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## MINORITY STRESS AND PHYSICAL HEALTH IN LESBIANS, GAYS, AND BISEXUALS: THE MEDIATING ROLE OF COPING SELF- EFFICACY

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Dr. Rory Remer, Director of Graduate Studies

MINORITY STRESS AND PHYSICAL HEALTH IN  
LESBIANS, GAYS, AND BISEXUALS: THE MEDIATING ROLE OF  
COPING SELF-EFFICACY

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DISSERTATION

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A dissertation submitted in partial fulfillment of the  
requirements for the degree of Doctor of Philosophy in the  
College of Education  
at the University of Kentucky

By  
Fowler Nicholas Denton

Lexington, Kentucky

Director: Dr. Sharon Scales Rostosky, Professor of Counseling Psychology

Lexington, Kentucky

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## ABSTRACT OF DISSERTATION

### MINORITY STRESS AND PHYSICAL HEALTH IN LESBIANS, GAYS, AND BISEXUALS: THE MEDIATING ROLE OF COPING SELF-EFFICACY

Mental health issues have been the primary focus of much of the health research concerning lesbian, gay, and bisexual (LGB) individuals over the previous decade. Studies have demonstrated that LGB individuals experience psychological distress due to prejudice and discrimination (Lewis, Derlega, Berndt, Morris, & Rose, 2002; Meyer, Schwartz, & Frost, 2008; Rostosky, Riggle, Horne, & Miller, 2009). Health researchers have not given the physical health of LGB individuals the same level of attention (Dibble, Eliason, & Christiansen, 2007). The Gay and Lesbian Medical Association (GLMA; 2001) asserted that little was known about LGB physical health disparities and called for more research in this area. However, the Institute of Medicine (2011) showed that comparatively little is known about LGB physical health. There is growing evidence from population-based studies that LGB individuals may be at greater risk than heterosexuals for many physical health conditions (Cochran & Mays, 2007; Dilley, Simmons, Boysun, Pizacani, & Stark, 2010; Sandfort, Bakker, Schellevis, & Vanwesenbeeck, 2009). Many of these studies (e.g., Cochran & Mays, 2007; Sandfort et al., 2009) referred to the stigmatization of LGB individuals; however, none of these studies empirically explored the relation between stigmatization and physical health in LGB individuals. The goal of this study was to test the utility of Meyer's (2003) minority stress model as a means of explaining the physical health of LGB individuals in the context of a heterosexist society.

This study investigated empirical questions about minority stress factors, physical health, and coping self-efficacy (CSE) of LGB individuals. Five-hundred fifteen LGB-identified adult participants ( $n = 222$  women and  $n = 293$  men) were recruited to complete a web-based survey. Participants were primarily recruited through online forums sponsored by LGB-affirming organizations. Results indicated that higher expectations of rejection based on sexual identity, internalized homonegativity, and LGB-based victimization predicted greater reported physical symptoms severity (PSS). CSE fully mediated the relation between expectation of rejection and physical symptom severity and internalized homonegativity and PSS. CSE partially mediated the relation between victimization and PSS. The document proposed several clinical and systemic interventions that may benefit physical health in LGB individuals.

KEYWORDS: Minority Stress, Victimization, Physical Health, Coping Self-Efficacy,  
Mediation

Fowler Nicholas Denton

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Student's Signature

07/19/2012

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Date

MINORITY STRESS AND PHYSICAL HEALTH IN  
LESBIANS, GAYS, AND BISEXUALS: THE MEDIATING ROLE OF  
COPING SELF-EFFICACY

By

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07/19/2012

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*“The meeting of two personalities is like the contact of two chemical substances: if there is any reaction, both are transformed”*  
(Carl Jung, *Modern Man In Search of a Soul*, 1933/1955, p. 49).

I have had the great fortune to be transformed many times by many different people during my life. Some of these experiences have been positive and others negative, but they have made me who I am today. I am grateful for the people who have helped me accomplish this monumental project and transform me along the way.

I must thank my parents for instilling in me the gifts of curiosity and reasoning. My family enjoyed debating current events around the kitchen table. I had to take a position on every topic. My position could not be based on instinct or emotional appeal; I had to be able to defend it. This required looking at a topic from every conceivable angle. The further refinement of these gifts of curiosity for the world within and around me as well as the ability to reasonably consider alternatives has made this dissertation possible.

Insight into my inner world is largely due to my encounters with Dr. Kelly Hill and Angela Mudd. In the words of Sigmund Freud, you taught me “[a] man should not strive to eliminate his complexes but to get into accord with them: they are legitimately what directs his conduct in the world.” You taught me to examine my inner workings, understand the impact of the world on me, and my impact on others and the world. The man I am and the psychologist I will become was shaped through many forces. Some I have resisted and others I have embraced. Further reflection of these experiences will show me how I can impact the world around me as a psychologist.

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promote this study. Working with the Imperial Court has shown me the importance of service and social justice. So many LGBT individuals feel alone and disenfranchised through the actions of the majority. This Court offers a regal and eloquent voice for sharing a message of hope. This hope is a hope in the capacity for individual and social progress. This hope builds a sense of personal and collective agency. Saint Augustine said, “Hope has two beautiful daughters. Their names are anger and courage; anger at the way things are, and courage to see that they do not remain the way they are.” The Court exudes these qualities. The Court has shown me I am not and we are not powerless! We may be shaped through adversity and oppression, but we have the ability to overcome challenges and inspire change.

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## **Chapter One: Introduction and Review of Literature**

Mental health issues have been the primary focus of much of the health research concerning lesbian, gay, and bisexual (LGB) individuals over the previous decade. Studies have demonstrated that LGB individuals experience psychological distress due to prejudice and discrimination (Lewis, Derlega, Berndt, Morris, & Rose, 2002; Meyer, Schwartz, & Frost, 2008; Rostosky, Riggle, Horne, & Miller, 2009). LGB individuals are more likely than heterosexual individuals to be diagnosed with mental disorders including mood and anxiety disorders. This finding has been replicated in Australia (McNair, Szalacha, & Hughes, 2011), Canada (Brennan, Ross, Dobinson, Veldhuizen, & Steele, 2010), the Netherlands (Sandfort, Bakker, Vanwesenbeeck, & Schellevis, 2006), and the United States (Cochran, Sullivan, & Mays, 2003). Researchers have attributed this finding regarding psychological distress to prejudice and discrimination that exist at all levels of the social context. Prejudice and discrimination could come in the form of familial rejection, work discrimination, interpersonal violence, or other means (Lewis et al., 2002).

Health researchers, however, have not given the physical health of LGB individuals the same level of attention (Dibble, Eliason, & Christiansen, 2007). In extensive reviews of the literature, Dean et al. (2000) and Boehmer (2002) found that very little was known about LGB physical health at the start of the previous decade. Boehmer showed that LGB and transgender individuals were 1 to 10% of the population; however, they constituted 0.1% of the focus of studies found in the MEDLINE database. This constituted a gross oversight of LGB health issues. This oversight is compounded when one considers that over one-half of these studies focused on sexually transmitted

diseases (STDs). Few will deny that advancing the understanding, testing, and treatment of STDs are worthy areas of research. However being LGB is about more than sex behavior; this focus on health related to sexual behavior contributes to a myopic view of LGB identity. This view may lead health care providers (HCPs) to know less about how having a marginalized or stigmatized identity can affect general health and physical functioning.

The Gay and Lesbian Medical Association's (GLMA; 2001) companion document for the Healthy People 2010 project asserted that little was known about LGB physical health disparities. The GLMA called for more research in this area in the decade leading up to 2010. However, the Institute of Medicine (2011) still found that comparatively little has been learned over the past decade. For example, researchers with the Institute of Medicine reported that there are no data on prostate cancer in bisexual and gay men. There are some data to suggest that bisexual and lesbian women may be at greater risk for breast, ovarian, and endometrial cancers. Also, few studies of cardiovascular disease include LGB individuals who are HIV-negative (see Institute of Medicine, 2011).

Though the research is scarce, there is growing evidence from population-based studies that LGB individuals may be at greater risk than heterosexuals for many physical health conditions. The current body of literature, however, is far from conclusive. Bisexual and gay men have been found to be more likely than heterosexual men to report health problems such as heart disease, migraines, liver disease, asthma, and chronic pain (Cochran & Mays, 2007; Dilley, Simmons, Boysun, Pizacani, & Stark, 2010). Cochran and Mays (2007) also found that heterosexual men who had some previous sexual experience with men were also more likely to report chronic health concerns when

compared to exclusively heterosexual men. Sandfort, Bakker, Schellevis, and Vanwesenbeeck (2009) found that gay men reported more chronic health concerns than heterosexual men; however, bisexual men reported fewer health concerns than heterosexual men.

Studies have found that bisexual and lesbian women have more health problems than heterosexual women (Cochran & Mays, 2007; Dilley et al., 2010; Sandfort et al., 2006). For example, McNair et al. (2011) found that lesbians were more likely to report having cancer than heterosexual women. In a study of Washington state residents (Dilley et al., 2010), bisexual and lesbian women were more likely than heterosexual women to have asthma. Bisexual women were also twice as likely as heterosexual women to have diabetes and hypertension.

### **Statement of the Problem**

These aforementioned findings regarding lesbian, gay, and bisexual physical health have almost exclusively been taken from population-based studies that utilize only descriptive methods. Many of these studies (e.g., Cochran & Mays, 2007; Sandfort et al., 2006) refer to the stigmatization of LGB individuals; however, none of these studies actually tested the relation between stigmatization and physical health in LGB individuals. Pascoe and Richman's (2009) meta-analysis—addressed in more detail later in this document—showed that experiences of discrimination suffered by stigmatized populations have a deleterious effect on their physical health. Unlike mental health outcomes (Meyer, 2003), the hypothesis that stigmatization has a detrimental effect on physical health has not been tested in lesbian, gay, and bisexual populations. This constituted a gap in the literature that the current study addressed. Counseling psychologists are increasingly called upon to address the social context and psychological



consequences of health disparities. We must understand how to use our expertise to address these disparities and the factors that contribute to them.

### **Stigmatization of LGB Individuals**

Lesbian, gay, and bisexual individuals experience prejudice and discrimination because their identities are stigmatized by a heterosexist society (Balsam & Szymanski, 2005; Brown, 2008; Rostosky, Riggle, Gray, & Hatton, 2007). Stigma increases their risk of chronic stress that can undermine health (Meyer et al., 2008). Even the earliest known published psychological study sampling gay men in a general population (Ellis, 1896) acknowledged the stigma these men face. Prejudice and discrimination toward LGB individuals operates on both an institutional level through sodomy laws, rejection from military service until recently, biased employment practices, denial of the rights of marriage, and on an interpersonal level through rejection and denigration from family, friends, coworkers, and other nonsupportive individuals.

Pascoe and Richman (2009) performed a meta-analysis on a sample of 134 studies of discrimination and health—both mental and physical—published between 1986 and 2007. Of these 134 studies, only six were peer-reviewed (Bianchi, Zea, Poppen, Reisen, & Echeverry, 2004; Díaz, Ayala, & Bein, 2004; Huebner & Davis, 2007; Waldo, 1999; Yoshikawa, Wilson, Chae, & Cheng, 2004; Zamboni & Crawford, 2007), and only one was a dissertation (Huebner, 2002), examined physical health issues in LGB individuals. Only Waldo (1999) included bisexual and lesbian women in his sample. Each of these studies operationalized sexuality based on participants' self-reported sexual identity. These studies found that oppression based on sexual identity correlated with higher frequency of high risk sexual activity (Díaz et al., 2004), more sexual problems (Zamboni & Crawford, 2007), poorer health habits including duration of sleep and quality of diet

(Bianchi et al., 2004), increased rates of hypertension (Huebner, 2002), and increased doctors visits and use of nonprescription medication (Huebner & Davis, 2007).

Yoshikawa et al. (2004) found that bisexual and gay Asian and Pacific Islander men who had more conversations with friends and family regarding discrimination were less likely to engage in high risk sexual behaviors.

Probably the most obvious weakness in this body of literature is the lack of studies of bisexual and lesbian women. Four of the six studies were also focused on health behaviors rather than rates of morbidity or quality of physical health (Bianchi et al., 2004; Díaz et al., 2004; Huebner & Davis, 2007; Yoshikawa et al., 2004). The current study addressed these gaps in the literature.

The Institute of Medicine (2011) proposed several recommendations for conducting research on LGB physical health concerns. This report acknowledged that few studies had addressed the role of social influences on the physical health of LGB individuals. The Institute of Medicine encouraged additional research that utilized a minority stress perspective. I utilized Meyer's (1995, 2003) minority stress model in my examination of LGB physical health concerns in response to this recommendation.

### **Minority Stress**

LGB individuals occupy an "ascribed inferior status" (p. 78) according to Brooks's (1981) seminal work. This status is supported in most cultures through religious proscriptions, legislation, and other social institutions (including the family). Both heterosexual and LGB individuals learn these cultural expectations through direct instruction and vicariously through observation of heterosexist events. These events that reinforce a second-class status are a source of chronic stress for LGB individuals.

The literature refers to *minority stress* as the experience associated with a stigmatized social identity (Brooks, 1981; DiPlacido, 1998; Meyer, 1995, 2003). Simply put, minority stress is “psychosocial stress derived from minority status” (Meyer, 1995, p. 38). In a more thorough definition, Brooks (1981) defined minority stress as the following:

Minority stress . . . can be viewed as a state intervening between the sequential antecedent stressors of culturally sanctioned, categorically ascribed inferior status, resultant prejudice and discrimination, the impact of these forces on the cognitive structure of the individual, and the consequent readjustment or adaptational failure. (p. 84)

Minority stress results from a conflict between the values of the dominant, majority culture and the values of the stigmatized group that possesses little social power. Meyer (2003) proposed two types of stressors in which these conflicts can manifest: distal and proximal minority stressors. These stressors exist on a continuum from more distal to more proximal. For the sake of parsimony, I briefly discuss them as discrete concepts. Meyer defined *distal stressor* as “objective stressors in that they do not depend on an individual’s perceptions or appraisals—although certainly their report depends on perception and attribution” (p. 676). These stressors are threat of overt events such as violence or harassment motivated by sexual identity and directed toward LGB-identified individuals as a group. These stressors also include structural level events such as legislation that targets LGB individuals (e.g., Rostosky et al., 2009, Rostosky, Riggle, Horne, Denton, & Darnell Huellemeier, 2010). Distal stressors originate outside the individual and can be objectively measured.

When an LGB person discloses his or her sexual identity, he or she identifies publicly as having a *discreditable* stigmatizing characteristic (Goffman, 1963) which is related to Brooks's (1981) "ascribed inferior status" (p. 78). This disclosure opens the individual to victimization, violence, discrimination, and prejudice. Disclosure, nonetheless, is not essential for one to experience stigmatization. Individuals can experience victimization based on the perception of having marginalized sexual identity. Stigmatization is a source of chronic stress that can undermine health for many individuals.

Meyer's (2003) second category of stressors is *proximal stressors* or more subjective stressors that operate on an intrapersonal level. These stressors are intrapersonal processes that occur based on one's experience as well as one's cognitive, emotional, and social resources. These stressors include *expectations of rejection* based on one's sexual identity, *concealment* of one's sexual identity for fear of the social consequences, and *internalized homonegativity* or an intrapsychic conflict vis-à-vis socialization in a heterosexist context and self-identification with a stigmatized sexual identity. This latter aspect of minority stress is referred to by several terms including internalized homophobia (Meyer, 1995, 2003), internalized heterosexism (Szymanski, Kashubeck, & Meyer, 2008), and more recently internalized homonegativity (Mohr & Kendra, 2011). Internalized homonegativity is probably the most accurate term to describe this concept. The term refers to a sense of negativity or denigration of the self or parts of self based on internalized heterosexist cultural, social, legal, familial, and/or religious expectations regarding sexuality. The concept includes internalized heterosexism but does not refer to a phobia in the diagnostic sense of the term.

