THE EFFECTS OF BIAS CRIMES ON SEXUAL MINORITY INDIVIDUALS: A STUDY OF MINORITY IDENTITY, DISCRIMINATION, AND FEAR RESPONSE

By

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ABSTRACT

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Vicarious traumatization of non-victim members of a community targeted by bias crimes has been suggested by previous qualitative research (Noelle, 2002). The present study extended this research in a quantitative examination of a model of proximal physiological, emotional, and cognitive responses among lesbian, gay, bisexual (LGB) and heterosexual participants during and immediately following exposure to bias crime information, using a novel quasi-experimental, mixed-factorial design with ecologically-valid stimuli. Participants listened to news information about neutral, general threat, and bias threat events while skin conductance level (SCL) and startle eyeblink magnitude were recorded, providing reports of affect following each clip. Participants reported pre-task negative beliefs about the world and completed post-task measures of negative cognitions, identity centrality, public regard, and additional variables of interest (e.g., past victimization).

I hypothesized that responses would differ between LGB and heterosexual participants, such that LGB participants would show exaggerated defensive mobilization to bias threats. I further hypothesized that collective identity would magnify defensive responses. Group differences were observed in startle, affect, and SCL. LGB participants' affective response and startle magnitude across conditions were consistent with defensive mobilization, while their pattern of SCL was inconsistent. Both groups demonstrated declines in negative cognitions, opposite of prediction. No relations were observed between collective identity and these responses. Results are discussed in light of defensive mobilization to threat, nonlinear relations

between trauma and physiological responses to threat, social identity, and threat-related cognition. These results suggest that LGB participants experience bias crime events differently from heterosexual participants, and indicates that they respond to them as threats, with subjective and physiological markers of defensive mobilization. Changes in worldview are not consistent with known responses to acute trauma exposure. Long-term consequences of exposure to bias crime information for mental health and well-being among LGB young adults are unclear. Potential pathways to mental health outcomes, such as stress-related dysregulation of the stress response, are discussed. Future research further explicating this phenomena is strongly recommended. The present study contributes to the growing literature on minority mental health and may have implications for clinical practice by informing clinicians of stress-related experiences of LGB individuals.

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CHAPTER ONE

Introduction

The October 1998 murder of openly-gay college student Matthew Shepard in Laramie, Wyoming, sparked a contentious national debate on the subject of bias-motivated crimes against lesbian, gay, and bisexual (LGB) individuals and prompted calls for bias crime legislation protecting sexual minorities at the federal level (Torkelson, 2008). The news – and details – of his victimization were broadcast across the nation and sparked strong emotions and bitter debates among gay rights and anti-gay rights activists alike (Brooke, 1998). One prominent gay rights activist, Andrew Sullivan, remarked on the effects of this crime on the gay community: "I think a lot of gay people, when they first heard of that horrifying event, felt sort of punched in the stomach. I mean it kind of encapsulated all of our fears of being victimized" ("New Details Emerge in Matthew Shepard Murder," November 26, 2004, n.p.). Shepard became a symbol of anti-gay victimization, and his case prompted calls for hate crime legislation protecting sexual minorities at the federal level (Torkelson, 2008). Following numerous unsuccessful lobbying attempts by gay rights groups, on October 28, 2009, President Barack Obama signed into law the Matthew Shepard Act, extending the coverage of federal hate crime laws to crimes targeted against individuals on the basis of sexual orientation, gender, and gender identity (Geen, 2009).

The Hate Crime and Statistics Act passed in April of 1990 and required the U.S. Department of Justice to maintain statistics on bias-motivated crimes, including crimes against sexual minorities (Otis & Skinner, 1996). In the year of Shepard's death, the Federal Bureau of Investigation reported 1,260 crimes motivated by sexual orientation bias, approximately 16% of all bias crimes reported that year (Federal Bureau of Investigation [FBI], 1998). In the most recent summary report released by the FBI (2012), 1,318 sexual orientation bias crimes were

reported, constituting approximately 19.6% of bias crimes. True base rates of bias-motivated victimization of sexual minorities are uncertain, however, as bias crimes are underreported by victims and agencies do not consistently release information on bias crimes (Berrill & Herek, 1990; Dunbar, 2006; Herek, Gillis, & Cogan, 1999; Otis, 2007; Otis & Skinner, 1996).

The Bureau of Justice Statistics (BJS) National Crime Victimization Survey (NCVS) interviewed a nationally-drawn sample of 143,120 individuals age 12 or older in 2011 regarding their experiences of crime victimization (Sandholtz, Langton, & Planty, 2013). Between 2007 and 2011, respondents reported more than 46,000 victimization events they perceived to be motivated by offender bias against sexual orientation or gender expression, nearly ten times more (annually) than recorded in the FBI statistics. Of these events, less than one-fourth were reported to authorities by the victim, and only one in ten resulted in a formal complaint. Notably, in this survey the percentage of respondents (reporting all types of bias victimization) who said they did not report the crime to authorities because they believed the police could not or would not help increased from 14% in 2003-2006 to 24% in 2007-2011.

Once a crime is identified by prosecutors as bias-motivated, individuals convicted of perpetration are subject to greater legal penalties and longer sentences (Berrill & Herek, 1990; Dunbar, 2006; Geen, 2009; Sullaway, 2004). Increased penalties for bias crime offenders reflect, in part, the severe nature of these crimes. Research on LGB bias crime victimization in the United States suggests that LGB bias crimes typically involve multiple offenders, are on average more severe than ethnic or religious bias crimes, are likely to involve assault, sexual assault, sexual harassment, and stalking, and involve greater victim distress than non-bias crimes (Dunbar, 2006; Herek et al., 1999; McDevitt, Balboni, Garcia, & Gu, 2001; Rose & Mechanic,

2002). In the NCVS, 92% of bias crime events reported between 2007-2011 were classified as violent offenses, as compared to less than 25% of non-bias crimes (Sandholtz et al., 2013).

In addition, advocates of social policies against bias victimization have argued that crimes motivated by bias against an identity affect members of a community for whom this identity is salient by creating feelings of fear, helplessness, and shock, as well as anger and a desire for retaliation, as they may lead community members to interpret these events as potential personal threats (Craig, 1999; Smith & Silva, 2011; Sullaway, 2004). However, this purported phenomenon has been subjected to little empirical scrutiny. Studies on bias victimization of sexual minorities typically examine only direct experiences of victimization and exclude awareness of victimization of others, although researchers note that this may be a relevant factor in explaining perceptions of victimization and fear of crime among LGB individuals (Otis, 2007). The present study will attempt to remedy this gap in the psychological literature by examining non-victim responses to bias crimes among individuals who identify as lesbian, gay, or bisexual, using sound empirical methodology and best research practices. Given that legal, social, and political arguments about bias crimes frequently rely on the untested assumption of vicarious effects, and that bias crimes are increasingly the subject of national debate, such a study is critical to the advancement of our understanding of these putative phenomena.

Given that bias crimes are so frequently defined and prosecuted in reference to the presumed increased harm inflicted upon targeted communities, it is striking that so little empirical research examining this purported effect. To date, only three extant studies have examined the psychological effects of exposure to information about bias crimes on non-victim members of a targeted population (Craig, 1999; Noelle, 2002; Perry & Alvi, 2012). Craig (1999) compared post-task subjective reports of emotional responses to the presentation of videotaped,

scripted scenes of racially-motivated bias crimes across a sample of White and Black male college students. He found that the Black participants, as compared to the White participants, reported greater anger, believing that the crime was more likely to occur to them and was typical of an experience that they would expect to encounter, and feeling that they would be more likely to return to the scene later with friends.

Noelle (2002) conducted qualitative analyses of interviews with 9 individuals who self-identified as lesbian, gay, or bisexual and who reported that they were significantly affected by Matthew Shepard's murder. She questioned whether non-victim individuals with LGB identities might exhibit strong personal reactions to salient, publicized bias crime events and posited that sexual minorities might respond to such events with shifts in their assumptive worldviews (i.e., belief in the benevolence, meaningfulness, and controllability of the world) that are consistent with cognitive changes following experiences of trauma and crime victimization. These self-selected individuals broadly reported identifying with Shepard and feeling personally threatened, with a significant proportion reporting increased vigilance to threat, increased vulnerability, and decreased belief in the justness and benevolence of the world. A subsample reported defensive changes in behavior such as removing identifying insignia from clothing, while a second group reported greater identification with and involvement in the LGB community. One participant reported sub-clinical levels of post-traumatic stress symptoms, including intrusive aversive thoughts of the event and increased avoidance of event cues.

Most recently, Perry and Alvi (2012) interviewed members of Canadian minority groups (n = 39) in an effort to understand bias crime vicarious victimization experiences of individuals within a shared identity group. Because the authors were interested in both shared and specific responses to bias crimes across minority groups, they interviewed members of seven

communities: Aboriginal peoples; African Canadians; Asians; Jews; Muslims; lesbian, gay, bisexual, and transgender people; and South Asians. A majority (75%) of participants in the full sample reported that, when learning about victimization of a member of their community, they feared a similar incident could happen to them or another member of their community. Asked to rate the impact of bias incidents on the community, 100% indicated that it made them feel fearful, vulnerable, and suspicious of other groups, and 91.7% reported feeling powerless. Among the consistent narrative themes identified by the authors were feelings of shock, surprise, and anger, persistent feelings of fear and vulnerability, behavioral changes aimed at increasing safety such as social withdrawal, and a belief that such crimes represent purposeful messages of inferiority and social exclusion against members of the targeted group. The authors argued that bias crimes serve as symbolic acts aimed at increasing fear and vulnerability among a targeted community, and that they exert "profound and negative impact[s] on affected communities" (69) marked by fears of victimization and defensive efforts to increase safety.

The Noelle (2002), Craig (1999), and Perry and Alvi (2012) studies suggest that members of a targeted community may experience emotional, cognitive, and behavioral changes to the threat of bias-motivated victimization. However, further research is needed in order to expand upon these foundations, more comprehensively examining these phenomena while addressing limitations of existing work. While these studies are novel and advance our understanding of vicarious responding to bias events, the qualitative interview, correlational and retrospective design of these studies necessarily limit interpretation of and extrapolation from their findings. Although all three studies argue for a collective or shared identity status as the putative mechanism of vicarious threat response, none directly assess this proposed relationship. Finally, these studies do not examine potential links between exposure to bias crimes and mental health

outcomes, which are of particular concern to clinical scientists. Given evidence that LGB individuals seek mental health services at proportionally higher rates than the rest of the population (Cochran, Sullivan, & Mays, 2003; Meyer, 2003), it is essential that psychologists understand the effects of discrimination and other forms of stress on this population.

The present study is designed to assess vicarious responses to bias crimes among lesbian, gay, and bisexual young adults using quantitative methodology within a quasi-experimental design. It quantitatively examines group and individual differences in physiological, cognitive, and affective responses to identity-threat (bias crime) stimuli based on a proposed model developed from a literature review integrating the biological, psychological, and sociological fields. The study employs real-time recording of physiological data, subjective self-report measures of affective response, and pre-post measures of world cognitions in a multi-method approach designed to address both the research questions at hand and the limitations of prior research.

This dissertation is organized into 9 chapters. Chapter 2 reviews the biological and cognitive processes involved in stress and trauma, and proposes peripheral psychophysiological measurement and assessment of beliefs about the world as methods assess these processes. Chapter 3 reviews the minority stress model (Meyer, 2003), provides an overview of the empirical literature on the prevalence and correlates of LGB victimization and mental health outcomes, and briefly reviews analogous literature in the fields of racial and sexual experiences of discrimination. A moderator of vicarious threat response, collective identity, is examined in Chapter 4. Chapter 5 provides a brief overview of the relevant historical context and methodological issues of conducting research with lesbian, gay, and bisexual individuals. Chapter 6 integrates the preceding review and provides a rationale and hypotheses for the present

study. Chapter 7 outlines in detail the methodology of the study, including study design, participant identification and recruitment, and data collection. Chapter 8 presents the results of the study. Chapter 9 provides a discussion of the results and their implications for future research and clinical practice. Finally, a series of appendices provide study materials and supplemental information on methodology and statistical analyses.

CHAPTER TWO

The Physiology and Cognition of Stress and Trauma

Stress and the Threat Response

The question of whether or not LGB individuals have vicarious responses to bias crime events is fundamentally a question of *stress* and the *threat response*. Stressors are environmental challenges that are perceived to overwhelm the individual's immediate capacity to cope, prompting the individual to react via physiological, cognitive, and/or behavioral changes aimed at adapting to the stressor (Thoits, 2010). A wide range of stimuli can serve as stressors, including physical illness, social disruptions, impediments to goals, acute physical danger, and perception of threats. Stress reactions may occur in response to both objectively threatening circumstances (e.g., being chased by a lion) and from subjectively threatening circumstances (e.g., perceptions of discrimination or social rejection). Individuals may exhibit the physiological changes that mark the threat response in reaction to both immediate and future (anticipated) events (Berntson & Cacioppo, 2007; Hamm & Weike, 2005).

Physiological responses to environmental stress are characterized by interactions between central and peripheral nervous system structures (Berntson & Cacioppo, 2007; Bradley & Lang, 2007; Hamm & Weike, 2005; Lang, Davis, & Öhman, 2000). The central nervous system consists of the brain and spinal cord, whereas peripheral nervous system structures include the somatic and autonomic nervous systems and extend throughout the musculature and organs. The somatic nervous system is primarily involved in the reception of external stimuli (e.g., touch) and coordination of motor movements, and the autonomic nervous system controls visceral responses and affects cardiovascular, electrodermal, endocrine, and gastrointestinal functioning (Berntson, Quigley, & Lozano, 2007; Dawson, Schell, & Filion, 2007). The two divisions of the

autonomic nervous system, the sympathetic (SNS) and parasympathetic (PNS), are responsible for mobilizing and conserving the body's energy resources through the activation and suppression of physiological arousal, respectively.

When confronted with a stressor, the sympathetic nervous system mobilizes an individual to confront or avoid the perceived threat (Berntson & Cacioppo, 2007; Cohen et al., 1998; Keary, Hughes, & Palmieri, 2009; Lang, 1995). Central and peripheral nervous system structures interact to excite or inhibit autonomic arousal, and central nervous system functions (such as primary and secondary appraisals; Smith & Ellsworth, 1985) can elicit or override immediate autonomic responses (Lang et al., 2000; Paterson & Neufeld, 1987). The individual's subjective emotional experience is likewise organized in accordance with two motivational systems (pleasant-appetitive and unpleasant-defensive) which motivate the individual to approach or withdraw from situations according to physical survival needs (Bradley, Codispoti, Cuthbert, & Lang, 2001). Emotional responses in the face of survival threats are typically perceived along two distinct but interactive primary dimensions, arousal (intensity of ANS activation) and valence (pleasure/displeasure), with positive emotions supporting appetitive motivation and negative emotions supporting defensive motivation (Lang, 1995).

When confronted with a threat, individuals conduct a series of rapid appraisals of both the positive or negative valence of the stressor (primary appraisals) and the individual's capacity to cope (secondary appraisals; Bovin & Marx, 2011; Carter, 2007; Smith & Ellsworth, 1985; Taylor, 1999). Perception of threat activates what is known as the defense cascade, a sequence of physiological response patterns organized according to the imminence of threat and intensity of fear (Bradley & Lang, 2007; Bradley et al., 2001; Fanselow, 1994; Lang, 1995). Moderate fear (typical of initial detection of a threat) is characterized by a period of initial freezing marked by a

reduction in heart rate, behavioral immobility, moderate increases in autonomic arousal, and modulation of the startle reflex. At lower levels of fear, the startle reflex may be inhibited rather than potentiated (Globisch, Hamm, Esteves, & Öhman, 1999). As fear increases further (such as when contact with a threat becomes imminent), the individual mobilizes physiological resources in order to act defensively and prompted to action by sharply increased heart rate, autonomic arousal, and startle potentiation (Fanselow, 1994; Hamm & Weike, 2005; Lang et al., 2000). At the same time, central nervous system structures within the limbic system (including the amygdala and hippocampus) interact in a process of memory acquisition and the development of fear-related memories (Lanius, Bluhm, & Frewen, 2011; Peri, Ben-Shakhar, Orr, & Shalev, 2000; Pole, 2007). The encoding of threat-related memories is a form of aversive conditioning that may account for the intrusive and reexperiencing symptoms of posttraumatic stress disorder (PTSD; Bovin & Marx, 2011; Hamm & Weike, 2005; Peri et al., 2000; Pole, 2007). Early research on the physiology of threat response and defensive mobilization was primarily conducted using animal models (e.g., Globisch et al., 1999). As technology and methodological sensitivity have improved, researchers have increasingly examined these responses in humans and found strikingly similar processes (Bradley & Lang, 2007; Lang et al., 2000).

Of concern for mental health practitioners, repeated activations of this system may have deleterious effects over time (Berntson & Cacioppo, 2007; Lanius et al., 2011; Thoits, 2010). Initially, the effects of chronic and inescapable stress manifest in heightened physiological reactivity (Edgar, Keller, Heller, & Miller, 2007; Peri et al., 2000). Over time, the responsiveness of this system may be attenuated as the stress response system downregulates (Edgar et al., 2007; Thoits, 2010). As Bernstein and Cacioppo (2007) note, this initial heightening of response followed by attenuation under conditions of prolonged stress may provide adaptive value insofar

as it allows the organism to keep up with environmental demands by conserving physiological resources in high stress environments.

However, these adaptive benefits may be exceeded by maladaptive consequences, as seen in cases of prolonged fear conditioning (Gros, Hawk, & Moscovitch, 2009; Lang et al., 2000; Peri et al., 2000. The development of phobias (social and specific), in which individuals respond to normally non-aversive or only mildly aversive stimuli with intense activation of the threat response system, are believed to represent the extremes of fear conditioning (Bradley et al., 2001; Gros et al., 2009; Hamm, Cuthbert, Globisch, & Vaitl, 1997; Klorman, Weissbert, & Wiessenfeld, 1977). The majority of studies examining patterns of physiological responding to threatening stimuli have used picture-viewing designs in which electrodermal and startle reflex potentiation responses are recorded concurrently with picture presentation (e.g., Bradley et al, 2001). In these studies, the final stage of the defensive cascade (overt activation, with potentiated startle and heightened ANS activation) is rarely observed, save in the cases of individuals with phobias exposed to phobic content or some individuals with PTSD exposed to trauma content (Gros et al., 2009; Peri et al., 2000). The present study hypothesizes that exposure to bias crime information is analogous to these cases insofar as it is proposed to lead to activation of similar mechanisms of fear conditioning. However, this study proposes that these responses are more analogous to those of traumatic stress, which involve both a process of fear conditioning and changes in physiological and cognitive.

Trauma and the Defense Cascade

Popular discussions of vicarious responses to bias crimes typically frame these events as a form of traumatic stress (Sullaway, 2004). The study of traumatic stress has historically constituted a separate area of study in the psychological literature from general life stress, as

traumatic events have been believed to differ from general stressors in both the severity of the stress event and in patterns of individual outcomes (Carter, 2007; Elhai et al., 2009; Hamm & Weike, 2005; Peri et al., 2000; Thoits, 2010). Traumatic stressors are defined as those which are threatening to the life and/or bodily integrity of a person, either directly experienced, witnessed, or occurring to someone close to an individual (American Psychiatric Association [APA], 2013). Physiological reactions to extreme stressors that are commonly defined as traumatic may have unique components (for a review, see Peri et al., 2001).

Most research in traumatic stress assesses posttraumatic stress disorder (PTSD), a psychiatric disorder with high rates of comorbidity with depression, anxiety, and substance use disorders (Edgar et al., 2007). Post-traumatic stress symptoms, as defined in the fifth edition of the Diagnostic and Statistical Manual (DSM 5; APA, 2013), include symptoms of intrusive recollection, avoidance and/or emotional numbing, changes in cognitive and emotional functioning (e.g., negative beliefs about the world, self-blame), and symptoms of hyperarousal such as hypervigilance and heightened physiological reactivity. Findings as to whether PTSD is marked by chronic or acute manifestations of hyperarousal are mixed (Cohen et al., 1998; Casada, Amdur, Larsen, & Liberzon, 1998; Edgar et al., 2007; Gerardi, Keane, Cahoon, & Klauminzer, 1994; Keary et al., 2009; Lanius et al., 2011; Pole, 2007). A meta-analysis of resting baseline studies of individuals with PTSD diagnoses suggests that PTSD patients have larger resting heart rates and diastolic blood pressure, suggesting long-term change in cardiovascular functioning following repeated and prolonged hyperactivity (Pole, 2007). Similarly, the same meta-analysis found that individuals with PTSD diagnoses generally exhibit larger startle responses, greater heart rate, and greater skin conductance to aversive stimuli. However, this meta-analysis drew upon studies with very limited variety in forms of traumatic stress (90%

combat trauma) and participant characteristics (primarily male, mid-thirties). Analyses also showed significant heterogeneity in effect sizes for both resting and stimuli-driven physiological responses across studies, suggesting that the substantial differences in sample characteristics and study design likely affect results.

It is important to note that individuals with PTSD do not always exhibit hyperarousal at resting baseline or in response to trauma cues (Lanius et al., 2011; McTeague et al., 2010; Pitman, Orr, Forgue, de Jong, & Claiborn, 1987; Pole, 2007). Rather, approximately 30-40% of PTSD patients exhibit physiological *non-responsivity* upon exposure to trauma cues (Pitman et al., 1987). Recent research has suggested that individuals who experience multiple traumatic events in their lifetime may display blunted reactivity in both autonomic nervous system activation and startle reflex potentiation (McTeague et al., 2010), potentially in a downregulation of the stress response as observed in models of general life stress (Edgar et al., 2007; Thoits, 2010). These findings reflect an ongoing area of uncertainty in the traumatic stress literature; namely, what intraindividual, interindividual, experiential, and situational factors differentiate responses to traumatic stressors (Bradley & Lang, 2007).

The Defense Cascade and LGB Responses to Bias Crimes

There is evidence within the stress and trauma literature to suggest that LGB individuals may evidence different responses to bias crime events than heterosexual individuals. For one, they may make different appraisals of these events. Substantial research indicates that appraisal moderates the relationship between exposure to a threat and defensive responding (Averrill, 1973; Foa, Zinbarg, & Rothbaum, 1992; Paterson & Neufeld, 1987; Peri et al., 2000). The appraisal of threat and subsequent stress response depends on a number of factors, as summarized by Paterson & Neufeld (1987): threats perceived to be more severe, imminent,

probable, salient, and threatening to goals produce greater anticipatory stress. The magnitude of anticipatory stress is proportional to the perceived severity of the threat. Ambiguity about the severity and imminence of threats may lead to elevated nervous system responses (Foa et al., 1992), and a perceived lack of control over the situation is also associated with heightened defensive responding (Averrill, 1973).

As has been demonstrated with studies of general life stress, traumatic stress responses may likewise be affected by appraisals of the controllability and predictability of the stressor (Hamm & Weike, 2005; Paterson & Neufeld, 1987; Peri et al., 2000). Social stressors (e.g., social exclusion) have also been shown to affect stress hormone levels and reactivity in a unique manner that other stressors do not (Berntson & Cacioppo, 2007). This may relate to findings that interpersonal violence is associated with the highest risk of later development of PTSD (Roberts, Austin, Cortiss, Vander Morris, & Koenen, 2010). Further, cumulative experiences of unpredictable and uncontrollable stressors may lead to both dysregulation of the stress response system and changes in processes of cognition and appraisal (Foa et al., 1992; McTeague et al., 2010). Subjective perceptions of control (e.g., situational dominance) are thus also likely to moderate emotional and physiological responses in response to threats (Bradley et al., 2001).

The processes involved in the development of symptoms of post-traumatic stress, and the individual and situational factors that discriminate between individuals at risk for PTSD, are not particularly well understood at this time (Bovin & Marx, 2011; Elhai et al., 2009). Why a majority of individuals may experience a traumatic event in their lifetime but only a small proportion of the population develops symptoms of post-traumatic stress remains unclear, although some factors (e.g., past trauma, post-trauma support) have been identified (Ozer, Best, Lipsey, & Weiss, 2003). However, the literature reviewed above suggests that the nature of

threat stimuli and appraisal processes may allow for prediction of immediate emotional and cognitive responses upon acute exposure to threat, if not necessarily allowing for accurate prediction of long-term consequences (Hamm & Weike, 2005; Peri et al., 2000). This is particularly relevant to the questions at hand: for some individuals, bias crimes may serve as a source of uncontrollable, ambiguous, and probable interpersonal threat, resulting in anticipatory stress responses to bias crime cues. The threat response and mobilization of defensive functioning may be assessed in-vivo using peripheral physiological measures, and participants may report on their subjective emotional experience directly. Measurement of both physiological and affective responses during exposure to bias crime information would have benefits for the assessment of group and individual differences in responses to perceived threat.

