injury

immediately following self-disclosure of their LGBQ identity to their family (Igartua, Gill, & Montoro, 2009; Meyer, Teylan, & Schwartz, 2014), possibly because self-disclosure can lead to rejection, which in turn is associated with self-injury (Ryan, Huebner, Diaz, & Sanchez, 2009). Another study found that risk for self-injury increased after the individual realized his or her LGBQ identity (Wichstrøm & Hegna, 2003), suggesting that self-injury could be impacted by minority stressors, regardless of an individual's public sexual identity. Accordingly, internalized homophobia and self-hatred have been connected to NSSI in qualitative studies (Alexander & Clare, 2004; Scourfield et al., 2008); however, quantitative empirical study of the relationship between internalized homophobia and NSSI specifically is lacking. Overall, NSSI disparities between heterosexual and LGBQ individuals do seem to be related to minority stressors, although more research is needed, particularly with adults.

The Psychological Mediation Framework. While past research has provided a considerable amount of evidence supporting Meyer's Minority Stress Model, it remains unclear exactly *how* minority stressors increase the likelihood of psychopathology in sexual minority individuals. Furthermore, research on suicide in LGBQ people reveals that mental disorders and general psychological processes do not seem to explain a majority of the variance in suicidal behaviors (Haas et al., 2010). One study found that sexual minority individuals still showed significantly higher rates of suicide attempts than heterosexual individuals even when the analyses controlled for presence of mental disorders (Bolton & Sareen, 2011). Due to the connection between suicide and NSSI, it seems probable that further research studying NSSI specifically would reveal a similar pattern, with general psychological risk factors not fully explaining the variance in NSSI

in LGBTQ people. Furthermore, limited research examines both general and LGBTQ-specific risk factors simultaneously when examining the mental health problems experienced by sexual minority individuals, preventing the literature from fully combining various theories.

Hatzenbuehler (2009) discussed these problems and suggested a new psychological mediation framework through which sexual minority mental health disparities might be understood. In the Minority Stress Theory, minority stress mediates the relationship between social status and psychopathology. In contrast, Hatzenbuehler's psychological mediation framework utilizes the literature on general psychological processes in sexual minority individuals. He proposes that these general psychological processes (e.g., affective and cognitive causes of mental health problems) mediate the relationship between distal minority stressors and psychopathology. Thus, this mediational model suggests that distal minority stressors increase an LGBTQ individual's risk of mental health problems primarily by increasing the individual's emotion dysregulation, interpersonal conflict, or maladaptive cognitive processes. Accordingly, increases in such experiences may then contribute to more severe mental health symptoms, such as NSSI.

Preliminary evidence does support the framework. Various studies have found that general psychological risk factors (e.g., depression, emotion dysregulation, shame) mediate the association between stigma-related minority stressors and suicide attempts (Mustanski & Liu, 2013), suicidal ideation (Michaels, Parent, & Torrey, 2015), and psychological distress (Mereish & Poteat, 2015; Hatzenbuehler, Dovidio, Nolen-Hoeksema, & Phills, 2009). One study found that internalized homophobia did not

predict suicide above and beyond depressive symptoms (Igartua, Gill, & Montoro, 2009), supporting the idea that minority stress alone cannot account for the mental health disparities facing sexual minorities. A recent study corroborated this research, finding that depressive symptoms mediated the relationship between internalized homophobia and suicidal ideation in gay men and lesbian women (McLaren, 2015). Another study found that perceived burdensomeness, believing that one is a burden on others (a construct consistently connected to suicide in research; Van Orden, Witte, Gordon, Bender, & Joiner, 2008), mediated the association between internalized homophobia and suicide proneness (Cramer, Burks, Stroud, Bryson, & Graham, 2015). Most of the research on NSSI in sexual minority individuals has not simultaneously examined general and LGBTQ-specific risk factors, and few studies have studied distal stressors as the first step in mediational models. Therefore, no claims can yet be made about the validity of the psychological mediation framework of minority stress and its role in NSSI among sexual minority adults.

The Current Study

The literature suggests that a wide variety of both general psychological and LGBTQ-specific risk factors contribute to the mental health and NSSI disparities that sexual minority populations face. Yet, most of the literature fails to integrate the various findings of previous research in the way that Hatzenbuehler's (2009) psychological mediation framework recommends. In addition, most studies examining the correlates of NSSI in sexual minority populations rely on data from youth populations, do not use validated measures of NSSI, do not include comparison samples of participants endorsing heterosexual identity, and do not include sexual minorities who do not explicitly identify

as sexual minority (e.g., actively or publically identify as gay, lesbian, bisexual, or queer). The current study aims to fill these gaps in the literature by examining a variety of general and LGBTQ-specific risk factors for NSSI in a diverse sample of sexual minority adults.

As a part of this study there are three primary hypotheses. First, I expected to corroborate previous research, hypothesizing that sexual minority adults would report significantly higher levels of mental health difficulties as compared to exclusively heterosexual adults. Specifically, I hypothesized that sexual minority adults would experience increased levels of depression, rumination, emotion dysregulation, and BPD symptoms. Second, I expected that mental health difficulties and sexual minority stress (i.e., experienced discrimination and internalized homophobia) would be significantly higher in sexual minority adults who have engaged in NSSI as compared to sexual minority adults who have never engaged in NSSI. Third, I hypothesized that elevated sexual minority stressors, particularly discrimination, would predict increased NSSI frequency in sexual minority adults, and that mental health difficulties would mediate this association.

II. Method

Participants

I recruited a total of 388 adults (aged 18-64), 303 of which were sexual minority. 105 of these participants were recruited for the sexual minority in-person study, 111 were recruited for the heterosexual in-person study, and 172 were recruited through the online study. Of these 388 adults, 303 were identified as sexual minority because they identified as a non-heterosexual sexual orientation (e.g., gay, lesbian, bisexual, and other) ($n = 256$), reported same-gender sexual attraction ($n = 291$), and/or reported same-gender sexual behavior in their lifetime ($n = 232$). Sixty-four percent of the entire study sample identified as female ($n = 249$), 30% identified as male ($n = 115$), 6% identified as other ($n = 24$), and 91% identified as cisgendered ($n = 356$). In terms of race, 51% of the sample was white/Caucasian ($n = 201$), 16% was Asian ($n = 64$), 12% was Hispanic ($n = 48$), 11% was black ($n = 44$), 2% was Native American ($n = 7$), and 8% was Other or multiple races ($n = 21$). Fifteen percent of the sample identified their ethnicity as Hispanic ($n = 60$). In terms of socioeconomic status, 34% of the sample reported their annual household income to be \$40,000-89,999 ($n = 132$), 26% reported greater than \$90,000 ($n = 102$), 21% reported \$20,000-39,999 ($n = 83$), and 18% reported less than \$19,000 ($n = 69$).