Similar to the effects of distal minority stressors, proximal stressors are a source of chronic stress for many LGB individuals. The stress of expectations of rejection because of one's sexuality, concealment of sexual identity, and internalized homonegativity are taxing on one's mental health (Meyer, 2003). It is likely that this category of chronic stress has a detrimental role on physical health; however, this hypothesis has not been well tested. The paucity of research in this area constitutes a major gap in the literature that the present study addressed empirically.

### **Coping**

Brooks (1981) reported in her pivotal work on minority stress that “[a]lthough the structural basis of minority stress all but precludes the possibility of its total resolution until the sustaining structures change, it does not preclude the individual learning of more effective coping responses that can greatly reduce levels of stress” (p. 78). Meyer (1995, 2003) built upon Brooks’s concept of minority stress and demonstrated that coping with stressors mediates the relationship between minority stressors and mental health outcomes with lesbian, gay and bisexual individuals. Those with high levels of distress who utilize effective coping may not show the poor health outcomes one would expect through looking at stress and health alone.

A brief overview of coping is necessary before proceeding. In their groundbreaking work, Folkman and Lazarus (1980) conceptualized coping as follows:

Coping is defined as the cognitive and behavioral efforts made to master, tolerate, or reduce external and internal demands and conflicts among them. Such coping efforts serve two functions: the management or alteration of the person-environment relationship that is the source of stress (problem-focused coping) and the regulation of stressful emotions (emotion-focused coping). (p. 223)

Coping efforts such as problem solving strategies or expression of emotions such as optimism, sadness, or anger may cluster into specific coping styles as problem-focused or emotion-focused coping styles, respectively. An individual's perception of a stressor depends both on the coping effort employed and the person's reevaluation of the impact of the stressor after coping efforts have been attempted. Coping efforts could, theoretically, be adjusted with each reevaluation. Therefore, a person's perception of a stressor and the person's means of coping cannot be understood independently. Coping is also context-specific. Coping styles such as emotion-focused coping may be more suited to certain situations while problem-focused coping could be better suited to others.

Meyer (2003) also stated that LGB individuals utilize more social means of coping with minority stress. Belonging to LGB communities may provide the individual with a support system that is protective of health. Kertzner, Meyer, Frost, and Strirratt (2009) found that LGB women and men who reported greater connectedness to the LGB communities also reported higher social well-being. Higher social well-being was also associated with fewer depressive symptoms and better psychological well-being. This process of more social means of coping could provide a means of teaching LGB individuals effective means of coping with minority stress, as suggested by social cognitive theory (Bussey & Bandura, 1999, 2004). Coping with minority stress has not been explored from a sociocognitive perspective, and the current study addressed this gap in the literature.

Folkman and Lazarus's (1980) definition of coping focuses on coping efforts or strategies. This conceptualization provides counselors and other HCPs with a basis for assessing a client's available coping strategies. Also, this focus on strategies gives HCPs a basis for teaching new coping strategies. However, the client's belief about one's own

ability to cope effectively is missing from this conceptualization. Bandura (1997) asserted that having appropriate skills as well as having the belief in one's ability to use such skills is necessary for effective performance of skills. Bandura's social cognitive theory refers to beliefs in one's capabilities as *self-efficacy* or *efficacy beliefs*. Understanding and building an LGB individual's efficacy beliefs for using emotional- or problem-based coping skills may be a valuable tool for HCPs and improve the health of LGB individuals.

**Social cognitive theory.** Social cognitive theory (SCT; Bandura, 1977, 1982, 1995, 2001, 2002, 2005) provides health researchers with a parsimonious theory of human behavior that is well established in the psychological literature. As the forbearer of SCT, Bandura (2001) challenged himself to develop a theory that captured both the internal and external forces that influence human behavior. Bandura and later Bussey and Bandura (2004) conceptualized behavior as resulting from a developmental process of triarchic reciprocal causation. In his model, personal factors (e.g., biological characteristics, thoughts, feelings) and environmental factors (e.g., socioeconomic status, family background, living conditions, societal pressures) influence one's behaviors. In turn, a behavior can influence personal and environmental factors.

**Modes of influence.** SCT (Bussey & Bandura, 1999, 2004) articulates that behavior is shaped by means of modeling, experience, and instruction. These forces influence an individual on all levels of social interaction. Social modeling, for example, occurs when an individual observes another's behavior in a given situation. Later in a similar situation, an individual may recall what they previously observed and respond to the situation similarly. Behavior can also be shaped through a macrosocial system of operant conditioning. Behaviors come with consequences, which can increase or

decrease the frequency of said behaviors in the future. For example, a man could engage in behavior that is socially understood as feminine (e.g., crying in public). Others may ridicule this man for being weak. He may then be less likely to engage in this behavior again as a result of this sociocultural experience. Finally, one can learn behavior through explicit instruction. For example, a common arena for the instruction of socially-appropriate behavior for many individuals is a religious institution. These institutions are held in high esteem socially. Directives and suggestions from clergy often carry considerable weight which shapes an individual's behavior.

**Self-efficacy.** At the core of SCT is the concept of self-efficacy or one's personal "conviction that one can successfully execute the behavior required to produce the outcomes" (Bandura, 1977, p. 193). Self-efficacy is said to possess three dimensions: magnitude, generality, and strength. Bandura (1977) stated that self-efficacy varied according to the magnitude of the objective difficulty of a task. Also, efficacy beliefs can be specific to a given task or generalized to a broader domain. Finally, strength refers to the level of attachment one has to a particular belief. If an individual has a strong efficacy belief, then this belief will be more difficult to alter compared to someone with a weaker belief.

Bandura (1992) reported that efficacy beliefs correlated with physiological activity. Those with weaker efficacy beliefs, or those who doubted their ability to cope with stressors, demonstrated greater autonomic arousal. This arousal included increased cardiac activity. Also, those with weaker efficacy beliefs exhibited greater catecholamine activation, a biochemical indicator of psychological distress. Finally, Bandura showed that those with weaker self-efficacy demonstrated greater endogenous opioid activation. These findings indicated that those who perceived themselves as less efficacious also



created more opioids to block nociception, or pain transmission, and ameliorate the psychological stress component of pain. This increased physiological activation may have physical health consequences for individuals with weaker self-efficacy.

Additional support for the construct of self-efficacy in regards to health behaviors can be found in a Dutch study (de Nooijer, Lechner, & de Vries, 2003). The researchers administered surveys that assessed participants' self-efficacy beliefs about identifying and reporting symptoms of cancer. Participants were more like to seek help from an HCP when they believed they had the ability to seek help and when they believed they could seek help if they were in doubt about a symptom.

Self-efficacy is domain specific, and coping strategies is a domain that has received some attention in the research of efficacy beliefs. Chesney et al. (2006) developed a coping self-efficacy scale to measure the strength of the beliefs of participants to utilize specific coping strategies. The scale was initially developed to measure coping self-efficacy in men who have sex with men. These men were HIV-positive and exhibited depressed mood. This measure has been used with other samples including with a community-based sample of women and men in the United Kingdom (Colodro, Godoy-Izquierdo, & Godoy, 2010) and caregivers of patients with Alzheimer's disease (Harmell et al., 2011). The measure has three subscales: use problem-focused coping, stop unpleasant emotions and thoughts, and get support from friends and family. The former two subscales correspond to Folkman and Lazarus's (1980) seminal conceptualization of problem-focused and emotion-focused coping, and the third subscale captures beliefs about one's ability to utilize his or her support network. Also, Chesney's scale is consistent with Bandura's (2006) guide for creating measures of self-efficacy.

*Sources of self-efficacy.* Bandura (1977, 1995, 1998) identified four sources of self-efficacy: mastery experiences, vicarious experiences, social persuasion, and physiological and emotional states. These sources shape one's beliefs about one's ability to complete certain tasks. An individual's interpretation of the experience with these sources influences how efficacious one feels in a particular domain. These sources provide a consideration for the role that social influences play on personal development. Through modeling, experience, and instruction an individual develops a perception of one's capabilities. Social influences may, for example, sanction men who seek assistance, because seeking help can be culturally understood as a sign of weakness. If this belief is present in a given man's culture, then others may reprimand him for his weakness. He will eventually internalize this reprimand and prevent himself from seeking help. Based on SCT, one could hypothesize that this man's self-efficacy belief for his ability to seek help would be low. Similar cultural proscriptions and experiences likely influence the efficacy beliefs of LGB individuals.

*Mastery experiences.* Bandura (1995) stated that cognitive processing of mastery experiences is the most influential of all the sources on one's efficacy beliefs. An individual develops a strong sense of personal efficacy after enduring challenges that require the use of effective skills to overcome such challenges; however, failure to overcome these challenges can weaken one's sense of personal efficacy. Teaching effective strategies (e.g., effective coping skills) is not enough to build personal efficacy. One must learn when and how to employ these strategies and deal with failures in an adaptive manner. This process of learning how to effectively implement these skills at appropriate times is why examining coping skills without considering one's efficacy beliefs for the skills provides an incomplete picture of coping (Kertzner et al., 2009;

Padilla et al., 2010). This limitation of previous studies of coping in LGB individuals was addressed in the present study.

*Vicarious experiences.* Vicarious experiences are the second source of efficacy beliefs that Bandura (1995) addressed. Efficacy beliefs are strengthened when one observes another who is perceived to be similar to oneself successfully perform a task. If the observer notices that the performer of the task is similar in some salient way (e.g., lesbian, gay, bisexual), then the observer may recognize that the observer has the necessary skills to complete the task. This tenet of SCT suggests that if LGB individuals are exposed to other LGB individuals who demonstrate effective strategies of coping with minority stress, then the efficacy belief for the observing LGB individual should increase.

This source of self-efficacy is particularly relevant to LGB individuals. Typically LGB people, unlike racial and ethnic minorities, do not have ready access to others who share their minority stress. LGB individuals must identify other LGB individuals to make use of vicarious experiences. Similar to social learning theory, LGB sexual identity development (Fassinger & Miller, 1996; McCarn & Fassinger, 1996) recognizes the personal self and social self as indivisible and reciprocal constructs with cognitive, affective, and behavioral implications. The phases of development involve pairing of more positive thoughts and feelings about one's self with increased exposure to and greater appreciation for LGB groups and communities (McCarn & Fassinger, 1996). LGB individuals' efficacy beliefs for coping with minority stress may strengthen with greater exposure to other LGB individuals. Stronger beliefs about being more efficacious may result because neophyte LGB individuals, or individual recently acknowledging an LGB identity, observe more senior LGB individuals successfully coping with minority stress. The neophytes recognize the seniors as similar because of sexual identity, build

the belief that they are capable of successful coping, practice coping more successfully, and develop an improved self-image and perhaps better health outcomes. This connection between sexual identity development and self-efficacy necessitates careful consideration of developmental influences on self-efficacy and health status.

*Social persuasion.* Bandura (1995) also asserted that efficacy beliefs are built through praise from others. Verbal recognition of successful and adaptive behaviors reinforces those behaviors. Friends, family members, and others can encourage coping behaviors and provide supportive feedback about coping effects. Social persuasion can lead to more mastery experiences. Again, this is particularly relevant for LGB individuals because of the role of sexual identity developmental processes. Other LGB individuals may recognize when a neophyte LGB individual successfully faces an episode of minority stress. This recognition could lead to the praise necessary to build self-efficacy.

*Physiological and emotional states.* Finally, Bandura (1995) acknowledged the importance of internal states as a source of self-efficacy. As physiological and emotional changes achieve consciousness, the individual interprets these changes based on existing cognitive habits. Those with poor coping self-efficacy, for example, may interpret internal stress responses (e.g., increased cardiovascular activity, increased respiratory activity, increased galvanic skin response) as a failure of personal coping abilities. This interpretation reinforces a poor coping self-efficacy. However, those with more positive coping self-efficacy may not interpret stress responses as a personal failure but as a normal and expected consequence of a stressful situation that is improved through practicing and refining coping efforts.

## **Goals for the Current Study**

The goal of this study was to test the utility of Meyer's (2003) minority stress model as a means of explaining the physical health of lesbian, gay, and bisexual individuals in the context of a heterosexist society. The role of minority stress has been well demonstrated in studies on the mental health of LGB individuals (Hatzenbuehler, Nolen-Hoeksema, & Erickson, 2008; Rostosky et al., 2009; Szymanski & Sung, 2010). This study addressed empirical questions about specific minority stress factors, physical health, and coping self-efficacy of LGB individuals. Do experiences of sexual orientation-based victimization predict poorer physical health outcomes in lesbians, gays, and bisexuals? Do expectations of rejection based on one's sexual orientation predict poorer physical health outcomes? Does concealment of one's stigmatized sexual orientation predict poorer physical health? Do higher rates of internalized homonegativity predict poorer physical health? Does coping self-efficacy mediate the relationship between these minority stress factors and physical health?

**Hypotheses regarding minority stress and physical health.** I proposed the following four hypotheses to test associations between minority stress processes and physical health. Age and annual income were important moderators; therefore, it was prudent to control for these variables in a stepwise fashion when testing each hypothesis.

***Hypothesis 1.*** As frequency of self-reported sexual orientation-based victimization increases, perceived physical health will decrease.

***Hypothesis 2.*** Expectations of rejection due to one's sexual orientation will predict poorer perceived physical health.

***Hypothesis 3.*** Higher levels of concealment of an LGB sexual identity will predict poorer perceived physical health.

*Hypothesis 4.* Higher levels of internalized homonegativity will predict poorer perceived physical health.

**Hypothesis for the mediation of minority stress and physical health.** Meyer (2003) asserted that psychosocial resources such as one's ability to cope with minority stress interrupt the relation between mental health outcome and minority stress. I proposed the following hypothesis in four parts to test the utility of Meyer's model for explaining physical health in LGB individuals.

*Hypothesis 5.* Higher levels of coping self-efficacy will diminish the deleterious effect of (a) victimization, (b) expectations of rejection, (c) concealment, and (d) internalized homonegativity on perceived physical health.

## **Chapter Two: Method**

In this chapter, I first describe the sample recruited. Second, I describe the measures used to assess the predictors, mediator, and outcome variables. This description also includes minor alternations from the original instruments. Third, I describe the procedures and recruitment strategies. Finally, I describe my plan for data analysis.

### **Participants**

I recruited lesbian, gay, and bisexual women and men of diverse ethnicities from 50 US states. My sample was limited to adults 18 years and older who did not endorse a heterosexual identity. I made special effort to sample individuals from diverse geographic locations within the US, because most studies of physical health in LGB individuals have been conducted on largely urban samples. I limited my study to the US in order to control for the impact of socialized health care systems found in other countries. I also limited my analyses to cisgender individuals (i.e., individuals whose psychological gender is consistent with their biological sex based on established social norms for sex and gender) since gender variant individuals experience different stressors that may impact health.

A total of 628 participants began the online survey; however, 2 participants documented their withdrawal by clicking “Exit” on the informed consent page. They answered no other questions. Sixty-eight participants failed to meet the criteria for inclusion in the study (3 participants reported being under 18 years old despite acknowledging they were at least 18 years old during the consent process; 5 identified as heterosexual; 60 identified as transgender/transsexual, genderqueer, other, or reported a gender identity socially incongruent with their reported genetic sex). All remaining

participants were cisgender and endorsed a lesbian, gay, bisexual, or other nonheterosexual sexual identity. The final sample contained 515 participants who provided enough data (completed at least 80% of items) to be included in the final analysis. Procedures for addressing missing data are discussed later in this document.