Methods in Physiological Assessment of Threat Response

Psychophysiological methods to study processes of stress, anxiety, and trauma have historically focused on measurements of peripheral (autonomic) nervous system functioning, although use of central nervous system measures (PET, EEG, etc.) has increased in recent years (Edgar et al., 2007). For this reason, markers of central nervous system responding to traumatic events are still undergoing examination, whereas peripheral markers of threat response are somewhat more established. Generally, CNS measures are also more expensive to use and may be prohibitively costly in early studies of psychological phenomena. Consequently, the present study will focus on the use of peripheral measures of defensive mobilization to threat.

Psychophysiological studies frequently collect baseline data on peripheral nervous system functioning, such as resting heart rate, and/or event-related data (e.g., exposing the participant to aversive or trauma-relevant images and measuring short-term PNS responses; Cohen et al., 1998; Gerardi et al., 1994). Studies of physiology and psychopathology typically

assume a categorical approach to mental illness (e.g., examining a PTSD group vs. no diagnosis group), although dimensional models have also been considered (Edgar et al., 2007). Physiological studies of psychopathology processes can benefit the study of psychological processes by providing data that is temporally concurrent with stimulus exposure and allowing for collection of information on implicit or unconscious responses that may be particularly impacted by response biases in interviews or questionnaires. Notably, psychophysiological measures may capture responses that are rapidly suppressed or aborted and that do not reach the level of conscious (reportable) awareness (Tassinary, Cacioppo, & Vanman, 2007). Thus, psychophysiological measures can complement subjective reports of phenomenological experience.

However, physiological studies of psychopathology also have limitations. The relationship between physiological responses and psychological processes is not always clear, and discrete observed changes in peripheral nervous system functioning (e.g., heart rate, skin conductance) may be associated with a range of central nervous system processes of emotion and motivation (Berntson et al., 2007; Bradley et al., 2001; Bradley & Lang, 2007; Nikula, 1991; Tassinary et al., 2007). Researchers should be careful to select physiological measures that have been shown to be related to the construct of interest and to use multi-method approaches to measuring psychological processes wherever possible (Edgar et al., 2007). For the purposes of examining differences in affective responses to bias crimes, the present study employs the use of a standardized stimuli paradigm with psychophysiological and questionnaire measures. This design allows for examination of group differences in defensive responding measured in vivo, during presentation of information about events that are standardized for all participants.

One reliable method for examining defensive mobilization is to measure *startle eyeblink* with electromyography (EMG). Electromyography (EMG) allows researchers to assess potentiation (electrical activity) of the skeletomotor system that occurs with the experience of emotions as they are communicated to others through the facial musculature (Blumenthal et al., 2005; Tassinary et al., 2007; Vrana, Spence, & Lang, 1988). These reactions can be assessed even when activity is too subtle to be viewed by the naked eye, and even in cases where individuals make efforts to suppress or avoid the emotional reaction. Startle eyeblink designs place electrodes over muscles near the outside of the eye (orbicularis oculi) and present sudden, loud sounds at random intervals through participants' headphones, then measure the magnitude of the startle response as an index of fear potentiation (Blumenthal et al., 2005). These designs may measure startle reflex potentiation during rest (without stimulus presentation) or during presentation of stimuli of varying valence and/or personal relevance (Hamm et al., 1997; Globisch et al., 1999; Gros et al., 2009; Pole, 2007). The startle eyeblink design has been widely employed in psychophysiological assessments of trauma and posttraumatic stress disorder, in particular as a reliable and sensitive measure of fear acquisition and learning (Edgar et al., 2007; Hamm & Weike, 2005).

Measurements of the startle eyeblink reflex inform researchers of potentiated fear states, as the startle reflex is a function of defensive behavioral cascades mediated by neural structures associated with fear such as the amygdala (Bradley & Lang, 2007; Peri et al., 2000). As previously noted, when confronted with aversive stimuli, generally humans and animals display initially attenuated (decreased) stimuli when orienting to a sudden threat, then potentiated (increased) startle as threat imminence increases (Bradley et al., 2001). This paradigm has been shown to reliably differentiate responses to aversive or threatening stimuli, as compared to

neutral or positive stimuli, and the valence of the startle response has been shown to be associated with ratings of stimuli aversiveness (Bradley et al., 2001; Bradley & Lang, 2007; Hamm et al., 2007). However, as with any method there are limitations to consider. The measurement of electrical activity from the facial musculature is subject to error due to noise such as movement artifacts or spontaneous blinks, and so care should be taken to differentiate startle responses from measurement error (Blumenthal et al., 2005). Typically, this differentiation is conducted via post-task data processing by examining only a very small window of responding (i.e., 200ms post-startle probe) and using computerized algorithms to identify noise elements and smooth the data curves.

In addition to fear potentiation, researchers have identified autonomic nervous system arousal as a marker of defensive mobilization to threat. One method of measuring autonomic arousal is to examine *skin conductance level*, or SCL. In SCL studies, two electrodes are placed at different points on the skin and an electrical current is passed between them, and the magnitude of the response potential generated reflects the conductance of the skin is related to activation of the sweat glands (Dawson et al., 2007; Fowles et al., 1981). Skin conductance measures reflect general autonomic arousal and do not differentiate between different valences of affect – that is, ANS arousal typically shows a linear increase with intensity of affect of any type – but it does tend to show large changes in response to aversive stimuli and the anticipation of threat (Bradley et al., 2001; Bradley & Lang, 2007; Nikula, 1991). The innervation of the electrodermal system by the sympathetic nervous system alone allows for a straightforward index of sympathetic arousal, in contrast to the dual innervation (and relative complexity) of the cardiac system (Bernston et al., 2007).

As Foa, Zinbarg, and Rothbaum (1992) note, "repeated experience with uncontrollable, unpredictable stress is necessary for formation of expectations that danger can occur at any time and is inescapable" (p. 231). For LGB individuals who may perceive the risk of bias crime victimization as a personally-relevant, uncontrollable, unpredictable, and probable event, exposure to bias crime information may lead to anticipatory activation of the ANS and engagement of the defensive cascade as marked by potentiated startle eyeblink reflexes. The use of a standardized trauma cue paradigm with electrodermal measurement of startle eyeblink responses and measurement of ANS arousal via skin conductance level would allow researchers to examine this response in real time with high specificity of nervous system response.

Establishing a theoretical link between these responses and vulnerability to psychopathology is complicated, however, because sexual minority individuals are exposed to numerous social stressors as a function of their minority status, and these stressors have been shown to relate to poorer mental health outcomes (Diaz, Ayala, Bein, Henne, & Marin, 2001; Frost & Bastone, 2008; Meyer, 2003; Quinn & Chaudoir, 2009). Further, LGB individuals are more likely to experience victimization and discrimination in adolescence and adulthood, which likewise may increase the risk of subsequent psychopathology (Diaz et al., 2001; Dworkin & Yi, 2003; Herek et al., 1999; Levitt et al., 2009; Meyer, 2003; Savin-Williams, 2004; Quinn & Chaudoir, 2009). Thus, it may be difficult to distinguish the dysregulating effects of responses to bias crime information on mental health from the effects of related social stressors, and the cumulative effects of these social stressors may affect responding on startle eyeblink tasks. Thus, the present study includes measures of past victimization and stressful life events in order to examine their cumulative effects on task responses.

Further, given the complex nature of PTSD (involving physiological, affective, and cognitive changes over a period of time), a cross-sectional study such as the proposed dissertation study is necessarily limited in its ability to assess the in-vivo effects of exposure to bias crimes on the development of symptoms of trauma, as previously noted. At best, such a study might assess whether immediate responses of LGB individuals to bias crimes are consistent with elements of acute responses to threatening events believed to be predictive of pathological outcomes – that is, peritraumatic responses associated with poorer outcomes following exposure to stressful events (Bovin & Marx, 2011; Pole, 2007). There is sufficient evidence to indicate that exaggerated startle responses and heightened ANS activation would suggest a high level of defensive responding (Bradley et al., 2001; Edgar et al., 2007; Hamm & Weike, 2005; Lang, 1995; Pole, 2007), but observing this pattern would not be sufficient in suggesting a vicarious trauma response. To establish that such a response is traumatogenic would require examination of responses that differentiate traumatic events from general stressors. To do this, we may look to the field of traumatic cognitions research, which examines the development of maladaptive beliefs about the world, others, and the self that may develop or be reinforced after traumatic event exposure and which have been identified as symptoms of traumatic stress (APA, 2013; Dagleish, 2004; Foa et al., 1999; Hagenaars, van Minnen, & Hoogduin, 2007; Halligan, Michael, Clark, & Ehlers, 2003).

Trauma and Cognition

In addition to further explicating the role of physiological responses to trauma, researchers have increasingly focused on the role that peritraumatic and posttraumatic cognitive constructs and processes play (for a review, see Dagleish, 2004). Despite the limited presence of cognitive symptoms in DSM-III and DSM-IV PTSD criteria, existing therapies for PTSD prior to

the release of DSM-5 frequently included components addressing post-traumatic cognitive processes and beliefs (such as Cognitive Processing Therapy for PTSD; Resick & Schnicke, 1993). Studies of cognitive responses to traumatic events have looked at the role of dysfunctional cognitions in predicting the development of symptoms of traumatic stress (Hagenaars et al., 2007; Halligan et al., 2003), and researchers interested in post-traumatic growth processes have also examined schemas and beliefs as explanatory factors in positive outcomes following trauma exposure (Linley & Joseph, 2004).

Among the revisions to the fifth edition of the American Psychiatric Association Diagnostic and Statistics Manual (APA, 2013) were the addition of specific cognitive symptoms of post-traumatic stress disorder related to negative beliefs about the self, others, and the world such as "The world is completely dangerous" and "No one can be trusted." These revisions emerged from a growing literature examining the role of cognitive processing in posttraumatic outcomes, both with regard to cognitive beliefs about the event itself (Bovin & Marx, 2011; Foa et al., 1999) and changes in broader cognitive schemas about the world, self, and others (e.g., assumptive worldview, Janoff-Bulman, 1989). As previously noted, neurobiological theories of the development of PTSD propose that fear learning takes place through the development of fear association networks that are encoded in a heightened autonomic state and subsequently repeatedly activated and strengthened in response to real or perceived environmental threat cues (Pole, 2007). There is evidence to suggest that peritraumatic cognitive responses (e.g., appraisal of the severity and consequences of the event) and maladaptive posttraumatic cognitive coping styles (e.g., negative cognitive beliefs about the self and world) predict increased severity of posttraumatic symptomatology such as intrusive memories and hyperarousal (Agar, Kennedy, & King, 2006; Ehlers, Mayou, & Bryant, 2003; Ehring, Ehlers, & Glucksman, 2008; Halligan et al.,

2003; Mueller, Moergeli, & Maercker, 2008; Nixon & Bryant, 2005; Regambal & Alden, 2009). Within the context of the present study, examination of traumatogenic cognitions may be appropriate for a number of reasons. Both Noelle (2002) and Perry and Alvi (2012) interpreted their qualitative results in relation to changes in cognitive beliefs about the self, others, and world. In addition, recent findings on the role of cognition in traumatic stress are consistent with minority stress models that postulate that minority stress occurs in part through broad processes of appraisal related to beliefs about the self, others, and the world (Meyer, 2003).

Research on cognitive models of posttraumatic stress have generally found relations between negative beliefs/assumptions about the world and PTSD symptoms (Dekel, Solomon, Elklit, & Ginzburg, 2004; Foa et al., 1999; Solomon, Iancu, & Tyano, 1997; Ullman, 1997), in particular the sub-domains of benevolence (of the world and of others), self-worth, and controllability (of the world and of the self). There is some evidence as well that relations between these beliefs and the development of posttraumatic stress may be mediated by differential coping responses (Goldenberg & Matheson, 2005). Diminished beliefs about the world, self, and others have also been found to mediate the relationship between interpersonal trauma exposure (e.g., IPV, sexual harassment) and other mental health outcomes such as depression, grief, and general psychological distress (Collinsworth, Fitzgerald, & Drasgow, 2009; Lilly, Valdez, & Graham-Bermann, 2010; Wickie & Marwit, 2000).

Of interest, a link between vicarious exposure to trauma and change in beliefs about the world has also been considered by researchers. One study (Feldman & Kaal, 2007) retrospectively examined cognitive beliefs about the world in individuals vicariously exposed to trauma (i.e., individuals acquainted with persons who had experienced a significant traumatic stressor) and found relations between secondary exposure and more negative worldviews. Noting

that this is the only known study examining vicarious trauma and beliefs, the authors suggest that vicarious exposure to traumatic events may similarly affect beliefs, although this study was necessarily limited by the use of a retrospective design. Although prospective studies are few, a handful of studies have prospectively measures domains of world beliefs and found that increased psychological distress is associated with reductions in perceptions of controllability (of self and world; Ranchor et al., 2010), perceptions of justice (Kaiser, Vick, & Major, 2004), and self-worth and benevolence of others (Dekel et al., 2004).

To the extent that individuals demonstrate changes in cognition that have been observed in trauma-exposed samples (e.g., more negative beliefs about the benevolence, controllability, and predictability of the world, self, and others), there may be tentative (but by no means definitive) evidence to suggest that similar processes of traumatogenic cognitive change could occur in impacted individuals. The literature on defensive mobilization reviewed above, however, suggests that the likelihood of activation of the defense cascade is dependent on individual perceptions and appraisals of threat. LGB individuals at this time are frequently exposed to social stressors that are likely to shape these perceptions of threat, including social exclusion, discrimination, and witnessed or directly experienced violence (Meyer, 2003). These group-specific experiences are collectively known as minority stress, and are explored in the next chapter.

CHAPTER THREE

Minority Stress

Drawing from a rich theoretical and empirical literature on the relationship between sociological stress and health spanning more than forty years (for a recent review, see Thoits, 2010), Meyer (1995) proposed the minority stress model to explain observed disparities in health between LGB and heterosexual individuals. *Minority stress* refers to the group-specific and cumulative stressful experiences faced by minority individuals as a result of social stigmatization, which may include experiences of discrimination, social exclusion, inequality, lack of opportunity, and threatened or real violence and victimization. As a consequence of social processes, customs, and institutions, these stressors are inescapable and chronic (Gee, Ro, Shariff-Marco, & Chae, 2009; Levitt et al., 2009). As stressors that are social in nature, they have particular implications for the development of mental disorders (Cochran, 2001).

There is growing evidence to suggest that the cumulative effects of these social stressors may impact both physical and mental health for minority individuals. A recent meta-analysis of 134 studies (N = 71,020) on perceived discrimination and physical and mental health outcomes found that perceived discrimination was associated with larger physiological stress responses, more engagement in harmful behaviors (e.g., alcohol use), and increased rates of mental illnesses such as depression among a range of minority groups (Pascoe & Smart Richman, 2009). Although the non-experimental nature of the studies analyzed necessarily limits inferences about causality, the authors noted that those studies including quasi-experimental manipulations generally showed greater magnitude of physiological and psychological stress responses following discrimination manipulations.

For LGB individuals, sources of minority stress include experiences of individual discrimination, systematic discrimination and exclusion from social institutions such as marriage, internalized homophobia/homonegativity, experiences of victimization, and repeated threats of victimization and marginalization (Meyer, 2003). In addition, LGB individuals face barriers to health care, including systemic structural disparities such as access to insurance coverage, and institutional biases that may deter individuals from seeking help such as screening questions about marital status and heteronormative or highly gendered language on forms and questionnaires (Dean et al., 2000). LGB individuals may also experience increased stress as a result of efforts to conceal or hide their identity, which has been associated with increased risk of negative mental health outcomes including depression (Frost & Bastone, 2008). Among the myriad of other reported stressors affecting LGB populations are experiences of police harassment, losing social support when revealing their sexual orientation identity, and having to move away from friends and family to find social support (Diaz et al., 2001).

The minority stress model explains how distal stressors such as instances of bias victimization against members of the LGB community may affect proximal individual processes such as perception and appraisal (Meyer, 2003). It notes, importantly, that minority stress is a social process that influences *individuals*, and individuals may respond to these stressors with dysphoria, anxiety, and dysfunctional behavioral changes, or may respond with resilient coping methods such as increasing social support and group solidarity to resist negative mental health outcomes (Branscombe, Schmitt, & Harvey, 1999; Dean et al., 2000; Leonardelli & Tormala, 2003; Smith & Silva, 2011). However, the nature of LGB minority stressors may interfere with utilization of active coping. For example, there is evidence to suggest that concealment, internalized homophobia, and victimization are related to less perceived social support and, in

turn, more mental health problems and substance use among LGB individuals (Frost & Bastone, 2008; Leharot & Simon, 2011; Meyer, 2003; Quinn & Chandoir, 2009). For this reason, research in minority stress among LGB individuals has generally focused on negative physical and mental health outcomes (Meyer, 2003; Pascoe & Smart Richman, 2009).

While a growing body of research exists examining the effects of minority stress – in particular, discrimination and traumatic response – in racial minority samples (Bryant-Davis, 2007; Carter, 2007; Gee et al., 2009; Pieterse, Carter, Evans, & Walter, 2010), research utilizing the minority stress model in LGB samples is relatively underrepresented in the literature but represents a rapidly growing area of research, which has consistently found links between sources of minority stress and poorer mental health and well-being (Diaz et al., 2001; Dworkin & Yi, 2003; Leharot & Simon, 2011; Levitt et al., 2009; Lewis, Derlega, Griffin, & Krowinski, 2003; Meyer, 2003).

Risk of Psychopathology in LGB Populations

Mood disorders, anxiety disorders, and substance use disorders have been linked to social stressors, including stigma, experiences of discrimination, and victimization (Blanchard, McKittrick, & Blanchard, 2001; Cochran, 2001; Connor-Smith & Compas, 2002; Rhodes & Jason, 2002; Taylor & Turner, 2002). Thus, to the extent that LGB individuals experience greater rates of social stress than non-LGB populations, we should expect to see elevated rates of these disorders. To test this argument, Meyer (2003) performed a meta-analysis of 10 studies (Full N = 876 lesbian, gay, bisexual; 27,562 heterosexual) conducted prior to 2001 and assessing rates of psychiatric diagnoses between LGB and heterosexual participants. His analysis found that LGB men and women were approximately 2.5 times more likely to be diagnosed with a mental illness (mood disorder, anxiety disorder, substance use disorder) over the course of their lifetime, with

significantly greater odds of mood disorders, anxiety disorders, and substance use. This analysis was limited by the nature of the included studies, which used varying definitions of sexual orientation, frequently assessed different disorders, and often relied on nonrandom sampling techniques. In light of the limitations of nonrandom sampling with LGB participants, Meyer stratified the data into studies using randomized or nonrandom sampling techniques. Notably, he found that differences in rates of mood disorders, anxiety disorders, and substance use disorders were found only in studies that randomized their sampling techniques. This may reflect a limitation of nonrandom sampling methods such as snowball sampling, in that individuals with less distress and greater overall functioning may be more likely to refer others (who may likewise be less distressed and higher functioning) to participate in these studies (Moradi, Mohr, Worthington, & Fassinger, 2009).

Early studies comparing heterosexual and LGB mental health have been criticized for the use of brief screening scales rather than diagnostic interviews and questionnaires, volunteer or convenience samples, and inconsistent or inappropriate methods of classifying individuals on the basis of sexual orientation and identity (Gilman et al., 2001; Otis & Skinner, 1996). However, recent studies in LGB mental health have been subject to greater methodological rigor in epidemiological research, including the use of more advanced methods of sampling and standardized, well-supported diagnostic instruments (Cochran, 2001). In general, more recent studies using more sophisticated population-based methods, diagnostic interviews or questionnaires, and multiple methods of sexual orientation classification have suggested that rates of mental illness, particularly rates of anxiety disorders, mood disorders, and substance use disorders, are higher among LGB populations than typically found in the general population, although the magnitude of the difference (and which disorder is found to be elevated) varies

across studies, with observed effect sizes ranging widely from small to large (Cochran, 2001; Cochran et al., 2003; Gilman et al., 2001; Green & Feinstein, 2012; McCabe, Hughes, Bostwick, West, & Boyd, 2009).

It is also important to note, however, that not all studies have demonstrated significant differences in rates of mental illness between LGB and heterosexual individuals (e.g., Alessi, Meyer, & Martin, 2011). Further, many population-based representative studies, particularly prior to the turn of the 21st century, were not designed to study sexual minority mental health a priori and so frequently were not designed in consideration of the sampling and assessment issues in research with LGB populations and relied on small subsamples (Meyer, 2003). Generally, studies using sophisticated (e.g., multi-method) assessment of sexual orientation increasingly show an elevation of risk for mood, anxiety, and/or substance disorders, with some variation across subgroups and by gender, and this effect has been demonstrated in a range of both nonrepresentative targeted sampling studies (e.g., Hellman, Sudderth, & Avery, 2002; Herrell et al., 1999; Sheets & Mohr, 2009) and population-based representative studies (e.g., Burgard, Cochran, & Mays, 2005; Cochran & Mays, 2000; Cochran et al., 2003; Sandfort, Bakker, Schellevis, & Vanwesenbeeck, 2006). LGB individuals are also more likely to utilize mental health care services, which may reflect the increased need among this population (Cochran et al., 2003; Meyer, 2003; Tjepkema, 2008).

Prior to the removal of homosexuality as a mental illness from the diagnostic cannon, researchers generally ascribed increased rates of mental illness among LGB populations to the (presumed) disorder of homosexuality itself (Cochran, 2001). However, in recent decades researchers working with LGB populations have increasingly argued that the elevated risk of psychopathology found among LGB adults is due to increased negative experiences and stress

incurred as members of a stigmatized minority group, including higher rates of victimization and fears of victimization (Diaz et al., 2001; Dworkin & Yi, 2003; Herek et al., 1999; Leharot & Simon, 2011; Levitt et al., 2009; Meyer, 2003; Savin-Williams, 2004). Cramer and colleagues (2012), assessing LGB and heterosexual victims of crime upon presentation at a trauma center, found that LGB orientation was associated with stronger acute stress responses and more pervasive general anxiety. The authors argue that sexual minority status leads to the internalization of social-identity threats, such that stigmatized individuals become hypervigilant to cues of identity threat and develop biases to threat that increase vulnerability to the development and maintenance of acute stress and anxiety responses.

LGB Bias Victimization across the Lifespan

One particularly damaging stressor disproportionately experienced by LGB individuals is interpersonal violence in childhood and adulthood, including physical and sexual assault, destruction of property and vandalism, and threats of violence (D'Augelli, Grossman, & Starks, 2006; House, Van Horn, Coppeans, & Stepleman, 2011; Roberts et al., 2010). Anti-gay violence has been described as a central stressor affecting LGB populations, and past experiences of victimization may increase fears of further victimization (Meyer, 2003; Otis, 2007).

Across multiple studies, a majority of LGB participants have reported childhood and adolescent experiences of bias victimization – that is to say, victimization perceived to be due to their sexual orientation - on the part of peers and family members, including bullying, social isolation, and verbal, physical, and sexual abuse, and these experiences are typically elevated in frequency, severity, and persistence as compared to non-LGB controls (D'Augelli et al., 2006; Savin-Williams, 1994; Roberts et al., 2010) and even as compared to non-LGB siblings reared within the same home (Balsam, Rothbaum, & Beauchaine, 2005). These data have been

proposed as one explanation for why risk of psychiatric disorders and suicidality for LGB individuals is particularly high in adolescence and young adulthood (Cochran, 2001). Victimization by peers and family members in youth has been associated with increased risk of poorer school performance, truancy, dropping out of school, running away, conflict with the law, substance abuse, and suicide (D'Augelli et al., 2006; Savin-Williams, 1994). Dragowski and colleagues (2011) found that verbal and physical sexual orientation bias-motivated victimization explained a significant proportion of the variance in posttraumatic stress symptoms among LGB youths, above and beyond the effects of non-bias life stressors.

LGB adults also report disproportionate experiences of victimization, including physical assault, sexual assault, threats of violence, and vandalism (Cochran, 2001; Dworkin & Yi, 2003; Herek et al., 1999; House et al., 2011; Otis, 2007; Otis & Skinner, 1996; Rose & Mechanic, 2002). In recruiting participants for a study of vicarious traumatization in bias crimes, Noelle (2002) noted that initial plans to exclude individuals with past experiences of victimization were changed due to high rates of past bias victimization, as approximately 79% of the initial sample reported at least one such experience. In one study, 73% of LGB participants recruited at a gay pride rally reported having experienced at least one such incident of bias victimization, which were correlated with traumatic stress symptoms and helpseeking behaviors (Rose & Mechanic, 2002). Otis and Skinner (1996) found that 50% of subjects (recruited via mailing lists, chain referrals, and convenience sampling at a gay pride event) endorsed experiencing at least 1 act of victimization in the previous two years that they attributed to sexual orientation bias (noting that this is at the low end of most prevalence estimates). A study by Herek and colleagues (1999) sampled over 2,000 gay and bisexual men and women through snowball and chain referral sampling and found that one-fourth of the men and one-fifth of the women reported that they had

experienced at least one act of criminal victimization since age 16 that they attributed to sexual orientation bias. Individuals who had experienced a bias crime within the past five years reported elevated rates of traumatic stress, mood, and anxiety symptoms.