Of the 388 participants, 129 identified as heterosexual, 84 identified as gay/lesbian/homosexual, 147 identified as bisexual/pansexual, and 28 identified as other, asexual, or unknown. Of the 129 heterosexual participants, 30% identified as male ($n = 39$) and 70% identified as female ($n = 90$); and 69% reported being exclusively attracted to the opposite gender ($n = 88$). Of the 84 homosexual participants, 49% identified as male ($n = 41$), 48% identified as female ($n = 40$), and 3 identified as other ($n = 3$). Of the

147 bisexual participants, 23% identified as male ($n = 33$), 69% identified as female ($n = 102$), and 8% identified as other ($n = 12$). Of the 28 participants of other/unknown sexual orientation, 7% identified as male ($n = 2$), 61% identified as female ($n = 17$), and 32% identified as other ($n = 9$). For full demographic information on the study samples, see Table 1.

Procedure

This project was comprised of three sub-samples: two in-person and one online. For the in-person study, I actively recruited two separate samples: adults who explicitly identified as heterosexual ($N = 105$), and adults who explicitly identified as lesbian, gay, bisexual, queer, or non-heterosexual ($N = 111$). Sexual minority participants for the sexual minority in-person study were recruited through flyers and advertisements in the local area as well as through the Rutgers Human Subjects Pool, and heterosexual participants for the in-person study were recruited exclusively through the Rutgers Human Subjects Pool. Heterosexual participants were administered the same questions assessing sexual orientation, sexual attraction, and sexual behavior as the sexual minority participants. As noted above, some participants who were recruited for the heterosexual sample (because they explicitly identified as heterosexual through the Rutgers Human Subjects Pool prescreening survey) reported same-gender attraction or same-gender sexual behavior on our study's questionnaires. Because endorsement of same-gender sexual attraction and same-gender sexual behavior should arguably be used to define sexual minority status in addition to sexual orientation when studying health disparities (Mayer, Bradford, Makadon, Stall, Goldhammer, & Landers, 2008), and both sexual attraction and behavior have been shown to be related to NSSI specifically (Skegg, Nada-

Raja, Dickson, Paul, & Williams, 2003; Wichstrøm & Hegna, 2003), these individuals were treated as sexual minorities in our analyses.

For the online study sample, I recruited sexual minority participants via Amazon Mechanical Turk Amazon Mechanical Turk website (MTurk: www.mturk.com). MTurk is an online crowdsourcing marketplace where jobs and research studies are posted and people can complete tasks for pay. It has been determined to be a high-quality system to use for research (Buhrmester et al., 2011; Litman, Robinson, & Rosenzweig, 2014), and it has previously been used as a valid method in the study of self-injurious behaviors (Andover et al., 2014). A prescreen questionnaire was used to confirm participant age and sexual orientation before any other study procedures were administered. Based on recommended guidelines for online research through MTurk, several attention checks were used in the online survey. These attention checks asked participants to provide specific answers (e.g., “If you are paying attention, select ‘1 – Never’ for your answer?”), and participants were excluded from further data collection if they failed any of these attention checks. One thousand two hundred eighty-seven people responded to the study’s post on MTurk and attempted to participate in the study. Of these 1,287 people, 742 completed the prescreening questionnaire and 249 were considered eligible. Of these 249 eligible individuals, 214 people completed consent for the study. Of these 214 participants, 172 completed study procedures, 22 failed attention checks, and 20 chose to stop participation during study procedures. Only data from the 172 participants who completed study procedures and received compensation was included in these analyses.

Study procedures consisted of a 30-minute session during which participants completed self-report questionnaires that assessed a variety of mental health-related and

LGBQ-related indices, as well as an IAT (described in detail below). For both the in-person and online samples, the study survey was hosted on Qualtrics, an online-based, private research company that specializes in data collection. Data entered through Qualtrics was not connected to any participant identifying information. For the completion of all study procedures, in-person sexual minority participants received \$15 as compensation, in-person heterosexual participants received course credit as compensation, and online sexual minority participants received \$1 through MTurk as compensation.

This study was approved by the Institutional Review Board at Rutgers University.

Measures

Demographics. General demographic information was collected, including sex, gender, age, sexual orientation, race, ethnicity, and annual household income. Gender identity and sexual orientation information was collected using questions based on recommendations in the literature (Badgett, 2009; The Fenway Institute, 2013; Alper, Feit, & Sanders, 2013). Current sexual orientation identification, current sexual attraction, and lifetime sexual behavior were collected separately. A participant was assessed to be sexual minority if they reported same-gender sexual behavior, reported same-gender sexual attraction, or self-identified as a non-heterosexual sexual orientation (e.g., homosexual or bisexual). A participant was assessed to be transgender if their current gender identity differed from their sex assigned at birth. A “sample” variable was created that identified which study sample each individual participant is from (e.g., in-person participants were labeled as “sample 1” and online participants were labeled as “sample 2”). Several demographic variables were entered as covariates into analyses (see

below for details).

The Inventory of Statements about Self-Injury (ISAS). For this project, the ISAS (Klonsky & Olino, 2008) was used to measure engagement in NSSI. The ISAS is a comprehensive measure of self-injurious behaviors that asks participants questions about lifetime NSSI frequency, lifetime NSSI methods used (e.g., cutting, biting, or burning), age at first self-injury, age of most recent self-injury, and the functions and motivations of NSSI. The ISAS previously has been demonstrated to have good internal consistency ($\alpha = .84$), test-retest reliability ($\rho = .85$), and validity (Klonsky & Olino, 2008; Klonsky & Glenn, 2009). For this study, an additional question will be added to assess lifetime suicidal behavior, as well as NSSI in the past year specifically. Total lifetime NSSI behaviors were calculated by summing the total NSSI behaviors reported for each individual method, and total lifetime “severe” NSSI behaviors were calculated by summing the total NSSI behaviors reported for only the methods of cutting, biting, burning, skin carving, and hitting oneself. Lifetime NSSI engagement and past-year engagement were used as dependent variables for hypotheses 1, 2, and 3 while total number of lifetime NSSI behaviors was used as the primary dependent variable in hypothesis 3.

The Center for Epidemiological Studies Depression Scale (CESD). The CESD (Radloff, 1977) was used to measure current symptoms of depression. This 20-item measure asks participants to indicate how often they have experienced various depressive symptoms (e.g., “I felt that everything I did was an effort”) over the past week on a four-point scale from “rare or none of the time (less than a day)” to “most or all of the time (5-7 days).” The CES-D has been shown to have good internal consistency ($\alpha = .85$),

expected test-retest reliability ($\rho = .51-.67$), and good validity (Lewinsohn, Seeley, Roberts, & Allen, 1997; Radloff, 1977; Roberts, Andrews, Lewinshon, & Hops, 1990). This measure obtained good internal consistency in the current study as well ($\alpha = .93$). This measure of depression was used as one measure of mental health difficulties, a dependent variable in hypotheses 1 and 2, and a mediator in hypothesis 3.