**Within group differences.** The sample contained 515 individuals including 222 (43.1%) women and 293 (56.9%) men. Participants who identified as heterosexual were excluded from the study. Four hundred eight (79.2%) participants identified as lesbian or gay. LGB was intended as an umbrella term in this study used only for the sake of parsimony to identify individuals with marginalized sexual identities. Some participants identified with nonheterosexual labels other than lesbian, gay, or bisexual. All nonheterosexual participants were included in the final analyses. See Table 2.1 for information on the distribution of sex and sexual identity included in the sample.

The sample was also socioeconomically diverse (see Table 2.2). The median annual income range for the sample was \$30,000 to \$39,999 ( $n = 70$ , 13.8%). In addition, the median level of education completed was college or technical school ( $n = 136$ , 26.5%). Only 22 participants (4.3%) reported completing less than secondary education; therefore, these categories were collapsed. Also, only 13 participants (2.6%) reported an income of \$150,000 per year or greater. As a result, all income levels \$150,000 per year or greater were collapsed into a single level. Table 2.2 represents the levels of education and income as the participants indicated. Collapsing these categories allowed for more powerful post hoc analyses.

Finally, Table 2.3 includes information on the ethnicity, regional, and age diversity of the sample. The mean age of the sample was 34.78 years ( $SD = 12.07$  years). Caucasian individuals comprised the largest singled ethnic group with 83.3% of the



Table 2.1

*Participant Sex and Sexual Identity (N = 515)*

Sexual Identity	Female ( <i>n</i> = 222)		Male ( <i>n</i> = 293)	
	<i>n</i>	%	<i>n</i>	%
Bisexual ( <i>n</i> = 69)	50	22.5	19	6.5
Gay/Lesbian ( <i>n</i> = 408)	146	65.8	262	89.4
Pansexual ( <i>n</i> = 10)	6	2.7	4	1.4
Queer ( <i>n</i> = 22)	17	7.7	5	1.7
Other ( <i>n</i> = 6)	3	1.4	3	1.0

*Note.* Total percentages do not add to 100% due to rounding.

Table 2.2

*Participant Socioeconomic Status Indicators*

Socioeconomic Status Indicator	<i>n</i>	%
Education Level Completed ( <i>n</i> = 513)		
No formal education	2	.4
Some primary education	1	.2
Primary education	13	2.5
Some secondary education	7	1.4
Secondary education	20	3.9
Some college or technical school	115	22.4
College or technical school	136	26.5
Some graduate or professional school	60	11.7
Graduate or professional school	159	31.0
Income ( <i>n</i> = 506)		
Under \$10,000	106	20.9
\$10,000 to \$19,999	62	12.3
\$20,000 to \$29,999	52	10.3
\$30,000 to \$39,999	70	13.8
\$40,000 to \$49,999	53	10.5
\$50,000 to \$59,999	42	8.3
\$60,000 to \$74,999	42	8.3
\$75,000 to \$84,999	20	4.0
\$85,000 to \$99,999	17	3.4

Table 2.2 continues

Table 2.2 continued

Socioeconomic Status Indicator	<i>n</i>	%
\$100,000 to \$149,999	29	5.7
\$150,000 to \$199,999	6	1.2
\$200,000 to \$249,999	1	.2
\$250,000 and above	6	1.2

Table 2.3

*Age, Ethnicity, and Regional Characteristics*

Characteristic	<i>n</i>	%
Age ( <i>n</i> = 511)		
18 to 29 years	217	42.5
30 to 39 years	133	26.0
40 to 49 years	87	17.0
50 to 59 years	55	10.8
60 years and older	19	3.7
Ethnicity ( <i>n</i> = 514)		
African/African American/African descent/Black	18	3.5
Asian/Asian American/Pacific Islander	15	2.9
Caucasian/White	428	83.3
Latino(a)/Hispanic	29	5.6
Native American/First Nations/Inuit	8	1.6
Other	16	3.1
Region ( <i>n</i> = 506)		
Northeast	61	12.1
Midwest	115	22.7
South	210	41.5
West	120	23.7

*Note.* Northeast: Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont; Midwest: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota,

Wisconsin; South: Alabama, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia; West: Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming. The final data set did not contain any data from Arkansas. Regional classification of states was based on US Census Bureau (2011) practice.

sample. This sample was also geographically diverse. The final data set included participants from 49 US states and the District of Columbia. Table 2.3 illustrates the distribution of participants by region as determined by the US Census Bureau (2011).

**Between group differences.** Analyses found no sex differences in regards to region of the country, ethnicity, level of education completed, or reported income. Also, results found no significant difference between comparing age to ethnic identity. Age varied significantly according to location of primary residence based on US Census (2011) region,  $F(3, 498) = 3.85, p < .05$ . Participants living in the West ( $M = 37.34$  years,  $SD = 12.35$  years) were significantly older than those living in the South ( $M = 32.82$  years,  $SD = 11.52$  years).

Age in years varied significantly according to level of education,  $F(2, 203) = 17.13, p < .001$ . Tukey HSD post hoc comparisons showed that participants who had completed graduate or professional school ( $M = 41.19$  years,  $SD = 12.10$  years) were significantly older than those who completed only secondary education ( $M = 27.90$  years,  $SD = 11.58$  years), some college or technical school ( $M = 29.86$  years,  $SD = 10.64$  years), college or technical school ( $M = 33.07$  years,  $SD = 10.99$  years), or some graduate or professional school ( $M = 33.00$  years,  $SD = 11.01$  years). Age also varied significantly according to reported income,  $F(10, 491) = 15.18, p < .001$ . See Table 2.4 for post hoc comparisons of age and income. Reported income varied significantly according to level of education completed,  $\chi^2(50) = 179.65, p < .001$ . Results suggest that the sample contained a high proportion of students or underemployed participants. Of participants reporting an annual income less than \$30,000, 88.6% had completed at least some college or technical school. All but one participant (97.6%) of those reporting an income greater than \$100,000 completed at least some college.

Table 2.4

*Tukey HSD Post Hoc Comparisons for Age and Annual Income*

	Income	<i>M</i>	<i>SD</i>	1	2	3	4	5
1.	Under \$10,000	26.30	7.96					
2.	\$10,000 to \$19,999	32.63	11.37	**				
3.	\$20,000 to \$29,999	32.94	10.20	*				
4.	\$30,000 to \$39,999	33.53	11.09	**				
5.	\$40,000 to \$49,999	36.42	10.69	***				
6.	\$50,000 to \$59,999	38.73	10.20	***				
7.	\$60,000 to \$74,999	39.85	12.17	***	*			
8.	\$75,000 to \$84,999	42.10	11.99	***	*	*		
9.	\$85,000 to \$99,999	43.24	15.31	***	*	*	*	
10.	\$100,000 to \$149,999	43.76	9.29	***	***	**	**	
11.	\$150,000 and above	47.69	9.66	***	***	***	**	*

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

## Measures

**Victimization.** I used a modified version of Szymanski's (2006) heterosexual harassment, rejection, and discrimination scale (HHRDS; Appendix A) to measure LGB victimization. This 14-item measure assesses the frequency of heterosexual events in the past year on a 6-point Likert-type scale from 1 *never* to 6 *almost all the time*. In a factor analytic study with self-identified lesbian women, Szymanski found three factors with eigenvalues greater than 1: (a) harassment and rejection ( $\alpha = .89$ ; 7 items), (b) workplace and school discrimination ( $\alpha = .84$ ; 4 items), and (c) other discrimination ( $\alpha = .78$ ; 3 items).

The original measure was written specifically for lesbian participants. However, Szymanski (2009) later revised the measure for use with men only. In an effort to be more inclusive of sex and sexual identity, I followed her alterations and changed each occurrence of *lesbian* to *LGB*. *Anti-lesbian/anti-gay* was changed to *anti-LGB*. In item 9, Szymanski (2006) asked women how many times that had been called "dyke" or "lezzie." I kept *dyke* and changed *lezzie* to *fag* to include heterosexual names commonly used for both women and men. Otherwise, the structure and content of the modified version is consistent with the original version. Szymanski reported the internal consistency of the full scale scores as .90. This score is calculated by taking the mean of 14 items. Higher scores indicated more experiences of discrimination in the past year. Internal consistency of HHRDS scores in the current study was .92, thus, indicating that the total score is an excellent measure of cumulative LGB victimization.

**Expectations of rejection, concealment and internalized homonegativity.** I used Mohr and Kendra's (2011) revised and extended version of the lesbian, gay, and bisexual identity scale (LGBIS; Appendix B) to measure the more proximal minority



stressors of expectations of rejection, concealment, and internalized homonegativity. This is a 27-item measure of multiple dimensions of LGB identity development. Participants responded to items on a 6-point scale from 1 *disagree strongly* to 6 *agree strongly*. Two items are reverse scored. The mean of the item rating for each subscale serves as the subscale score; therefore, the range of possible scores was 1 to 6. Higher scores indicated stronger agreement with respective subscales. Subscales include acceptance concerns, concealment motivation, identity uncertainty, internalized homonegativity, difficult process, identity superiority, identity affirmation, and identity centrality. I used three subscales (3 items each): acceptance concerns ( $\alpha = .73$ ), concealment motivation ( $\alpha = .79$ ), and internalized homonegativity ( $\alpha = .86$ ). These measures demonstrated adequate reliability with the current sample. The scale Mohr and Kendra referred to as acceptance concerns served as my measure of expectations of rejection.

Mohr and Kendra (2011) developed this measure through exploratory factor analysis ( $n = 297$ ) and confirmatory factor analysis ( $n = 357$ ) studies with LGB-identified university students across North America. They reported moderate to high Cronbach's alpha coefficients from .72 to .94. Transgender students ( $n = 12$ ) who identified as lesbian, gay, or bisexual were included in these scale development studies.

**Coping self-efficacy.** I used the total sum score of the coping self-efficacy (CSE; Appendix C) scale (Chesney et al., 2006) to measure the mediating effects of coping on the association between the aforementioned minority stress factors and physical health. Participants were asked to indicate how certain they are on an 11-point scale that they can use a particular coping strategy. Anchors for this scale included 0 *cannot do at all*, 5 *moderately certain can do*, and 10 *certain can do*. An example of a coping strategy

included “think about one part of the problem at a time.” The scale was composed of 13 items. The sum of the total responses served as the score for this measure. It provided a general score across various types of coping that was appropriate for testing the utility of coping self-efficacy in regards to physical health and minority stress. The range of possible scores was 0 to 130.

Chesney et al.'s (2006) factor analytic studies supported three subscales: *use problem-focused coping* ( $\alpha = .91$ ; 6 items), *stop unpleasant emotions and thoughts* ( $\alpha = .91$ ; 4 items), and *get support from friends and family* ( $\alpha = .80$ ; 3 items). Colodro et al. (2010) found similar reliability coefficients ( $\alpha = .91, .91, \text{ and } .85$ , respectively). Subscales were moderately correlated from .54 to .67. Test-retest correlation coefficients after three months from two different studies were .61 and .65 for use of problem-focused coping, respectively, .80 and .68 for stop unpleasant emotions and thoughts, respectively, and .43 and .52 for get support from friends and family, respectively (Chesney et al., 2006).

I altered the instructions to the instrument to direct participants to specifically consider their coping self-efficacy from the perspective of their LGB identity. The original directions read, “When things aren’t going well for you, or when you’re having problems, how confident or certain are you that you can do the following[?]” I changed the directions to read, “When things aren’t going well for you *as an LGB individual*, or when you’re having problems *as an LGB individual*, how confident or certain are you that you can do the following[?]” (emphasis added). This change made the instrument more consistent with the predictor variables. Also, there are theoretical advantages to this alternation. Meyer’s (2003) conceptualization of coping is specific to coping with stigma associated with one’s stigmatized identity. The addition of “as an LGB

individual” makes the measure more consistent with the theory of minority stress. Bandura (1977) indicated that efficacy beliefs could be measured for specific contexts and behaviors. LGB individuals may employ certain coping behaviors to address minority stress and other coping behaviors in other situations. This alteration should specifically target the efficacy beliefs regarding coping behaviors used where LGB identity is relevant. Scores from the current study produced an alpha coefficient of .94.

**Physical symptom severity.** I used the Cohen-Hoberman inventory of physical symptoms (CHIPS; Cohen & Hoberman, 1983; Appendix D) as a measure of physical symptomology. The 33-item measure requires that participants indicate their level of distress over the past two weeks for each symptom specified. Participants respond to the prompt “how much were you bothered by” the specific symptom by rating their distress from 0 *not at all* to 4 *extremely*. The sum of all item ratings served as a measure of physical symptom severity (PSS). The range of possible scores was 0 to 132. Scores from the current study demonstrated an internal consistency of .93. PSS served as the outcome variable for this study. This measure has been used in a recent comparative study with LGB and heterosexual individuals currently in romantic relationships (Blair & Holmber, 2008;  $\alpha = .88$ ). Blair and Holmber’s (2008) study demonstrates the utility of the measure with an LGB sample and illustrates how physical symptoms can be influenced by social context.

**Sociodemographics.** I gathered sociodemographic information (see Appendix E) including biological sex (male, female), gender identity (male, female, genderqueer, transgender, other), sexual identity (gay, lesbian, bisexual, queer, straight, other), ethnicity (Caucasian, African American/African descent, Asian/Asian American/Pacific Islander, Latino/Hispanic, Native American/First Nations/Inuit, Other), age in years, level

of education completed (no formal education, some primary education, primary education, some secondary education, secondary education, some college or technical school, college or technical school, some graduate or professional school, graduate or professional school), annual income, height, weight, and US state of primary residence. These variables were coded as categorical in SPSS 20; therefore, the program automatically dummy coded the variables in the analyses described in chapter three.

### **Procedure**

I created a web-based survey through Survey Monkey with the aforementioned measures. The first page of the survey welcomed participants with a description of the study, an invitation to participate, information on their rights as participants, and a description of potential risks and benefits of the study. Participants acknowledged their understanding of the provided information and agreed to participate by clicking “Acknowledge-Continue” (see Appendix F). The survey was programmed so that participants could not continue with the survey without acknowledging their consent. Surveys were completed anonymously and were eight pages long. The order of the measures was the same for each participant. Pilot participants completed the survey in five to 15 minutes. Participants were not paid for their time; however, I offered an incentive for participation. Participants could enter a drawing for a \$100 gift card to an online retailer. The University of Kentucky Office of Research Integrity approved the study materials and procedures (Non-Medical IRB Protocol 11-0794-P4S).