These three studies (Herek et al., 1999; Otis & Skinner, 1996; Rose & Mechanic, 2002) reflect the limitations of early research on bias victimization, in particular the use of small, non-representative samples recruited via convenience sampling, which tend to result in higher-functioning samples (Moradi et al., 2009). These studies relied on retrospective reporting of events and did not verify these incidents' occurrence; consequently, the accuracy of the reported rates is unclear. It is possible that higher rates of retrospective reporting of bias victimization are associated with response biases associated with individual differences in recall and reporting (e.g., neuroticism). There may also be an additional confounding effect of sampling; multiple studies (typically with racial and gender minorities) suggest that greater perceived discrimination is associated with greater identification with and involvement with one's stigmatized group, although the direction of this effect is unclear (Branscombe et al., 1999; Leonardelli & Tormala, 2003; Sellers & Shelton, 2003; Smith & Silva, 2011). Finally, these studies did not consistently examine links to mental health outcomes.

More recent studies of LGB victimization have attempted to focus less on gauging the rates of LGB victimization and more on assessing the relations (direct and indirect) between experiences of violence and mental health outcomes (D'Augelli et al., 2006; House et al., 2011; Leharot & Simon, 2011; Roberts et al., 2010). Much of this research has been conducted with youth and adolescents, particularly through examination of bias victimization in schools (e.g., Birkett, Espelage, & Koenig, 2009). These studies have also substantiated a link between experiences of bias victimization and poor mental health outcomes, although they have (as in

earlier studies) generally relied on nonrepresentative convenience, snowball, or chain sampling techniques (D'Augelli et al., 2006; Dragowski, Halkitis, Grossman, & D'Augelli, 2011; House et al., 2011; Leharot & Simon, 2011).

Studies examining the relationship between sexual orientation, crime victimization, and mental health have increasingly employed more advanced sampling and assessment methodology. Roberts and colleagues (2010) employed a nationally-representative sample (n = 33,046 self-identified heterosexual, 1022 self-identified gay, lesbian, or bisexual) and found that LGB individuals reported more experiences of interpersonal trauma (childhood maltreatment, assault, etc.), early exposure to traumatic events, and higher lifetime risk of PTSD. Although this study did not specifically ask about bias motivation in defining traumatic events, the authors note that bias victimization likely account for some of the difference in rates of exposure to traumatic events.

Vicarious Victimization and Discrimination as Trauma: Examples from Other Literatures

In recent years, there has been a movement by some researchers working with marginalized groups to categorize experiences of discrimination as traumatic, given the observation that emotional reactions to acts of discrimination often include feelings of shock, helplessness, and fear (Avina & O'Donahue, 2002; Bryant-Davis, 2007; Carter, 2007; Dunbar, Liu, & Horvath, 1995: Harrell, 2000), and the cumulative effects of exposure to discrimination include patterns of avoidance, hypervigilance, identity confusion, feelings of guilt and shame (lowered self-worth), and interpersonal difficulties, as well as pervasive perceptions of the environment as hostile (Pieterse et al., 2010; Sanchez-Hucles, 1999). Although the majority of these studies have focused on racial and gender discrimination (and the intersectionality thereof), they have generally adopted a broad view on the basis of social psychological theories that

"societal traumas include not only racism but also sexism, poverty, heterosexism, and religious intolerance" (Bryant-Davis, 2007, p. 140). In addition to examining experiences of discrimination as potential sources of traumatic stress, researchers in these fields have also increasingly considered physiological processes as both markers of physical health and potential mechanisms of stress-related changes in mental health (Carter, 2007).

There is evidence of changes in autonomic nervous system functioning during and as a consequence of experiences of racial- and gender-based discrimination (Burrow & Ong, 2010; Harrell, Halls, & Taliaferro, 2003; Kiang, Blumenthal, Carlson, Lawson, & Shell, 2009; Richman, & Jonassaint, 2008). Racism has been identified as a stressor that may increase vulnerability to negative mental health outcomes (Clark, Anderson, Clark, & Williams, 1999; Williams & Williams-Morris, 2000), and racial discrimination has been linked to dysregulation of the threat response system (DeSantis et al, 2007; Kiang et al., 2009; Lepore et al., 2006). For example, exposure to a highly-publicized racial stressor (the Duke Lacrosse scandal) was associated with sustained elevated cortisol levels in racial minority college students post-exposure (as compared to pre-exposure levels; Richman & Jonassaint, 2008).

Similarly, research in the field of sexual harassment suggests that individuals may experience negative outcomes in response to sexual harassment experienced both directly and indirectly, and these negative outcomes are consistent with traumatic exposure (e.g., Miner-Rubino & Cortina, 2007); as such, multiple researchers have questioned whether individuals exposed to environments in which sexual harassment occurs (experienced directly or indirectly) may meet criteria for diagnoses of trauma-related disorders (Avina & O'Donahue, 2002; Stockdale, Logan, & Weston, 2009; McDermut, Haaga, & Kirk, 2000; Wolfe, Crooks, Chiodo, & Jaffe, 2009; Woods, Buchanan, & Settles, 2009). It is possible that similar patterns of response

may be observed in other minority groups exposed to social identity-based discrimination and violence, such as sexual minorities exposed to information about bias-motivated violence.

The Impact of Bias Crimes for Victims and Non-Victims

The data on LGB experiences of violent victimization and mental health outcomes highlight the high prevalence and harmful effects of direct trauma exposure among this population (D'Augelli et al., 2006; Otis & Skinner, 1996; Savin-Williams, 1994; Roberts et al., 2010). However, discrimination represents a "continuum of violence" with forms ranging from stigmatizing and emotionally painful exclusion from and devaluation within social contexts, to social and cultural institutions and practices that support systemic inequalities, to the threatened or actual use of force and power in maintenance of these inequalities (Sanders-Phillips, 2009, p. 174). One recent study of LGB individuals exposed to non-life-threatening (non-Criterion A1) bias-motivated events reported similar behavioral, cognitive, and emotional changes in response as were observed in individuals exposed to life-threatening bias-motivated events (Alessi et al., 2013), suggesting that responses to discrimination may likewise lie on a continuum of distress.

Most importantly for the purposes of the present study, there is some evidence that individuals not directly exposed to victimization may also show symptoms of distress and changes in cognition, mood, and behavior consistent with experiences of traumatic stress (e.g., Herek et al., 1999), although this research is sparse in comparison to the accumulated findings of the racial discrimination literature (Bryant-Davis, 2007; Carter, 2007). In addition to the studies explicitly examining vicarious responses to bias crime previously reviewed (Craig, 1999; Noelle, 2002; Perry & Alvi, 2012), other researchers have assessed whether simply living within a broader social context in which victimization occurs is associated with psychological distress (Duncan & Hatzenbuehler, 2014; Herek et al., 1999; Meyer & Grollman, 2014). Higher past-year

suicidality has been found among LGB adolescents living in neighborhoods with a higher prevalence of bias crimes against sexual minorities (Duncan & Hatzenbuehler, 2014). LGB participants across multiple studies have reported more fears of crime, fears of being victimized, reduced belief in the benevolence of the world and of others, reduced perceptions of self-mastery, and more attributions to prejudice (Herek et al., 1999; Meyer & Grollman, 2014).

Witnessing hostility, incivility, and harassment against other LGB individuals on college campuses has been shown to partially mediate the relations between sexual minority status and anxiety (Woodford, Han, Craig, Lim, & Matney, 2014), substance use (Woodford, Krentzman, & Gattis, 2012), and physical health problems (Woodford, Howell, & Silverschanz, 2012) among college students. Living in states with discriminatory policies has been associated with higher rates of psychiatric morbidity among LGB adults (Hatzenbuehler, McLaughlin, Keyes, & Hasin, 2010). In one study, LGB young adults who had been raised in highly stigmatizing environments (based on level of structural/legal/organization stigma at the state level) demonstrated blunted cortisol responses in a stress task (Hatzenbuehler & McLaughlin, 2014). The authors concluded that "the stress of growing up in environments that target gays and lesbians for social exclusion may exert biological effects that are similar to traumatic life experiences" (p. 39).

It is plausible to hypothesize that exposure to information about bias crime events would serve as a form of minority stress with implications for physiological, emotional, and cognitive functioning among LGB individuals. However, it is important to note that not all LGB individuals who experience victimization and discrimination develop symptoms of psychopathology or report lasting distress (Dean et al., 2000; Levitt et al., 2011; Otis, 2007). It is likely that individual factors may affect responsiveness to actual and threatened victimization, even if group-level effects exist. As theorized by Meyer (2003), one critical interindividual factor

likely to moderate responses to minority stressors is the salience of and evaluations that an individual makes about their social identity. An individual's perception of their social group membership and the value placed upon that membership is known as *collective identity* (Ashmore, Deaux, & McLaughlin-Volpe, 2003).

CHAPTER FOUR

Collective Identity

Collective identity, previously referred to as social identity, refers to an individual's evaluation of membership in a group perceived to have some shared characteristics and fate (Ashmore et al., 2003). An individual may develop a collective identity with reference to an ascribed group, such as a gender or ethnic group, or with reference to an achieved group, such as a professional or occupational group. Collective identity is subjective and self-defined. As it is psychological in nature, it may influence an individual regardless of the level of physical contact with the collective group. Individuals have multiple collective identities that become more or less salient within different social contexts. Collective identity has been identified as a relevant construct for minority stress and coping among LGB-identified individuals (Meyer, 2003).

Current theories of collective identity are based heavily in Tajfel's (1978) social identity theory and Turner's (1987) self-categorization theory, which refer to, respectively, an individual's self-conceptualization as a member of a social group and the cognitive processes and conditions that then influence social categorization and behavior. Tajfel's (1978) social identity theory was developed initially in order to explain patterns of interactions between groups, including social prejudice, discrimination, and stereotyping. Noting that individuals placed into arbitrary groups exhibited preferences for the in-group and prejudices against out-groups, he argued that individuals define themselves and organize their behavior according to their perceived status in social categories and the emotional significance of their group membership. Thus, social categorization shapes self-identity, attributions, and behavior, and this categorization depends on social context. According to self-categorization theory, an extension of social identity theory that explains cognitive mechanisms of individual behavior in social

contexts, individuals attune to environmental cues relevant to their own identity (Smith & Silva, 2011).

Reviewing the literature on collective identity and noting the existence of considerable disparity across models of collective identity, Ashmore, Deaux, and McLaughlin-Volpe (2003) proposed unifying these disparate models according to shared, consistent characteristics. They noted seven relatively consistent elements across models, albeit with differing rates of inclusion and levels of emphasis. As a precondition, there must be some form of *self-categorization*, or division into social categories. Second, there is some form of *evaluation*, or positive or negative attitude to the identity. These include favorability judgments that individuals hold about the group as well as judgments of how one believes others perceive the group. Third, there is some judgment of the degree of *importance* of group membership to the individual's overall self-concept. These include both evaluations of "centrality," or conscious appraisal of importance, and "salience," or readiness to act on an identity (which may not explicitly be recognized by the individual). Fourth, there is often an *attachment* or *sense of interdependence*, including both a feeling of belonging (such as affective responses to group symbols) and a sense of shared fate. Fifth, there may be some variation in *social embeddedness*, or the degree to which one's identity is involved in social relationships in day-to-day life – which may in turn reflect an individual's level of group commitment or the cost of abandoning the identification. Sixth, there may be *behavioral involvement* in group events or causes.

Finally, individuals may derive *content and meaning* from their collective identification, whether with regard to self-attributions of traits or toward the development of a particular ideology or social stance. Thus, individuals are likely to vary widely in their expression and interpretation of any given collective identity according to their standing on each of these

dimensions. Although existing models of collective identity vary in the choice of and relative emphasis that they place upon each of the elements outlined above, a recent meta-analysis of nearly two hundred studies using a range of ethnic identity models and well-being concluded that results did not vary by measures, reflecting the shared constructs of these models (Smith & Silva, 2011). Models of collective identity have been applied primarily in the study of inter- and intra-group processes, and have been applied heavily in studies of minority mental health (Leonardelli & Tormala, 2003; Sanders-Thompson, 1996; Sellers & Shelton, 2003; Settles, Navarrete, Pagano, Abdou, & Sidanius, 2010). In general, self-identity and self-categorization theories have shaped the development of individualized models of collective identification for a broad range of minority identities (Benish-Weisman & Horenczyk, 2010; Bombay, Matheson, & Anisman, 2010; Houkamau & Sibley, 2010; Quinn & Chaudoir, 2009; Rughinj, 2011; Yip & Cross, 2004).

Building upon social theories of collective identity and historical research with ethnic minorities, Sellers and colleagues (1998) proposed the Multidimensional Model of Racial Identity (MMRI) in an attempt to posit a mechanism by which group identity affects an individual's interpretation of and response to the social environment via situational appraisals and behaviors. Noting the constraining influence of context on behavior and the importance of subjective appraisals of environmental events, the MMRI is primarily concerned with the individual's *perception* of their identity, the "significance and meaning that [individuals] place on race in defining themselves" (p. 19). Similarly, because the MMRI is concerned primarily with predictive validity rather than internal validity, it adopts a cross-sectional approach that focuses on an individual's status along relevant dimensions of collective identification and does not require the categorization of individuals into different stages of identity development.

The model posits four major domains of racial identity: centrality, salience, regard, and ideology. *Centrality* and *salience* refer, respectively, to the extent to which an individual identifies him or herself as belonging a racial group and the relative importance of that association within specific contexts, reflecting the two aspects of *importance* described by Ashmore and colleagues (2003). *Regard* refers to the positive or negative affective judgments an individual makes of the group, and reflects two aspects of *evaluation*: *private regard*, or the individual's subjective evaluation of the extent to which he or she feels positive or negative feelings about the group and their membership within the group; and *public regard*, or the individual's evaluation of how he or she believes others evaluate the group (Sellers, Smith, Shelton, Rowley, & Chavous, 1998). Finally, *ideology* refers to beliefs and attitudes about how the individual feels members of the group should react (e.g., through distancing or assimilation), and reflects the culturally-specific *content and meaning* that individuals derive from membership in a racial group (Ashmore et al., 2003). The salience of public and private regard evaluations may vary across social contexts, but centrality reflects the chronic accessibility of identity constructs in appraisals and behavior (Sellers et al., 1998).

This model of identity, particularly with regard to the domains of centrality, salience, and regard, has been successfully adapted for use with a wide variety of racial, ethnic, religious, and sexual orientation groups, including Chinese Americans, Eastern European Roma adults, First Nations peoples, individuals with stigmatized medical conditions, Maori peoples, Israeli immigrants, and U.S. sexual minorities (Benish-Weisman & Horenczyk, 2010; Bombay, Matheron, & Anisman, 2010; Houkamau & Sibley, 2010; Quinn & Chaudoir, 2009; Rughinj, 2011; Yip & Cross, 2004). The MMRI has also been used as a predictive model in many studies of discrimination, perceptions of bias, well-being, and coping (e.g., Settles et al., 2010).

Literature on collective identity suggests that identity salience, centrality, and regard may reflect general cognitive processes of social identification and may translate easily across social groups, although ideology appears to reflect the unique experiences and values of particular social groups (Sellers et al., 1998).

To date, no large-scale studies have compared the psychometric properties of the modified MMRI across ethnic, gender, or sexual orientation minority groups, and so caution must be taken in interpreting these constructs across identity groups. However, given that no comparable, independent cross-sectional model of collective identity yet exists for LGB persons, the constructs examined within the MMRI model have thus far successfully been examined across other groups repeatedly, and meta-analysis suggests that the core constructs of collective identity maintain relatively consistent relations with stress and well-being variables across measures (Smith & Silva, 2011), applying this model to LGB participants seems appropriate for the current study.

Collective Identity, Discrimination, and Psychological Well-Being

Discrimination against one's group has been associated in some studies with less private regard and lower self-esteem (e.g., Leonardelli & Tormala, 2003); however, under some circumstances collective identity can serve a protective purpose (e.g., Branscombe et al., 1999). There is some evidence to suggest that stigma may lead to increased group coping efforts and group cohesion, whereas other research suggests that immediate and long-term effects may include negative outcomes (Leonardelli & Tormala, 2003; Meyer, 2003). High public regard has been shown to be either unrelated to individual psychological functioning or to relate to lower levels of distress in samples (e.g., Sellers & Shelton, 2003), whereas high private regard has consistently been shown to insulate members of stigmatized groups from negative mental health

outcomes (Settles et al., 2010). Highly-identified individuals may also be more likely to perceive actions as discriminatory and report experiencing more psychological distress (Leonardelli & Tormala, 2003; Sellers & Shelton, 2003).

A recent meta-analysis (Smith & Silva, 2011) of 184 studies of ethnic identity and one or more aspects of well-being (n = 41,676) found varied effect sizes of identity on well-being across studies, with greater effect sizes in younger populations. The authors speculated that these results may follow from a relatively greater influence of identity on self-perception and well-being in adolescence and young adulthood (Berman, Schwartz, Kurtines, & Berman, 2001), but caution that relatively fewer studies have been conducted with middle-aged and older adults and so further replication is needed. As also noted by Smith and Silva (2011), studies of the relationship between collective identify, discrimination, and coping use cross-sectional data and by nature are unable to employ experimental designs, which limits interpretation of causality. For the purposes of the present study, examining identity in young adults may be particularly likely to reveal relations with discrimination, given these findings.

Collective Identity and Exposure to Bias Crimes

Research on the effects of discrimination on minority groups has relied heavily of models of minority stress and collective identity to explain both the processes by which individuals are affected by stigma and victimization and to provide an explanation for the diversity of responses to marginalization (Bryant-Davis, 2007; Carter, 2007; Sellers & Shelton, 2003; Settles et al., 2010). These responses include both positive cognitive and behavioral coping strategies and changes in self-worth, perceptions of group status, increased feelings of social isolation and rejection, avoidance behaviors, and other risk factors for the development of psychopathology.

These models provide a useful framework within which to make predictions about the differential responses of LGB individuals upon exposure to bias crimes.

As noted by Dunbar (2006), reactions to and effects from bias crimes are likely to vary depending on the individual's social identity. Individuals who identify highly with the in-group may interpret events such as bias crimes as more salient to their group membership, consistent with social identity and self-categorization theories (Smith & Zarate, 1992). Thus, I would predict that individuals who perceive their LGB identity as more central would exhibit stronger defensive responding to bias crime information. Similarly, lower public regard (perception that out-group members value or devalue the in-group) seems likely to elicit stronger defensive responding insofar as it relates to appraisals of the likelihood and imminence of threat. I would predict that individuals who perceive public regard as low will demonstrate greater activation of the threat response system. Finally, I would predict that the combination of high centrality and low public regard would predict even greater defensive activation, as it would positively predict immediate appraisals about threat salience, imminence, and likelihood.

CHAPTER FIVE

Research with LGB Individuals: History and Methodological Considerations

Before designing any research study with sexual minority individuals, it is important to review the historical context and methodological considerations specific to research with this population in order to provide a context within which to interpret existing research and a basis upon which to determine best methodological practices in the present study. The history of psychological research with LGB individuals has been colored by social prejudices that shaped the conflation of sexual orientation with mental wellness for decades (Meyer, 2003). It was only in the 1950s that psychological research with LGB-identified populations began to use non-psychiatric samples. Prior to this time, research with sexual minorities often used evidence of mental illness among institutionalized gay men to justify the assertion that homosexuality was equated with mental illness (Cochran, 2001). As evidence mounted in support of the removal of homosexuality as a diagnosable mental illness in 1974, studies assessing mental illness among homosexual populations shifted to looking at non-psychiatric populations and generally failed to find significant group differences in rates of psychopathology, leading to waning interest in such research (Cochran, 2001; Meyer, 2003). However, prior to the onset of the HIV/AIDS epidemic in the 1980's, large, population-based national studies did not typically ask about sexual orientation, and these early non-psychiatric studies often lacked the methodological rigor of modern epidemiological studies, used small samples, and lacked a theoretical frame (Cochran, 2001; Otis & Skinner, 1996).

Prior to the 1990s, a small number of studies assessed mental illness among LGB populations and found inconsistent results; in most cases, studies that demonstrated slightly elevated (but not outside normal range) levels of mental illness among LGB samples were taken

as evidence of no difference (Meyer, 2003). Further, in sharp contrast to pre-1950's studies, studies of LGB mental health conducted from the 1970's to the 1990's generally excluded participants with significant histories of psychosis, mania, or hospitalization (Hellman et al., 2002). As discussed previously in this review, more recent research from the 1990s and 2000s indicates that LGB individuals exhibit higher rates of mental disorders as compared to heterosexual controls (Meyer, 2003). More recent epidemiological studies are more methodologically rigorous than earlier studies, although they are not exempt from limitations and some methodological issues can confound interpretation of specific results (Cochran, 2001).

Surveying the state of research on sexual orientation and psychopathology, Cochran (2001) proposed a variety of explanations for why research on mental health and wellbeing with LGB populations is scarce. First, the vestiges of historical debates continue to color modern disagreements on the importance and interpretation of LGB data, which may lead researchers to be discouraged from taking professional risks by publishing in a field wrought with ongoing controversy and potential political implications. Second, population-based research surveys have only recently begun to incorporate data on sexual orientation in their demographic questionnaires; prior to the onset of the HIV/AIDS epidemic, these surveys generally did not ask about sexual orientation or behavior. Finally, research with LGB populations is subject to significant methodological limitations that may create barriers to conducting reliable and valid research.

Classification of Participants as LGB

The base rate of homosexual and bisexual behavior among American men and women has been popularly estimated to be approximately 10% of the population; however, depending on the methodology of the study prevalence rates may vary as widely as 1-15% (Savin-Williams &

Ream, 2007). The wide variation in prevalence rates across studies is due in part to differences in methods of identifying individuals as homosexual or bisexual. Studies that identify individuals on the basis of self-reported sexual attraction generally show higher prevalence rates than those classifying individuals based on reported sexual behavior or self-identification, and this pattern has been replicated within studies that have collected data on both attraction and behavior (Bagley & Tremblay, 1998; Cochran, 2001; Savin-Williams & Ream, 2007; Sell, Wells, & Wypij, 1995).

Although studies assessing same-sex sexual attraction may show lifetime rates as high as 13-17% among both American men and women, studies of lifetime same-sex sexual behavior have suggested somewhat lower rates of behavior ranging from 2-6% of men reporting same-sex behavior exclusively, 1-4% of women reporting same-sex behavior exclusively, and 1-2% of men and women reporting sexual behavior with both same-sex and opposite-sex partners (Dickson, Paul, & Herbison, 2003; Laumann, Gagnon, Michael, & Michaels, 1994; Sell, Wells, & Wypij, 1995). Prevalence rates of reported same-sex attractions and behavior may also vary according to social setting and, in particular, in relation to the wider social acceptability of same-sex relationships (e.g., Copas et al., 2002; Fergusson, Horwood, Ridder, & Beautrais, 2005; Kuyper & Vanwesenbeeck, 2009). As well as affecting prevalence rates, differences in methods of classifying individuals by sexual orientation across studies can make comparison of results across studies difficult, or even produce different results (Midanik, Drabble, Trocki, & Sell, 2007; Moradi et al., 2009; Sell, 1997; Sell & Petrulio, 1996; Worthington & Reynolds, 2009). In addition, each method of classification is subject to methodological strengths and limitations.

The most common method of assessing sexual orientation in the psychological literature is to ask participants to self-identify by choosing a label of gay, lesbian, or bisexual (Cochran et

al., 2003; Hellman et al., 2002; Otis, 2007; Worthington & Reynolds, 2009). Another method of identifying individuals as gay, lesbian, or bisexual that is common in national population-based research relies on assessing reported sexual behavior histories, such that individuals reporting only same-sex sexual partners are classified as gay or lesbian, individuals reporting both same-sex and opposite-sex partners are classified as bisexual, and individuals reporting only opposite-sex partners are classified as heterosexual (Cochran & Mays, 2000; Gilman et al., 2001). In an effort to assess both behavior and attraction, some studies use the Kinsey scale, a 7-point scale that attempts to assess a range of possible patterns of sexual behavior and attraction, ranging from 0 (exclusively homosexual) to 6 (exclusively heterosexual) with intermediate levels representing a gradient of bisexuality (Hellman et al., 2002).

Studies that ask individuals to self-identify as heterosexual, homosexual, lesbian, or bisexual may suffer from non-response and response biases confounded with willingness to disclose, although the natures of the potential confounding effects are currently unknown (Cochran et al., 2003). For example, willingness to disclose sexual orientation may correlate with willingness to disclose psychological distress, artificially inflating rates of distress; it may reflect social context factors such as regional or local acceptability of disclosure of emotional states and/or personal information, including sexuality (Cochran et al., 2003; Fassinger & Miller, 1996). Conversely, reluctance to disclose sexual orientation may correlate positively with distress, such that more highly distressed individuals are less likely to disclose their sexual orientation status. However, the importance of response biases (and non-response biases) in sexual orientation remains unclear (Cochran, 2001).