The McLean Screening Instrument for Borderline Personality Disorder

(MSI-BPD). The MSI-BPD (Zanarini et al., 2003) was used to measure lifetime symptoms of BPD, which are commonly associated with NSSI in the literature (Klonsky, Oltmanns, & Turkheimer, 2003). This 10-item measure asks participants if they have ever experienced the symptoms of BPD associated with the diagnosis criterion (e.g., “Have you been extremely moody?”), providing only “yes” and “no” answer choices. The MSI-BPD has been demonstrated to have good internal consistency ($\alpha = .74$) as well as good test-retest reliability ($\rho = .72$), and high specificity as compared to other validated structural interviews for BPD (Zanarini et al., 2003). The MSI-BDI had good internal consistency in the current study ($\alpha = .81$). This measure of BPD symptoms was used as one measure of mental health difficulties, a dependent variable in hypotheses 1 and 2, and a mediator in hypothesis 3.

The Difficulties with Emotion Regulation Scale (DERS).

The DERS (Gratz & Roemer, 2004) was used to measure emotion dysregulation. This 36-item measure asks participants to rate on a five-point scale from “almost never” to “almost always” how often they struggle with a variety of emotion regulation difficulties (e.g., “I experience my emotions as overwhelming and out of control”). The scale has been shown to have good internal consistency ($\alpha = .93$), good test-retest reliability ($\rho = .88$), and good validity

(Gratz & Roemer, 2004). The DERS total score demonstrated strong internal consistency in this sample ($\alpha = .99$). This measure of emotion dysregulation was used as one measure of mental health difficulties, a dependent variable in hypotheses 1 and 2, and a mediator in hypothesis 3.

The Ruminative Responses Scale (RRS). The RRS (Treynor, Gonzalez, & Nolen-Hoeksema, 2003) was used to measure rumination, or the degree to which individuals respond in ruminative ways during depressed moods. This 22-item measure asks participants to indicate how often they engage in a variety of ruminative responses (e.g., “Think about how alone you feel”) on a four-point scale of “almost never” to “almost always.” The scale has been shown to have good internal consistency ($\alpha = .90$), good test-retest reliability ($\rho = .67$), and good validity (Treynor, Gonzalez, & Nolen-Hoeksema, 2003; Butler & Nolen-Hoeksema, 1994). In this study it also demonstrated good internal consistency ($\alpha = .94$). This measure of rumination was used as one measure of mental health difficulties, a dependent variable in hypotheses 1 and 2, and a mediator in hypothesis 3.

Internalized Homophobia Scale (IHP). A version of the IHP (Meyer, 1995) was used to measure explicit internalized homophobia, or the extent to which LGBTQ individuals reject their sexual orientation. The scale has been shown to have good internal consistency ($\alpha = .79$; Meyer, 1995). I used a version similar to the scale used in previous research (Frost & Meyer, 2009). This version is a 9-item measure that asks participants to rate on a four-point scale from “often” to “never” how frequently they experience various homophobic thoughts and behaviors (e.g., “I feel it best to avoid personal or social involvement with other non-heterosexual people”). Higher scores on the IHP indicate

higher levels of internalized homophobia, with 9 being the lowest possible score and 36 being the highest. The IHP obtained good internal consistency in this study ($\alpha = .85$). This measure of internalized homophobia was used as one measure of sexual minority stress, a dependent variable in hypotheses 1 and 2, and an independent variable in hypothesis 3.

Experiences of Discrimination Scale (EDS). The EDS will be used to measure lifetime experiences with sexual-orientation-based discrimination. It was originally created and validated for measuring racial and ethnic discrimination (Williams, Yu, Jackson, & Anderson, 1997), but has been adapted and validated for measuring sexual orientation-based discrimination (McCabe, Bostwick, Hughes, West, & Boyd, 2010; Krieger et al., 2005). The version used in this study is a six-item measure that asks participants to indicate how often they have “experienced discrimination, been prevented from doing something, or been hassled or made to feel inferior” in various situations on a four-point scale from “1 - never” to “4 - very often.” Therefore, a score of 6 was the lowest possible score one could receive and indicated a participant reported never experiencing sexual-orientation-based discrimination, while a score of 24 was the highest possible score. The scale has been shown to have good internal consistency ($\alpha = .74$), good test-retest reliability ($\rho = .70$), and good validity (Krieger et al., 2005). In this study the EDS obtained good reliability ($\alpha = .81$). This measure of discrimination was used as one measure of sexual minority stress, a dependent variable in hypotheses 1 and 2, and an independent variable in hypothesis 3.

Homophobia-based IAT. This study used an Sexual Orientation IAT (SO-IAT) as a measure of implicit heterosexism in heterosexual participants and as a measure of

implicit internalized homophobia in sexual minority participants. The SO-IAT is composed of several stages during which the individual is asked to classify words and images into categories while the responses and response times are being recorded. There are four categories of words/images: two categories representing the primary target concept (“straight” versus “gay”), and two categories representing an attribute (“pleasant” versus “unpleasant”). Over the several stages, target concept categories are paired with attribute categories alternatively, and participants sort words/images into these pairs of categories. During stages when category pairs represent highly automatically associated concepts (e.g., gay/unpleasant and straight/pleasant), participants will be able to sort words more quickly than in stages when category pairs represent less automatically associated concepts (e.g., gay/pleasant and straight/unpleasant). The greater the difference in response times (or, latencies) between stages, the greater the differential association between certain target concept and attribute pairings.

The SO-IAT was calculated using the standardized scoring algorithms used in the literature (Lane, Banaji, Nosek, & Greenwald, 2007). The mean latency for each SO-IAT stage was computed, and the difference in mean latencies between SO-IAT stages was computed and then divided by the standard deviation of all latencies in the stages (which provided a *D* score; Greenwald et al., 2009). In sexual minority participants, SO-IAT *D* scores were used to measure the minority stressor of internalized homophobia, with larger differences in response latencies leading to larger *D* scores, which in turn indicated stronger internalized homophobia. In heterosexual participants, *D* scores were used to measure internalized heterosexism and were not conceptualized as a minority stressor in

these individuals. Previous studies have shown homosexuality-based IATs have good validity and reliability (Banse, Seise, & Zerbes, 2001; Steffans & Buchner, 2003; Millar, Wang, & Pachankis, 2016). In this study, the SO-IAT was significantly, but weakly, positively correlated with the IHP ($r = .134, p < .05$).

Data Analytic Strategy

I first examined the dataset for any participants who had failed attention checks and deleted participant cases when any single attention check was failed ($n = 22$). I then examined the dataset for missing data. While most completing participants had no missing data, thirty-four cases had one missing item from the RRS. These missing data were assumed to be missing at random and then handled by entering in the rounded average score of the other completed RRS items for that participant. I then examined descriptive information for all independent and dependent variables. The ISAS total count data included five values that were determined to be unrealistically high, and these five outliers were brought down to equal the sixth-highest value in this variable. All dependent and independent variables appeared normal in their distributions and had skewness statistics less than two. Next, I compared the in-person and online study samples via multivariate analyses of variance (MANOVAs) and Chi-Square analyses on all demographics variables. The variables that were determined to be significantly different between samples were entered into all analyses as covariates. To account for the multiple variables examined in each analysis, I corrected my alpha to .01 to determine significance.