### **Recruitment**

The recruitment phase of the study spanned 90 days from November 17, 2011, to February 15, 2012. I identified several national level LGB-oriented organizations with local level chapters and made request for distribute a study announcement to their

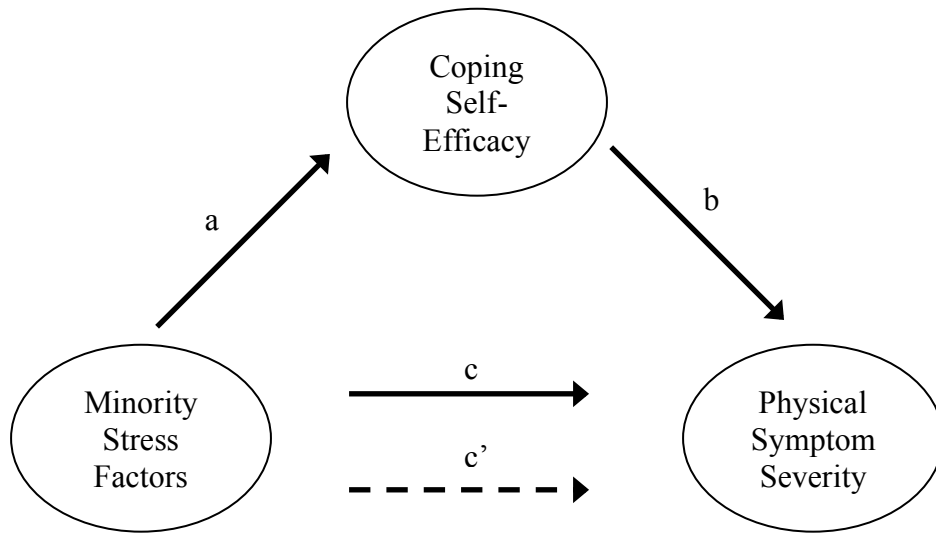
members. These national level organizations included Center Link, an association of pride centers across the US; the International Court System, a philanthropic organization that primarily supports LGB-oriented non-profit organizations; Integrity, a ministry for LGB individuals in the US Episcopal Church; the Metropolitan Community Church, a Christian denomination that ministers to LGB individuals; and the National Gay and Lesbian Task Force, an advocacy organization that promotes the civil rights of LGB individuals. I contacted these chapters via email and Facebook. In addition, I targeted relevant Facebook groups and pages and other websites with a reportedly substantial LGB subscribership. I also purchased advertising space for the month of December 2011 in the *Community Letter*, an LGB-oriented newspaper serving the upper South and Midwest; and space during for first quarter of 2012 in the *International Court Communiqué*, a newsletter distributed to member of the International Court System and its supporters. Lastly, I posted advertisements in bars, restaurants, and other public businesses in the Central Kentucky area. In addition to my efforts at recruitment, I encouraged but did not require participants to distribute the announcement to others they thought might be interested in completing the survey. No effort was taken to track this process. Therefore, it is not possible to assess the extent of this snowball technique. (See Appendix G for the letter used to recruit participants.)

### **Statistical Methods**

An a priori power analysis using G\*Power (Faul, Erdfelder, Buchner, & Lang, 2009) substantiated that a sample size of 312 was large enough to detect a .05 effect size. This is a conservative expectation of effect size. Meyer (1995) found effect sizes between .01 and .15 in his pivotal study of minority stress in gay men. I used SPSS 20 for all other statistical tests. Participants with no more than 20% missing data for any

measure were included in the final analysis. Missing data patterns were analyzed using Schlomer, Bauman, and Card's (2010) guidelines for handling missing data in counseling psychology research. Missing data was imputed using the expectation-maximization (EM) algorithm. I conducted tests of normality and homoscedasticity prior to hypothesis testing. I assessed the normality of the data by examining kurtosis and skewness. I found that some data were not normally distributed; therefore, I utilized a bootstrapping technique of 5000 samples to bolster the robustness of methods for hypothesis testing (Preacher & Hayes, 2004). Levene's test of homogeneity of variance was used to test homoscedasticity. Models for hypothesis testing were created based in part on the results of Levene's test.

I generated hierarchical regression equations to test the direct effects of minority stress on physical health (hypotheses 1 through 4). Step 1 included demographic variables determined to be important covariates. Step 2a through 2d comprised of adding each minority stress factor to the model to test their independent effects. I used Baron and Kenny's (1986; Figure 2.1) model for mediation to test hypothesis 5. Specifically, linear regression questions were generated to test each part of hypothesis 5. Preacher and Hayes (2004) bootstrap approach was used to assess the significance of mediation.



*Figure 2.1.* Model of mediating role of coping self-efficacy on the relation between minority stress factors and physical symptom severity (on the basis of Baron & Kerry, 1986 and Frazier, Tix, & Barron, 2004).

## Chapter Three: Results

This chapter provides a detailed description of the techniques used to handle missing data. Next, the chapter describes the assessment of the assumption of normality and homoscedasticity prior to inferential statistical analysis. Finally, steps in hypothesis testing are explained. Statistical methods are described in text and illustrated in tables.

### Missing Data Considerations

Schlomer et al. (2010) identified the best practices for handling missing data in counseling psychology research. Their suggestions served as guidelines addressing missing data for the current study. Visual inspection suggested missing data was primarily the result of attrition. Participants with missing data seemed to answer one page—which included a single measure each—then withdrew from the study.

Withdrawal, in this case, was as simple as closing their web browser.

Moving beyond visual inspection, I next determined the pattern of missing data. The first step was to consider if data could be missing completely at random (MCAR). This was determined using Little's MCAR test (see Schlomer et al., 2010). This test is a chi-square statistic with the null hypothesis that missing data are due to completely random chance. Behaviorally, failing to reject the null hypothesis may suggest careless oversight of an item or other event that was not related to the data. Missing items from the victimization ( $\chi^2[228] = 259.46, p = .08$ ), expectations of rejection ( $\chi^2[6] = 7.51, p = .28$ ), concealment ( $\chi^2[6] = 2.43, p = .88$ ), and internalized homonegativity ( $\chi^2[7] = 11.01, p = .14$ ) were found to be MCAR because I failed to reject the null hypothesis on Little's MCAR test for each measure assuming an alpha level of .05. However, missing items for coping self-efficacy ( $\chi^2[165] = 289.86, p < .001$ ) and physical symptom severity ( $\chi^2[1198] = 1698.71, p < .001$ ) could not be considered MCAR. Rejecting the null



hypothesis suggested that missing items might be related to study conditions or variables within the study. The possibility of attrition has already been discussed. These measures were two of the last measures in the survey. It is possible that fatigue or loss of interest contributed to missing data.

I created dummy variables for each measure to examine the effect of other study variables on the pattern of missing items in the coping self-efficacy and physical symptom severity measures. A score of 1 in the dummy variable indicated that missing data were present, and a score of 0 indicated that the participant completed all items. Results failed to support a relation between missingness and any sociodemographic variable. Attrition remains a strong possible explanation for the pattern of missing data. This would suggest that coping self-efficacy and physical symptom severity items were missing at random (MAR). “Random” in this case can be misleading, because the item missed were missed in a systematic fashion when considering other study variables. Attrition, however, cannot be objectively tested as a reason for missing data in this case. As a result, data not missing at random (NMAR) is a possibility (see Enders, 2010).

After the patterns of missing data were determined, the focus next turned to how to respond to the missing items. Prior to data analysis, I determined that cases with less than or equal to 20% of data missing for any variable could be included in the final analysis. Chesney et al. (2006) suggested this threshold for the coping self-efficacy scale. For the sake of consistency, this suggestion was adopted for all measures. Missing items were imputed using the expectation-maximization (EM; Dempster, Laird, & Rubin, 1977) algorithm provided in SPSS 20. Balsam and Mohr (2007) used an EM algorithm to impute missing items on the original version of the LGBIS. Chesney et al. suggested replacing missing items with the appropriate subscale mean; however, Enders (2010) and

Schlomer et al. (2010) strongly discouraged this approach to handling missing data. Enders and Schlomer et al. reported that arithmetic mean imputation reduces the variance of scores. This also places scores on a horizontal line within the data, thus, compromising the ability of linear inferential statistics from performing adequately.

EM is a superior method of imputation for MCAR and MAR missing data, and it avoids the statistical bias that can result from listwise deletion (Enders, 2010). EM is a two-step process to estimate the mean and variance necessary to create the observed scores for a given variable. The E-step creates a series of regression equations to predict the values of missing items. The M-step uses these predicted values to create a new estimate of the mean and variance. The next E-step again generates regression equations to predict missing values. This process is repeated until the parameter estimates do not change between the E and M steps. The EM algorithm converged in fewer than 25 iterations in the present study. See Dempster et al. (1977) and Enders (2010) for a more detailed overview of EM and the broader family of maximum likelihood estimation techniques.

### **Evaluation of Inferential Assumptions**

Before I began hypothesis testing, I examined the characteristics of the data that could compromise the assumptions of normality and homoscedasticity required of inferential statistical tests. Measures of distribution, central tendency, and dispersion are illustrated in Table 3.1. Data that are normally distributed have a kurtosis of 0. Extreme deviations from 0 suggest that scores may not be normally distributed. Skewness is another measure of the distribution of scores in a sample. Extreme deviations from 0 suggest that data are not distributed symmetrically but clustered at one extreme. Based on these scores, victimization, IH, and PSS may not be normally distributed. This

Table 3.1

*Summary Statistics for Inferential Assumptions Characteristics*

Variable	<i>n</i>	Distribution		Central Tendency		Dispersion	
		Kurtosis ( <i>SE</i> )	Skewness ( <i>SE</i> )	Mdn	<i>M</i>	<i>SD</i>	<i>SEM</i>
<b>Predictors</b>							
Victimization	497	5.17 (.22)	1.88 (.11)	1.71	1.89	.75	.03
Rejection	515	-.56 (.22)	.21 (.11)	3.00	3.07	1.13	.05
Concealment	515	-.45 (.22)	.44 (.11)	2.67	2.88	1.20	.05
IH	515	3.50 (.22)	1.79 (.11)	1.33	1.70	.92	.04
<b>Mediator</b>							
CSE	469	.02 (.23)	-.61 (.11)	94.00	90.79	24.59	1.14
<b>Outcome</b>							
PSS	466	2.62 (.23)	1.64 (.11)	14.00	20.31	18.28	.85

*Note.* IH = internalized homonegativity; CSE = coping self-efficacy; PSS = physical symptom severity.

phenomenon is common in social and psychological studies, and utilizing robust statistical procedures can adequately address the limitations of sample distribution. For example, using a bootstrap procedure in hypothesis testing is a common and robust way to examine data when the assumptions of inferential statistics are in question in psychological research (Brennan et al., 2010; Kline, 2011; Potoczniak, Aldea, & DeBlaere, 2007; Preacher & Hayes, 2004).

I assessed for homoscedasticity with Levene's test (see Table 3.2). The null hypothesis for Levene's test is that variance is equal across groups. If one rejects the null hypothesis one can assume that variance is heteroscedastic, or not equal across groups. Regression models operated under the assumption that variance is homoscedastic; however, tests of regression models are robust enough to handle some deviation. When Levene's test indicated that variance was heteroscedastic, I added demographic variables to the model to see if the variance of the predictor and outcome variables related to demographic variables known to predict physical health. My first step was to add annual income to the model. Only internalized homonegativity remained heteroscedastic at this step; therefore, I added level of education completed to this model. Data were homoscedastic at this step. Inferential statistical tests are robust enough to handle small deviations in distribution of variance. Adding income to later hierarchical regression equations will minimize heteroscedasticity and maximize degrees of freedom.

### **Inferential Statistical Analysis**

The alpha level for all tests was .05. Effect sizes for each test were reported as  $r^2$ , the amount of variance accounted for in the stated effect. SPSS 20 was used to conduct each hypothesis. G\*Power 3.1 (Faul et al., 2009) was used to conduct post hoc power analyses. Given the leptokurtic distribution of certain variables, results from all

Table 3.2

*Homoscedasticity of Study Variables (Outcome Variable: PSS)*

Predictor	Levene's Test ( <i>df</i> )		
	Predictor	+ Income	+ Education
Victimization	2.69*** (70, 393)	1.17 (236, 221)	
Rejection	3.35*** (20, 445)	1.17 (137, 322)	
Concealment	1.38 (18, 447)		
IH	2.99*** (17, 448)	1.45 (91, 368)**	1.20 (202, 255)
CSE	1.90*** (118, 334)	1.14 (346)	

*Note.* PSS = physical symptom severity; IH = internalized homonegativity; CSE = coping self-efficacy. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

hypotheses testing in this study are based a simple percentile bootstrap procedure using 5000 samples with replacement (Kline, 2011; Preacher & Hayes, 2004).

**Comparison of participant characteristics and study measures.** Table 3.3 provides a summary of one-way ANOVA comparisons of categorical demographic information with minority stress factors, coping self-efficacy, and physical symptoms severity. Tukey's HSD post hoc comparisons were used to identify significant mean differences between the level of the categorical variables and the study variables. Education was significantly related to PSS ( $F[5, 458] = 3.47, p < .01$ ). Post hoc comparisons found that PSS scores differed significantly between participants with some college or technical school education ( $M = 24.47, SD = 19.50$ ) and participants who completed graduate or professional school ( $M = 15.56, SD = 13.02$ ). CSE scores also differed significantly by education ( $F[5, 461] = 2.91, p < .05$ ). Post hoc testing found that a significant difference in CSE scores existed between participants with some college or technical school education ( $M = 86.15, SD = 25.11$ ) and those who completed graduate or professional school ( $M = 96.07, SD = 21.59$ ). In addition victimization scores also different between participants with less than secondary education ( $M = 2.37, SD = 1.07$ ) and those who completed college or technical school ( $M = 1.79, SD = .59$ ) as well as those who completed graduate or professional school ( $M = 1.77, SD = .66; F[5, 489] = 3.89, p < .01$ ). Education was also significantly related to concealment ( $F[5, 507] = 3.57, p < .01$ ). Post hoc comparison found that those with secondary education ( $M = 3.95, SD = 1.30$ ) reported significantly higher levels of concealment than those a college or technical school education ( $M = 2.79, SD = 1.17$ ), some graduate or professional school ( $M = 2.83, SD = 1.03$ ), or graduate or professional degrees ( $M = 2.81, SD = 1.17$ ).

Table 3.3

*One-Way Analysis of Variance Summary Table for Categorical Demographic and Study Variables*

Variable	Education	Ethnicity	Income	Sex
1. Victimization	3.89**	4.47**	1.81	.10
2. Rejection	2.11	.61	2.32*	3.67
3. Concealment	3.57**	.73	2.43**	3.74
4. IH	1.47	.35	.94	9.97**
5. CSE	2.91*	.44	3.30***	5.09*
6. PSS	3.47**	1.99	2.49**	1.54

*Note.* IH = internalized homonegativity; CSE = coping self-efficacy total score; PSS = physical symptom severity score. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ . Results are based on 5000 bootstrap samples.

Expectations of rejection and internalized homonegativity were not significantly different for levels of education.

Victimization and IH scores did not vary significantly according to reported income. Expectations of rejection ( $F[10, 495] = 2.32, p < .05$ ), concealment ( $F[10, 495] = 2.43, p < .01$ ), CSE ( $F[10, 452] = 3.30, p < .001$ ), and PSS ( $F[10, 449] = 2.49, p < .01$ ) did vary according to income. Nevertheless, Tukey's HSD post hoc comparisons were not significant for expectations of rejection and PSS. Results indicated that concealment was significantly greater for participants reporting an income under \$10,000 ( $M = 3.20, SD = 1.33$ ) when compared to participants reporting an income between \$85,000 and \$99,999 ( $M = 2.12, SD = .79$ ). Post hoc comparisons showed that participants reporting an income under \$10,000 ( $M = 83.45, SD = 24.27$ ) had significantly weaker CSE than participants in the \$50,000 to \$59,999 ( $M = 99.93, SD = 26.28$ ) and \$60,000 to \$74,999 ( $M = 98.25, SD = 22.75$ ) ranges. Also, those with a reported income between \$20,000 and \$29,999 had weaker CSE ( $M = 82.03, SD = 27.28$ ) than those with incomes between \$50,000 and \$59,999. LGB individuals with more income and education may have better health, stronger coping self-efficacy, and lower minority stress.

Victimization scores significantly differed based on ethnicity ( $F[5, 490] = 4.47, p < .01$ ). Post hoc comparisons found that Latino participants ( $M = 2.32, SD = .99$ ) differed from Caucasian ( $M = 1.85, SD = .73$ ) and Asian/Asian American/Pacific Islander participants ( $M = 1.48, SD = .32$ ). Also, Asian/Asian American/Pacific Islander participants also differed from Native American participants ( $M = 2.47, SD = .41$ ). The remaining minority stress indicators (expectations of rejection, concealment, and IH), CSE, and PSS did not significantly vary by ethnicity. Failure to identify difference based on ethnicity may be a result of limited power.