Another concern with the use of self-identification methods alone is that sexual orientation labels often fail to capture the complexity of sexual desires, fantasies, attitudes,

beliefs, and behaviors (Moradi et al., 2009).For example, one study of 2,372 adults recruited online via email lists and in a large Midwestern university applied cluster analysis to determine sexual orientation groups on the basis of sexual arousal, attraction, fantasies, behavior, and romantic relationships, and then compared these groups on measures of group commitment and negative attitudes toward homosexuality (Worthington & Reynolds, 2009). Using Ward's (1963; cited in Worthington & Reynolds, 2009) method of cluster analysis, the authors found 12 distinct sexual orientation clusters, with differences in profiles of sexual attraction, behavior, and relationships, as well as variation in group commitment and homonegativity. These results suggest that the exclusive use of forced-choice self-identification labels may obscure significant interindividual variation in attraction, behavior, group identification, and attitudes.

Studies classifying individuals as gay, lesbian, or bisexual on the basis of behavioral histories alone may misclassify individuals whose sexual behavior does not reflect constructs relevant to the hypothesis (Cochran et al., 2003; Cochran, 2001). A study examining discrimination on the basis of sexual orientation identity, for example, may suffer from categorization errors using a behavioral classification method. An additional limitation of relying on behavioral reports of sexual interest is that these reports are often time-limited to the previous year or previous two years, which may exclude participants without partners during those time frames who would otherwise identify as LGB. One study of major (chronic, recurrent) mental illness in an LGB sample found that 48.8% of the women and 57.9% of the men reported no partners in the previous year – about ten times higher than typically found in a nonpsychiatric LGB sample (Hellman et al., 2002). These results would suggest that studies assessing sexual orientation on the basis of past year sexual behavior may be particularly limited by the exclusion

of a chronically ill individuals who have had limited sexual experiences in recent years and thus were misclassified as (presumably) heterosexual.

Some studies attempt to compensate for this possibility by asking participants to report all sexual partners across the lifespan, but this may result in overclassifying individuals as homosexual or bisexual, given that studies have suggested that approximately half of individuals who report past same-sex partners self-identify as heterosexual (in contrast to the 95% of those self-identifying as homosexual or bisexual who report same-sex past partners; Cochran & Mays, 2000). These studies may likewise exclude individuals who have not yet engaged in same-sex sexual experiences. One study of sexual orientation identity among LGB youths and young adults ($N = 72$, mean age = 20.88, SD = 2.94) found that 10% of their sample had not yet had a same-sex sexual experience, and this was significantly related to both the age of first disclosure of orientation and levels of immersion in LGB social networks (Floyd & Stein, 2002). Thus, the sole use of behavioral methods for classification of LGB individuals may introduce confounds and produce biased samples that are less psychologically distressed, more comfortable with disclosure of sexual orientation identity, and more immersed in LGB social networks.

To overcome these inherent classification limitations, the most carefully developed studies use a combination of methods to classify individuals as gay, lesbian, or bisexual, asking participants to self-identify an orientation as well as collecting information on sexual behavior, fantasy, and desire (Floyd & Stein, 2002; Hellman et al., 2002; Roberts et al., 2010). The use of multiple methods of classification has been recommended both to control for the potential effects of social stigma that may lead to response biases and to provide a more richly detailed and complete picture of sexual orientation (Moradi et al., 2009).

When time, sample, and monetary constraints do not preclude the use of multiple methods of identification, obtaining information on attraction, fantasy, and behavior in addition to forced-choice self-identification items is likely to provide the most detailed picture of sexual orientation and sexual orientation identity. Given limitations in analysis, however, it may not always be possible to compare a large number of orientation groups or control for all potential confounding factors. Ultimately, the choice of classification system used in data analysis seems to depend upon the nature of the question asked as well as a consideration of what potential confounding factors an experimenter is willing to hazard. Given evidence of rich diversity in sexual orientation beyond existing forced-choice categories, the potential impact of social stigma on participant responses, and the known benefits and limitations of the use of single measures of orientation, the choice of classification system employed should be theoretically driven and consistent with sound experimental methodology.

Sampling Methods with LGB Populations

Given the low prevalence rates of homosexuality and bisexuality, the social stigmatization of sexual minorities, and a history of discrimination against sexual minorities on the part of scientific and health organizations, obtaining a testable sample of LGB participants for psychological research often necessitates the use of non-representative or non-random sampling methods (Savin-Williams, 1994). For example, it is common for studies with LGB individuals to use convenience sampling, recruiting participants from gay pride events, LGB organizations, or similar environments in which researchers expect to find a high proportion of individuals identifying as LGB (Otis & Skinner, 1996: Hellman et al., 2002). Studies examining LGB adolescents may recruit participants via community programs or youth centers aimed specifically at LGB youth (D'Augelli et al., 2006).

To maximize recruitment, researchers may rely on snowball sampling, also known as referral sampling, a non-random sampling technique in which enrolled participants refer acquaintances for participation in a study (Hellman et al., 2002). Given the risk of bias inherent in non-random, non-probability survey methods, and the possibility of regional differences when sampling from a single city or area, researchers have increasingly attempted to assess the prevalence of mental illness in LBG populations using nationally representative surveys (Cochran & Mays, 2000; Gilman et al., 2001). However, only recently have national surveys of mental health included information on sexual orientation identity and same-sex behavior, some still do not include information on sexuality, and many of these surveys are focused primarily on youth (Dean et al., 2000)

Choices about the location of convenience sampling, or the "anchors" of chain referral sampling methods, may limit the generalizability of results. As Otis and Skinner (1996) note, the use of convenience sampling at gay pride events, via organizational mailing lists, and through subsequent chain referrals tends to result in a sample that is urban, relatively well-educated, and typically young or middle-aged. Researchers examining LGB youth by recruiting participants at community centers and youth organizations tend to access a population that is more willing to disclose sexual orientation and more highly distressed than LGB youth not involved in such organizations (Savin-Williams, 1994). Sampling at bars or other social venues frequented by LGB adults may suffer from similar sampling effects, as well (Diaz et al., 2001). Snowball sampling may produce samples with similar characteristics as individuals recruit friends and acquaintances that may share environments and behaviors. The use of subsamples from national data sets is limited by inconsistency across national studies in how sexual orientation is defined and assessed, and researchers may be limited to only one aspect of sexual orientation such as

past sexual behavior (e.g., Cochran & Mays, 2000). Decisions about sampling methods should be made in consideration of the research question, practical limitations, and potential confounding effects of the recruitment method chosen (Moradi et al., 2009).

Assessment and Analysis of Data with LGB Populations

As with all psychological research studies conducted in laboratory settings, failing to replicate real-world experiences may limit the generalizability of results (Moradi et al., 2009). The method of administration of measures may affect responses. For example, Villarroel et al. (2006) found that individuals were more willing to reveal same-sex attraction and behaviors when interviews were conducted by computer rather than in-person, which may reflect concerns related to stigma and social exclusion (Fassinger & Miller, 1996; Moradi et al., 2009). Given that willingness to disclose sexual orientation may be correlated with other psychological variables, this research indicates that providing participants with the perceived anonymity of responding via computer may widen the pool of participants who identify as non-heterosexual and produce more diverse and accurate samples (Villarroel et al., 2006). Researchers should be careful to avoid using biased language when writing items so as to solicit the most accurate information possible (Moradi et al., 2009). Presuming sample and data accuracy, however, considerations around analysis of collected data remain.

Sexual orientation subgroups are often combined into broader categories (e.g., gay men and lesbian women combined into a single 'homosexual' group), which may increase statistical power but likewise obscure intragroup variation (Moradi et al., 2009; Worthington & Reynolds, 2009). It may be the case that some experiences are shared across sexual minority subgroups, but it is unclear which experiences are likely to vary and there is evidence that subgroup differences exist, including subgroup differences in patterns of psychopathology comorbidity (Cochran,

2001). As with decisions regarding sampling and classification, reviews of methodological issues with LGB populations recommend weighing the risks and benefits of different methods of task administration and data analysis according to the research questions and limitations (Moradi et al., 2009). Given the significant and varied methodological issues involved in conducting research with sexual minorities, it is important to choose methods of measurement that minimize the risk of confounding factors while providing adequate means to test the research questions at hand.

The present study collected a random sample of young adults from an undergraduate subject pool, oversampling for LGB participants. Data was collected on sexual orientation self-categorization and behavior, as well as on a continuous measure of attraction, fantasy, and behavior (the Kinsey scale). For the purposes of statistical analyses, the Kinsey scale was chosen as a primary grouping method due to its dimensional nature, established conventions for grouping, and opportunity for participants to identify their sexual orientation based on their life history of attraction, fantasy, and behavior (rather than self-identification or behavior alone). Sexual orientation information was collected by computer and participant data was collected anonymously in order to maximize participant disclosure. Finally, study staff were blind to group status in order to minimize expectancy effects.

CHAPTER SIX

Rationale and Hypothesis

The current study is designed to examine three research questions. Do bias crimes serve as a unique source of minority stress for LGB individuals that are experienced differently from heterosexual individuals? Is exposure to bias crime information a potential source of traumatogenic stress for LGB individuals, insofar as it evokes defensive threat responses and leads to changes in cognitive worldview? Finally, do individuals vary in their physiological, cognitive, and emotional responses to bias crimes as a function of their collective identity?

To date, two qualitative studies (Noelle, 2002; Perry & Alvi, 2012) and one quantitative study (Craig, 1999) have examined responses of non-victim members of a targeted group to racial (Craig, 1999), ethnic (Perry & Alvi, 2012), and sexual orientation bias crimes (Noelle, 2002), and have suggested that non-victim members of a targeted group may have threat-related emotional, cognitive, and behavioral responses to bias crimes. However, these studies have relied primarily on the use of qualitative and correlational designs, small sample sizes, nonrandom sampling, and retrospective reporting of responses. The aim of the present dissertation study was to build upon this work by assessing the questions posed above within a strong theoretical framework and using sound quantitative and quasi-experimental methodology.

Minority stress models describe how distal events such as sexual minority bias crimes may influence individual outcomes by gaining meaning in proximal processes such as perception and appraisal (Meyer, 2003). Minority stress further defines the threat of violence against minority individuals as a source of chronic and inescapable social stress, the effects of which are moderated by individual factors such as identity (Cochran, 2001). The sexual harassment and racial discrimination literature suggests that minority individuals are exposed to daily and life

stressors as a function of discrimination that may reach the level of traumatic threat (Avina & O'Donahue, 2002; Bryant-Davis, 2007; Stockton et al., 2009; McDermut et al., 2000; Pieterse et al., 2010; Wolfe et al., 2009; Woods et al., 2009), and that stress responses can occur through indirect exposure such as working or living in an environment in which sexual harassment and/or discrimination occur (DeSantis et al, 2007; Lim & Cortina, 2005; Miner-Rubino & Cortina, 2004; Miner-Rubino & Cortina, 2007; Raver & Gelfand, 2005).

Models of collective identity are based in social identity and self-categorization theories, which support the hypothesis that threat to the community, interpreted as threat to self, may affect immediate responses that would be marked by changes in physiological activity (Smith & Silva, 2011; Tajfel, 1978; Turner, 1986). Individual aspects of identity may function to alternately buffer or potentiate these reactions, and may have proximal (immediate physical response) and distal (later development of pathology) effects via mechanisms of perception and appraisal (Sellers, 1998). To the extent that individuals perceive identity as central and believe public regard is low, they are theoretically more likely to both perceive a threat to a group member on the basis of identity as a threat to the self and to appraise the likelihood of this threat as high. The nature of bias crimes (as suggested by the subjects of the Noelle [2002] study) is unpredictable and uncontrollable, which may exacerbate the stress response (Averill, 1973; Foa et al., 1992). This is likely to activate autonomic defense cascade responses in preparation for coping with perceived threat, which increases fear learning and fear acquisition via a variety of nervous system and hormonal mechanisms (Hamm & Weike, 2005; Pole, 2007).

The study assesses proximal physiological, emotional, and cognitive responses during and immediately following exposure to bias crime information, using a quasi-experimental, mixed-factorial design with ecologically-valid stimuli. This study recruited heterosexual and

LGB individuals - identified using a continuous scale of same-sex attraction, fantasy, and behavior - from a young-adult population of college students. Participants completed pre-task questionnaires online assessing sexual orientation and assumptive worldview, then completed an in-lab quasi-experimental task in which they listened to randomized bias-crime, non-bias crime, and neutral stimuli in the form of auditory news reports while skin conductance level and startle reflex potentiation were simultaneously and continuously recorded. Following the task, provided reports of their cognitive and emotional responses to the clips, collective identity, post-task measures of traumatogenic cognition, and supplemental variables of interest (e.g., past personal bias victimization).

Specific Hypotheses

The following hypotheses are guided by three primary research questions:

1. Do LGB-identified individuals respond to exposure to bias crimes differently from heterosexual-identified individuals?
    a. LGB individuals show a greater magnitude of ANS activation and greater startle response to bias-crime exposure than heterosexual individuals.
    b. LGB individuals will report (subjectively) more negative affective responses and greater arousal during exposure to bias-crime clips than will heterosexual individuals.
    c. LGB individuals will report more negative cognitions about the safety, predictability, benevolence, and controllability of the world and of others following exposure to news information about bias crimes following exposure to bias crimes than will heterosexual individuals.

2. Do LGB-identified individuals respond to exposure to bias crimes as a source of potential threat to the self?
    a. LGB individuals will show a greater magnitude of ANS activation and greater startle response to bias-crime clips than to general threat or neutral clips.
    b. LGB individuals report more negative affective responses and greater arousal during exposure to bias-crime clips than during neutral or general threat clips.
    c. LGB individuals report more negative cognitions about the safety, predictability, benevolence, and controllability of the world and of others following exposure to news information about bias crimes than they reported prior to exposure.
3. Are responses to bias crimes related to domains of collective identity for LGB individuals and heterosexual individuals?
    a. Greater reported identity centrality predicts greater ANS activation and startle responses in LGB individuals during exposure to bias crimes.
    b. Lower reported public regard predicts greater ANS activation and startle responses in LGB individuals during exposure to bias crimes.
    c. The interaction of high identity centrality and low public regard predicts greater ANS activation and startle magnitude in LGB individuals during exposure to bias crimes.
    d. Sexual orientation identity does not predict ANS activation or startle magnitude for heterosexual individuals upon exposure to bias crimes.

CHAPTER SEVEN

Methods

Design

The study employed a mixed model repeated measures design. Two groups of participants (LGB and heterosexual) completed pre-task questionnaires and then completed a lab task between one and two weeks later. In the lab task, participants listened to audio only news clips belonging to three conditions (neutral, general threat, and bias threat) while physiological responses were continuously recorded. In the *neutral* (*non-threat)* condition, news content consisted of non-threatening information such as reports of a manufacturing fair or a local art festival. In the *general threat* condition, news content consisted of information regarding a violent crime (an assault, murder, or arson) that was not identified by the newscaster as a bias-motivated crime. In the *bias threat* condition, news content consisted of information regarding a violent crime (an assault, murder, or arson) that was identified by the newscaster as potentially bias-motivated. All participants listened to all clips and completed questionnaire measures following completion of the listening task.

Participants

Participants were recruited in the fall of 2012 and spring, summer, and fall of 2013 using the Internet-based Human Participation in Research (HPR) system at a large, Midwestern university. Individuals enrolled in the HPR system were primarily students enrolled in lower-level courses in the Psychology Department and received course credit for their participation. Participants were also entered into a raffle in which an iPod Shuffle (cash value: $49.99) was granted to a randomly selected participant each semester using a randomized computer algorithm. The following inclusion and exclusion criteria were used to identify participants: all

participants were at least 18 years of age, had no significant impairments in hearing or vision, and were reasonably fluent in reading and writing English. Participants meeting these criteria were eligible to complete a global screening questionnaire via the HPR system, which was used to determine enrollment for the lab study. A total of 2,352 students (31.2% male, 68.6% female, <1% other) completed the global screening questionnaire.

The global screening questionnaire assessed sexual orientation on the basis of three items. The first asked individuals to choose a sexual orientation label from a set of presented categories (gay, lesbian, bisexual, heterosexual, queer, asexual, or other). The second item asked individuals to describe the pattern of gender of their past sexual partners ("All men," "Mostly men, some women," "Equal parts men and women," "Mostly women, some men," or "All women"). The third item asked individuals to describe their sexual orientation on a modified Kinsey scale, which asked individuals to rate their sexual orientation on a scale of 0 ("Exclusively heterosexual") to 6 ("Exclusively homosexual") on the basis of their total lifetime experiences of sexual attraction, fantasy, and behavior. The scale was modified to add an additional item, "Nonsexual/Asexual", to allow individuals to identify as asexual. Individuals who rated their sexual orientation at or above a 2 on the modified Kinsey scale ("More than incidentally homosexual") were classified as LGB. Individuals who rated their sexual orientation as a 0 ("Exclusively heterosexual") or 1 ("Only incidentally homosexual") were classified as heterosexual. Any individual identifying as LGB on the global screener, and a randomly-selected subset of individuals identifying as heterosexual, was made eligible for participation in the full study. Of the 2,352 individuals who completed the global screener, 8.3% (n = 204) were classified as LGB, 91.1% (n = 2,133) were classified as heterosexual, and 0.6% (n = 15) described themselves as "Nonsexual/Asexual."

A total of 65 participants (33 heterosexual, 32 LGB; 61.5% female) attended the laboratory session. Of those who attended, 4 (6.2%) experienced technical difficulties that led to loss of more than 10% of data collected and so were excluded from the final sample. One participant failed a validity check of attention to auditory clips and was also excluded from the sample. An additional 5 participants (7.7%) experienced technical difficulties that resulted in < 10% questionnaire data loss, specifically the loss of a final demographic questionnaire which provided information on family income, ethnicity, region of upbringing, and other sample characteristics. In addition, 3 participants experienced technical errors that led to the recording of startle reflex EMG data that was not analyzable, and corruption of a data file led to the loss of SAM ratings for one participant. As participants with < 10% data loss retained the majority of data on other variables of interest, they were retained within the final sample. The final sample consisted of 60 participants (32 heterosexual, 28 LGB) primarily raised in the Midwest area of the United States and from a diverse range of ethnic, racial, and socioeconomic backgrounds. A complete summary of available sample demographic characteristics can be found in Table 1. A summary of sample sexual orientation characteristics can be found in Table 2.

Table 1.

Sample Demographic Characteristics, Full Sample and in Comparison by Kinsey Group

	Full Sample	Heterosexual	LGB		
	N = 60	*N* = 32	*N* = 28		
	N(%)	*N*(%)	*N*(%)	χ^2 or *t (p)*	*d*/ϕ/V
Age, M(SD)	20.03 (1.87)	20.06 (1.80)	20.00 (1.93)	0.13 (.90)	.03
Sex					
Male	22 (36.7%)	14 (43.8%)	8 (28.6%)		
Female	38 (63.3%)	18 (56.3%)	20 (71.4%)	10.38 (.24)	.42

Table 1 (cont'd)

Race					
Asian/AAPI	9 (16.0%)	8 (25.0%)	1 (3.6%)		
Black/Af. Am.	6 (10.0%)	3 (9.4%)	3 (10.7%)		
Latino/Chicano	4 (6.7%)	0 (0.0%)	4 (14.3%)		
White/Caucasian	33 (55.0%)	16 (50.0%)	17 (60.7%)		
Biracial/Multiracial	3 (5.0%)	2 (6.3%)	1 (3.6%)	9.67 (.05)	.42
Ethnicity					
Hispanic	6 (10.0%)	1 (3.1%)	5 (17.9%)		
Not Hispanic	49 (81.7%)	28 (87.5%)	21 (75.0%)	3.51 (.06)	.25
Area of Upbringing					
Rural	5 (8.3%)	2 (6.3%)	3 (10.7%)		
Small town	12 (20.0%)	6 (18.8%)	6 (21.4%)		
Suburban	21 (33.3%)	10 (34.5%)	10 (38.5%)		
Small city	7 (11.7%)	3 (10.3%)	4 (14.3%)		
City	10 (16.7%)	7 (24.1%)	3 (10.7%)		
Other	1 (1.7%)	1 (3.4%)	0 (0.0%)	2.79 (.73)	.23
Region of Upbringing					
New England	2 (3.3%)	2 (6.3%)	0 (0.0%)		
Mid-Atlantic	2 (3.3%)	1 (3.1%)	1 (3.6%)		
Midwest	44 (73.3%)	22 (68.8%)	22 (78.5%)		
Pacific West	1 (1.7%)	0 (0.0%)	1 (3.6%)		
Outside the U.S.	6 (10.0%)	4 (12.5%)	2 (7.1%)	5.62 (.35)	.32
Family Income					
Less than 20k	3 (5.0%)	2 (6.3%)	1 (3.6%)		
20k-39.9k	6 (10.0%)	1 (3.1%)	5 (17.9%)		
40k-59.9k	7 (11.7%)	4 (12.5%)	3 (10.7%)		
60k-79.9k	13 (21.7%)	7 (21.9%)	6 (21.4%)		
80k-99.9k	9 (15.0%)	5 (15.6%)	4 (14.3%)		
100k-119.9k	6 (10.0%)	3 (9.4%)	3 (10.7%)		
More than 120k	11 (18.3%)	7 (21.9%)	4 (14.3%)	3.99 (.68)	.27

Table 1 (cont'd)

Education					
Diploma or GED	52 (86.7%)	28 (87.5%)	24 (85.7%)		
Associate's	1 (1.7%)	0 (0.0%)	1 (3.6%)		
Bachelor's	2 (3.3%)	1 (3.1%)	1 (3.6%)	1.15 (.56)	.14
Religious Identity					
Protestant	5 (8.3%)	4 (12.5%)	1 (3.6%)		
Roman Catholic	17 (28.3%)	9 (28.1%)	8 (28.6%)		
Evangelical	2 (3.3%)	2 (6.3%)	0 (0.0%)		
Jewish	1 (1.7%)	0 (0.0%)	1 (3.6%)		
Muslim	1 (1.7%)	1 (3.4%)	0 (0.0%)		
Atheist/Agnostic	16 (26.7%)	5 (15.6%)	11 (39.3%)		
Other	13 (21.7%)	8 (25.0%)	5 (17.9%)	8.66 (.19)	.40
Religiosity, M(SD)	3.51 (2.08)	4.03 (2.06)	2.92 (1.98)	2.04 (.05)	.56

Note: Percentages do not add to 100 for some variables due to missing data ($N = 5$).

Table 2.

Sample Sexual Orientation Characteristics, Full Sample and by Kinsey Group (n = 60)

		Full Sample ($n = 60$)	Heterosexual ($n = 32$)	LGB ($n = 28$)
		N(%)	*N*(%)	*N*(%)
Kinsey Scale				
	0	29 (48.3%)	29 (90.6%)	0 (0.0%)
	1	3 (5.0%)	3 (9.4%)	0 (0.0%)
	2	14 (23.3%)	0 (0.0%)	14 (50.0%)
	3	4 (6.7%)	0 (0.0%)	4 (14.3%)
	4	3 (5.0%)	0 (0.0%)	3 (10.7%)
	5	4 (6.7%)	0 (0.0%)	4 (14.3%)
	6	3 (5.0%)	0 (0.0%)	3 (10.7%)
Self-Identification				
	Lesbian	2 (3.3%)	0 (0.0%)	2 (7.1%)

Table 2 (cont'd)

Gay	6 (10.0%)	0 (0.0%)	6 (21.4%)
Bisexual	8 (13.3%)	1 (3.1%)	7 (25.0%)
Heterosexual	41 (68.3%)	31 (96.9%)	10 (35.7%)
Other	3 (5.0%)	0 (0.0%)	3 (10.7%)
Sexual Behavior			
All men	18 (30.0%)	15 (46.9%)	3 (10.7%)
Mostly men, some women	18 (30.0%)	2 (6.3%)	16 (57.1%)
Equal numbers men and women	2 (3.3%)	0 (0.0%)	2 (7.1%)
Mostly women, some men	3 (5.0%)	0 (0.0%)	3 (10.7%)
All women	14 (23.4%)	14 (43.8%)	0 (0.0%)
No partners	5 (8.3%)	1 (3.1%)	4 (14.3%)

Materials

Auditory stimuli.

Auditory stimuli were 11 news clips gathered from the Internet and consisting of news reports presented by local news stations in a variety of municipalities across the United States and Canada. All news clips were presented in English and between 1m27s and 1m33s in length. All clips in all conditions followed the following format: first, a presenter announced the topic (e.g., "A crime was reported in the X district last night, and police are investigating whether or not the event was a hate crime."). Then, a reporter on scene conducted interviews with relevant individuals (e.g., an identified victim, a witness, an attendee at a reported event). Finally, the presenter summarized the news story and provided any additional information (e.g., "Police are on the lookout for an individual believed to be wearing…"). All clips were publicly available via local news websites and video indexing sites such as YouTube. During presentation of each clip participants viewed a black screen, so only auditory information was provided.