Hypothesis 1: Comparison of Sexual Minority Adults Versus Heterosexual Adults. In order to assess whether sexual minority adults report higher levels of mental

health difficulties than heterosexual adults, a multivariate analysis of covariance (MANCOVA) was used to examine the differences in each sample's mean levels of emotion dysregulation, rumination, BPD symptoms, and depressive symptoms. Similarly, in order to validate my behavioral measure of implicit homophobia with the self-report measures of sexual minority stress, I used a MANCOVA to examine differences in sexual-orientation-based discrimination and implicit homophobia between the sexual minority adult sample and the heterosexual adult sample. For the analyses on these sexual minority stressors, I hypothesized that compared to exclusively heterosexual adults, experienced discrimination would be higher in sexual minorities and that implicit homophobia would be slightly lower in sexual minorities (due to in-group biases often seen on IATs; Ashburn-Nardo, Voils, & Monteith, 2001). Self-reported internalized homophobia could not be compared between the two groups, as the IHP can not be modified appropriately for an exclusively heterosexual person. Because the data for lifetime NSSI frequency from the ISAS was not normally distributed, I could not examine this dependent variable in the MANOVA. Instead, I used negative binomial regression to examine whether sexual minority status was associated with number of lifetime NSSI behaviors. I also used Chi-Square analyses to examine whether sexual minority adults were more likely than heterosexual adults to have engaged in NSSI ever during their life, engaged in NSSI in the past year, attempted suicide, and been previously diagnosed with a psychiatric disorder, to further examine and replicate past research findings in my study's samples.

Hypothesis 2: Comparison of Sexual Minority Adults Who Engage in NSSI Versus Sexual Minority Adults Who Do Not Engage in NSSI. For the second, I

limited my analyses to the data from sexual minority adults only. Based on previous literature suggesting that depression, emotion dysregulation, rumination, and BPD symptoms are correlated with NSSI, I expected that these mental health difficulties would be associated with NSSI in my study's sexual minority population. In order to assess whether sexual minority adults who self-injure reported higher levels of mental health difficulties than sexual minority adults who do not self-injure, I used a MANCOVA to examine the differences in each sample's mean levels of emotion dysregulation, rumination, BPD symptoms, and depressive symptoms. Similarly, based on previous research that has found sexual minority stress to be related to NSSI in sexual minority youth populations, I expected that minority stressors would also be associated with NSSI in my study's adult population. I again used a MANCOVA to examine differences in each sample's mean levels of sexual-orientation-based discrimination, explicit internalized homophobia, and implicit homophobia.

These analyses for hypothesis 2 were completed twice each, dichotomizing the sexual minority sample into NSSI and non-NSSI sample using two distinct approaches. First, sexual minority adults who have never self-injured ($n = 113$) were compared to sexual minority adults who have ever self-injured in their lifetime ($n = 190$). Second, sexual minority adults who have never self-injured were compared with sexual minority adults who have self-injured in the past year ($n = 82$). As several dependent variable measures were time-limited in their assessment (e.g., the CES-D measures depression in the past week), comparing these groups of self-injurers separately increased confidence that observed relations would hold despite the varying time periods of assessment.

Hypothesis 3: Examining a Meditational Model of Contributing Factors for NSSI in Sexual Minority Adults. For the third hypothesis, I again limited my analyses to the data from sexual minority adults only. I originally planned to exclusively use bootstrapping methods in the PROCESS SPSS macro (Hayes, 2013) to examine my mediation models, as they do not rely as heavily on normal distributions of data. Due to my main dependent variable (lifetime frequency of NSSI behaviors) being a count variable with extreme skewness (skewness statistic of 6.616), PROCESS (which uses the product of coefficients approach) no longer appeared to be the most appropriate choice for these analyses. Therefore, I analyzed the data using the four-step mediation analysis strategy (Baron and Kenney, 1986). Specifically, I used negative binomial regression analyses to examine the power of depression, rumination, emotion dysregulation, and BPD symptoms to predict lifetime NSSI behaviors. I also used negative binomial regression analyses to examine the power of experienced discrimination, implicit homophobia, and self-reported internalized homophobia to predict lifetime NSSI behaviors. Then, I used linear regression analyses to examine the power of experienced discrimination, implicit homophobia, and self-reported internalized homophobia to predict depression, rumination, emotion dysregulation, and BPD symptoms. I followed up these regression analyses using the PROCESS macro to examine if there were any significant indirect pathways between all variables that were not detected when using the regression analyses to examine direct associations.

Based on the nature of sexual minority stress, it is likely that sexual minorities who explicitly as such differ from sexual minorities who do not identify as LGBTQ. (For example, it is less likely that an individual would be discriminated based on their sexual

orientation if their non-heterosexual orientation or sexual attraction is not public knowledge.) Therefore, I replicated the analyses for hypothesis 3 in a sample of sexual minority adults who explicitly identify as sexual minority, in order to test the psychological mediation framework in these different sub-populations of sexual minorities. Additionally, I repeated the analyses for hypothesis three utilizing different NSSI variables as the outcome variables in the mediation model. Specifically, I substituted lifetime severe NSSI behaviors for lifetime NSSI behaviors, as previous research suggests that sexual minorities might be at particular risk for more severe forms of self-harm as compared to heterosexuals (Marshall et al., 2011). Similarly, I substituted lifetime NSSI engagement for lifetime NSSI behaviors and utilized binary logistic regression analyses, in order to determine whether general NSSI engagement is predicted by sexual minority stress with mental health difficulties mediating this relationship.

III. Results

Sample Descriptive Statistics

Exploratory analyses were performed to examine the frequencies and means of the dependent and independent variables in each of the study samples.

Within the exclusively heterosexual sample, there were no participants who reported having attempted suicide at some point in their life, 7 participants (8%) reported engaging in NSSI at some point in their life, and 3 (3%) reported engaging in NSSI in the past year. Lifetime NSSI behaviors ranged from 0 to 281, with a mean of 5.52 ($SD = 33.57$) NSSI behaviors. Lifetime “severe” NSSI behaviors ranged from 0 to 81, with a mean of 2.01 ($SD = 11.64$) behaviors. Exclusively heterosexual adults had scores ranging from 22 to 83 on the RRS ($M = 41.57$, $SD = 14.28$), scores ranging from 45 to 144 on the DERS ($M = 75.7882$, $SD = 22.24$), scores ranging from 0 to 9 on the MSI-BPD ($M = 2.68$, $SD = 2.70$), and scores ranging from 20 to 66 on the CESD ($M = 33.40$, $SD = 10.67$). Exclusively heterosexual participants reported scores ranging from 6 to 18 on the EDS ($M = 6.75$, $SD = 2.20$) and D scores of $-.41$ to 1.08 on the SO-IAT ($M = .41$, $SD = .37$).