Expectations of rejection, concealment, victimization, and PSS did not vary according to the participants' biological sex. However, sex was a significant factor for IH ( $F[1, 513] = 9.91, p < .01$ ) and CSE ( $F[1, 459] = 5.09, p < .05$ ). Females ( $M = 1.55, SD = .71$ ) reported lower rates of IH than males ( $M = 1.80, SD = 1.04$ ). Also, CSE was weaker for females ( $M = 88.09, SD = 25.95$ ) than males ( $M = 93.24, SD = 22.94$ ).

Finally, participants reported age in years as a whole number. Product-moment correlations illustrated that age was mildly though significantly associated with expectations of rejection ( $r = -.19, p < .01$ ), concealment ( $r = -.18, p < .01$ ), IH ( $r = -.11, p < .05$ ), victimization ( $r = -.10, p < .05$ ), and CSE ( $r = .12, p < .01$ ). Curiously, age was not significantly correlated to physical symptoms severity. Participants were generally healthy; therefore, the variance of physical symptoms severity may have been insufficient to detect a significant association with age.

**Bivariate analysis.** Pearson's product-moment correlations (see Table 3.4) demonstrated that three of the four minority stress factors were significantly and positively correlated with PSS. Those with more frequent experiences of victimization within the past year, those with higher expectations of rejection based on sexual identity, and those with more internalized homonegativity also reported more severe physical symptoms. Only concealment of sexual identity was not significantly associated with PSS. Minority stress factors were modestly related to one another. The only exception was concealment and victimization; they were not significantly related. Finally, coping self-efficacy was significantly and negatively correlated with each minority stress factor. Those who reported greater minority stress (victimization, expectations of rejection, concealment, and internalized homonegativity) reported weaker beliefs about their ability to cope with stress as an LGB individual. Coping self-efficacy was negatively and

Table 3.4

*Summary of Descriptive Statistics and Bivariate Correlations for Minority Stress Factors, Coping Self-Efficacy, and Physical Health*

Variable	<i>M</i>	<i>SD</i>	Product-Moment Correlations						
			1	2	3	4	5	6	
1. Victimization	1.91	.76	(.92)						
2. Rejection	3.04	1.12	.26**	(.73)					
3. Concealment	2.86	1.19	.04	.39**	(.79)				
4. IH	1.66	.88	.14**	.44**	.34**	(.86)			
5. CSE	90.96	24.42	-.27**	-.33**	-.15**	-.24**	(.94)		
6. PSS	20.28	18.31	.38**	.17**	.04	.16**	-.31**	(.93)	

*Note.* IH = internalized homonegativity; CSE = coping self-efficacy total score; PSS = physical symptom severity score. Coefficient alphas are presented in parentheses along the diagonal. Scores for rejection, concealment, and IH ranged from 1 to 6. Victimization scores ranged from 1 to 5.93, CSE scores ranged from 8 to 130.05, and PSS scores ranged from 0 to 95.76. EM imputation caused slight score irregularities. \* $p < .05$ ; \*\* $p < .01$ . Results are based on 5000 bootstrap samples.

significantly associated with physical symptom severity indicating that those with stronger beliefs regarding their coping abilities reported less severe physical symptoms.

**Direct effects of minority stress on physical health.** I tested the effects of LGB-related minority stress on health; therefore, the prudent course was to control for the effect of demographic variables. To that end, I created stepwise hierarchical regression equations to adequately test for direct effects of each minority stress factor on physical symptom severity. Step 1 in the hierarchical regression analyses was to first test the effect of age and income on physical health (see Table 3.5). This model significantly predicted physical health ( $F[2, 451] = 9.62, p < .001$ ). Age ( $\beta = .16, t[452] = 2.04, p < .05$ ) and income ( $\beta = -1.43, t[452] = -4.37, p < .001$ ) each were significant independent predictors of PSS.

Step 2 was completed in four parts. A model was created for minority stress factor to measure the independent effects of the minority stress factors on PSS when controlling for age and income. Income was included because Levene's test (see Table 3.2) indicated that the variance of minority stress and coping self-efficacy scores was significantly related to income when testing their effects on physical symptom severity. Including income ensured the homogeneity of variance in the models. Each model significantly predicted PSS (see Table 3.5). Inspection of beta coefficients showed that victimization ( $\beta = .35, t[451] = 7.95, p < .001$ ), expectations of rejection ( $\beta = .15, t[454] = 3.12, p < .01$ ), and internalized homonegativity ( $\beta = .13, t[454] = 3.56, p < .001$ ) made significant contributions to the variance of PSS scores. Although the model containing concealment did significantly predict PSS ( $F[3, 452] = 6.76, p < .001$ ), concealment was not significant predictor ( $\beta = .04, t[454] = .90, p > .05$ ). These models show the direct

Table 3.5

*Summary of Hierarchical Regression Analysis of Direct Effects of Minority Stress**Factors on Physical Health (N = 452)*

Predictor	<i>B</i>	<i>SE</i>	$\beta$	$r^2$	<i>F</i>
Sociodemographic Variables					
Step 1				.04	9.73***
Constant	19.27***	2.51			
Age	.16*	.08	.11		
Income	-1.44***	.33	-.23		
Victimization					
Step 2a				.15***	28.39***
Constant	2.15	3.18			
Age	.18*	.07	.12		
Income	-1.21***	.31	-.19		
Victimization	8.22***	1.03	.35		
Expectations of Rejection					
Step 2b				.06**	9.87***
Constant	10.82**	3.67			
Age	.20*	.08	.13		
Income	-1.42***	.32	-.23		
Rejection	2.30**	.73	.15		
Concealment					
Step 2c				.04***	6.76***

Table 3.5 continues

Table 3.5 continued

Predictor	<i>B</i>	<i>SE</i>	$\beta$	$r^2$	<i>F</i>
Constant	17.09***	3.48			
Age	.17*	.08	.11		
Income	-1.41***	.33	-.23		
Concealment	.63	.70	.04		
Internalized Homonegativity					
Step 2d				.07***	10.87***
Constant	13.00***	3.04			
Age	.18*	.08	.12		
Income	-1.37***	.32	-.22		
IH	3.20***	.90	.16		

*Note.* IH = internalized homonegativity. Results are based on 5000 bootstrap samples.

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

effects of each minority stress factor on PSS when controlling for the influence of age and income.

**Mediation analysis.** I used Baron and Kenny's (1986) model as a basis for testing the mediating effect of coping self-efficacy on the association between minority stress factors and physical health. Frazier, Tix, and Barron (2004) further elaborated on this model and provide counseling psychologists with a checklist for performing mediation analysis. (See Figure 2.1)

*Analysis of direct effects.* The first step in a mediation analysis according to Frazier et al. (2004) was to determine if a significant association existed between the predictor variables and outcome variable. This was essentially the same step used for the analyses for hypotheses 1 through 4; however, those first analyses included sociodemographic covariates to more accurately assess the direct effect of LGB minority stress on physical health. Ultimately, the two sets of analysis produced the same result. Therefore, potential moderators such as the sociodemographic covariates were not included here to simplify interpretation of mediation. I conducted general linear models to test the direct effects of each minority stress factor on physical health. These models are depicted in step 1 of Tables 3.6 through 3.9. Even without accounting for the covariates found in the hierarchical regression equations, the same trend held: Victimization ( $F[1, 459] = 76.49, p < .0001$ ), expectations of rejection ( $F[1, 461] = 13.74, p < .001$ ), and internalized homonegativity ( $F[1, 461] = 12.29, p < .001$ ) significantly predicted physical health in the hypothesized fashion while concealment was not significantly related to PSS. Although these findings were less conservative than the findings from the hierarchical regression analyses, the two sets of result are consistent. Using the direct effect of the predictor variables in the mediation analysis was, therefore,

Table 3.6

*Mediation Effect of Coping Self-Efficacy on the Association Between Victimization and Physical Health (N = 461)*

Test of mediation effect	<i>B</i>	<i>SE</i>	<i>r</i> <sup>2</sup>	<i>F</i>
Step 1 (Path c)			.14	76.49****
Outcome: PSS				
Constant	2.96	2.13		
Predictor: Victimization	9.07****	1.04		
Step 2 (Path a)			.07	35.92****
Outcome: CSE				
Constant	107.42****	2.96		
Predictor: Victimization	-8.63****	1.44		
Step 3 (Paths b and c')			.19	53.47****
Outcome: PSS				
Constant	20.99****	4.08		
Mediator: CSE (Path b)	-.17****	.03		
Predictor: Victimization	7.62****	1.05		

*Note.* Results are based on 5000 bootstrap samples. PSS = physical symptom severity;

CSE = coping self-efficacy. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ ; \*\*\*\* $p < .0001$ . Sobel test:

$z = 3.86, p < .001$ .

Table 3.7

*Mediation Effect of Coping Self-Efficacy on the Association Between Expectations of Rejection and Physical Health (N = 463)*

Test of mediation effect	<i>B</i>	<i>SE</i>	<i>r</i> <sup>2</sup>	<i>F</i>
Step 1 (Path c)			.03	13.74****
Outcome: PSS				
Constant	11.84****	2.44		
Predictor: Rejection	2.79***	.75		
Step 2 (Path a)			.11	58.28****
Outcome: CSE				
Constant	113.31****	3.14		
Predictor: Rejection	-7.40****	.97		
Step 3 (Paths b and c')			.11	27.05****
Outcome: PSS				
Constant	36.51****	4.59		
Mediator: CSE (Path b)	-.22****	.03		
Predictor: Rejection	1.18	.77		

*Note.* Results are based on 5000 bootstrap samples. PSS = physical symptom severity;

CSE = coping self-efficacy. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ ; \*\*\*\* $p < .0001$ . Sobel test:

$z = 4.82, p < .0001$ .



Table 3.8

*Mediation Effect of Coping Self-Efficacy on the Association Between Concealment and Physical Health (N = 463)*

Test of mediation effect	<i>B</i>	<i>SE</i>	<i>r</i> <sup>2</sup>	<i>F</i>
Step 1 (Path c)			.00	.98
Outcome: PSS				
Constant	18.30****	2.22		
Predictor: Concealment	.71	.72		
Step 2 (Path a)			.02	11.68***
Outcome: CSE				
Constant	100.12****	2.96		
Predictor: Concealment	-3.26***	.96		
Step 3 (Paths b and c')			.10	25.74****
Outcome: PSS				
Constant	41.94****	3.94		
Mediator: CSE (Path b)	-.24****	.03		
Predictor: Concealment	-.06	.69		

*Note.* Results are based on 5000 bootstrap samples. PSS = physical symptom severity;

CSE = coping self-efficacy. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ ; \*\*\*\* $p < .0001$ . Sobel test:

$z = 3.05, p < .01$ .

Table 3.9

*Mediation Effect of Coping Self-Efficacy on the Association Between Internalized Homonegativity and Physical Health (N = 463)*

Test of mediation effect	<i>B</i>	<i>SE</i>	<i>r</i> <sup>2</sup>	<i>F</i>
Step 1 (Path c)			.03	12.29****
Outcome: PSS				
Constant	14.79****	1.79		
Predictor: IH	3.33***	.95		
Step 2 (Path a)			.07	32.36****
Outcome: CSE				
Constant	102.66****	2.36		
Predictor: IH	-7.12****	1.25		
Step 3 (Paths b and c')			.11	27.69****
Outcome: PSS				
Constant	37.31****	3.88		
Mediator: CSE (Path b)	-.22****	.03		
Predictor: IH	1.77	.94		

*Note.* Results are based on 5000 bootstrap samples. PSS = physical symptom severity; IH = internalized homonegativity; CSE = coping self-efficacy. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ ; \*\*\*\* $p < .0001$ . Sobel test:  $z = 4.25$ ,  $p < .0001$ .

merited. Also, this allowed for testing a simple mediation model with coping self-efficacy without assuming moderation by sociodemographic characteristics.

*Analysis of indirect effects.* The second step in Frazier et al.'s (2004) mediation analysis was to determine if a significant association existed between each minority stress factor and the mediator coping self-efficacy. This step is represented in path a of Figure 2.1 and step 2 of Tables 3.6 through 3.9 for each minority stress factor. The prior step did not show support for concealment having a significant direct effect on physical symptom severity. Frazier et al. stated that continuing with a mediation analysis was merited only if a theoretical rationale could be demonstrated. Meyer (2003) suggested that concealment was an important minority stress to consider and that coping resources mediated the relation between concealment and mental health. The purpose of the present study is to apply Meyer's framework to the exploration of physical health in LGB individuals; therefore, it is necessary to continue to assess concealment and test how CSE may affect its association on PSS. Results indicated that victimization ( $F[1, 459] = 35.92, p < .0001, r^2 = .07, 1 - \beta = .99$ ), expectations of rejection ( $F[1, 461] = 58.82, p < .0001, r^2 = .11, 1 - \beta = 1.00$ ), concealment ( $F[1, 461] = 11.68., p < .001, r^2 = .02, 1 - \beta = .86$ ), and internalized homonegativity ( $F[1, 461] = 32.36, p < .0001, r^2 = .07, 1 - \beta = .99$ ) were significantly associated with coping self-efficacy. The beta coefficient (see Tables 3.6 through 3.9) for each minority stress factor was negative indicating that those with higher levels of each minority stress factor was significantly associated with weaker efficacy beliefs for one's ability to cope with stress and an LGB individual.

The third step of a mediation analysis according to Frazier et al. (2004) is to determine if the minority stress factors affect physical health when accounting for coping self-efficacy. This step required four regression equations and was represented in parts b

and  $c'$  of Figure 2.1. If the minority stress factors have no effect on physical health when controlling for coping self-efficacy, then I can say that coping self-efficacy fully mediates between factors of minority stress and physical health. The results from this step will be illustrated for each predictor variable in step 3 of Tables 3.6 through 3.9.

The relation between the predictors, mediator, and outcome can affect the power of tests of indirect effects. Using the actual sample size in a post hoc power analysis can overestimate the power of regression equations. Frazier et al. (2004) provided a formula to calculate an *effective sample size* that takes the relation of each predictor and mediator into consideration:  $N(1 - r_{xm}^2)$ , where  $N$  was the actual sample size and  $r_{xm}$  was the product-moment correlation coefficient for the mediator and the predictor. The effective sample size ( $n_e$ ) was used when reporting post hoc power ( $1 - \beta$ ) in the tests of indirect effects. Effective sample size was rounded to the nearest whole number and was reported as an approximate value.

The regression models illustrated that CSE serves as a significant predictor of PSS when considering victimization ( $F[2, 458] = 53.47, p < .0001, r^2 = .19, n_e \approx 411, 1 - \beta = 1.00$ ), expectations of rejection ( $F[2, 460] = 27.05, p < .0001, r^2 = .11, n_e \approx 413, 1 - \beta = .99$ ), concealment ( $F[2, 460] = 25.74, p < .0001, r^2 = .10, n_e \approx 453, 1 - \beta = .99$ ), and internalized homophobia ( $F[2, 460] = 27.69, p < .0001, r^2 = .11, n_e \approx 436, 1 - \beta = .99$ ). Examination of beta coefficients found that CSE fully mediates the relation between expectations of rejection and physical symptom severity and internalized homonegativity and PSS. These minority stress factors were significant predictors of PSS when CSE was not considered in the regression equation; however, these factors became non-significant when CSE was added. This suggested that if you have higher CSE, then expectation of rejection and internalized homonegativity have an insignificant effect on health. CSE

appeared to be a partial mediator of the relation between victimization and PSS. The beta coefficient for victimization remained significant after accounting for CSE suggesting that victimization has a strong direct effect on physical health as well as a partially mediated effect through CSE. In spite of higher CSE, LGB victimization has a significant influence on physical health. Finally, the effect of concealment on PSS seems to be mediated through CSE; however, it is difficult to say that it a perfect mediator in the traditional sense for statistically concealment was not a significant predictor of PSS. This support for mediation does have theoretical utility.