News clips were identified for inclusion in the study via the following process: first, a search was conducted to identify local news reports using two popular Internet index search engines (Google and Bing) and a popular video indexing website (YouTube) using keywords such as "bias crime," "hate crime," and "LGBT crime." Approximately 30 potential clips were initially identified based on meeting the topic (possible LGBT-related event) and length criteria (approximately 1m30s ± 5s). Clips were then analyzed for presentation and content. Clips were removed from the list if they a) did not follow the presentation format described above; b) did not state explicitly that the event was potentially a bias-motivated crime; c) did not provide a description of the event itself; d) contained excessive (defined as >5s duration) music; e) contained music that was not presented in the initial 10s of the clip (as a "lead-in" to the news report); f) explicitly stated perpetrator or victim race; or g) presented any difficulties re: intelligibility (e.g., in one clip subtitles were used due to speaking impairments as a result of an injury; this clip was excluded on this basis). Using these criteria, the list was narrowed to 7 potential clips. The final three clips were then selected to provide a range of events (assault, murder, and arson), victim characteristics (male, female couple, LGBT-owned business), and presenter and reporter gender (multiple presenters, at least one male and one female in each).

The selection of general threat clips was then conducted with the aim of matching the salient event characteristics of the bias crime clips while also satisfying the same inclusion criteria. An identical search process was conducted, using event type ("assault," "murder," or "arson") as the primary search terms. Clips were identified on the basis of matching characteristics and length. Clips were rejected for inclusion if they a) did not follow the presentation format given above; b) stated a potential bias motivation for the event (i.e., the events described must be presented as *not* occurring due to any bias based on victim

characteristics); c) did not provide a description of the event itself; d) contained excessive (defined as >5s duration) music; e) contained music that was not presented in the initial 10s of the clip (as a "lead-in" to the news report); f) explicitly stated perpetrator or victim race; or g) presented any difficulties re: intelligibility. The final three clips were selected to provide a matched range of events (assault, murder, and arson), victim characteristics (male, male/female couple, non-LGBT business), and presenter/reporter gender.

Finally, neutral clips were selected in similar fashion, with the aim of providing neutral (non-emotive) information to compare the two threat conditions against a non-threatening condition. Potential clips were identified based on length (1m30s ± 5s) and were rejected for inclusion if they a) did not follow the presentation format given above; b) described any potentially threatening or emotionally-evocative event (e.g., a crime, a high-intensity event such as skydiving or rollercoasters, a bereavement or memorial); c) contained excessive (defined as >5s duration) music; e) contained music that was not presented in the initial 10s of the clip (as a "lead-in" to the news report); f) described any specific characteristics of involved individuals (e.g., race, gender); g) presented any difficulties re: intelligibility. Five clips were selected for inclusion as neutral stimuli and consisted of a range of neutral events (a manufacturing job fair, changes in fall leaf colors, a local art festival, school board changes to class schedules, and a drought's effects on corn crops) and presenter/reporter gender.

Stimuli in all conditions were modified to remove visual content and normalize audio content volume using widely-distributed freeware programs, AviSynth ver. 2.5 and Avidemux ver. 2.6. All visual content was replaced by a blank (black) screen. Clips were further run through volume analysis algorithms within these programs in order to assess the decibel range of presented information, and volume was normalized such that all auditory data was presented

within the 55dB-65dB range when played using volume settings that were standardized across all participants. A decibel meter was used to determine matching volume settings on the local task computer such that clip volume was consistently within this range.

Auditory stimuli were presented in one of six potential orderings, determined based on the generation of approximately 50 random orderings of the 11 clips using a computerized random list generator. Six orderings were selected from this larger list based on meeting the constraint that no bias threat clip should be presented immediately following a general threat clip, and vice-versa (in order to further protect against any potential carry-over effects of physiological arousal).

Psychophysiological data recording.

Continuous psychophysiological data were recorded using the Biosemi Active2 system (Biosemi, The Netherlands). EMG recordings were taken from two Ag-AgCl electrodes positioned approximately 25mm apart on the orbicularis oculi muscle below the left eye. Skin conductance activity was recorded from two Ag-AgCl electrodes affixed to the distal phalanges of the index and middle fingers of the left hand. Skin conductance level (SCL) sensors applied a 1V, 50Hz alternating voltage and measuring the returning current. During data acquisition, the Common Mode Sense (CMS) active electrode and Driven Right Leg (DRL) passive electrode formed a ground loop, consistent with Biosemi's design specifications. The function of the CMS-DRL loop, in addition to serving as a reference, is to constrain the common mode voltage (i.e. the average voltage of the participant), limiting the amount of current that can possibly return to the participant. SCL signals were converted to an analog voltage of .2V/μS. All signals were digitized at 24-bit resolution and a sampling rate of 1024 Hz.

Questionnaire Measures

Demographics. A demographic questionnaire was administered post-lab task to assess age, sex, gender identification, city/suburban/rural upbringing, region of upbringing, education, socioeconomic status, religious identification, religiosity and ethnicity. Appendix A contains copies of all measures.

Sexual orientation. Sexual orientation information was collected in the Global Screening Questionnaire using a multi-method approach. One item asked participants to self-select a sexual orientation from a list of categories, including "lesbian," "gay," "bisexual," "heterosexual," "queer," "asexual," and "other." Participants selecting "other" were provided a free-response box to describe their preferred sexual identity descriptor. A second item asked participants to report on their sexual behavior history (kissing, fondling, intercourse) with regard to the gender of their partners on a five point scale including "All men," "Mostly men, some women," "Equal numbers of men and women," "Mostly women, some men," "All women," and "I have not had any sexual experiences." Finally, a third item asked participants to report on their sexual orientation and history of attraction, fantasy, and behavior using a version of the Kinsey scale. Participants were asked, "Considering your history of attraction, fantasy, and behavior across your entire life, how would you describe your sexual orientation?" Participants chose a response on a 7 point Likert-type scale, from 0 (Exclusively heterosexual) to 6 (Exclusively homosexual). An additional response option not included in the original Kinsey scale, 7 (Non-sexual/Asexual) was also provided to allow participants to identify as asexual. For the purposes of the present study, the Kinsey scale variable was used to determine group categorization, with individuals reporting values of 2 (Mostly heterosexual, but more than incidentally homosexual) and above classified as LGB.

Sexual orientation collective identity. A modified version of the Multidimensional Inventory of Black Identity (MIBI) was administered post-lab task to assess dimensions of sexual orientation collective identity. The MIBI has been modified for use in a wide range of minority populations and has demonstrated good psychometric properties across populations (for a full review, see Chapter Four, above). The modified version of the MIBI used in this study consisted of 20 statements assessing collective identity centrality, public regard, and private regard. An example statement is, "I have a strong sense of belonging to other people who share my sexual orientation." Participants indicated their agreement with each statement using a 7 point Likert-type scale ranging from 1 (Strongly Disagree) to 7 (Strongly Agree). Scale scores were produced for identity centrality, public regard, and private regard by averaging the items within each scale and ranged from 1 to 5. In the present study, reliability of the identity centrality subscale (Cronbach's α) was good for the full sample (α = 0.71), acceptable for the heterosexual subsample (α = 0.63), and good for the LGB subsample (α = 0.79). The reliability of the public regard subscale was excellent for the full sample (α = 0.91), good for the heterosexual subsample (α = 0.79), and good for the LGB subsample (α = 0.89). The reliability of the private regard subscale was acceptable for the full sample (α = 0.67), good for the heterosexual subsample (α = .70), and acceptable for the LGB subsample (α = 0.65).

Subjective ratings of affect during task presentation. Following presentation of each trial in the lab task (stimulus plus intertrial interval), participants completed three computer items rating the magnitude of arousal (high vs. low), valence of affect (positive/pleasant vs. negative/unpleasant), and subjective perceptions of controllability/dominance (in control/dominant vs. not in control/non-dominant) and warmth (interpersonal closeness) using a modified version of the Self-Assessment Manikin (SAM) system developed by Peter Lang

(1980; Lang, Bradley, & Cuthbert, 1997). The standard SAM system uses sets of 9 graphic figures arranged along a 9-point scale representing a continuum of arousal, valence, and dominance from low to high. An additional scale using the same 9-point scale of reference but without graphic representations was added to assess interpersonal warmth (the warm/cold scale), and was presented immediately following presentation of the three SAM figures. Figure 7 in Appendix B provides examples of these items. Participants were instructed to select the number in each scale that best represented their responses while listening to the auditory clips. The SAM system has been widely used as a quick and reliable method of obtaining subjective ratings of affective responses during exposure to images, sounds, film clips, and painful stimuli (Bradley & Lang, 1994). Internal (split-half) reliability coefficients for the arousal and valence scales have been as high as .93 and .94, respectively, in previous studies (Lang et al., 1997). Psychophysiological studies have demonstrated correlations between SAM valence ratings and startle magnitude of r = -.53 (Bradley & Lang, 2000), and the correlation between SAM arousal ratings and electrodermal activity has also been shown to be high (r = .81; Lang, 1995).

Subjective ratings of arousal, valence, dominance, and warmth were computed for each category of stimuli by averaging SAM responses across all clips within each category (e.g., average of all ratings of arousal for bias crime clips). In the present sample, reliabilities of arousal ratings were good for the full sample ($\alpha = 0.84$), heterosexual subsample ($\alpha = 0.87$), and LGB subsample ($\alpha = 0.77$). Reliabilities of valence ratings were also good for the full sample ($\alpha = 0.80$), heterosexual subsample ($\alpha = 0.81$), and LGB subsample ($\alpha = 0.75$). Reliabilities of dominance ratings were good for the full sample ($\alpha = 0.88$), excellent for the heterosexual subsample ($\alpha = 0.91$), and good for the LGB subsample ($\alpha = 0.74$). Reliabilities of warmth

ratings were good for the full sample (α = .71), acceptable for the heterosexual subsample (α = 0.67), and good for the LGB subsample (α = 0.73).

Assumptive worldview. The World Assumptions Questionnaire (WAQ; Janoff-Bulman, 1989; Kaler, 2009) was administered pre- and post-lab task to assess pre- and post-task beliefs about the world. The WAQ is an alternative measure of assumptive worldview from the World Assumptions Scale (WAS; Janoff-Bulman, 1992) based on a psychometric analysis of the limitations of the WAS (Kaler, 2009). The WAQ consists of 22 statements rated on a 6-point Likert-type scale ranging from 1 (Strongly Disagree) to 6 (Strongly Agree). Factor analysis in the Kaler (2009) study indicated four subscales: Controllability of Events, Comprehensibility and Predictability of People, Truthworthiness and Goodness of People, and Safety and Vulnerability. The WAQ subscales showed improved internal reliability (α = .74 to .82) over WAS subscales. The WAQ is also moderately related to similar trauma measures such as the Posttraumatic Cognitions Inventory (PTCI; Foa et al., 1999) Negative Cognitions subscale (*r* = .46) and measures of general distress (but not related to measures of social desirability).

In the present study, subscale scores were computed by averaging items within each subscale to produce four scale scores according to the factors identified by Kaler (2009). Scales were scored such that higher scores reflected more positive world beliefs (e.g., greater belief in the controllability of the world). Scale scores were computed separately for pre-task and post-task responses, for a total of 8 scales. In the current study, reliabilities (Cronbach's alpha) of the pre- and post-task subscales ranged from unacceptable (post-task Safety, heterosexual sample α = .32) to good (pre-task Controllability and Predictability of People, LGB sample α = .84). Unacceptable reliability estimates were observed within the heterosexual sample on two pre-task scales (Controllability α = .57; Safety α = .49) and one post-task scale (Safety α = .32). Given

this, closer examination of this scale's psychometric properties was conducted to assess whether the factor structure reported by Kaler was replicated within the present sample, and is summarized under Results, Preliminary Analyses, below.

Negative cognitions about the world. The Negative Cognitions about the World subscale of the PTCI was administered pre- and post-task to provide an additional measure of changes in cognitions related to exposure to information about bias-motivated crimes. The Negative Beliefs about the World subscale consists of 7 statements rated on a Likert-type scale ranging from 1 (Totally Disagree) to 7 (Totally Agree), such as, "People can't be trusted." Two overall scale scores were computed by averaging responses across the 7 items at pre-task and post-task. The reliability of the pre-task scale was good for the full sample ($\alpha = 0.73$), acceptable for the heterosexual subsample ($\alpha = 0.68$), and good for the LGB subsample ($\alpha = 0.75$). The reliability of the post-task scale was good for the full sample ($\alpha = 0.80$), the heterosexual subsample ($\alpha = 0.79$), and the LGB subsample ($\alpha = 0.80$).

Past experiences of bias victimization. Past experiences of bias victimization were assessed post-lab task using a slightly-modified version of a brief, 7-item inventory developed by D'Augelli and colleagues (1992; with author permission) that has been used in studies with both LGB youth (D'Augelli, Pilkington, & Hershberger, 2002) and LGB adults (Herek et al., 1997). Seven types of victimization were assessed, including verbal victimization (verbal insults, threats of violence, and threats to disclose the individual's orientation) and physical victimization (objects being thrown, physical assault, threat of assault with a weapon, and sexual assault). Participants were asked to estimate the numbers of times they had experienced such events in their lifetime. A sample item is, "How many times have you been threatened with physical violence because you were, or were thought to be, lesbian, gay, or bisexual?" Mean frequency

scores may be computed for verbal victimization experiences, physical victimization experiences, and total victimization experiences. An additional item ("How many times has this happened within the past month?") was added to the original questionnaire to assess past-month frequency of victimization. Total estimated past victimization events ranged from 0 to 101. As a continuous sum score representing number of reported events was found to be highly skewed (skewness = 3.04, SE = .32) due to a small subsample of participants reporting very high rates of victimization, a binary variable was created to represent the presence ("1") or absence ("0") of reported past victimization for the present analyses.

Tendency toward negative affect/neuroticism. The neuroticism scale of the International Personality Item Pool (IPIP-NEO; Goldberg, 1999; Goldberg, 2006) was administered post-lab task to assess participant tendency toward negative affect/neuroticism. The IPIP Neuroticism scale consists of 20 statements (5 reverse-scored) such as, "I get stressed out easily." Participants rated the extent to which each statement described them on a 5-point Likert type scale ranging from 1 (Very Inaccurate) to 5 (Very Accurate). The IPIP Neuroticism scale has demonstrated both high internal reliability (α = .91) and strong convergent validity (r = .86) with the Revised NEO Personality Inventory (NEO-PI-R) Neuroticism scale. A single scale score for neuroticism was computed by averaging all 20 items after reverse-scoring 10 items. In the present sample, the internal reliability (Cronbach's α) of the IPIP Neuroticism scale was good for the full sample (α = 0.89), the heterosexual subsample (α = 0.89), and the LGB subsample (α = 0.89).

Life Events Checklist. The Life Events Checklist (LEC) was administered post-lab task to participants to assess for exposure to other potentially traumatic prior life events. The LEC was developed at the National Center for PTSD as a method of assessing for potentially

traumatic life events, and consists of 17 items assessing a range of events (example: "Natural disaster (for example, flood, hurricane, tornado, earthquake"). Participants indicate whether each event happened to them, was witnessed by them, occurred to someone close to them, did not apply to them, or if they were unsure/did not know whether the event applied to them. The LEC has been shown to be correlated with both general psychological distress and PTSD symptoms in clinical samples (Gray, Litz, Hsu, & Lombardo, 2004). In the present study, events were coded dichotomously for participant exposure such that events directly experienced, witnessed, or learned about after occurring to someone close were coded as "1" and events coded as "not sure" or "doesn't apply" were coded as "0". Events were then summed to produce an overall life events score (range: 0 – 17).

Other post-traumatic cognitions (full scale). The full Post-Traumatic Cognitions Inventory (PTCI; Foa et al., 1999) was administered post-lab task to assess for the presence of post-traumatic cognitions related to any prior stressful life experience. Participants were instructed to complete the scale in reference to any stressful life experience endorsed on the LEC that continued to bother them at the time of the lab assessment. The PTCI consists of 33 statements rated on a Likert-type scale ranging from 1 (Totally Disagree) to 7 (Totally Agree), such as, "My reactions since the event mean that I am going crazy." Principal-components analyses of the PTCI have yielded three primary factors: Negative Cognitions about the Self, Negative Cognitions about the World, and Self Blame. In initial studies of PTCI reliability and validity, internal consistencies for the three scales ranged from 0.88 to 0.97. The PTCI has also demonstrated adequate convergent, discriminant, and predictive validity in follow-up studies (Beck et al., 2004). Participants were instructed to complete this inventory in reference to any event that occurred in the past and continues to bother them. Scale scores were computed for the

three subscales by averaging items within each scale. In the present sample, the internal reliability of the Negative Cognitions about the Self subscale was excellent in the full sample (α = 0.94), good in the heterosexual subsample (α = 0.89), and excellent in the LGB subsample (α = 0.96). The internal reliability of the Negative Cognitions about the World subscale was good in the full sample (α = 0.86), heterosexual subsample (α = 0.81), and LGB subsample (α = 0.89). The internal reliability of the Self Blame subscale was good in the full sample (α = 0.78), heterosexual subsample (α = 0.73), and LGB subsample (0.82).

Attention to task. A series of questions regarding the factual content of the auditory news clips was created in order to provide a rough measure of participant attention to task. Two items were created for each clip, for a total of 22 accuracy items. An example item for a general threat clip ("Couple Shot") is, "Where did this event occur?" with possible responses of "a park," "a street," "a home" (correct response), or "a store." Response frequencies were examined to determine the level of item difficulty across the sample. Six items were answered incorrectly by more than 25% of the sample and so were judged to be poorly discriminating. The remaining 16 items were coded dichotomously for accuracy of response (1 = correct, 0 = incorrect) and summed to produce an overall accuracy score. Scores of 12 or above were judged to represent acceptable attention to clip content. Only one participant among those who completed the lab task with less than 10% data loss due to technical error failed this validity check (Score = 7) and was not included in the final sample.

Procedures

Identification and enrollment of participants.

Participants meeting basic inclusion criteria were eligible to complete a global screening questionnaire through the MSU Human Participation in Research (HPR) system consisting of

three items assessing sexual orientation, a pre-task World Assumptions Questionnaire, and the Negative Beliefs about the World subscale of the PTCI. Prior to completing this questionnaire, participants were provided with information about the purpose of the questionnaire, possible risks and benefits, and the possibility that they may be invited to complete a lab task following completion of the screening questionnaire. Participants indicated their consent by clicking a button labeled "I Consent" and were then presented with screening items. Participants who identified as LGB on the basis of the modified Kinsey scale (2 and above = LGB), and a randomly selected subsample of participants who identified as heterosexual (0, 1), were invited to participate in an in-lab task. Individuals who elected to enroll in the study were invited to complete the in-lab task no less than one week but no more than two weeks following completion of the global screening questionnaire and identification of eligibility. To ensure that participation in the task was completed within this time frame, the global screening questionnaire was made available to individuals enrolled in the HPR system at varying time and dates within each week until a maximum of 100 individuals completed the questionnaire, at which point access to the global questionnaire was closed. At this time, eligible participants were identified based on their responses on the modified Kinsey scale and invited to enroll in the study within the specified time frame. This identification and enrollment procedure was completed on a weekly basis. Participant confidentiality and participation tracking was maintained through the use of identification numbers assigned by the HPR system such that researchers were not exposed to identifying information such as names or email addresses.

Lab task procedures.

All procedures were approved by the Institutional Review Board (IRB) of Michigan State University prior to beginning the study. Eligible participants were invited to attend a 75-minute

lab-based session conducted at the Michigan State University Department of Psychology. All sessions were conducted by a team of trained graduate and undergraduate research assistants who were blind to the sexual orientation status of participants. Upon arrival at the laboratory, participants were asked to read a written consent form detailing their rights as research participants, the risks and benefits of participation in the study, and a basic outline of what participation in the study entailed.

Given that the potential risks of inadvertent disclosure of sexual orientation status were judged by the researcher and IRB members to outweigh the need to maintain a written record of consent, and the study design did not necessitate retention of identifying information, a waiver of written consent was obtained. Participants were informed verbally and in writing that the study was being conducted anonymously and so no identifying information would be collected. Participants were afforded the opportunity to ask questions about their rights as a research participant at this time and researchers fully answered any questions regarding the consent procedure to ensure that participants understand their rights. Participants were informed that they may choose not to answer any of the questions or withdraw from the study at any time, and that their decision to do so would not affect their relationship with MSU. In lieu of written consent, verbal consent was obtained by explaining the consent procedure and asking participants to state their consent to participate explicitly (e.g., "I consent to participating in this study"). Participants who elected not to participate in the study at the time of consent were thanked for reviewing the consent information but did not receive HPR credit for their attendance. Participants who consented to participate in the study and began the task were awarded HPR credit for their participation regardless of their decision to not answer questions or terminate their participation early.

Participants were seated approximately 60cm from a 19-inch computer monitor (for more detailed information, see *Materials*, above). Researchers provided a verbal overview of study procedures and introduced study materials to the participants in order to familiarize them with the task and mitigate potential anxiety over study procedures (e.g., physiological recording). Researchers explained the function and safety of the equipment and answered any additional participant questions at this time. After answering any additional questions, electrodes were attached to the middle and index fingers of the left hand, below the left eye, and on the forehead, using double-sided adhesive, medical tape, and a small amount of conductive gel. Once electrodes were attached, researchers examined physiological recording data to ensure that equipment was functioning within normal parameters and made adjustments if needed. Researchers retained a written record of any abnormalities in task administration, physiological recording, and/or participant behavior to protect study validity.

Once researchers verified that all equipment was functioning within normal parameters, they introduced the computer task. Researchers described the structure of the task and played an example of an acoustic startle probe. Participants were asked to listen carefully to the information provided in each auditory clip and to do their best to imagine the events described in as much detail as possible. Researchers also explained the SAM subjective emotion response system and showed example scales. After explaining the task, researchers answered any questions. Once participants indicated that they understood the task, participants put on headphones and researchers left the room. Participants were instructed to press any button on the computer keyboard once the researcher had left to begin the task.

The computer task was entirely automated and was similar to that developed by Quevado and colleagues (2009), which has been shown to reliably elicit affectively-modulated startle

responses across a wide range of age groups. Modifications to the paradigm consisted of the use of auditory stimuli in place of visual stimuli to reduce potential confounding effects of imagery, the constraint that no bias threat and general threat clip should be played immediately following one another, and the increase of the interval between startle probes from 5 to 10 seconds in order to allow concomitant skin conductance measures to return to baseline between clips.

Participants completed 11 trials (3 bias threat, 3 general threat, and 5 neutral), which were presented in one of six randomized orderings created via a publically-available computerized random list generator (www.random.org/lists/). Which ordering was presented was pre-determined by participant number via random list generator to ensure that no group had any greater or lesser chance of being presented with any particular ordering. For each trial, participants were first instructed to listen to the auditory clip and effortfully imagine the described events while listening. To ensure attention to task, participants were informed that they would be asked questions regarding the content of the clip following clip presentation.

For each trial, the following procedures were followed. During presentation of the stimuli, three binaurally-presented acoustic startle probes consisting of white noise played at 95dB were randomly presented to elicit a startle reflex response with the constraint that no two startle probes were presented within a single 10 second interval (to enable psychophysiological measures to return to baseline between probes). Following presentation of the auditory stimulus, an intertrial interval (ITI) of 10 seconds was presented during which no auditory stimulus was given and a single acoustic startle probe of 95dB was presented at a random point within the interval. Following the ITI, participants were be presented with four questions about their subjective emotional response to the clip (for detailed information, see *Measures*, below). Participants were also be presented with two questions related to the semantic content of the clip

(e.g., if the incident occurred in a stated location such as a park, participants were asked to select the location from a list of possible locations) to ensure continued attention to task. Upon completion of these questions, participants proceeded to the next trial until all eleven trials were completed.

Following completion of the trials, participants were disconnected from the psychophysiological equipment and completed post-task questionnaires on their demographics, victimization history, collective identification with LGB or heterosexual individuals as a group, world assumptions, tendency toward negative affect/neuroticism, and post-traumatic cognitions related to any significant stressful life event. All questionnaires were presented on the computer and participants used the number pad to enter their responses. Once participants had completed the questionnaires, they were informed that they had completed the study and were invited to ask any additional questions about the study aims, their participation, or any other related matter. Researchers ensured that participants were provided with a copy of the consent form, including contact information for the researchers and IRB, prior to leaving the laboratory.

CHAPTER EIGHT

Results

Preliminary Data Analyses

Missing values.