Within the sexual minority population, 52 participants (17%) reported having attempted suicide at some point in their life, 190 participants (62%) reported engaging in NSSI at some point in their life, and 82 (27%) reported engaging in NSSI in the past year. Lifetime NSSI behaviors ranged from 0 to 6535, with a mean of 320.60 ($SD = 1003.17$) NSSI behaviors. Lifetime “severe” NSSI behaviors ranged from 0 to 5060, with a mean of 73.02 ($SD = 322.51$) behaviors. Sexual minority had scores ranging from 23 to 80 on the RRS ($M = 51.47$, $SD = 13.55$), scores ranging from 37 to 155 on the DERS ($M = 93.37$, $SD = 27.02$), scores ranging from 0 to 10 on the MSI-BPD ($M = 5.35$, $SD = 2.82$),

and scores ranging from 21 to 69 on the CESD ($M = 39.93$, $SD = 12.23$). Sexual minority participants reported scores ranging from 6 to 21 on the EDS ($M = 8.5$, $SD = 3.06$), scores of 9 to 30 on the IHP ($M = 14.12$, $SD = 5.05$), and D scores of -1.52 to 1.69 on the SO-IAT ($M = .03$, $SD = .47$)

Covariate Determination.

ANOVA and Chi-Square analyses revealed that the three study samples were significantly different on the variables of age ($F[2,387] = 93.60$, $p < .001$), gender ($\chi^2[4, N = 388] = 15.66$, $p < .005$), transgender identity ($\chi^2[2, N = 388] = 11.71$, $p < .005$), ethnicity ($\chi^2[2, N = 387] = 14.59$, $p = .001$), race ($\chi^2[16, N = 388] = 112.74$, $p < .001$), and income ($\chi^2[14, N = 388] = 61.29$, $p < .001$). These variables, and the sample variable, were included as covariates for all analyses below.

Hypothesis 1 Analyses.

My first hypothesis was supported. When compared to exclusively heterosexual adults, sexual minority adults reported significantly higher levels of mental health difficulties ($F[4,373] = 12.08$, $p < .001$, $\eta^2 = .12$); specifically reporting higher levels of emotion dysregulation ($F[1,376] = 22.96$, $p < .001$, $\eta^2 = .06$), rumination ($F[1,376] = 30.21$, $p < .001$, $\eta^2 = .07$), BPD symptoms ($F[1,376] = 39.57$, $p < .001$, $\eta^2 = .10$), and depressive symptoms ($F[1,376] = 10.47$, $p < .005$, $\eta^2 = .03$). Sexual minority adults were significantly more likely to be able to be diagnosed with BPD (as determined here by an MSI-BPD score of 7 or greater; $\chi^2[1, N = 388] = 26.14$, $p < .001$). Sexual minority adults were also significantly more likely to report ever engaging in NSSI in their lifetime ($\chi^2[1, N = 388] = 78.80$, $p < .001$), engaging in NSSI in the past year ($\chi^2[1, N = 388] = 16.85$, $p < .001$), having been previously diagnosed with a psychiatric disorder ($\chi^2[1, N = 388] =$

45.25, $p < .001$), and having attempted suicide in their life ($\chi^2[1, N = 388] = 45.25, p < .001$). Additionally, sexual minority adults had significantly higher rates of lifetime NSSI behaviors when compared to exclusively heterosexual adults ($t(385) = 2.89, p = .004$), and they were younger on average ($M = 13.70$ years old, $SD = 4.32$) when they began self-injuring as compared to exclusively heterosexual adults ($M = 14.71, SD = 1.80$).

When compared to exclusively heterosexual adults, sexual minority adults reported significantly higher levels of sexuality-based discrimination ($F[1,299] = 7.97, p < .005, \eta^2 = .03$). Conversely, sexual minority adults showed an in-group biases on the IAT as hypothesized, with exclusively heterosexual adults reporting significantly more implicit homophobia as measured by the IAT ($F[1,299] = 26.71, p < .001, \eta^2 = .08$). The group means and standard deviations for all of hypothesis one's dependent variables are displayed in Table 2 and are graphed in Figure 1.

Hypothesis 2 Analyses.

My second hypothesis was partially supported. As hypothesized, when compared to sexual minority adults who had never engaged in NSSI during their lifetime, sexual minority adults who had engaged in NSSI during their lifetime reported significantly higher levels of mental health difficulties ($F[4,290] = 23.45, p < .001, \eta^2 = .24$); specifically reporting higher levels of emotion dysregulation ($F[1,293] = 56.31, p < .001, \eta^2 = .16$), rumination ($F[1, 293] = 24.61, p < .001, \eta^2 = .08$), BPD symptoms ($F[1, 293] = 78.61, p < .001, \eta^2 = .21$), and depressive symptoms ($F[1, 293] = 28.08, p < .005, \eta^2 = .09$). Contrary to my second hypothesis, however, sexual minority adults who had engaged during their lifetime did not report significantly higher sexual minority stress. Analyses remained nonsignificant when examining experienced discrimination,

internalized homophobia, and implicit homophobia individually or within the same model.

Results were similar for the analyses examining the differences between sexual minority adults who had engaged in NSSI in the past year and sexual minority adults who had never engaged in NSSI in their lives. Sexual minority adults who had engaged in NSSI in the past year reported significantly higher levels of mental health difficulties ($F[4,182] = 25.57, p < .001, \eta^2 = .36$); with higher levels of emotion dysregulation ($F[1, 185] = 77.43, p < .001, \eta^2 = .30$), rumination ($F[1, 185] = 33.82, p < .001, \eta^2 = .16$), BPD symptoms ($F[1, 185] = 68.49, p < .001, \eta^2 = .27$), and depressive symptoms ($F[1, 185] = 61.99, p < .001, \eta^2 = .25$). There were no significant group differences in experiences of sexual minority stressors. The group means and standard deviations for all of hypothesis two's dependent variables are displayed in Table 3, and graphed out in Figure 2 and Figure 3.

Hypothesis 3 Analyses.

My third hypothesis was unsupported. Experienced discrimination and self-reported internalized homophobia did not significantly predict number of lifetime NSSI behaviors, nor did they significantly predict lifetime NSSI engagement. Implicit homophobia significantly predicted lifetime NSSI behaviors, but negatively so ($B = -1.27, SE = .18, wald = 49.13, p < .001, RR = .28$), and implicit homophobia did not significantly predict lifetime or past-year NSSI engagement. As hypothesized, rumination ($B = .07, SE = .0051, wald = 186.81, p < .001, RR = 1.07$), emotion dysregulation ($B = .05, SE = .0031, wald = 308.99, p < .001, RR = 1.055$), depressive symptoms ($B = .98, SE = .0059, wald = 176.13, p < .001, RR = 2.66$), and BPD symptoms ($B = .41, SE = .0290,$

$wald = 201.93, p < .001, RR = 1.51$) all significantly positively predicted lifetime NSSI behaviors. Similarly, rumination ($B = .05, SE = .0123, wald = 17.96, p < .001, RR = 1.05$), emotion dysregulation ($B = .04, SE = .0077, wald = 28.280, p < .001, RR = 1.04$), depressive symptoms ($B = .03, SE = .0146, wald = 18.884, p < .001, RR = 1.03$), and BPD symptoms ($B = .53, SE = .0787, wald = 45.46, p < .001, RR = 1.70$) all significantly positively predicted general lifetime NSSI engagement.