The final step in the analysis was to test the significance of the mediation effect. Frazier et al. (2004) and Baron and Kenny (1986) describe a modified version of the Sobel's (1982) test of mediation. The formula for this test is as follows:  $(b^2s_a^2 + a^2s_b^2 + s_a^2s_b^2)^{1/2}$ . In this formula  $b$  represents the unstandardized regression coefficient (path  $b$  from Figure 2.1),  $a$  represents the unstandardized regression coefficient (part  $a$  from Figure 2.1). The variables  $s_a$  and  $s_b$  represent their respective standard errors. This test produces a  $z$  score of the mediated effect. If the score is greater than 1.96, then the effect is considered significant assuming an alpha level of .05. However, this test is sensitive to the distribution of the sample. Sobel's test assumes a normal distribution, and it has already been established that victimization, IH, and PSS may have a leptokurtic distribution. Several sources (Brennan et al., 2010; Kline, 2011; Potoczniak, Aldea, & DeBlaere, 2007; Preacher & Hayes, 2004; Shrout, & Bolger, 2002) suggested the use of a bootstrap procedure to confirm mediation in lieu of Sobel's test when sample distribution is in question. Sobel's test is a more traditional method for testing the significance of indirect effects, and Sobel's test statistical were reported in the notes of Tables 3.6 through 3.9. However, final interpretation of the significance of indirect effects came from the

more conservative bootstrap procedure. Like previously reported tests, 5000 bootstrap samples were used in the test of indirect effects. A 95% confidence interval was used to interpret the effect. Shrout and Bolger (2002) as well as Preacher and Hayes (2004) reported that mediation was significant if 0 fell outside the confidence interval. See Table 3.10 for an illustration of the results. Bootstrap estimates of the indirect effects minority stress factors on physical symptom severity through coping self-efficacy were significant for victimization, expectations of rejection, concealment of sexual identity, and internalized homonegativity.

Table 3.10

*Summary of Bootstrap Estimates of Indirect Effects*

Path	<i>B</i>	<i>SE</i>	95% CI
V→CSE→PSS	1.45	.38	[.76, 2.23]*
R→CSE→PSS	1.61	.37	[.95, 2.39]*
C→CSE→PSS	.77	.28	[.27, 1.38]*
IH→CSE→PSS	1.56	.43	[.80, 2.46]*

*Note.* Results are based on 5000 bootstrap samples. Estimates of indirect effects are based on unstandardized coefficients. CI = confidence interval; V = victimization, R = expectations of rejection, C = concealment, CSE = coping self-efficacy, PSS = physical symptom severity, IH = internalized homonegativity. \* $p < .05$ .

## **Chapter Four: Discussion and Conclusions**

In this chapter I discuss the findings in the context of their contribution to the minority stress literature. Secondly, I describe how the findings of the current study compare the findings of the research reviewed in chapter one. Thirdly, this chapter highlights several implications of these findings for the practice of counseling psychology specifically. Counseling psychologists are also actively engaged in meso- and macrosocial level interventions as part of the social justice component of the counseling psychologist identity. Consistent with the results of this study, I suggest systemic interventions that may benefit the health of LGB individuals. Fourthly, this chapter concludes with a discussion of the strengths and limitations of the present study and some directions for future research.

### **Contribution to Minority Stress Literature**

This study contributes to the minority stress literature by examining stigma-related psychological factors that affect physical health. Previously, minority stress research with LGB individuals almost exclusively concerned mental health (Brennan et al., 2010; Cochran et al., 2003; McNair et al., 2011; Meyer, 1995, 2003; Sandfort et al., 2006). Only a handful of studies over the past two decades explored minority stress and physical health conditions in LGB individuals, and these have been limited to epidemiological surveys sometimes using 1-item indicators (Cochran & Mays, 2007) and often focusing on men who have sex with men (Bianchi et al., 2004; Díaz et al., 2004; Huebner & Davis, 2007; Yoshikawa et al., 2004; Zamboni & Crawford, 2007). The limitations of the studies have already been addressed in detail. This study is one of the first to use a national sample of LGB women and men to explore physical symptomology



and severity. Also, this is the first study to my knowledge that has investigated the potential of coping self-efficacy as a mediator for minority stress and health. Finally, the current study demonstrated comparable effect sizes to Meyer's (1995) initial study of minority stress and mental health in gay men and a later study of minority stress and coping resources in LGB individuals (Meyer et al., 2008). This finding is evidence of convergent validity, thus, supporting use of the minority stress framework in studies of physical health in lesbians, gays, and bisexuals.

### **Review of Findings**

The present study employed Frazier et al.'s (2004) elaboration of Baron and Kenny's (1986) model for mediation analysis to test the utility of Meyer's (2003) model of minority stress as applied to the physical health and coping self-efficacy of lesbian, gay, and bisexual individuals. Based on the literature reviewed in chapter one, I generated four hypotheses regarding the direct effects of minority stress factors on physical health. Results supported three of the four hypotheses. The present study found that scores on victimization, expectations of rejection, and internalized homonegativity predicted greater reported physical symptom severity. Contrary to the minority stress framework, results failed to support the hypothesis that concealment of one's sexual identity would predict physical symptom severity.

I also proposed a fifth hypothesis that coping self-efficacy would mediate the association between each minority stress factor and physical health. Results demonstrated that CSE served as a significant mediator for the relation between each minority stress factor and physical symptom severity. Specifically, CSE fully accounted for the relation between expectation of rejection, internalized homonegativity, and physical health. CSE also fully accounted for the relation between concealment and

physical symptom severity. Although the relation between concealment and physical symptom severity was not significant, Meyer (2003) provided theoretical rationale for considering concealment in the mediation analysis. Finally, CSE partially mediated the relation between reports of victimization and physical symptom severity. I will return to the unique properties of concealment and victimization later in this chapter.

**Minority stress and physical health.** Scores for the four minority stress factors demonstrated acceptable to excellent internal consistency in the current study. Therefore, the predictor variables were assumed to be reliable indicators of minority stress. Consistent with Meyer's (2003) minority stress framework, LGB individuals with greater expectations of rejection based on one's sexual identity, higher levels of internalized homonegativity, and more reports of victimization based on one's sexual identity exhibited poorer physical health by reporting more severe physical symptoms than those with lower levels of these minority stress factors. Expectations of rejection, concealment, and internalized homonegativity represented the more proximal measures of minority stress while victimization represented a more distal measure. The findings of the current study indicated that both proximal and distal characteristics of an LGB person's intrapsychic, interpersonal, social, and cultural contexts might influence physical health.

Concealment scores were considered reliable, but they did not perform as the minority stress framework (Meyer, 2003) suggested. Concealment failed to significantly predict physical health in statistical tests where demographic variables were and were not controlled. Conceptually, concealment also differed from the other three minority stress factors included in this study. Concealment referred to the behavior of not disclosing one's sexual identity. On the other hand, expectations of rejection and internalized

homonegativity refer to more cognitive and affective qualities of one's perceptions of the environment. Concealment of one's sexual identity may be an adaptive response to these perceptions under certain conditions. For example, if one is likely to lose a source of general support (e.g., through familial rejection), then one may choose to conceal one's sexual identity resulting in an overall benefit to one's health.

Deeper examination of the literature on concealment indicated that this finding might not be so surprising after all. Pérez-Benítez, O'Brien, Carels, Gordon, and Chiros (2007) found that those who reported a tendency to conceal their sexual identity in general and who, under laboratory conditions, disclosed stressful experiences of concealment demonstrated more cardiovascular recovery than those who were less likely to disclose under laboratory conditions. This finding indicated a healthier cardiovascular response. Participants for the current study were recruited primarily through affirming social groups such as faith communities, Imperial Court chapters, pride centers, advocacy groups, and other online social media. These participants—by virtue of being affiliated with these groups—likely have had a social outlet for disclosure of stressful experiences regarding concealing one's sexual identity from time to time. Concealment may still cause distress; however, it is possible that participants were able to disclose with those they trusted and reap the health benefits of disclosure.

It is also possible that the measure of concealment was not unidimensional. Two of the three items expressed beliefs about concealing one's sexual identity. The third item was more behavioral. High scorers on this third item reported being able to “keep careful control over who knows” about the participants' sexual identity (Mohr & Kendra,

2011; see Appendix B). This item reflected an active approach of monitoring disclosure of sexual identity that can result in concealment in certain circumstances. Selvidge, Matthews, and Bridges (2008) investigated the effect of self-monitoring and concealment of sexual identity on psychological well-being in bisexual and lesbian women in a web-based study. They found that high scores in self-monitoring predicted positive psychological well-being while concealment predicted negative psychological well-being. Monitoring who knows about one's sexual identity is distinct from beliefs about concealment, and each can have opposite effects on well-being. The active process of monitoring is an adaptive response to a difficult situation. It is possible that the detrimental effect of the stress associated with concealment was psychometrically countered by the ameliorating effect of self-monitoring. This resulted in an inability to distinguish the effects of the two constructs and, thus, failure to reject the null hypothesis that concealment had no effect on physical health.

**Coping self-efficacy effects.** The fifth hypothesis stated that coping self-efficacy would account for the association between minority stress factors and physical health. CSE scores demonstrated excellent internal consistency and were deemed to be adequately reliable based on Frazier et al.'s (2004) criteria for a mediator variable. Results illustrated that those with higher levels of minority stress based on expectations of rejection and internalized homonegativity may not exhibit more severe physical symptoms if they have stronger efficacy beliefs for coping with minority stress (i.e., higher CSE scores). This finding suggested that counseling psychologists and other health care providers may be able to affect LGB client's reported physical symptoms severity by developing interventions to promote coping self-efficacy.

I have already established that concealment was not a significant predictor of physical health in this sample of LGB individuals. However, Frazier et al. (2004) allowed for the examination of insignificant predictors if there was a compelling theoretical rationale for an association between the predictor and outcome. Also, I have established that the minority stress framework (Meyer, 2003) provided such a rationale. Therefore, it was appropriate to interpret the mediation effect of coping self-efficacy on the relation between concealment and physical health. The current study demonstrated a significant effect: CSE fully accounted for the relation between concealment and physical health. I cannot rule out the possibility that the finding may be a statistical anomaly. The beta coefficient for concealment was not significantly related to physical symptoms severity, but CSE was sufficient to significantly reduce the beta in the mediation analysis. Also, this finding may also be the result of chance; statistical tests have a 1 in 20 chance of being significant assuming an alpha level of .05. Psychologists are generally willing to take a 1 in 20 chance of finding a false positive. There are many questions left unanswered regarding the effect of concealment, but this finding does suggest that CSE has a strong potential as an area for intervention to improve the physical health of LGB individuals.

The effect of CSE on the more proximal factors notwithstanding, the study showed that CSE was not a “cure” for minority stress by any means. This study found that high coping self-efficacy reduced but not eliminated the effect of victimization on physical health. This concept was the most distal of the factors under investigation. Victimization remained a significant predictor to physical symptoms severity scores after coping was considered. In spite of one’s beliefs about coping abilities, victimization still had a deleterious effect on physical health. Developing a client’s beliefs about coping is

not enough to ameliorate the effect of victimization. Victimization was out the individual's control, because it was based less on one's perception and more on one's lived experience in a social and cultural context. These contexts, of course, form the greater environment in which the individual exists. Stress on this level can seem inescapable. This study provided more evidence for the negative effects of discriminatory practices, prejudice, and bullying on LGB individuals. To alleviate this effect, broader, systemic interventions will be necessary. This finding further demonstrated that discrimination based on sexual identity should be elevated to a national public health concern.

The study found that full mediation occurred when considering the more proximal minority stress factors (expectations of rejection, concealment, and internalized homonegativity). These are factors that are more closely related the participant's intrapsychic and interpersonal contexts. Distress in these areas may be more readily apparent. The perceptions of these more proximal factors may be viewed as being more within the individual's control. Therefore, one's beliefs about coping abilities should diminish one's level of distress. This study provided no intervention, but the study amply identified CSE as an area worthy of further exploration as an intervention for LGB individuals dealing with minority stress.

### **Implications for Social Justice Work in Counseling Psychology**

The findings show a considerable need for intervention on multiple levels. Counseling psychologists are well suited to address the issue of minority stress and physical health in lesbian, gay, and bisexual individuals. This will be especially true as counseling psychologists become more influential in the field of clinical health

psychology (Nicholas & Stern, 2011; Schmidt, Hoffman, & Taylor, 2006). Counseling psychologists incorporate the core values (see Packard, 2009) of promoting positive coping, advocating for social justice, and incorporating relevant social contextual factors in their practice at multiple levels of intervention. As clinicians, counseling psychologists engage in direct intervention with LGB individuals after more proximal minority stress factors have developed and after more distal events have occurred resulting in poor well being. Counseling psychologists also serve as consultants to other health care providers such as physicians and nurses. Consultation services can help HCPs develop skills for working with LGB individuals. Also, counseling psychologists are deeply concerned with prevention and wellness. This current study has implications for the practice of counseling psychology at each level of intervention.

The literature refers to these varied activities as *prevention*. Colloquially, prevention means to keep an event from happening; however, Romano and Hage (2000) defined prevention as “interventions designed to reduce the incidence, prevalence, and impact on problem behaviors” in addition to “[including] personal well-being (e.g., health promotion) and social and political change initiatives to improve environments where people learn, live, and work” (p. 740). Romano and Hage described five dimensions of prevention work relevant to the practice of counseling psychologists: (a) “stops (prevents) a problem behavior from ever occurring,” (b) “delays the onset of a problem behavior,” (c) “reduces the impact of an existing problem behavior,” (d) “strengthens knowledge, attitudes, and behaviors that promote emotional and physical well-being,” and (e) “supports institutional, community, and government policies that promote physical and emotional well-being” (p. 740-741). The first three dimensions referred to what prevention researchers have traditionally called *primary*, *secondary*, and *tertiary*

*prevention*, respectively; the latter two reflected a *risk reduction framework*. This framework offered avenues for systemic intervention to support health while the more traditional approaches involved more directed individuals or community level interventions. These levels of prevention could serve as a guide for a counseling psychologist developing interventions on multiple levels.

More and more, counseling psychologists are realizing that prevention requires moving out of the counseling office and being visible, proactive members of the community. Romano and Hage's (2000) expansion on prevention increases the opportunity for counseling psychologists to promote issues of diversity and social justice. Promoting social justice requires counseling psychologists to look *upstream* at the sources of health and not just *downstream* where the problems have already occurred and washed on shore (McKinlay & Marceau, 2000). To that end, the implications of this study should be considered in the manner most befitting of a counseling psychologist: to identify both upstream and downstream interventions that improve the health of lesbian, gay, and bisexual individuals, inoculate against the influence of minority stressor in the future, and provide environmental changes that reduce or eliminate minority stressors.

**Implications for clinical intervention.** The current study found support for coping self-efficacy as a potential area for intervention to improve the health of LGB individuals. Direct clinical interventions can relate to different domains of prevention depending upon the client's presentation. Clinicians should know the evidence base that relates to their clients. Therapists can develop coping self-efficacy interventions based on the current study to stop, delay, or reduce the impact of problems related to minority stress and physical health according to the needs of the client.