A total of 2,318 data points were included in analyses of the present study, across 32 primary and 6 supplemental variables comprised of a combination of physiological and questionnaire data. A total of 58 (2.5%) data points were missing in the final data set. As previously mentioned, of those participants who completed the lab task and were retained within the final sample ($N = 60$), 8 (13.3%) experienced technical errors leading to <10% loss of questionnaire data. Five participants (8.3%) experienced the loss of a final demographic questionnaire and the final two items of a past bias victimization questionnaire (assessing frequency of sexual assaults prior to age 18 and within the past year). Three participants (5.0%) produced non-analyzable startle reflex EMG data. Consideration of the method of data loss (via technical errors) does not suggest any theoretical mechanism of nonrandom missingness. Little's MCAR test failed to reject the null hypothesis that these data points were missing completely at random, $\chi^2(56, N = 60) = 24.95$, $p = 1.00$.

Options for possible imputation of missing data for variables of interest in the primary analyses (e.g., startle reflex EMG) were explored. The most powerful method of imputation, multiple imputation, was not feasible for the purposes of the current study as the statistical software in use (SPSS) was unable to provide pooled estimates for mixed model ANOVA analyses, and an agreed-upon set of guidelines for averaging test values across iterations was not available at the time of analysis. Therefore, given the small proportion of overall missingness within the full data set, a pairwise deletion method was employed as the most parsimonious

solution. Because demographic information was not necessary for the purposes of primary hypothesis testing and imputation of a large number of categorical values was not feasible, missing values for these six participants were also excluded pairwise from frequency analyses of sample characteristics. (As information on age and sex were collected on the pre-task questionnaire, these demographic variables were retained for all participants.)

Psychophysiological data reduction.

Offline analyses were performed using BrainVision Analyzer 2 software (BrainProducts, Gilching, Germany). EMG activity was bandpass filtered with cutoffs of 28 and 256 Hz (24 dB/Oct rolloff and 48 dB/Oct rolloff, respectively). Individual trials were inspected and rejected if the startle reflex began less than 20ms following probe onset or if an unrelated blink occurred within 50ms of the startle probe. EMG startle reflex activity was rectified in the post-startle window and smoothed using a 6-point running average. Startle amplitude was then quantified as the maximum response in the 20-200 ms post-probe window relative to the average activity in the 200-ms pre-probe baseline period. Skin conductance activity was defined as the average value of the SCL curve during presentation of the audio clip relative to the 1000ms pre-stimulus baseline. Finally, startle amplitude and average SCL for each subject were converted to t-scores to reduce between-subject variability unrelated to variables of interest in the current study.

Questionnaire data preparation.

Raw questionnaire data were preserved in EPrime output files, which were converted to Microsoft Excel files for the purposes of efficient data entry. Audio response questionnaire files and post-task questionnaire files were run through separate macros (repeatable automated task programs within Excel) to organize data into single-row sets of values for each participant, which were then entered into the statistical analysis program (SPSS). A random subsample of

data points within each macro-produced single-row set of values was compared to the accompanying raw data value to assess the accuracy of this process. No discrepancies were observed between raw data files and data entered into the analysis file. Data were also checked to ensure that entered values were consistent with the theoretical range of possible responses to each questionnaire item. A small number of participants appeared to have double-entered responses on a fraction of categorical items assessing demographic characteristics in which the participant was asked to enter a number and then press the enter key (e.g., "Would you describe yourself as Hispanic or Latino/a? 1. Yes; 2. No," participant response: "22{ENTER}"). None of these responses appeared ambiguous upon examination and so they were recoded. No other discrepancies were observed.

Evaluation of statistical and theoretical assumptions.

Remaining variables were evaluated for assumptions of the general linear model once the data had been checked for accuracy of entry and coding. Standardized residuals were retained after each analysis and examined for the presence of outliers. Cook's distance and single fitted values did not reveal any influential cases.

Confirmation of the structure of the World Assumptions Questionnaire.

Due to unacceptable reliability of some subscales of the World Assumptions Questionnaire (see Methods, above), a confirmatory factor analysis was employed in order to examine whether the factor structure observed by Kaler (2009) in scale development was adequately replicated in the present study. Factor analysis of the questionnaire data within the final sample ($N = 62$) alone was not feasible due to failure to meet common recommended guidelines of both minimum necessary sample size and minimum ratio of sample size to model variables (for a review, see MacCallum, Widaman, Zhang and Hong, 1999). However, as the

WAQ was administered to all individuals who completed the pre-task screening questionnaire, sufficient sample size was achieved by including questionnaire data from this larger screening sample. In total, WAQ questionnaire data was available for 2,352 individuals, of whom 204 identified as LGB based on Kinsey scale cutoffs. An equal number of heterosexual individuals were selected from the larger sample at random using an automated computer algorithm, for a total sample of 408 individuals.

Following an initial process of item selection, content rating, exploratory factor analysis (EFA), item reduction, and confirmatory factor analysis (CFA), Kaler's (2009) WAQ was comprised of 22 items loading on four subscales: Controllability and Predictability of the World, Controllability and Predictability of People, Trustworthiness and Goodness of People, and Safety and Vulnerability. To assess the fit of the questionnaire to this proposed structure within the present sample, a CFA was conducted using IBM SPSS AMOS v.22.0.0. Appendix C presents the models of these analyses. Determination of model fit was based on suggested cutoffs frequently cited in the literature for modifying indices (Steiger & Lind, 1980; Bentler, 1990).

Fit of the specified model was assessed with maximum likelihood estimation. Factors were allowed to correlate with one another, error covariances were constrained to zero, and factor variances were constrained to one. The model for this analysis was recursive and can be seen in Figure 8. Fit statistics of the model consistently did not support fit in the current sample, χ^2 (203) = 648.38, $p < .001$, RMSEA = .07 (90% CI = .067-.080), CFI = .83, SRMR = .11. Standardized estimates for the full sample and LGB and heterosexual subsamples are displayed in Figures 9 – 11. The factor structure of the WAQ could not be replicated in the present sample and therefore was not included in analyses for this study.

Individual differences in neuroticism as a possible covariate.

Given the possibility that group differences could be a function of differences in tendency toward negative affect across groups, this supplementary measure was included in data collection and explicitly examined a priori as a possible covariate in primary analyses. An independent samples t-test was conducted to assess whether neuroticism scores varied across groups (see Appendix E). No significant difference was observed. Given this observation and limited sample size, neuroticism was not included as a covariate in primary hypothesis testing.

Primary Analyses

A series of mixed model repeated measures ANOVA and ANCOVA models were employed to test the hypotheses of the study, with outcome variables (SCL, startle reflex EMG magnitude, SAM ratings, PTCI) entered in separate models. Identity variables (centrality, private regard, and public regard) were entered as continuous covariate in models examining their moderating effects. In analyses examining startle reflex magnitude, intertrial interval startle magnitude scores were also entered into the model.

Mauchly's (1940) test of sphericity was used to assess for violations of sphericity in repeated measures analyses of variance in which more than two levels of outcome variable were examined. Where violations were observed, the Greenhouse-Geisser correction (Greenhouse & Geisser, 1959) was applied. Effect sizes (Cohen's *d* and η_p^2) were computed for all analyses. For within-subjects comparisons, effect size estimates were corrected for dependence between means according to the guidelines provided by Morris and DeShon (2002). As final sample size was less than initially planned, observed power estimates ($\alpha = .05$) based on observed effect sizes were also computed for all analyses. Due to smaller than expected sample size, descriptive information is first examined for the pattern and magnitude of observed relations between variables in conjunction with null-hypothesis significance testing.

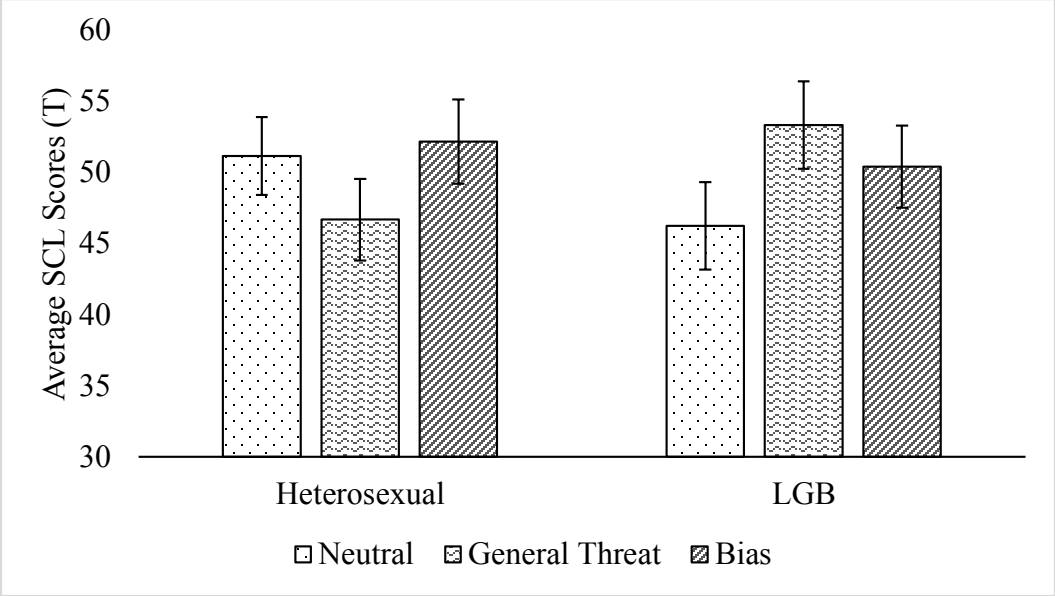
Descriptive data.

Figures 1 through 4 graphically display the means and confidence intervals for participants' average skin conductance level (SCL) during clip presentation, average startle reflex EMG magnitude during the three clip conditions and intertrial interval, subjective ratings of affect (arousal, valence, dominance, and warmth) following clip presentation, and pre- and post-task PTCI Negative Cognitions about the World scores, stratified by Kinsey group. Numerical means, standard deviations, and ranges are presented in Tables 16 – 19 in Appendix D and interrcorrelations between outcome variables of interest are presented in Tables 21 – 35 in Appendix D.

Visual examination of mean trends suggests that heterosexual and LGB participants displayed different patterns of physiological responding across clip conditions (Figures 1 and 2, below). LGB participants' mean autonomic arousal was highest in the general threat condition, somewhat lower in the bias threat condition, and lowest in the neutral condition. Heterosexual participants' mean autonomic arousal was lowest in the general threat condition, with similar higher levels of mean arousal during neutral and bias threat clips. With regard to startle reflex potentiation, LGB participants displayed larger startle reflex during threat condition clips (both general threat and bias threat) as compared to neutral clips. Heterosexual participants' greatest mean startle reflex potentiation magnitude was observed during presentation of general threat clips, with moderate potentiation during presentation of neutral clips, and lowest potentiation during presentation of bias threat clips.

Figure 1.

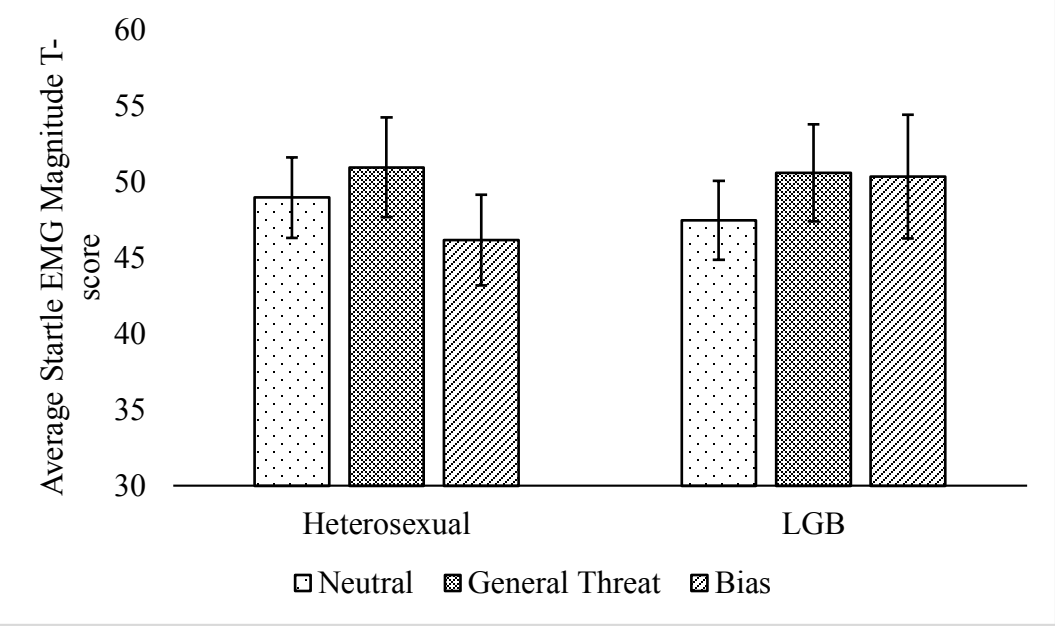
Average Skin Conductance Level (SCL) across Stimulus Conditions, by Group (*N = 60*)



Note: Error bars represent the 95% confidence interval of the mean.

Figure 2.

Average Startle Reflex EMG Magnitude across Stimulus Conditions, by Group (*N = 57)*

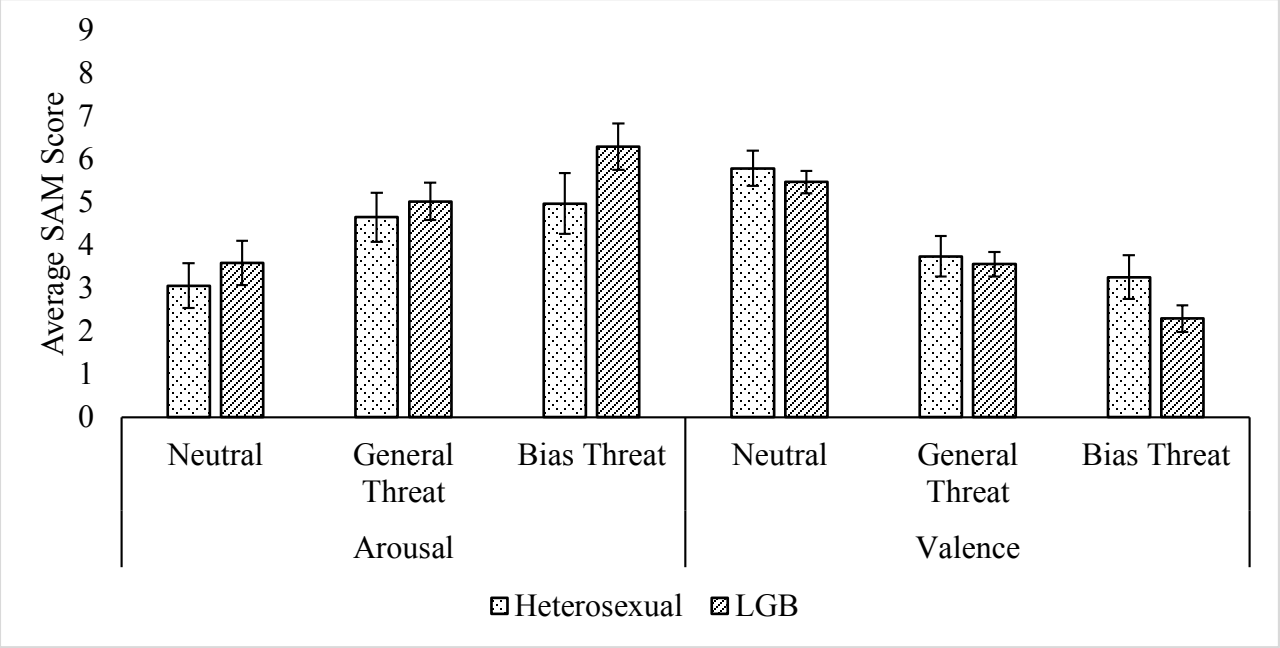


Note: Error bars represent the 95% confidence interval of the mean.

Examination of the mean self-reported levels of arousal and affect valence during clip presentation (Figures 3 and 4) similarly suggests that the pattern of affective response to bias crime material differed across groups. Heterosexual participants rated neutral clips as least arousing, with similar ratings of arousal for general threat and bias threat clips. LGB participants rated neutral clips as least arousing, with general threat clips evoking more arousal and bias threat clips evoking the most arousal. With regard to affect valence, the pattern of response is highly similar to that of arousal. Heterosexual participants rating neutral clips as most positive, with general threat and bias threat clips more negative (but similarly so). Similarly, LGB participants rated neutral clips as the most positive, with general threat clips rated more negatively. However, visual inspection suggests that LGB participants' ratings of affect valence during bias threat clips was lower than affect valence reported during general threat clips. Similar patterns were observed with respect to dominance and interpersonal warmth, such that LGB individuals generally appeared to report lower dominance and warmth during bias crime clips, as compared to heterosexual participants and as compared to ratings of general threat clips.

Figure 3.

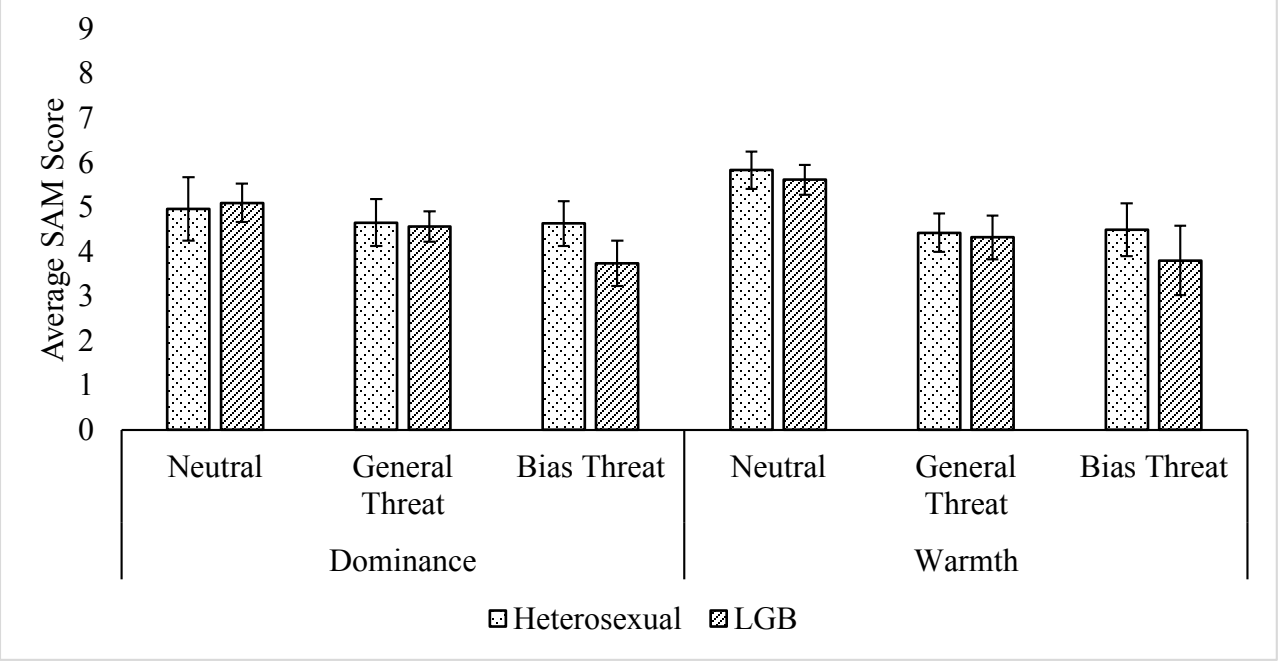
SAM Arousal and Valence Ratings across Stimulus Conditions, by Group (*N = 60)*



Note: Error bars represent the 95% confidence interval of the mean.

Figure 4.

SAM Dominance and Warmth Ratings across Stimulus Conditions, by Group (*N = 60)*

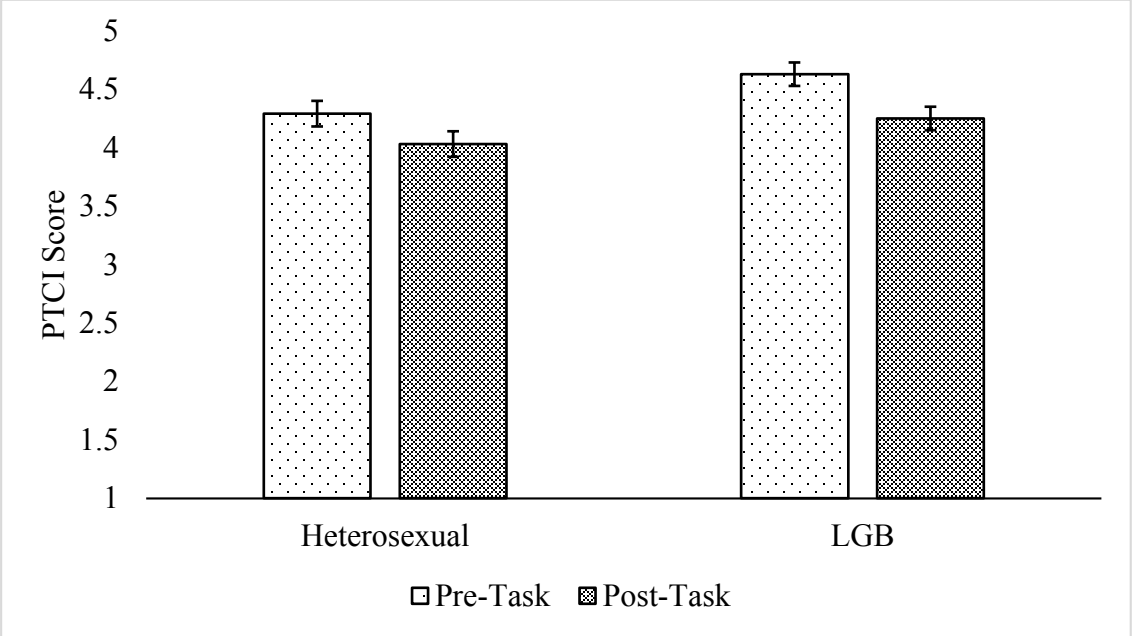


Note: Error bars represent the 95% confidence interval of the mean.

The observed pattern of pre- to post-task change in PTCI Negative Cognitions about the World scores (Figure 5) was contrary to hypotheses. At pre-task, LGB participants appeared to report slightly higher levels of negative cognitions than did heterosexual participants. However, both groups reported lower levels of negative cognitions post-task, contrary to predictions that reported negative cognitions would increase following exposure to threat information.

Figure 5.

Average Pre- and Post-Task PTCI Negative Cognitions about the World, by Group (*N = 60)*



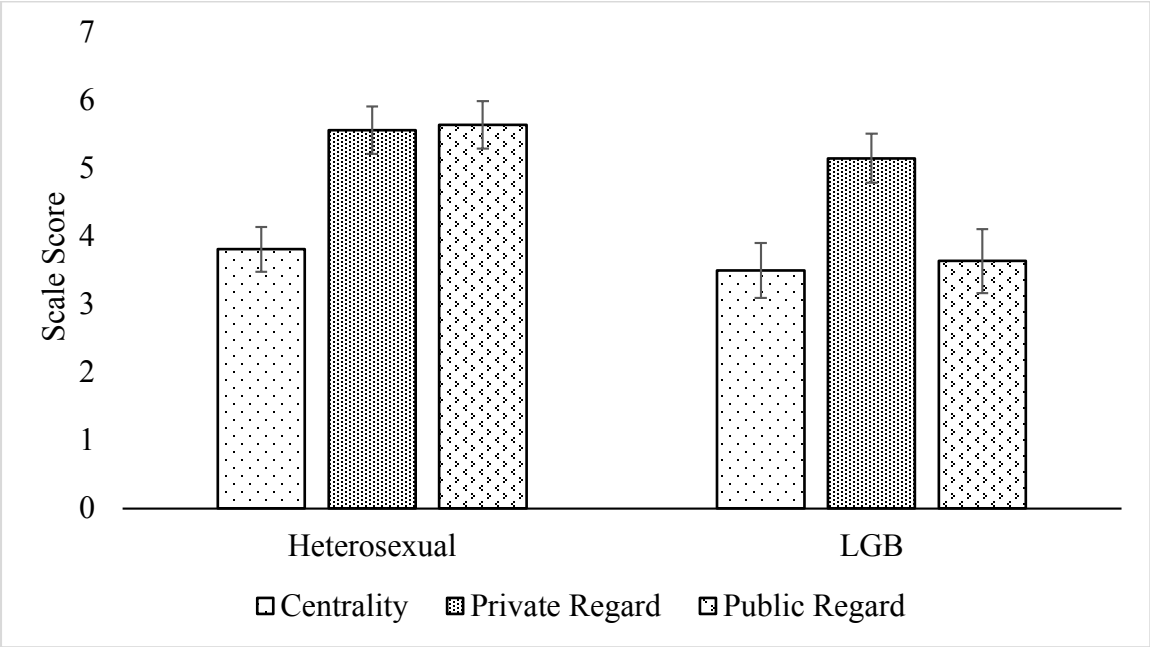
Note: Error bars represent the 95% confidence interval of the mean, adjusted for between-subject variability using Cousineau's (2005) method.