When examining the relationships between sexual minority stressors and mental health difficulties, however, experienced discrimination only significantly positively predicted BPD symptoms ($B = .15, SE = .05, wald = 8.38, p = .004, RR = 1.166$), and self-reported internalized homophobia significantly predicted emotion dysregulation ($B = .76, SE = .30, wald = 6.53, p = .011, RR = 2.13$). There were no pathways between sexual minority stress, mental health difficulties, and lifetime NSSI in which all variable pathways were statistically significant, and bootstrapping analyses (examined in PROCESS) did not reveal any significant indirect pathways between all variables, in conjunction with the absence of direct associations. Similar results were found when analyses were replicated using data exclusively from sexual minority adults who explicitly identified as sexual minority and when examining only more severe forms of lifetime NSSI behaviors. The full results for hypothesis three are displayed in Table 4, and depicted in Figure 4.

IV. Discussion.

Extensive research has shown that sexual minority people face significant mental health disparities (King et al., 2008; Cochran & Mays, 2000) and face particularly increased risk of engaging in NSSI (Batejan Batejan, Jarvi, & Swenson, 2014). Most of this research, however, has been limited to youth populations. Furthermore, much of the research examining the potential mechanisms of risk for NSSI in sexual minority adults has focused either exclusively on general mental health difficulties or on sexual minority stressors. The current study hoped to address these gaps in the literature by examining NSSI in an adult sample of sexual minority individuals, and by examining both sexual minority stressors and general mental health difficulties together in the same predictive model for NSSI in this population.

My first hypothesis was fully supported. Sexual minority adults reported significantly higher levels of all examined mental health difficulties when compared to exclusively heterosexual adults. Sexual minority adults also reported higher levels of sexual-orientation-based discrimination experiences. These findings corroborate past research that has found sexual minorities to be at particularly increased risk for depression (Cochran & Mays, 2000), rumination (Hatzenbuehler, McLaughlin, & Nolen-Hoeksema, 2008), general emotion dysregulation (Matthews, Hughes, Johnson, Razzano, & Cassidy, 2002; Hatzenbuehler, McLaughlin, & Nolen-Hoeksema, 2008), and general mental health problems (King et al., 2008). The results from this study expand upon previous research in two significant ways. First, as very few previous studies examine NSSI in sexual minority adults specifically, this study fills notable gaps in the literature. This study's results extend previous research that has found that sexual minority youth

report higher levels of NSSI than their heterosexual counterparts (Tsypes, Lane, Paul, & Whitlock, 2015). Sexual minority adults in the current study were significantly more likely than exclusively heterosexual adults to have engaged in NSSI. Furthermore, sexual minority adults were on average younger when they began self-injuring, they were significantly more likely to have engaged in NSSI in the past year, they reported significantly greater numbers of lifetime NSSI behaviors, and these results remained significant when controlling for age. Therefore, not only are sexual minorities more likely to engage in NSSI at some point during their lives, but they also seem more likely to continue self-injuring into adulthood and to engage in greater amounts of NSSI than their heterosexual counterparts. These findings support previous research suggesting that NSSI, often conceptualized as an adolescent problem, might be better understood as a problem that can affect a person in any developmental stage. More importantly, however, these findings indicate that NSSI might be a particular problem for adults who identify as LGBTQ.

Second, while previous research has found sexual minorities to experience personality disorders at higher rates than their heterosexual counterparts (Bolton & Sareen, 2011), to my knowledge no studies have examined BPD specifically. This study's finding that sexual minority adults reported significantly greater levels of BPD symptoms is therefore notable. Individuals with BPD use more psychiatric services than other psychiatric patients (Bender et al., 2001; Zanarini, Frankenburg, Hennen, & Silk, 2004) and have particularly high rates of suicide (Zisook, Goff, Sledge, & Shuchter, 1994). This study's finding that sexual minority individuals might be at particular risk for BPD, in addition to other mental health problems, builds upon existing evidence

suggesting that mental health research and resources should be devoted to this population.

If sexual minority adults do indeed appear to be at increased risk for NSSI, it becomes vital to examine potential mechanisms for this increased risk in order to understand how to reduce the risk and prevent NSSI in this population. My second hypothesis, which took the first step in examining potential risk factors by comparing sexual minority adults who have self-injured to sexual minority adults who have never self-injured, was partially supported. Sexual minority adults who self-injured had significantly higher levels of mental health difficulties, but did not report significantly higher levels of sexual minority stressors. The findings on mental health difficulties parallels previous research demonstrating that rumination (Selby, Connel, & Joiner, 2011; Selby, Franklin, Carson-Wong, & Rizvi, 2013; Hilt, Cha, & Nolen-Hoeksema, 2008;), BPD (Muehlenkamp, Ertelt, Miller, & Claes, 2011; Brickman, Ammerman, Look, Berman, & McClosky, 2004), depression (Hilt, Cha, & Nolen-Hoeksema, 2008; Gollust, Eisenberg, & Golberstein, 2008), and emotion dysregulation (Gratz & Roemer, 2004; Brickman, Ammerman, Look, Berman, & McClosky, 2004) are all associated with NSSI. This study's findings on the lack of relationships between sexual minority stressors and NSSI, however, are surprising. Past research extensively shows that sexual minority stressors are related to mental illnesses (Mays & Cochran, 2001), general mental health problems (Hatzenbuehler, Dovidio, Nolen-Hoeksema, & Phills, 2009), and even NSSI specifically (Liu & Mustanski, 2012; DeCamp & Bakken, 2015; Muehlenkamp, Hily, Ehlinger, & McMillan, 2015; Blosnich & Bossarte, 2012).

The surprising results from hypothesis two were mirrored in my findings for hypothesis three. When I examined the relationships between sexual minority stressors, mental health problems, and NSSI, according to the psychological mediation framework, my third hypothesis was largely unsupported. My findings exploring the relationships between mental health difficulties and NSSI again corroborated previous research, with elevated levels of depression, rumination, emotion dysregulation, and BPD symptoms all independently showing significant positive relationships with number of lifetime NSSI events as hypothesized. Elevated self-reported internalized homophobia and experienced discrimination, however, did not predict elevated levels of lifetime NSSI behaviors as I hypothesized. These results contradict previous research that has found significant relationships between mental health outcomes and internalized homophobia processes (Hatzenbuehler, Dovidio, Nolen-Hoeksema, & Phills, 2009; Newcomb & Mustanski, 2010) and discrimination (Mays & Cochran, 2001; Mohr & Sarno, 2015). Moreover, implicit internalized homophobia was significantly related to lifetime NSSI behaviors, but in the opposite direction as hypothesized and contradicting previous research (Hatzenbuehler, Dovidio, Nolen-Hoeksema, & Phills, 2009), with more implicit homophobia predicting fewer lifetime NSSI behaviors. While experienced discrimination was related to BPD symptoms, and self-reported internalized homophobia was related to emotion dysregulation, sexual minority stressors overall exhibited no consistently positive relationship with lifetime NSSI behaviors, either directly or indirectly.