Bandura (1977, 1995) provides a framework to understanding how efficacy beliefs are influenced. This framework of the sources of self-efficacy reviewed in chapter one is an excellent place for beginning to develop self-efficacy interventions. Briefly, the sources of self-efficacy are mastery experiences, vicarious experiences, persuasion, and physiological and emotional states (Bandura, 1977, 1995).

***Interventions targeting mastery experiences.*** Psychodynamic psychotherapies assert that clients unconsciously repeat patterns of behavior when thoughts and affects are activated and reinforced through a relational experience (McWilliams, 1999). A healthy client-psychotherapist relationship can provide a corrective emotional experience and interrupt a maladaptive behavioral pattern (Teyber, 2006). An intervention designed to target mastery experience could be to ask the clients to identify times in which they believe they coped well with a stressful experience relevant to their LGB identity such as bullying, expectations of rejection, concealment, or internalized homonegativity. Clients and clinicians could collaboratively process the thoughts and behaviors associated with coping during this experience. The specific coping strategies could be identified. Ineffective strategies could be discarded or refined. Effective strategies could be supported. New strategies could be taught, tested, and refined. As clients realize they are mastering particular coping strategies for dealing with minority stress, efficacy beliefs will become stronger.

***Interventions targeting vicarious experiences.*** McWilliams (1999) reported that assessing a client's relational patterns is an essential component of psychodynamic conceptualization. Also, a therapist needs a thorough understanding of the associations for relevant individuals and groups within the client's interpersonal, social, and cultural contexts. These associations are sometimes called identifications. A therapist's

assessment of relational patterns and identifications could inform the therapist on how to utilize vicarious experiences to build self-efficacy.

Clinicians could utilize vicarious experiences by helping clients identify another LGB individual in their social network whom they believe are good models for coping. Their perceptions of this person's coping strategies could be identified in session and applied by the client. Theoretically, as the client sees what others do to effectively cope with minority stress, the client's efficacy beliefs for coping will become stronger. This may also be an opportunity for the clinician to support the client in becoming more involved with the LGB community. Engaging in prosocial activities to support the LGB community could be empowering for the client by increasing the client's sense of agency and exposing the client to the effective coping strategies of other LGB individuals. These suggestions are far from exhaustive, but they exemplify how clinicians could intervene to support the developing of coping self-efficacy for LGB individuals. These techniques could serve as primary, secondary, or tertiary prevention approaches depending on the client's situation.

***Interventions targeting social persuasion.*** The most obvious intervention to utilize social persuasion to build efficacy beliefs in a psychotherapeutic encounter is for the therapist to praise successes and identify the effort needed for success. Traditional psychodynamic practitioners might object to this approach because it violates the concept of *analytic neutrality*, an approach where the clinician is a blank screen onto which the client can project unconscious intrapsychic conflicts (Auld, Hyman, & Rudzinski, 2005). Contemporary theorists such as McWilliams (2004) and Teyber (2006) have called the concept of neutrality into question.

There is value from a psychodynamic perspective in the therapist offering praise to a client. Meyer's (2003) minority stress framework establishes and this study replicates the finding that LGB individuals can develop strong expectations of rejection based on sexual identity. Receiving affirmations related to sexual identity from a person of power (e.g., a therapist) could create a corrective emotional experience for the client. This affirmation could stir an interpersonal experience to which the client is unaccustomed given the client's experience with oppression. This interpersonal experience could arouse conflicting feelings of anxiety and gratification at acceptance. Interventions targeting social persuasion might not only build coping self-efficacy but move deeper to improve the client's general self-image.

***Interventions targeting physiological and emotional states.*** Developing insight into the relation between belief and emotion is at the heart of psychodynamic psychotherapy and psychoanalysis (Freud, 1916/1920; McWilliams, 1999). Therapists can assess emotional states through direct communication, body language, and characteristics such as tone of voice (McWilliams, 1999). The assessment of affect is necessary to understand the origins of efficacy beliefs. Bandura (1995) asserts that individuals often misinterpret negative emotion and physiological arousal with being inefficacious. These individuals may lack insight into the underlying sources of emotional and arousal.

One might not be surprised that an LGB individual would experience anxiety during an episode of minority stress. A realistic degree of uncertainty exists in such situations; this is particularly true in interpersonal, social, or cultural situations that can result in victimization. An LGB individual can use counseling to assess if one's anxiety is within bounds of the realistic threat of the situation. Also, the juxtaposition of extant

coping mechanism and the co-occurring emotions in a given situation could provide insight into one's true efficacy. It is possible that coping mechanisms partially ameliorate the effect of the situation but beliefs remain weak. The individual may discount the partial mediation because of the fallacious expectation that coping skills should result in absolute elimination of distress. Juxtaposing coping skills and emotions can demonstrate just how efficacious the client truly is.

In the situation where the client lacks effective coping skills for dealing with minority stress, the therapist and client can collaboratively develop skills such as developing a supportive social network, breaking problems into smaller components, or authentic expression of emotion. The client's emotional and physiological states could serve as a guidepost for charting the client's sense of efficacy as skills are developed, implemented, and refined.

**Implications for systemic intervention.** The current found support for LGB individuals experiencing detrimental stress from forces outside their control. Building coping self-efficacy only partially accounted for the effect of victimization on health. Systemic interventions are needed to target the sources of minority stress to fully redress this effect. Policy changes are needed to health care facilities to ensure affirmative and ethical care for LGB individuals. The Joint Commission (2011), an accrediting body for hospitals and other health care facilities in the United States, recently released a field guide to support the development of affirmative practices and supportive environments in health care for LGB and transgender individuals. This guide recommends creating a supportive environment by developing policies prohibiting discrimination in employment and care on the basis of sexual orientation, gender identity, or gender expression. The field guide also recommends including significant persons in the recovery that the patient

identifies regardless of legal relationship. This policy change would ensure that same-sex partners could be involved in care in jurisdictions where marriage equality is not provided.

Legislative and judicial interventions are also necessary to develop an affirmative state, national, and international environment for LGB individual and end institutional discrimination. Rostosky et al. (2009, 2010) demonstrated that LGB individuals experience psychological distress related to the denial of civil marriage. This denial prevents many LGB individuals from gaining access to health care that would be guaranteed for married partners. Marriage equality would eliminate a source of institutional victimization that has distal effects on health and ensure immediate access to health care through insurance benefits, thus, having a proximal effect on health in LGB individuals. Hatzenbuehler et al. (2012) recently found evidence to support this hypothesis. Bisexual and gay men reported fewer medical care visits within six months after marriage equality was established in Massachusetts when compared to the 12 months prior to the law going into effect.

### **Strengths and Limitations**

This study was not without its limitations. Conducting a web-based study may have compromised internal validity. I had no control over the setting in which participants completed the study. Also, this study was restricted to individuals who had access to a computer and were accessible through email or other means of online communication. The study had a large age range, but most of the participants were young adults. Participants also reported being relatively healthy and with mostly lower levels of minority stress. Due to the stigma of being LGB, some individuals are not likely to associate with other LGB individuals or with LGB cultural and social venues.

Therefore, these individuals cannot be easily recruited into research studies such as this one. The sample, therefore, was likely limited to individuals who are “out” on some level and willing to be identified as LGB. These restrictions may account for the skewed distribution of some study variables.

All study variables were explicitly described and had demonstrated strong psychometric properties in this and previous studies. Therefore, replication of these findings should be a straightforward process. The results of this study may only be generalizable to adult LGB individuals who are out to some degree and who reside in the United States. Despite attempts to recruit people of color, the sample is biased toward Euro-American individuals. Therefore, results should be applied cautiously to LGB people of color. Despite these limitations, the sample was sufficiently large enough to test the effect of minority stress factors and coping self-efficacy on physical health.

### **Future Research**

This study employed a straightforward approach of examining minority stress factors independently. Future studies could examine the cumulative effects of minority stress factors in a full factorial design. Additional research is also needed to explore the dimensionality of concealment to identify possible health promoting and health depleting factors. Also, the study was restricted to lesbian, gay, and bisexual-identified individuals. Future research may benefit from investigating the health of heterosexual-identified women who have sex with women and men who have sex with men. The dynamics of stress, coping, and health in transgender, genderqueer, and gender variant individuals may also be a fruitful area of investigations. A more thorough investigation of mediation with coping self-efficacy and moderation by sociodemographic variables is also an area for future investigation. Finally, future studies may also test the efficacy of

sociocognitive interventions designed to alleviate minority stress and improve health in LGB individuals. The findings of such studies would contribute to affirmative evidence-based practice with LGB individuals.

### **Conclusions**

This study has expanded our understanding of the biopsychosocial aspects of health in lesbian, gay, and bisexual individuals. The findings support the use of interventions designed to bolster efficacy beliefs for coping with minority stress and to address stigma and discrimination at all levels of the system. Also, the results of this study support the utility of the minority stress framework (Meyer, 2003) in the exploration of physical health of LGB individuals.

## Appendix A:

### Heterosexist Harassment, Rejection, and Discrimination Scale (HHRDS)

Please think carefully about your life as you answer the questions below. Read each question and then select the number that best describes events in the PAST YEAR, using these rules. Select 1—If the event has NEVER happened to you; Select 2—If the event happened ONCE IN A WHILE (less than 10% of the time); Select 3—If the event happened SOMETIMES (10–25% of the time); Select 4—If the event happened A LOT (26–49% of the time); Select 5—If the event happened MOST OF THE TIME (50–70% of the time); Select 6—If the event happened ALMOST ALL OF THE TIME (more than 70% of the time).

Never	Once in a while (less than 10% of the time)	Sometimes (10-25% of the time)	A lot (26-49% of the time)	Most of the time (50-70% of the time)	Almost all of the time (more than 70% of the time)
1	2	3	4	5	6

IN THE PAST ONE YEAR . . .

1. How many times have you been treated unfairly by teachers or professors because you are LGB?
2. How many times have you been treated unfairly by your employer, boss, or supervisors because you are LGB?
3. How many times have you been treated unfairly by your co-workers, fellow students, or colleagues because you are LGB?



4. How many times have you been treated unfairly by people in service jobs (by store clerks, waiters, bartenders, waitresses, bank tellers, mechanics, and others) because you are LGB?
5. How many times have you been treated unfairly by strangers because you are LGB?
6. How many times have you been treated unfairly by people in helping jobs (by doctors, nurses, psychiatrists, caseworkers, dentists, school counselors, therapists, pediatricians, school principals, gynecologists, and others) because you are LGB?
7. How many times were you denied a raise, a promotion, tenure, a good assignment, a job, or other such thing at work that you deserved because you are LGB?
8. How many times have you been treated unfairly by your family because you are LGB?
9. How many times have you been called a HETEROSEXIST name like dyke, fag, or other names?
10. How many times have you been made fun of, picked on, pushed, shoved, hit, or threatened with harm because you are LGB?
11. How many times have you been rejected by family members because you are LGB?
12. How many times have you been rejected by friends because you are LGB?
13. How many times have you heard ANTI-LGB remarks from family members?
14. How many times have you been verbally insulted because you are LGB?

Subscales: Harassment and rejection (items: 8, 9, 10, 11, 12, 13, 14), Workplace and school discrimination (items: 1, 2, 3, 7), Other discrimination (items: 4, 5, 6).

Alterations from the original: “lesbian” was changed to “LGB,” “anti-lesbian/anti-gay” was changed to “anti-LGB,” “lezzie” in item 9 was changed to “fag” to provide a heterosexist example typically directed to men.

## Appendix B:

### Lesbian, Gay, and Bisexual Identity Scale: Revised and Extended

Some of you may prefer to use labels other than ‘lesbian, gay, and bisexual’ to describe your sexual orientation (e.g., ‘queer,’ ‘dyke,’ ‘questioning’). We use the term LGB in this survey as a convenience, and we ask for your understanding if the term does not completely capture your sexual identity.

For each of the following questions, please mark the response that best indicates your current experience as an LGB person. Please be as honest as possible: Indicate how you really feel now, not how you think you should feel. There is no need to think too much about any one question. Answer each question according to your initial reaction and then move on to the next.

Disagree Strongly	Disagree	Disagree Somewhat	Agree Somewhat	Agree	Agree Strongly
1	2	3	4	5	6

1. I prefer to keep my same-sex romantic relationships rather private. (CM)
2. If it were possible, I would choose to be straight. (IH)
3. I’m not totally sure what my sexual orientation is.
4. I keep careful control over who knows about my same-sex romantic relationships.  
(CM)
5. I often wonder whether others judge me for my sexual orientation. (AC)
6. I am glad to be an LGB person.
7. I look down on heterosexuals.

8. I keep changing my mind about my sexual orientation.
9. I can't feel comfortable knowing that other judge me negatively for my sexual orientation. (AC)
10. I feel that LGB people are superior to heterosexuals.
11. My sexual orientation is an insignificant part of who I am.
12. Admitting to myself that I'm an LGB person has been a very painful process.
13. I'm proud to be part of the LGB community.
14. I can't decide if I am bisexual or homosexual.
15. My sexual orientation is a central part of my identity.
16. I think a lot about how my sexual orientation affects the way people see me. (AC)
17. Admitting to myself that I'm an LGB person has been a very slow process.
18. Straight people have boring lives compared with LGB people.
19. My sexual orientation is a very personal and private matter. (CM)
20. I wish I were heterosexual. (IH)
21. To understand who I am as a person, you have to know that I'm LGB.
22. I get very confused when I try to figure out my sexual orientation.
23. I have felt comfortable with my sexual identity just about from the start.
24. Being an LGB person is a very important aspect of my life.
25. I believe being LGB is an important part of me.
26. I am proud to be LGB.
27. I believe it is unfair that I am attracted to people of the same sex. (IH)

Subscale scores are computed by reverse-scoring items as needed and averaging subscale item ratings. Subscale composition is as follows (underlined items should be reverse-

scored): Acceptance Concerns (5, 9, 16), Concealment Motivation (1, 4, 19), Identity Uncertainty (3, 8, 14, 22), Internalized Homonegativity (2, 20, 27), Difficult Process (12, 17, 23), Identity Superiority (7, 10, 18), Identity Affirmation (6, 13, 26), and Identity Centrality (11, 15, 21, 24, 25).