Figure 6 graphically displays the means and 95% confidence intervals of the three dimensions of collective identity assessed within the present study (centrality, private regard, and public regard), stratified by Kinsey group. The precise values of the means, standard deviations,

and observed ranges of these variables are presented in Table 20 in Appendix D. Of note, LGB participants reported lower public regard as compared to heterosexual participants.

Figure 6.

Average Centrality, Private Regard, and Public Regard Scores, by Group (*N = 60)*



Note: Error bars represent the 95% confidence interval of the mean.

Tables 3 – 9 below display the bivariate correlations between collective identity variables and outcome variables of interest, by Kinsey group. Correlations between identity variables and outcome variables of interest were not statistically significant, but some trends were observed within the present sample.

For the LGB group, identity centrality was marginally negatively related to private regard and strongly negatively correlated with public regard. Private and public regard were strongly positively related. Centrality showed a weak positive relationship with autonomic arousal during bias crime clips and startle reflex magnitude during neutral clips, a moderate positive relationship with subjective ratings of affect during neutral clips and with pre-task PTCI scores,

and a weak positive relationship with post-task PTCI scores. Private regard was weakly positively correlated with SCL, affect valence, and dominance during neutral clips, weakly correlated with self-reported arousal during general threat clips, and moderately correlated with reported warmth during general and bias threat clips. Public regard had a weak negative correlation with startle reflex magnitude, and a weak positive correlation with self-reported arousal, during general threat clips. No correlations were observed between identity variables of interest and change in PTCI scores.

For the heterosexual group, identity centrality, private regard, and public regard showed small to moderate positive interrelations. Identity centrality was weakly negatively correlated with SCL and moderately negatively correlated with startle reflex magnitude during general threat clips. Identity centrality also showed weak, moderate, and strong negative correlations to self-reported arousal during bias, neutral, and general threat clips, respectively. A weak positive correlation between centrality and self-reported dominance during bias crime clips was also observed. Finally, centrality was weakly negatively correlated with both pre- and post-task PTCI Negative Cognitions about the World scale scores. Private regard was strongly negative correlated with startle reflex magnitude during general threat clips, weakly positively related to self-reported arousal during bias crime clips, and moderately negatively correlated with reported affect valence during neutral clips. Public regard was moderately positively correlated with SCL during neutral clips and strongly negatively correlated with SCL during viewing of bias crime clips. Weak negative correlations were also observed between public regard, self-reported arousal during neutral and general threat clips, and self-reported interpersonal warmth during general threat clips. A weak positive correlation was observed between public regard and self-reported dominance during general threat clips. As within the LGB sample, no correlations were

observed between identity variables of interest and change in PTCI scores for heterosexual participants.

Table 3.

Correlations between Average Skin Conductance Level (SCL) across Clip Conditions and Dimensions of Collective Identity within the LGB Subsample (in Plain Text; N = 28) and Heterosexual Subsample (in Bold; N = 32)

	1	2	3	4	5	6
1. Centrality	-	-.17	-.40*	-.16	-.07	.24
2. Private Regard	**.33**	-	.40*	.23	-.05	-.19
3. Public Regard	**.20**	**.25**	-	.03	.03	-.06
4. Neutral SCL	**.14**	**.04**	**.38***	-	-.56*	-.47*
5. GT SCL	**-.21**	**.05**	**.14**	**-.44***	-	-.47*
6. Bias SCL	**.07**	**-.09**	**-.49***	**-.49***	**-.56***	-

*$p < .05$

Table 4.

Correlations between Startle Reflex EMG Magnitude across Clip Conditions and Dimensions of Collective Identity within the LGB Subsample (in Plain Text; N = 27) and Heterosexual Subsample (in Bold; N = 30)

	1	2	3	4	5	6
1. Centrality	-	-.17	-.40*	-.20	.15	-.07
2. Private Regard	**.33**	-	.40*	.17	-.02	.10
3. Public Regard	**.20**	**.25**	-	-.06	-.25	.16
4. Neutral Startle	**.19**	**.05**	**.13**	-	-.02	-.23
5. GT Startle	**-.35**	**-.40***	**.03**	**-.06**	-	-.55*
6. Bias Startle	**.30**	**.17**	**-.03**	**-.43***	**-.35**	-

*$p < .05$

Table 5.

Correlations between Subjective Ratings of Arousal during Neutral, General Threat, and Bias Threat Clips and Dimensions of Collective Identity within the LGB Subsample (in Plain Text; N = 28) and Heterosexual Subsample (in Bold; N = 32)

	1	2	3	4	5	6
1. Centrality	-	-.17	-.40*	.35	.08	.10
2. Private Regard	**.33**	-	.40*	.05	.24	.10
3. Public Regard	**.20**	**.25**	-	-.07	.06	.01
4. Neutral Arousal	**-.30**	**-.03**	**-.25**	-	.33	.18
5. GT Arousal	**-.43***	**-.04**	**-.24**	**.49***	-	.41*
6. Bias Arousal	**-.24**	**.20**	**.17**	**.32**	**.63***	-

*$p < .05$

Table 6.

Correlations between Subjective Ratings of Affect Valence and Dimensions of Collective Identity within the LGB Subsample (in Plain Text; N = 28) and Heterosexual Subsample (in Bold; N = 32)

	1	2	3	4	5	6
1. Centrality	-	-.17	-.40*	.03	-.04	-.11
2. Private Regard	**.33**	-	.40*	.29	.05	.00
3. Public Regard	**.20**	**.25**	-	.08	-.03	-.02
4. Neutral Valence	**-.08**	**-.36***	**-.01**	-	.47*	.17
5. GT Valence	**.09**	**-.10**	**-.10**	**.01**	-	.58*
6. Bias Valence	**.18**	**-.15**	**-.16**	**-.02**	**.82***	-

*$p < .05$

Table 7.

Correlations between Subjective Ratings of Dominance and Dimensions of Collective Identity within the LGB Subsample (in Plain Text; N = 28) and Heterosexual Subsample (in Bold; N = 32)

	1	2	3	4	5	6
1. Centrality	-	-.17	-.40*	.15	-.13	-.17
2. Private Regard	**.33**	-	.40*	.26	.09	.05
3. Public Regard	**.20**	**.25**	-	.02	.08	.08
4. Neutral Dominance	**-.13**	**-.08**	**.04**	-	.35	-.27
5. GT Dominance	**.15**	**-.01**	**.21**	**.45***	-	.37*
6. Bias Dominance	**.21**	**-.12**	**.06**	**.39***	**.84***	-

*$p < .05$

Table 8.

Correlations between Subjective Ratings of Interpersonal Warmth and Dimensions of Collective Identity within the LGB Subsample (in Plain Text; N = 28) and Heterosexual Subsample (in Bold; N = 32)

	1	2	3	4	5	6
1. Centrality	-	-.17	-.40*	.05	.06	.10
2. Private Regard	**.33**	-	.40*	.00	.31	.31
3. Public Regard	**.20**	**.25**	-	-.07	-.03	-.01
4. Neutral Warmth	**.07**	**.14**	**.02**	-	.04	-.23
5. GT Warmth	**.08**	**-.09**	**-.24**	**-.09**	-	.78*
6. Bias Warmth	**.18**	**.01**	**-.10**	**-.05**	**.53***	-

*$p < .05$

Table 9.

Correlations between Pre- and Post-Task Negative Cognitions about the World and Dimensions of Collective Identity within the LGB Subsample (in Plain Text; N = 28) and Heterosexual Subsample (in Bold; N = 32)

	1	2	3	4	5	6
1. Centrality	-	-.17	-.40*	.05	.20	-.17
2. Private Regard	**.33**	-	.40*	.00	.07	.11
3. Public Regard	**.20**	**.25**	-	-.07	-.01	-.00
4. Pre-Task PTCI	**-.20**	**-.03**	**-.06**	-	.75*	-.33
5. Post-Task PTCI	**-.28**	**-.03**	**-.13**	**-.09**	-	.38*
6. Change in PTCI	**-.17**	**-.01**	**-.12**	**-.05**	**.62***	-

*$p < .05$

Hypothesis testing.

The first research question asked whether LGB and heterosexual participants would show differing patterns of response to bias crime information across physiological, affective, and cognitive domains. First, I predicted that LGB individuals would show greater magnitude of ANS activation and startle reflex in response to bias crime exposure than would heterosexual individuals. Tables 10 and 11 present the results of two mixed model repeated measures ANOVAs testing these hypotheses.

Statistical comparison of patterns of autonomic nervous system responding using the general linear model indicated a significant interaction between sexual orientation group and clip condition. Post-hoc analyses with Bonferroni correction indicated that the average SCL varied between groups in the neutral ($F[1,58] = 5.98$, $p = .02$, $\eta_p^2 = .09$, observed power = .67) and general threat ($F[1,58] = 10.45$, $p = .002$, $\eta_p^2 = .15$, observed power = .89) conditions, such that the heterosexual participants demonstrated greater autonomic nervous system activation during

neutral clips relative to LGB participants, and LGB participants demonstrated greater autonomic nervous system activation during general threat clips as compared to heterosexual participants.

Table 10.

Results of a 2x3 Mixed Model Repeated Measures Analysis of Variance Comparing Average Skin Conductance Level During Three Clip Conditions (Neutral, General Threat, and Bias Threat), Across Heterosexual and LGB Participants (N = 60)

	df	*F*	*p*	η_p^2	Power (obs.)
Main effects					
Group	1	2.92	.09	.05	.39
Condition	2	1.09	.34	.02	.24
Two-way interactions					
Group*Condition	2	5.75	.004	.09	.86

With regard to startle reflex magnitude, statistical analysis did not reveal a significant interaction between group and condition or any significant main effect of group or condition. Small to medium effect sizes were observed for the main effects of group and the interaction of group and condition.

Table 11.

Results of a 2x4 Mixed Model Repeated Measures Analysis of Variance Comparing Average Startle Reflex EMG Magnitude During Four Clip Conditions (Neutral, General Threat, Bias Threat, and Intertrial Interval) Between Heterosexual and LGB Participants (N = 60)

	df	*F*	*p*	η_p^2	Power (obs.)

Table 11 (cont'd)

Main effects					
Group	1	1.12	.29	.02	.18
Condition	2	.09	.91	.00	.06
Two-way interactions					
Group*Condition	2	2.62	.08	.05	.51

I also predicted that LGB participants would report higher levels of arousal and lower affect valence during exposure to bias crime clips than did heterosexuals. Results of a series of mixed-model repeated measures ANOVAs testing these hypotheses are presented in Table 12. Also presented for exploratory purposes are the dimensions of dominance and interpersonal warmth.

Statistical tests of significance were largely consistent with the hypothesized pattern of results. An interaction between condition and group in predicting ratings of arousal was not significant, although main effects of both condition and group on arousal ratings were observed. For both groups, arousal ratings for the general threat clips ($t[59] = 8.01$, $p < .001$, $d = 1.04$, 95% CI of the difference = 1.14 – 1.90) and bias threat clips ($t[59] = 9.19$, $p < .001$, $d = 1.20$, 95% CI of the difference = 1.78 – 2.78) were higher than ratings for the neutral clips. Arousal ratings for the bias crime clips were greater than those for the general threat clips for the full sample, $t(59) = 3.83$, $p < .001$, $d = .51$, 95% CI of the difference = .36 – 1.16. A between-group difference was observed in ratings of arousal to bias crime clips; specifically, LGB individuals reported greater arousal in response to bias crime clips than did heterosexual participants, $t(55.56) = 3.03$, $p < .01$, $d = .81$, 95% CI of the difference = 0.45 – 2.19.

Similarly, the interaction between condition and group in predicting ratings of affect valence was not significant, but main effects of condition and group were observed. Both groups rated their affective response to general threat (t[59] = 11.46, p < .001, d = , 95% CI of the difference = -1.48) and bias threat clips (t[59] = 14.44, p < .001, d = -1.89, 95% CI of the mean = -3.22 – -2.44) as more negative than their response to neutral clips. Participants also rated affect in response to the bias crime clips as more negative than the general threat clips t(59) = -7.60, p < .001, d = -1.01, 95% CI = -1.07 – -.62. Comparing ratings across the groups, LGB individuals reported less positive affect in response to bias crime clips than did heterosexual individuals, t(49.99) = 3.27, p < .01, d = .92, 95% CI = .35 – 1.57. LGB participants also reported feeling less dominant during bias crime clips than did heterosexual participants, t(58) = 2.27, p = .03, d = .58, 95% CI = .09 – 1.68. No significant difference was observed between groups in ratings of interpersonal warmth during bias crime clips, t(58) = 1.49, p = .14, d = .38, 95% CI = -.24 – 1.62.

Table 12.

Results of a Series of 2x3 Mixed Model Repeated Measures Analyses of Variance Comparing Four Subjective Ratings of Affect (Arousal, Valence, Dominance, and Warmth) During Three Clip Conditions (Neutral, General Threat, and Bias Threat) Between Heterosexual and LGB Participants (N = 60)

	df	*F*	*p*	η_p^2	Power (obs.)
Arousal					
Main effects					
Group	1	5.95	<.01	.09	.67
Condition	1.78	61.70	<.001	.52	1.00

Table 12 (cont'd)

Two-way interactions					
Group*Condition	1.78	2.86	.07	.05	.52
Valence					
Main effects					
Group	1	5.95	<.01	.09	.39
Condition	1.43	43.26	<.01	.43	1.00
Two-way interactions					
Group*Condition	1.43	3.36	.06	.06	.62
Dominance					
Main effects					
Group	1	5.59	.34	.02	.16
Condition	1.44	8.21	<.01	.12	.96
Two-way interactions					
Group*Condition	1.44	3.31	.06	.06	.52
Warmth					
Main effects					
Group	1	1.83	.18	.03	.16
Condition	1.53	28.18	<.001	.33	1.00
Two-way interactions					
Group*Condition	1.53	0.96	.39	.02	.21

With regard to negative cognitions about the world, I predicted that LGB participants would show greater increases in negative cognitions about the world than would heterosexual participants. Results of a mixed-model repeated measures ANOVA testing this hypothesis are

presented in Table 13. Contrary to prediction, no interaction between group and task was observed. A main effect of task was observed. Specifically, both groups displayed a decline in PTCI scores from pre-task to post-task, $t(59) = 4.15$, $p < .001$, $d = .54$, 95% CI of the mean = .16 – .47. No significant main effect of group was observed.

Table 13.

Results of a Mixed Model Repeated Measures Analysis of Variance Comparing Negative Cognitions about the World Pre- and Post-Laboratory Task, Between Heterosexual and LGB Participants (N = 60)

	df	*F*	*p*	η_p^2	Power (obs.)
Main effects					
Group	1	2.28	.15	.04	.30
Task	1	17.52	<.001	.23	.98
Two-way interactions					
Group*Task	1	0.64	.43	.01	.12

The second research question asked whether LGB participants would show a pattern of responding to bias crime information that is consistent with defensive mobilization against threat. I hypothesized that LGB individuals would show a greater magnitude of ANS activation and greater startle response to bias-crime clips than to general threat or neutral clips. Contrary to prediction, LGB participants' average autonomic nervous system arousal during bias crime clips did not significantly differ from arousal during general threat ($t[27] = -1.17$, $p = .25$, $d = -.22$, 95% CI of the difference = -8.01 – 2.19) or neutral clips ($t[27] = 1.67$, $p = .11$, $d = .32$, 95% CI of the difference = -.94 – 9.30). LGB participants demonstrated greater autonomic nervous

system activation during viewing of general threat clips than during viewing of neutral clips, $t(27) = 2.68$, $p = .01$, $d = .51$, 95% CI of the difference = 1.66 – 12.51.

As previously noted, visual examination of group means suggests that LGB participants' greatest mean magnitude of startle reflex potentiation was observed during presentation of both bias threat and general threat clips, with somewhat lower potentiation observed during presentation of neutral clips. This is not consistent with expectations that startle reflex potentiation during bias crime clips would exceed potentiation during general threat and neutral clip presentation. Statistical analysis of these trends within the general linear model did not reveal any significant differences between mean autonomic arousal during bias crime clip presentation and mean autonomic arousal during presentation of general threat or neutral threat clips. Similarly, no statistically-significant differences were observed between clip conditions in mean startle reflex magnitude for LGB participants.

I further hypothesized that LGB individuals would self-report greater arousal and less positive affect during exposure to bias crime clips than during general threat or neutral clips. As predicted, LGB participants rated bias crime clips as more arousing ($t[27] = 8.25$, $p < .001$, $d = .92$, 95% CI = 2.03 – 3.37) and less positive ($t[27] = -17.46$, $p < .001$, $d = -3.34$, 95% CI = -3.55 – -2.80) than neutral clips. LGB participants also reported feeling more arousal ($t[27] = 4.83$, $p < .001$, $d = .20$, 95% CI = .73 – 1.80) and less positive affect ($t[27] = -9.40$, $p < .001$, $d = -1.79$, 95% CI = -1.54 – -.99) during bias crime clips than during general threat clips.

Finally, I predicted that LGB participants would report more negative cognitions about the world following exposure to bias crime clips. The observed pattern of pre- to post-task change in PTCI Negative Cognitions about the World scores was contrary to hypotheses. As

previously noted, LGB participants reported fewer negative cognitions about the world following the lab task than they had prior to the lab task.

The third research question asked whether domains of collective identity (specifically, centrality and public regard) moderated relations between group membership and responses to bias crime information for LGB and heterosexual individuals. A series of 2x3 mixed-model repeated measures analyses of variance conducted, with the three dimensions of collective identity entered as covariates, to examine whether identity centrality, private regard, and public regard moderated relations between sexual orientation group, clip condition, and outcome variables of interest. Tables 36-42 in Appendix D display the results of these analyses. Figures 12 - 16 in Appendix D display the marginal means of outcome variables under consideration, at grand mean values of identity centrality, private regard, and public regard.

I hypothesized that higher identity centrality would positively predict autonomic nervous system activation, startle reflex magnitude, negative affect (i.e., greater ratings of arousal and less positive reported valence), and more negative beliefs about the world in LGB participants during exposure to bias crimes, but not heterosexual participants. No significant three-way interactions were observed between centrality, clip condition, and group for any of the specified outcome variables. Similarly, no significant interactions were observed between centrality and Kinsey group, or between centrality and clip condition. Notably, examination of marginal means suggest that the trends observed across groups in outcome variables were maintained in physiological measures and SAM ratings of arousal and affect valence when controlling for identity variables. Group differences in SAM ratings of dominance and warmth were attenuated when controlling for identity variables. In the case of change in PTCI over time, controlling for identity variables suggested divergent pre- to post-PTCI slopes between LGB and heterosexual

participants (though this overall interaction of group and condition remained non-significant in statistical testing).

With respect to public regard, I hypothesized that lower reported public regard would predict heightened ANS activation, greater startle reflex potentiation, more negative affect (i.e., greater arousal and less positive valence), and more negative cognitions about the world in LGB individuals during exposure to bias crimes, but not heterosexual participants. An interaction was observed between public regard, clip condition, and sexual orientation on average SCL. To clarify the nature of the interaction between public regard, clip condition, and sexual orientation on SCL, difference scores were calculated between average SCL scores during each clip condition (bias – general threat, bias – neutral, general threat - neutral), and bivariate correlations between public regard and these difference scores were computed separately for the LGB and heterosexual subsamples. These matrices are presented below in Table 14. Examination of these correlation matrices suggests that the nature of this interaction is as follows: for heterosexual participants, greater perceived public regard was associated with smaller differences in autonomic nervous system activation during bias crime clips as compared to during general threat or neutral clips. No significant relations were observed between public regard and differences in autonomic nervous system activation among LGB participants, contrary to predictions.

Table 14.

Correlations between Public Regard and Difference Scores between Average Skin Conductance Level (SCL) across Stimulus Conditions, within the LGB Subsample (in Plain Text; N = 28) and Heterosexual Subsample (in Bold; N = 32)

	LGB	Het	1	2	3	4

Table 14 (cont'd)

	M (SD)	*M* (SD)	*r*	*r*	*r*	*r*
1. Public Regard	3.64 (1.26)	**5.64 (1.01)**	-	-.05	-.05	.00
2. Bias – GT SCL	-2.91 (13.16)	**5.48 (14.32)**	**-.36***	-	.44*	-.53*
3. Bias – Neutral SCL	4.18 (13.21)	**1.02 (13.65)**	**-.51***	**.55***	-	.53*
4. GT – Neutral SCL	7.09 (13.98)	**-4.47 (13.24)**	**-.14**	**-.51***	**.43***	-

*$p < .05$

An interaction was also observed between public regard, clip condition, and sexual orientation on subjective ratings of arousal. To clarify the nature of this interaction, difference scores were calculated between SAM arousal ratings during each clip condition (bias – general threat, bias – neutral, general threat - neutral), and bivariate correlations between public regard and these difference scores were computed separately for the LGB and heterosexual subsamples. Means, standard deviations, and correlation matrices of difference scores are presented below in Table 15. Examination of these correlation matrices suggests that the nature of this interaction is as follows: for heterosexual participants, greater reported public regard for heterosexuals was positively associated with greater (positive) differences in reported arousal during bias crime clips as compared to reported arousal during general threat clips. There was no such association observed within the LGB subsample, contrary to predictions.

Table 15.

Correlations between Public Regard and Difference Scores between SAM Arousal Ratings across Stimulus Conditions, within the LGB Subsample (in Plain Text; N = 28) and Heterosexual Subsample (in Bold; N = 32)

	LGB	Het	1	2	3	4

Table 15 (cont'd)

	M (SD)	*M* (SD)	*r*	*r*	*r*	*r*
1. Public Regard	3.64 (1.26)	**5.64 (1.01)**	-	-.05	.06	.12
2. Bias – GT Arousal	1.26 (1.38)	**0.32 (1.56)**	**.46***	-	.60*	-.24
3. Bias – Neutral Arousal	2.70 (1.73)	**1.91 (2.03)**	**.34**	**.67***	-	.63*
4. GT – Neutral Arousal	1.44 (1.42)	**1.59 (1.53)**	**-.02**	**-.14**	**.65***	-

*$p < .05$

Finally, I hypothesized that the interaction of high identity centrality and low public regard would positively predicted greater defensive mobilization on the part of LGB participants (but not heterosexual participants), marked by greater ANS activation, greater startle reflex potentiation, more reported negative affect, and greater increases in negative cognitions about the world from pre-task to post-task assessment. Contrary to this hypothesis, no significant interactions were observed between identity centrality, public regard, group, and condition in the present analyses.

Additional Analyses

Descriptive statistics, group comparisons, and bivariate correlations for additional variables of interest (e.g., neuroticism) can be found in Appendix E, Tables 43 - 50. In brief, notable observations include the following: for both groups, neuroticism was positively correlated (weakly to moderately) with negative cognitions about the world and weakly negatively correlated with autonomic arousal during general threat clips. Stressful life experiences were weakly negatively associated with autonomic arousal during general threat clips for the LGB subsample. Within the LGB subsample, past direct experiences of bias victimization were weakly positively associated with self-reported arousal, post-task negative

cognitions about the world, and change in negative cognitions, and weakly negatively associated with reported dominance and warmth during bias crime clips.

CHAPTER NINE

Discussion

The present study examined non-victim responses to auditory information about bias-motivated crimes against lesbian, gay, and bisexual (LGB) individuals in order to examine whether LGB individuals evidence physiological, affective, and cognitive responses consistent with vicarious threat. Based on a review of relevant literature in biological, social, and clinical psychology, a model of threat responding, cumulative physiological consequences of stress, and long-term cognitive changes in cognitions about the world was proposed to explain proximal and distal pathways to negative mental health consequences of exposure to bias crime information for LGB populations (Lannert, 2014). This model proposes that individuals who are members of a targeted group are more likely to appraise bias-motivated violence against another member of that group as a source of uncontrollable, unpredictable, and personally-relevant threat, and to mobilize physiological and cognitive defensive systems in response. Over time, the combined consequences of repeated activation of the threat response system, cognitive changes in beliefs about the self, others, and the world, and behavioral changes aimed at increasing safety are proposed to place LGB individuals at higher risk for stress-related psychiatric disorders such as depression, anxiety, PTSD, and substance use disorders.

This dissertation study examined in-vivo responses to bias crime information in a sample of heterosexual and LGB young adults as a preliminary examination of this model. Four forms of response were considered: subjective affective responses as reported by participants, a physiological marker of generalized autonomic arousal (skin conductance level), a physiological marker of defensive responding to threat (startle reflex EMG magnitude), and changes in negative beliefs about the world consistent with traumatogenic cognitions. In addition, the role of

collective (social) identity was examined as a potential moderator of these responses within the LGB subsample. I hypothesized that LGB and heterosexual participants would evidence different patterns of responses to bias crime information on physiological, affective, and cognitive measures. I predicted that LGB individuals would display a pattern of proximal responses to bias crime information consistent with defensive mobilization to threat. Specifically, I hypothesized that LGB participants would display heightened autonomic arousal (SCL), potentiated startle reflex magnitude, greater subjective arousal, and more negative affect in response to bias crime clips, as compared to heterosexual participants and as compared to their responses to general threat clips. I further hypothesized that LGB participants would show increases in negative cognitions about the world following exposure. I proposed that domains of collective identity (in particular, centrality and public regard) would moderate these responses such that high centrality and high public regard would magnify defensive mobilization, both individually and in interaction with one another. Results of the present study provide partial support for these hypotheses. In general, participants' subjective reports of affective response are consistent with hypotheses, physiological measures were equivocal or inconsistent, and observed changes in negative cognitions about the world were opposite of predictions.