While the psychological mediation framework has received considerable support, there are several studies that do not provide evidence to substantiate the framework (e.g., Austin et al., 2004; Wichstrom & Hegna, 2003), including the current study. Few studies

have assessed the framework's usefulness in understanding the disparities that sexual minorities face for self-harm broadly defined, and no studies have assessed its usefulness for understanding NSSI. Notably, this study also did not provide support for the Minority Stress Theory, as the sexual minority stressors in this study were not significantly associated with NSSI or other mental health problems. The current study's lack of support for the psychological mediation framework, as well as the minority stress theory, could be understood in several ways.

First, while previous research has consistently shown that sexual minority stressors are related to NSSI, most studies have utilized younger samples than the current study. It is possible that sexual minority stressors' role in the increased risk for NSSI decreases in significance as sexual minorities age. This possibility seems unlikely, however, based on previous research. While most studies have examined sexual minority youth, research on NSSI including sexual minority young adults has found that LGBT-specific stressors, such as victimization, impact NSSI rates (e.g., Mustanski & Liu, 2013). Additionally, general research on sexual minority adults has found that sexual minority stressors impact a variety of mental health outcomes throughout adulthood (e.g., Berg, Munthe-Kaas, & Ross, 2015; Mays & Cochran, 2001). Moreover, based on the fact that NSSI and suicide are heavily related (Guan, Fox, & Prinstein, 2012) and that suicide attempts in sexual minorities cannot be explained entirely by general mental health problems (Bolton & Sareen, 2011), it seems further unlikely that sexual minority stressors do not influence NSSI behaviors in sexual minority adults, or that they positively influence NSSI behaviors (as my findings on the SO-IAT suggest).

If we assume that sexual minority stressors significantly negatively impact NSSI in sexual minority adults, this study's surprising findings might be best understood by questioning its methodology. There are several conceptual and measurement issues with studying sexual minority stressors that can make them difficult to study (Meyer, 2003b). In this study, I utilized a scale of discrimination (the EDS) that might have been too limited in its scope. The EDS focuses on specific areas and contexts of possible discrimination that may be less likely for adults in America to experience in today's world (e.g., ability to obtain quality healthcare because of your sexual orientation, or not getting a job because of your sexual orientation). In this sample, EDS scores ranged from 6 (the lowest possible score) to 21, with 60% of the sample reporting some level of previous experience of discrimination. This rate is similar to the rate found in previous research (McCabe et al., 2010). This study appeared to have greater skew in EDS scores, however, with over 75% of the sample reporting scores under 11. Perhaps a different discrimination scale would have provided data with greater variability and normality. For example, the Everyday Discrimination Scale used by Mays and Cochran (2001) asks about less overt discrimination (e.g., situations in which the participant experienced being treated with less courtesy or respect because of their sexual orientation) that might be more common. Therefore, a more nuanced scale might have contributed to this study finding a more powerful relationship between discrimination and NSSI in sexual minority adults.

Similarly, it's possible that the IHP was not the most appropriate measure of internalized homophobia for this population. The Lesbian, Gay, and Bisexual Identity Scale (Mohr & Kendra, 2011), for example, has been shown to be particularly well suited

for assessing internalized homophobia in diverse LGBTQ populations (Berg, Munthe-Kaas, & Ross, 2015). The IHP, on the other hand, was created and largely validated using men who explicitly identified as men. This study's data for the IHP, however, largely mirrored that of previous research. For example, this study's mean IHP score for sexual minorities was 14.1, while other studies had IHP means of 13.1 (Meyer & Dean, 1998) and 13.6 (Lewis, Derlega, Griffin, & Krowinski, 2003). Additionally, while IHP scores in this study were positively skewed, positive skewness on the IHP is common in the literature (Meyer & Dean, 1998; Meyer, 1995; Hatzenbuehler et al., 2009), and other studies have found connections between the IHP and mental health difficulties like rumination (Hatzenbuehler et al., 2009) and depression (Lewis, Derlega, Griffin, & Krowinski, 2003).

Although the scales of sexual minority stressors used in this study have been used and validated previously in research, this study notably differs from previous research in its examination of sexual minority adults who do not explicitly identify as LGBTQ. It's possible that these sexual minority individuals would differ in the way that they experience minority stress, the way minority stress might impact their mental health, and the way they should best be asked about their minority stress. Therefore, this study may have shown results more consistent with past literature, and with its hypotheses, if different measures of minority stress had been utilized. It should be noted, however, that I repeated analyses for the third hypothesis only looking at explicitly identified sexual minorities, and the IHP and EDS remained nonsignificant in their relationship to NSSI and mental health.

There may be other sexual minority stressors not examined in this study that would more strongly predict NSSI behaviors in sexual minority adults (regardless of their explicit identification). Previous research that has not supported the psychological mediation framework (Austin et al., 2004; Wichstrom & Hegna, 2003) found that mental health processes were not significant in explaining differences in mental health outcomes, but these studies were limited in their methodology because they did not examine specific minority stressors. This study partially supports the psychological mediation framework, in that it found psychological issues (e.g., emotion dysregulation) to be significantly associated with NSSI, but it failed to show that discrimination and internalized homophobia were also significantly related to NSSI (regardless of whether mental health difficulties were included in the same model). It therefore is possible that there are *other* sexual minority stressors not studied here that might better explain how sexual minority status conferred greater risk for both mental health problems generally and NSSI specifically. More research is needed to examine sexual minority stressors role in NSSI specifically, and more research is needed to determine how sexual minority stress experiences might differ in sexual minority adults who do not actively identify as LGBTQ.

Implications

While this study's hypotheses were not all fully supported and it failed to find the psychological mediation framework to be applicable to NSSI behaviors in sexual minority adults, its findings add to the literature in a number of critical ways. First and foremost, our results suggest that NSSI remains a significant public health concern into adulthood for sexual minorities. Sexual minority adults in our study showed greater likelihood to have engaged in NSSI in their lifetime, greater likelihood to have continued

NSSI into adulthood, and greater numbers of self-injurious behaviors when they did engage in NSSI. This increased rate of NSSI is particularly concerning given NSSI's predictive relationship to suicide (Guan, Fox, & Prinstein, 2012). Accordingly, our study found that sexual minority adults were more likely than exclusively heterosexual adults to report both NSSI and suicide attempts. Clinicians should place particular emphasis on assessing for self-injurious thoughts and behaviors in their sexual minority clients regardless of client age. Relatedly, researchers of NSSI and suicide should be sure to include adequate assessment of sexual orientation, sexual attraction, and sexual behavior in future research in order to better elucidate how sexual minority status impacts NSSI onset and maintenance.