## Appendix C:

### Coping Self-Efficacy Scale

When things aren't going well for you as an LGB individual, or when you're having problems as an LGB individual, how confident or certain are you that you can do the following:

Cannot do at all					Moderately certain can do					Certain can do
0	1	2	3	4	5	6	7	8	9	10

#### Use problem-focused coping (6-items)

1. Break an upsetting problem down into smaller parts
2. Sort out what can be changed, and what cannot be changed
3. Make a plan of action and follow it when confronted with a problem
4. Leave options open when things get stressful
5. Think about one part of the problem at a time
6. Find solutions to your most difficult problems

#### Stop unpleasant emotions and thoughts (4-items)

7. Make unpleasant thoughts go away
8. Take your mind off unpleasant thoughts
9. Stop yourself from being upset by unpleasant thoughts
10. Keep from feeling sad

#### Get support from friends and family (3-items)

11. Get friends to help you with the things you need

12. Get emotional support from friends and family

13. Make new friends

**Appendix D:**

**Cohen-Hoberman Inventory of Physical Symptoms (CHIPS)**

Mark the number for each statement that best describes HOW MUCH THAT PROBLEM HAS BOTHERED OR DISTRESSED YOU DURING THAT PAST TWO WEEKS INCLUDING TODAY. Mark only one number for each item. At one extreme, **0 means that you have not been bothered by the problem.** At the other extreme, **4 means that the problem has been an extreme bother.**

Not bothered by the problem				The problem has been an extreme bother
0	1	2	3	4

HOW MUCH WERE YOU BOTHERED BY:

1. Sleep problems (can't fall asleep, wake up in middle of night or early in morning)
2. Weight change (gain or loss of 5 lbs. or more)
3. Back pain
4. Constipation
5. Dizziness
6. Diarrhea
7. Faintness
8. Constant fatigue
9. Headache
10. Migraine headache
11. Nausea and/or vomiting
12. Acid stomach or indigestion



13. Stomach pain (e.g., cramps)
14. Hot or cold spells
15. Hands trembling
16. Heart pounding or racing
17. Poor appetite
18. Shortness of breath when not exercising or working hard
19. Numbness or tingling in parts of your body
20. Felt weak all over
21. Pains in heart or chest
22. Feeling low in energy
23. Stuffy head or nose
24. Blurred vision
25. Muscle tension or soreness
26. Muscle cramps
27. Severe aches and pains
28. Acne
29. Bruises
30. Nosebleed
31. Pulled (strained) muscles
32. Pulled (strained) ligaments
33. Cold or cough

**Appendix E:**  
**Sociodemographics**

1. What is your biological sex (sex at birth)?
  - a. Female
  - b. Male
  
2. Which of the following best describes your gender identity?
  - a. Female
  - b. Genderqueer
  - c. Male
  - d. Transgender/transsexual
  - e. Other: \_\_\_\_\_
  
3. Which of the following best describes your sexual identity?
  - a. Bisexual
  - b. Gay
  - c. Lesbian
  - d. Pansexual
  - e. Queer
  - f. Straight/Heterosexual
  - g. Other: \_\_\_\_\_
  
4. Which of the following best describes your ethnicity?
  - a. African American/African descent/Black
  - b. Asian/Asian American/Pacific Islander
  - c. Caucasian/White
  - d. Latino(a)/Hispanic

- e. Native American/First Nations/Inuit
  - f. Other: \_\_\_\_\_
5. Age in years: \_\_\_\_\_
6. Height in inches: \_\_\_\_\_
7. Current weight in pounds: \_\_\_\_\_
8. Level of education completed:
- a. No formal education
  - b. Some primary education
  - c. Primary education
  - d. Some secondary education
  - e. Secondary education
  - f. Some college or technical school
  - g. College or technical school
  - h. Some graduate or professional school
  - i. Graduate or professional school
9. What is your current income level?
- a. Under \$10,000
  - b. \$10,000 to \$19,999
  - c. \$20,000 to \$29,999
  - d. \$30,000 to \$39,999
  - e. \$40,000 to \$49,999
  - f. \$50,000 to \$59,999
  - g. \$60,000 to \$74,999
  - h. \$75,000 to \$84,999

- i. \$85,000 to \$99,999
- j. \$100,000 to \$149,999
- k. \$150,000 to \$199,999
- l. \$200,000 to \$249,999
- m. \$250,000 and above

10. In what US state is your primary residence? \_\_\_\_\_

## **Appendix F:**

### **Welcome Page**

#### **INTRODUCTION AND PURPOSE**

This is a research study of the health of adults who identify as lesbian, gay, or bisexual (LGB). This study is being conducted by Nicholas Denton, M.S., Ed.S. This study is being guided by Sharon Rostosky, Ph.D. at the University of Kentucky. We appreciate your willingness to participate in this study. The purpose of this study is to document the different aspects of health in LGB individuals.

The survey will take about 10-15 minutes to complete.

#### **ALL OF THE INFORMATION YOU SUBMIT WILL BE TREATED CONFIDENTIALLY.**

We are not collecting information that identifies you. This survey is being conducted through the web and with all information transmitted through the web, there is the possibility that your answer could be intercepted by a third party. However, in order to minimize security risks, you may wish to shut down your browser and restart your machine after you answer this survey.

#### **WHAT WILL I BE ASKED TO DO?**

Your participation in this study involves the completion of a survey that asks questions about you, your experiences of as an LGB individual, and questions about your health. By completing the survey and submitting it to us, you are agreeing to participate in the study.

#### **WHAT ARE THE POSSIBLE RISKS AND DISCOMFORTS?**

To the best of our knowledge, the things you will be doing have no more risk of harm that you would experience in everyday life. Although we have made every effort to minimize this, you may find some questions we ask you to be upsetting or stressful. **YOU MAY ELECT TO SKIP ANY QUESTION(S) THAT YOU DO NOT WISH TO ANSWER.**

#### **WILL I RECEIVE ANY PAYMENT OR REWARDS FOR TAKING PART IN THE STUDY?**

You will be eligible to enter a drawing for one \$100 gift card to Amazon.com if they complete the survey in the first 90 days of the study (by February 15, 2012). This information will be collected and stored separate from your answers on the survey. There is no other payment or external reward associated with participation in this study.

## WHO WILL SEE THE INFORMATION I GIVE?

We will make every effort to prevent anyone who is not on the research team from knowing that you gave us information or what that information is. The results will be combined with the responses of others, analyzed, and reported.

Please be aware, while we make every effort to safeguard your data once received from the online survey company, given the nature of online surveys, as with anything involving the Internet, we can never guarantee the confidentiality of the data while still on the survey company's servers, or while en route to either them or us. It is also possible the raw data collected for research purposes may be used for marketing or reporting purposes by the survey company after the research is concluded, depending on the survey company's Terms of Service and Privacy policies.

We will keep private all research records that identify you to the extent allowed by law. However, there are some circumstances in which we may have to show your information to other people. For example, the law may require us to show your information to a court. Also, we may be required to show information which identifies you to people who need to be sure we have done the research correctly; these would be people from such organizations as the University of Kentucky.

## CAN MY TAKING PART IN THE STUDY END EARLY?

You may elect to stop your participation at any time by simply exiting the study.

## WHAT IF I HAVE QUESTIONS?

If you have questions about the study, please feel free to ask; my contact information is given below. If you have complaints, suggestions, or questions about your rights as a research volunteer, contact the staff in the University of Kentucky Office of Research Integrity at 859-257-9428 or toll-free at 1-866-400-9428.

Thank you in advance for your assistance with this important project.

Sincerely,

Nicholas Denton, M.S., Ed.S.  
Doctoral Candidate  
Department of Educational & Counseling Psychology  
University of Kentucky  
PHONE: 859-379-LGBT  
EMAIL: f.nicholas.denton@uky.edu

Sharon Scales Rostosky, Ph.D.  
Professor  
Department of Educational & Counseling Psychology  
University of Kentucky

PHONE: 859-257-7880  
EMAIL: s.rostosky@uky.edu

#### ACKNOWLEDGMENT

I consent to participate in this research. The following has been completely explained to me: the purpose of the study, the procedures to be followed, and the expected duration of participation. Possible benefits and risks of the study have been described.

I acknowledge that I have been given the opportunity to obtain additional information regarding the study and that any questions I have raised have been answered to my full satisfaction. Furthermore, I understand that I am free to withdraw consent at any time and to discontinue participation in the study without prejudice to me.

Finally, by clicking the Acknowledge-Continue button, I acknowledge that I am over the age of 18 and that I have read and fully understand this consent form.

If you do not meet the criteria listed above or are not interested in continuing, please click the Do Not Acknowledge-Exit button.

**Do you acknowledge the above statement and agree to participate in this study?**

Acknowledge-Continue

Do Not Acknowledge-Exit

**Appendix G:**  
**Recruitment Letter**

Dear Potential Participant,

I am a graduate student in the Department of Educational and Counseling Psychology at the University of Kentucky. I would like to invite you to participate in my research study to explore the health of lesbian, gay, and bisexual (LGB) individuals. You may participate if you are at least 18 years of age, identify as an LGB person, and reside in the United States.

Participants will be asked to complete a demographic questionnaire and an internet survey. The survey will take approximately 10-15 minutes to complete. There will be not cost to you.

I will not be collecting any information that identifies you. You may elect to skip any question(s) that you do not wish to answer. You may not receive any benefit for completing this study; however, you may be gratified to know that you are contributing to our knowledge of the health of LGB individuals. If you complete the survey by **February 15, 2012**, you will have a chance to win a \$100 gift card to Amazon.com.

Please feel free to forward this study to others who may be qualified to participate. However, you are not required to do so and this will not be tracked to see if you have forwarded the information. There will be no way to identify and connect your responses with anyone you may have received information about this study from or forwarded this information to. In other words, no one will be able to tell if you received the study from another individual or forwarded the information on to another individual.

If you have questions about the study, please feel free to ask; my contact information is given below. If you have complaints, suggestions, or questions about your rights as a research volunteer, contact the staff in the University of Kentucky Office of Research Integrity at 859-257-9428 or toll-free at 1-866-400-9428.

You can read more about this study and complete the survey by going to the following site:

<https://www.surveymonkey.com/s/LGBhealth>

Thank you in advance for your assistance with this important project.

Sincerely,

Nicholas Denton, M.S., Ed.S.  
Doctoral Candidate  
Department of Educational & Counseling Psychology  
University of Kentucky  
PHONE: 859-379-LGBT (5428)



E-MAIL: [f.nicholas.denton@uky.edu](mailto:f.nicholas.denton@uky.edu)

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## Vita

### GENERAL INFORMATION

Full Name: Fowler Nicholas Denton

Date of Birth: December 19, 1983

Place of Birth: Bowling Green, Kentucky

### EDUCATION

**Doctor of Philosophy** (Doctoral Candidate), Counseling Psychology

University of Kentucky, Lexington, KY

August 2008-Present

Expected graduation date: August 2014

Specialty: Health Perspectives on Gender and Sexuality

Dissertation title: *Minority Stress and Physical Health in Lesbians, Gays, and Bisexuals: The Mediating Role of Coping Self-Efficacy*

Dissertation Chair: Sharon S. Rostosky, Ph.D.

GPA: 3.94/4.00

**Specialist in Education**, Counseling Psychology

University of Kentucky, Lexington, KY

August 2008-May 2010

GPA: 3.97/4.00

**Master of Science**, Counseling Psychology

University of Kentucky, Lexington, KY

August 2006-May 2008

GPA: 4.00/4.00

**Bachelor of Science** (cum laude), Psychology (major), Psychobiology (minor)

Centre College, Danville, KY

September 2002-May 2006

GPA: 3.52/4.00

### PROFESSIONAL PSYCHOLOGICAL PRACTICE

**Eastern State Hospital, Psychology Services (Inpatient Psychiatric Hospital)**

August 2011-Present

Counseling practicum

**University of Kentucky, Department of Educational, School, and Counseling Psychology**

August 2006-Present

**Georgetown College Counseling Center**

August 2010-May 2011

Counseling practicum

**University of Kentucky Counseling and Testing Center**

June 2009-May 2010

Counseling practicum

**Catholic Social Service Bureau**

August 2007-May 2008

Counseling practicum

**Catholic Charities of East Tennessee**

January 2005

Undergraduate internship

**TEACHING EXPERIENCES**

**University of Kentucky, Department of Behavioral Science**

- 2006-2011—BSC 331: Behavioral Factors in Health and Disease (primary instructor: 2010-2011; teaching assistant: 2006-2009)
- 2006-2011—BSC/CDE 814: Patients, Dentist & Society (teaching assistant)
- 2009-2011—MD 811: Introduction to Clinical Medicine I (teaching assistant)
- 2006-2008—MD 810: Patients, Physicians & Society I (teaching assistant)
- 2006-2008—MD 820: Patients, Physicians & Society II (teaching assistant)

**University of Kentucky, Department of Education, School, and Counseling Psychology**

- 2008-2011—EDP 652: Theories of Counseling—Psychodynamic Psychotherapies (guest lecturer)

**PEER-REVIEW PUBLICATIONS**

Gray-Couch, J. R., **Denton, F. N.**, Piercey, R., & Gerrard, L. (2012). *Discerning lesbian and gay responses to heterosexism*. Manuscript submitted for publication.

Rostosky, S. S., Riggle, E. D. B., Horne, S., **Denton, F. N.**, & Darnell Huellemeier, J. (2010). Lesbian, gay, and bisexual individuals' psychological reactions to amendments denying access to civil marriage. *American Journal of Orthopsychiatry, 80*, 302-310. doi:10.1111/j.1939-0025.2010.01033.x

**OTHER PUBLICATIONS**

Wiese, H. J. C., **Denton, F. N.**, Shurling, T., Weatherbee, A., & Archer, A. (2007). Returning soldier. (Available from the Department of Behavioral Science, University of Kentucky College of Medicine, 107 Medical Behavioral Science Building, Lexington, KY 40536-0086)

## PROFESSIONAL PRESENTATIONS

**Denton, F. N., & Rostosky, S. S.** (2012). *Minority stress, coping self-efficacy, and mental health in lesbians, gays, and bisexuals*. Poster to be presented at the Convention of the American Psychological Association, Orlando, FL.

**Denton, F. N., Piercey, R. R., & Wilson, J. F.** (2010, February). *Students' responses to longitudinal clinical experiences*. Poster presented at the Southern Regional Meeting for the Society of Clinical Investigation, New Orleans, LA.

Piercey, R. R., **Denton, F. N., & Wilson, J. F.** (2010, February). *Medical humanities: Student choices and reflections*. Paper presented at the Southern Regional Meeting for the Society of Clinical Investigation, New Orleans, LA.

**Denton, F. N., Riggle, E. D. B., Rostosky, S. S., Darnell Huellemeier, J. & Horne, S. G.** (2008, March). *Counseling psychology in a changing world: GLB individuals' reactions to the 2006 marriage-ban amendments*. Poster presented at the International Counseling Psychology Conference, Chicago, IL.

**Denton, F. N., & Wertz, J. J.** (2006, April). *Autonomic arousal, personality traits, and gambling behavior in college students*. Paper presented at the Carolinas Psychological Conference, Raleigh, NC.

**Denton, F. N., & Wertz, J. J.** (2005, November). *Autonomic arousal, personality traits, and gambling behavior in female college students: A pilot study*. Paper presented at the meeting of the Kentucky Academy of Science, Richmond, KY.

## RESEARCH IN PROGRESS

Member of the Psychosocial Research Initiative on Sexual Minorities (PRISM), University of Kentucky College of Education, PIs: Sharon S. Rostosky, Ph.D., Ellen Riggle, Ph.D.

## PREVIOUS RESEARCH EXPERIENCE

Medical education research, University of Kentucky College of Medicine, PI: John F. Wilson, Ph.D. (2009-2011)

Member of consensual qualitative analysis team, Exploring Heteronegative Mitigation of Homonegating Processes, University of Kentucky College of Education, PI: J. Russell Couch, Ed.S. (2008).

Focus group facilitator, Interprofessional education research, University of Kentucky College of Pharmacy, PI: Kelly Smith, Pharm.D. (2007).

Research assistant, Pet population control research, Centre College, PI: Jan Wertz, Ph.D. (2005-2006)



## **PROFESSIONAL AFFILIATIONS**

### **American Psychological Association** (student affiliate)

Division 17 – Society of Counseling Psychology

Division 44 – Society for the Psychological Study of Lesbian, Gay, Bisexual, and Transgender Issues

### **Gay and Lesbian Medical Association** (student member)

## **SPECIALIZED TRAINING**

Dec 2006-May 2009	Personal psychoanalysis
May-Jun 2009	Trauma counseling seminar
Aug 2008	Diversity training for trainers – 6 hours
Nov-Dec 2007	Diversity training for trainers – 6 hours
Aug 2007	Social justice and diversity leadership training – 8 hours
Jun-Jul 2007	Psychodrama training series – 20 hours

## **COMMUNITY SERVICE EXPERIENCE**

### **Imperial Court of Kentucky, Inc.**

2009-Present

Member, Board of Directors (2010-2011)

### **University of Kentucky OUTsource**

August-December 2007