This study also demonstrates that several mental health processes and issues are significantly associated with NSSI behaviors in sexual minority adults. These findings have important implications for future treatments and prevention measures. While addressing the mental health disparities facing LGBTQ people has been a priority of national organizations for some time (e.g., the U.S. Department of Health and Human Services [2000]), research is still needed to assess the specific psychological processes that impact mental health outcomes in sexual minorities. Identifying the specific processes through research will allow for the creation of targeted and effective clinical interventions. This need is arguably more important than identifying the sexual minority stressors that impact mental health outcomes, as most sexual minority stressors require societal changes (Meyer, 2003) that are relatively expensive and difficult to achieve. While addressing societal problems and infrastructures may lead to the most significant and wide-reaching reduction in LGBTQ people's increased risk for NSSI, focusing on

psychology-based treatments and prevention programs (even if not LGBTQ-specific) may lead to benefits more quickly. This study helps this field push forward by identifying specific psychological issues—namely, depressive symptoms, rumination, emotion dysregulation, and BPD symptoms—that might be appropriate targets for clinical interventions.

Limitations and Future Directions

Beyond the possible methodological limitations discussed above, there are several other limitations that should be considered when interpreting the results of this study. First, the measures in this study were all administered at one timepoint. Mediation analyses are best answered using multiple timepoints so that the directional nature of the relationship can be determined more certainly. Therefore this study's design is not the most appropriate for examining the psychological mediation framework. A single timepoint study, however, is an appropriate first step for testing the framework, and also is appropriate to answer this study's first two hypotheses. This study was one of the very first studies to examine NSSI in an adult population of sexual minorities, and therefore the results can be used to inform future research. Future studies should assess the variables examined in this study using longitudinal designs and multiple assessment timepoints in order to better understand the directional, and possible bidirectional, relationship between sexual minority stressors, mental health difficulties, and NSSI.

Second, this study's samples differed in their recruitment and experience of the study. Specifically, more than half of the sexual minority sample in this study was recruited online. While the study survey itself was identical between the online and in-person procedures, the in-person participants all completed the survey in the same room

and were given the same standardized instructions by research staff. It is not possible to know, conversely, in what type of environment the online participants completed their surveys and what effects these environments might have had on their participation. Most obviously, anonymity or privacy does seem to impact research participants' willingness to report on sexual orientation (Gribble, Miller, Rogers, & Turner, 1999; Des Jarlais et al., 1999), so it is likely that online participants had an increased sense of anonymity, which in turn could have impacted their answers on sexual minority stress measures as well. Additionally, it's understandable that the demographic characteristics of the two samples were very different. This study tried to account for this problem by statistically comparing the study samples and then including as covariates any demographic variables that significantly differed between samples. Furthermore, past research has shown that online research completed through mTurk is as high quality as in-person research, and might even be of higher quality (Buhrmester et al., 2011; Litman, Robinson, & Rosenzweig, 2014). Lastly, the significant differences between samples may actually strengthen this study's results, as having a more diverse participant pool allows for greater generalizability to the general sexual minority adult population.

A second problem with this study's samples and methodology deals with the heterosexual "comparison" group. Many past studies in the field of LGBTQ mental health have failed to include comparison heterosexual groups. While the current study does not suffer from this limitation, this study's comparison group was recruited using different sampling procedures than the ones used for the sexual minority samples. Most obviously, there was no heterosexual comparison group recruited online via mTurk. The heterosexual sample was recruited solely via an online screening system utilized by the

Rutgers University psychology department, and participants were all given course credit rather than monetary compensation for their participation. These differences do introduce potential confounds in this study; most notably the difference in ages between the heterosexual and sexual minority samples. While this study was limited by its sampling due to financial reasons, future studies will want to include both sexual minority participants and comparison heterosexual participants that are recruited via similar sampling methods.

Conclusion

This study adds to the literature in several ways, most significantly in its study of an adult population, its use of a nuanced assessment of sexual identity and sexual minority status, its use of both an objective and subjective measure of internalized homophobia, and its examination of both mental health problems and sexual minority stressors. This study's results provide preliminary information about which specific sexual minority stressors and mental health difficulties should be studied further and which might be appropriate areas for potential clinical interventions. Furthermore, the findings that sexual minority adults report significantly higher levels of both lifetime and past-year NSSI demonstrates that it is vital that future research further study NSSI behaviors in this population.

V. References

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Table 1.
Demographic information of study samples.

	In-Lab LGBQ (N = 105)	In-Lab Hetero (N = 111)	mTurk (N = 172)	Sexual Minority (N = 303)	Not Sex. Min. (N = 85)
Age	M (range)	M (range)	M (range)	M (range)	M (range)
	22 (18-59)	19 (18-56)	31 (18-64)	27 (18-64)	18 (18-21)
Gender	N (%)	N (%)	N (%)	N (%)	N (%)
Male	39 (37)	33 (30)	43 (25)	83 (27)	32 (38)
Female	59 (56)	78 (70)	112 (65)	196 (65)	53 (62)
Other	7 (7)	0 (0)	17 (10)	24 (8)	0 (0)
Transgender Identified	10 (10)	1 (1)	21 (12)	31 (10)	1 (1)
Hispanic Ethnicity	26 (25)	20 (18)	14 (8)	42 (14)	18 (21)
Race					
White	46 (44)	28 (25)	127 (74)	182 (60)	19 (22)
Black/African American	10 (10)	21 (19)	13 (8)	29 (10)	15 (18)
Asian	19 (18)	39 (35)	6 (3)	32 (10)	32 (38)
Hispanic	20 (19)	16 (14)	12 (7)	34 (11)	14 (16)
Native American	0 (0)	0 (0)	7 (4)	7 (2)	0 (0)
Multiple	7 (7)	4 (4)	4 (2)	13 (4)	2 (2)
Other	2 (2)	3 (3)	0 (0)	2 (1)	3 (4)
Unknown	1 (<1)	0 (0)	0 (0)	1 (<1)	0 (0)
Sexual Orientation					
Homosexual/ Gay/Lesbian	49 (47)	0 (0)	35 (20)	84 (28)	0 (0)
Bi-/Pan-sexual	48 (46)	0 (0)	99 (57)	147 (49)	0 (0)
Other	4 (4)	0 (0)	4 (23)	8 (3)	0 (0)
Asexual	1 (1)	0 (0)	14 (8)	17 (6)	0 (0)
Straight/ Heterosexual	0 (0)	110 (99)	19 (11)	44 (14)	85 (100)
Unknown	3 (2)	1 (<1)	1 (<1)	3 (1)	0 (0)
Income					
Under \$19,999	26 (25)	12 (11)	31 (18)	61 (20)	10 (12)
\$20k-\$39,999	12 (11)	17 (15)	54 (31)	68 (22)	23 (27)
\$40k-\$89,999	28 (27)	38 (34)	66 (38)	104 (34)	28 (33)
> \$90,000	39 (37)	42 (38)	21 (12)	70 (23)	32 (38)
Ever homeless	3 (3)	2 (2)	32 (19)	36 (12)	1 (<1)