Firstly, examination of group means indicated that the patterns of response across clip conditions for all outcome variables, except for negative beliefs about the world, were different for LGB and heterosexual participants. In the case of subjective ratings of affect, these differences were statistically significant and effect sizes in the present sample were generally medium to large. LGB participants rated bias crime clips as more aversive (more arousing, less positive) than did heterosexual participants, and endorsed feeling less dominant during exposure to bias crime clips. A non-significant but consistent trend was observed with ratings of

interpersonal warmth, with LGB participants reporting feeling less warm during bias crime clips than heterosexual participants. With regard to autonomic arousal, heterosexual and LGB participants produced different patterns of activation, and these group differences in pattern were also statistically significant, with generally small to medium effect sizes observed. LGB participants showed similar potentiation of startle reflex during bias threat and general threat clips, greater than that exhibited during neutral clips, whereas heterosexual participants' startle reflex magnitude during bias threat clips was comparable to their response to neutral clips. Both LGB and heterosexual participants displayed similar reductions in negative beliefs about the world from pre-task to post-task assessments, contrary to the prediction that negative beliefs would increase for LGB participants following the task and with no clear differences in the degree of change by group.

Given past qualitative (Noelle, 2002; Perry & Alvi, 2012) and quantitative (Herek et al., 1999) work suggesting that sexual minority individuals are more likely to respond to these events as threatening, it is not surprising that patterns of response varied between LGB and heterosexual participants. However, while the patterns of responses observed within the LGB sample were generally suggestive of defensive responding, there was no support for traumatogenic response (that is, both defensive responding to threat and alterations in cognition) as described in the rationale and hypotheses. Participants' reported affective responses (i.e., high arousal, low valence, and low dominance) and observed patterns of startle reflex potentiation in response to bias crime information are consistent with defensive mobilization to threat (Bradley et al, 2001; Hamm & Weike, 2005; Lang, 2010). Notably, heterosexual participants evidenced potentiated startle during general threat clips only, suggesting that LGB participants uniquely responded to bias crimes as threatening. LGB participants evidenced similar levels of startle potentiation

during bias and general threat clips, and the greatest autonomic arousal during general threat clips (followed closely by bias crime clips, then neutral clips). These patterns are not consistent with the hypothesis that LGB individuals experience bias crime events as exceptionally threatening as compared to non-targeted events. Finally, both LGB and heterosexual participants reported fewer negative appraisals of the world following the lab task – entirely opposite of hypotheses, and inconsistent with acute responses to traumatic events.

That LGB participants' autonomic nervous system activation and startle reflex magnitude observed during bias crime clips were not greater than that observed during general threat clips (as was hypothesized) could be due to any of three factors. First, with regard to startle reflex potentiation, results may reflect a ceiling effect in which startle reflex magnitude was maximized during threat exposure for LGB participants, regardless of content. Second, the prediction that LGB participants would exhibit greater startle potentiation and autonomic arousal in the bias crime condition as compared to the general threat condition was based upon the assumption that responses to bias crime events within that subgroup would be most consistent with those observed in extreme cases of fear learning (such as social and specific phobias; Gros et al., 2009; Hamm et al., 1997; Klorman et al., 1977). Though the present data suggest that LGB participants respond to bias crime clips as a comparable source of threat to other, non-bias-motivated violent crimes, they may not necessarily respond to them as an *imminent* threat in the way that an individual with a phobia may respond to the feared object or situation. Imminence of threat is an important dimension of threat attribution that demonstrates positive relations with the degree of observed defensive activation (Fanselow, 1994). In the present study, I hypothesized that LGB individuals would perceive bias crime events as imminent threats given the frequency of these events and their uncontrollable, unpredictable, and (perceived) likely nature, and so demonstrate

high levels of defensive activation analogous to individuals exposed to phobic stimuli (Hamm et al., 1997). However, it may be that LGB individuals experience learning about these events as threatening but not necessarily imminent – that is, with some psychological distance.

Finally, the assumption that the pattern of response observed in a phobic response and one observed in a traumatic response are identical may itself be faulty. Although phobic individuals consistently show sharply potentiated startle reflex and autonomic arousal in response to phobia cues (Gerlach, Wilhelm, Gruber, & Roth, 2001; Gros et al., 2009; McTeague et al., 2009; Weerts & Lang, 1978), this pattern is not necessarily always observed in cases of trauma and other anxiety disorders. For example, trauma researchers have observed that individuals with PTSD often show blunted physiological responses to trauma cues (McTeague et al., 2010), and studies of physiological reactivity in PTSD frequently find only one peripheral measure (e.g., heart race or SCL) elevated during trauma cue exposures (e.g., Gerardi et al., 1994; McDonagh-Coyle et al., 2001; Orr et al., 1998; Pitman et al., 1987). Recent work suggests that individuals with a history of a single traumatic event typically show magnified responses to trauma cues, whereas individuals with a history of multiple traumatic events often show a blunting response, with a non-linear dose-response effect (Lanius et al., 2011; McTeague et al., 2010). In fact, this finding has been generalized across the whole spectrum of anxiety disorders, such that individuals with disorders marked by central fear responses to imminent threats (e.g., specific phobia) tended to show pronounced patterns of defensive responding across physiological measures, while individuals with conditions characterized by more long-term, chronic apprehension and avoidance (e.g., chronic PTSD, generalized anxiety disorder) showed paradoxical blunting of responses consistent with the long-term effects of dysregulation of the functioning of central nervous system structures such as the amygdala (McTeague & Lang,

2012). The authors noted that this pattern was observed within disorders as well, with self-reported level of distress inversely correlated with the magnitude of defensive physiological mobilization observed at the highest levels of distress.

Thus, it may be that the lack of consistency between subjective ratings of affective response and observed patterns within the physiological data is at least partly due to the presence of subgroups of LGB individuals who evidence physiological blunting in response to prolonged experiences of stress and emotional dysregulation. In the present sample, summed past stressful life events was weakly negatively correlated with startle magnitude during bias crime clips for LGB participants. Past bias victimization (dichotomously coded), for LGB participants, was positively correlated with self-reported arousal but not with physiological arousal during bias crime clips. It is possible that the relationship between past bias victimization and physiological responses to bias crime information is a non-linear one obscured by the use of linear models, as suggested by the previously-mentioned research (McTeague & Lang, 2012). As LGB individuals as a group experience higher rates of victimization during childhood, adolescence, and adulthood (D'Augelli et al., 2006; House et al., 2011; Roberts et al., 2010), this possibility is feasible. Although the overall number of stressful life events reported by participants in the present study did not differ, a significant proportion (nearly 80%) of the LGB sample reported at least one episode of bias-motivated victimization in their lifetime (as compared to 25% of the heterosexual sample). The likelihood of this scenario is further suggested by recent findings that youth raised in environments with high rates of stigma against LGB individuals show blunted cortisol reactivity in stress-induction tasks (Hatzenbuehler & McLaughlin, 2014). Given the small sample size of the present study, however, it was not possible to model these relations with any degree of confidence at this time.

Changes in pre- to post-task cognitions about the world were not consistent with traumatogenic responses. Rather than demonstrating increases in negative beliefs about the world, LGB and heterosexual individuals both showed decreases in negative beliefs from pre-task to post-task assessment. Positive change in worldview (as opposed to no change) demands explanation, which may be provided by the social-cognitive literature on *positive illusions* (Taylor & Brown, 1988; Taylor & Brown, 1994). Positive illusions refer to the tendency for humans to maintain exaggerated evaluations of performance, perceptions of mastery and control, and unrealistic optimism about future outcomes, which have been positively linked to psychological health. As Taylor and Brown (1994) note: "the mentally healthy person appears to have the enviable capacity to distort reality in a direction that enhances self-esteem, maintains beliefs in personal efficacy, and promotes an optimistic view of the future" (p. 204). These positive illusions have been found to be generally adaptive, insofar as they are correlated with contentment, are positively associated with elements of social bonding such as increased social connections, and enhance motivation, persistence, and performance across tasks (Janoff-Bulman, 1989; Taylor & Brown, 1994). Belief in a just world for the self, for example, has been linked to decreases in depression and stress, and increases in life satisfaction (Lipkus, Dalbert, & Siegler, 1996).

Notably, positive biases have been shown to become more prominent as threats to the self are introduced (Greenwald, 1981), as seen in studies of the just-world hypothesis wherein individuals respond to information about crimes by inflating their perceptions of control and frequently assigning blame (believed to be due to an inflated sense of control and self-efficacy) to the victim (Furnham, 2003; Hafer & Bègue, 2005). Of particular relevance to the present question, a series of studies have suggested that individuals who share a social identity with a

crime victim are even more likely than those who do not share an identity to make efforts to psychologically distance themselves from the threat of the situation by either derogating the victim or distancing themselves from the targeted group (Correia et al., 2012). The same researchers recently found that not endorsing just-world beliefs or distancing from the victim led to low self-esteem when individuals were highly identified with the group (Ramos, Correia, & Alves, 2014). Finally, this pattern of response has also been observed in responses to discriminatory events, specifically (Stroebe, Dovidio, Barreto, Ellemers, & John, 2011). That LGB individuals demonstrated a decline in negative cognitions is consistent with this process and suggests that they responded to the news information provided as a threat. Presented with potentially threatening information, the individuals in this sample may have engaged in an immediate process of cognitive restructuring, inflating their positive perceptions of the safety and benevolence of the world and others in order to defend against the negative mood states and cognitions evoked by exposure to aversive information.

It may then be that these individuals are showing a form of coping in response to threat, though this pattern of response is not consistent with the changes in cognitions about the world observed in trauma survivors (Foa et al., 1999; Janoff-Bulman, 1989). Cross-sectional and retrospective studies of cognitive appraisal in trauma have typically focused on appraisals related to the self, such as self-blame (e.g., Foa et al., 1999) or appraisals about the severity and meaning of symptoms of acute stress such as intrusive memories (e.g., Steil & Ehlers, 2000). Longitudinal studies have also found links between negative appraisals of the self and symptoms and later symptoms of posttraumatic stress (Ehlers et al., 2003; Ehring et al., 2008; Nixon & Bryant, 2005; Mueller et al., 2008; O'Donnell, Elliott, Wolfgang, & Creamer, 2007; Regambal & Alden,

2009), and have also suggested that pre-trauma negative cognitions about the self may predict PTSD symptoms following trauma exposure (Bryant & Guthrie, 2005).

Negative appraisals of the world and PTSD symptoms have also been found to be related (albeit, typically more weakly) in correlational and cross-sectional studies (Agar et al., 2006; Kolts, Robinson, & Tracy, 2004; Laposa & Alden, 2003), although other studies have found that this effect was not significant when controlling for negative self-appraisals (Beck et al., 2004), maladaptive control strategies (e.g., worry and self-punishment; Bennett, Beck, & Clap, 2009) and other factors such as gender and depressed mood (Karl, Rabe, Zöllner, Maercker, & Stopa, 2009; Moser, Hajcak, Simons, & Foa, 2007). Longitudinal studies have also suggested that the path between acute (shortly post-exposure) negative cognitions about the world and PTSD symptom severity may be mediated by negative self-appraisals and have suggested that internal perceptions of threat (e.g., the individual's perceived lack of ability to cope) may be more influential in the development of PTSD than are perceptions of external threat (O'Donnell et al., 2007). The present study did not assess negative beliefs about the self in relation to vicarious exposure to bias crime information, which limits comparisons between types of negative cognitions and which would likely have provided richer information about the LGB individuals' cognitive responses to such events. Regardless, although observed changes in negative cognitions about the world suggest individuals in the present study were responding to a threatening event, there is no evidence that these changes are consistent with changes observed following exposure to trauma.

The final research question under consideration was whether dimensions of collective identity moderated LGB participants' responses to bias crime events. Small to moderate positive correlations were observed between identity centrality and average SCL during bias crime clips,

pre-task PTCI, and post-task PTCI for LGB participants. Public regard did not correlate with any outcome variable of interest. These relations between identity centrality and outcome variables of interest were not significant in general linear models, however. Notably, significant interactions were observed between clip condition and identity measures for heterosexual participants, but not for LGB participants. This is contrary to expectation, given literature indicating that more central social identity has found to moderate the severity of anxiety and trauma symptoms in individuals who have undergone discriminatory events such as exposure to racism (Khaylis, Waelde, & Bruce, 2007) and exposure to sexism (Eliezer, Major, & Mendes, 2010). Collective identity has been little studied in sexual minority samples, however, and the possibility that it does not exhibit the same pattern of relations cannot be denied.

Conversely, these results may be primarily a function of methodological and sample constraints. Of greatest concern, given how group assignment was conducted (using a continuous scale of sexual orientation rather than self-identification), the meaning of participant responses on this scale is unclear. The wording of the items (e.g., "In general, my sexual orientation is an important part of my self-image") suggests that responses to these items are most likely to reflect a general centrality of sexual orientation identity, as intended for comparison across groups. However, although group differences in outcome measures were observed using this classification system, this manner of group assignment may not as clearly map onto the cognitive processes of self-identification via explicit endorsement of group membership, as presumed by the collective identity model employed (Sellers et al., 1998). In addition, the structure and functioning of this scale has not been psychometrically examined with Kinsey-derived LGB subsamples and so interpretation of subscale scores in the present study is tenuous at best. (For

additional discussion of sexual orientation categorization in the present study, see Strengths, Limitations, and Future Directions, below.)

The types of discriminatory events presented as stimuli in the present study (arson, assault with injury, murder) were selected because they were judged to be the most threatening form of bias-motivated events and therefore believed to be most likely to evoke defensive responding on the part of like-identified individuals. In general, these clips appeared to function as predicted, as responses to threat condition clips (general and bias) across groups were typically more aversive than were responses to neutral clips. Consistent with predictions, there is evidence that LGB participants respond to bias crime events as more aversive than heterosexual participants in both self-report and physiological measures, and LGB participants described bias crimes as more aversive than general crime events. However, there is no support in the present findings for the hypothesis that exposure to these events provokes a response consistent with defensive mobilization to imminent threat consistent with the extreme fear learning of a phobia, as assessed by physiological measures, or with trauma exposure, as assessed by changes in traumatogenic cognitions. It is plausible that subgroup differences exist such that individuals are likely to vary in their responses according to their personal experiences of life stress and bias victimization. Further, the grouping method used in the present study may not be the most sensitive for the assessment of responses to an identity threat, and none of the predicted relations between domains of collective identity and responses to bias crime information were observed in significance testing within the LGB sample.

Clinical and Research Implications

As this study was an early quasi-experimental examination of a model of a vicariously-experienced source of minority stress for LGB individuals, direct clinical implications of these

findings are somewhat limited. The present findings provide support for the hypothesis that LGB individuals experience bias crime events as a source of stress unique from heterosexual participants, and partial support for the hypothesis that this experience is consistent with responses to threats such as are observed in responses to threatening stimuli. According to the full theoretical model (Lannert, 2014), repeated exposure to these events may lead to strengthening of fear associations and greater likelihood of defensive mobilization in the presence of ambiguous and clear threats, as well as being experienced as a general stressor, with implications for behavior by increasing the risks of avoidance and social withdrawal (Foa et al., 1992; Peri et al., 2000). Repeated physiological activation, combined with psychological shifts in worldview and self-evaluation, may then lead to alterations in physiological and psychological functioning that increase the risk of trauma-related mental illnesses such as posttraumatic stress and other anxiety disorders, mood disorders, and substance use disorders as allostatic load is increased incrementally (Berntson & Cacioppo, 2007; McTeague et al., 2010).

This study examines the immediate proximal responses to exposure to bias crime information in light of these potential downstream effects, although it does not purport to assess mental health outcomes directly in light of the suggested cumulative nature of these stress effects. Future studies may incorporate estimates of lifetime vicarious exposure to such events as well as direct measures of psychological well-being in order to evaluate the links between these in-vivo responses and mental health outcomes. Overall, further examination of these processes may have implications for understanding the development of a vulnerability to anxiety symptoms in response to social identity threat, which may inform further research and clinical practice. Before considering how future research may build upon these findings, it is necessary to address

the strengths and limitations of the current study design.

Strengths, Limitations, and Future Directions

The present study has a number of strengths. First, it is the first study to examine real-time responses to bias crime information in non-victim members of a targeted group, building and expanding upon past retrospective and qualitative studies (Craig, 1999; Noelle, 2002; Perry & Alvi, 2012) within a quantitative approach. Across disciplines, it contributes to the sociological, legal, and psychological literature on crime victimization by examining an often-argued but little studied assumption of community intimidation in bias crimes (Sullaway, 2004). It expands upon the sparse literature on LGB mental health by testing existing qualitative findings with empirically-sound quantitative methodology. Methodologically, its design allows for examination of complex processes using systematic data collection and minimizing additional sources of variance. For example, by ensuring that study facilitators remained blind to sexual orientation status, the study is able to minimize potential observer-expectancy effects. To maximize ecological validity, stimuli consisted of news reports of bias crimes, analogous to likely sources of exposure to bias crime information for most LGB individuals (Craig, 1999). Clips were carefully selected to minimize possible influences of other intersecting identities. Physiological data were collected and analyzed in accordance with the best available practices and recommendations of the field (Blumenthal et al., 2005; Fowles et al., 1981). Finally, the study design allowed for longitudinal assessment of variables of interest (i.e., PTCI) where included in the pre-study questionnaire.

This study was not without limitations, however. Primary among these was a relatively small sample size. Examination of effect size and observed power statistics suggests that the present study was underpowered for the analysis of some of the proposed hypotheses. Namely,

analyses failed to achieve sufficient power (commonly identified as .80 or above for a Type I error rate of alpha = .05; Cohen, 1992) to detect significant group differences for the majority of statistical comparisons made, save for some observed relations (e.g., self-reported arousal and affect valence) in which observed effect sizes were large or very large. One significant consequence of low power is that these results cannot reasonably be generalized to a broader population, given the increased risk that findings are a sample-specific function of the particular composition of LGB and heterosexual participants in this study.

However, the presumption of replicable effect sizes cannot be made, given that prior research indicates that effect sizes tend to become attenuated as sample size increases (Button et al., 2013; Ferguson, 2009; Wilkinson, 1999). Therefore, an additional consequence of the small sample size in the present study is that effect sizes observed in the present sample likely overestimate those within the broader population from which this sample was derived. Similarly, smaller samples sizes are more prone to sampling bias and may be less likely to accurately represent the characteristics of the broader population (Button et al., 2013; Wunsch, 1986). There is some evidence that this may be the case in the present study. For example, the present sample did not display the same distribution of demographic characteristics (e.g., race, ethnicity) as that of the university population or of the surrounding municipality. In fact, a larger proportion of racial and ethnic minority individuals were observed within the LGB subsample than within the heterosexual subsample. It is possible that the pattern of relations between variables observed within the present sample are at least partially a function of sampling error.

Finally, small sample size was problematic in the present study insofar as it precluded the use of some analyses (e.g., covariate models) that may further elucidate relations between the constructs under consideration. For example, prior research has suggested that different

classification strategies for sexual orientation are likely to yield different, if overlapping, samples of individuals, often with different characteristics and results (Midanik et al., 2007; Moradi et al., 2009; Sell, 1997; Sell & Petrulio, 1996; Worthington & Reynolds, 2009). The present study collected data on three forms of sexual orientation classification (self-identification, sexual behavior, and the Kinsey scale). The Kinsey scale (Kinsey, 1948) was chosen as the grouping method in this study because it allowed participants to rate themselves on a continuum based on their perception of their life histories of attraction, fantasy, and behavior rather than solely on self-categorization or behavior. Conceptualizing sexual orientation as a spectrum rather than as discrete categories is more consistent with recent research on sexuality and sexual orientation identity suggesting a continuum of orientation (Vrangalova & Savin-Williams, 2012).

The nature of the quasi-experimental design employed necessitated initial categorization into two group for comparison, and so the original Kinsey scale cutoffs (in which individuals reporting "more than incidental" same-sex attraction, fantasy, and behavior are categorized as LGB) were used in accordance with convention (Kinsey, 1948; Sell, 1997) and with the presumption that this would be strongly associated with differences in the appraisal of bias crime events with regard to self-relevance, likelihood, prevalence, and imminence (Paterson & Neufeld, 1987). No direct evaluation (e.g., through questioning) of individuals' appraisals of these events was conducted, however, and although many of the group differences observed (e.g., in self-ratings of affect) suggest that appraisals likely differed by group, the precise nature of the relation between the grouping method and threat appraisals is not clear. Future studies should directly ask participants about their appraisals of these events. Similarly, the meaning of collective identity variables assessed is unclear, given that these scales were worded to assess general dimensions of identity (e.g., centrality of sexual orientation) to allow for comparison

across groups, rather than in specific reference to the individual's own self-categorization (e.g., centrality of lesbian identity), which may evoke more meaning for participants. It is possible that when asked about their specific identity, as in prior modifications of the Multidimensional Inventory of Black Identity (Benish-Weisman & Horenczyk, 2010; Bombay et al., 2010; Houkamau & Sibley, 2010; Quinn & Chaudoir, 2009; Rughinj, 2011; Yip & Cross, 2004), responses may have differed.

At the time of study design, it was presumed that comparisons of different methods of identification (and, potentially, a continuous measure of sexual orientation) might be employed; however, given sample size constraints this was not feasible. It is very possible that different results may have been achieved by comparing groups on the basis of another classification system such as self-identification. Further, larger sample size may have allowed for comparison between different combinations of methods of categorization, such as comparing the responses of individuals who report same-sex sexual behavior but do not identify as LGB to those of individuals who both report same-sex sexual behavior and self-identify as LGB. As concealment of sexual identity has been linked to both stigma consciousness and negative mental health outcomes (Frost & Bastone, 2008; Quinn & Chandoir, 2009), such an analysis would likely have yielded rich information about the complexities of social identity, sexuality, and discrimination that was not available in the present sample.

Similarly, an additional weakness of the present study is that it administered only some measures prior to the laboratory exposure. This study design is therefore limited in its ability to draw linkages between exposure to bias crime information and additional variables of interest. For example, the collective identity measure was administered only post-exposure. Thus, the direction of the observed correlations between identity dimensions and some outcome measures

for LGB participants cannot be indicated with any confidence. It is possible that participants may demonstrate pre-task to post-task changes in collective identity domains, as observed in studies of responses to observed discrimination in which minority individuals were more likely to distance themselves from the targeted in-group in response to perceived threat than were majority individuals (Correia et al., 2012; Ramos, Correia, & Alves, 2014).

The failure to administer the collective identity questionnaire pre-exposure also precluded a closer analysis of its psychometric properties. Although the internal reliability statistics of the sub scales of the modified MIBI/MISOI ranged from acceptable to excellent across both groups, and scale means differed between groups in theoretically expected directions (i.e., lower public regard was observed within the LGB subsample), it was not possible to confirm the underlying structure of this scale in the present sample. Of particular interest would be an assessment of invariance across groups, including construct invariance. Given that the structure of one questionnaire proposed for use in this study (the World Assumptions Questionnaire) was not replicated within a larger pre-task screening sample, as well as exhibiting measurement variance between the LGB and heterosexual groups, the risk of scale structure failing to conform to theoretical expectations among LGB individuals cannot be ignored. It is also unclear what group participants who endorsed more-than-incidental same-sex feelings, attractions, and behavior, but who identified as heterosexual, used as a reference point in answering items on this scale. Further evaluation of the psychometric properties of the modified MIBI/MISOI is necessary.

Additional sources of variance that fell beyond the scope of the present study but which deserve further consideration in future research include specific characteristics of the crime events, including characteristics of perpetrators and victims. In the interest of limiting these potential sources of variance to strictly test differences between the presentation of bias and non-

bias crime information, auditory clips were carefully selected based on stringent criteria which attempted to exclude many of these sources of variance (e.g., deliberately selecting clips that did not explicitly describe the race of perpetrators or victims). To that same end, news clips were selected to address a range of potential events (assault, murder, and arson), with a range of potential victim genders, and with a range of presenter and reporter genders. Thus, selected clips in the bias and general threat conditions were matched according to a broad range of criteria and are presumed to be only minimally affected by these sources of variance. However, despite careful selection of stimuli it was not possible in the present study to eliminate all such sources of variance, and participants may have responded somewhat differently to clips according to this information in ways that could not be measured in the current design (e.g., by drawing assumptions about victim or perpetrator characteristics based on information given about names or locations of crimes). In addition, despite efforts to vary specific characteristics explicitly stated in the clips such as gender, the limited sample size of the present study prevented in-depth analysis of these differences at the level of individual clips. Given the complexity of social identity and the likelihood that individual differences in characteristics not assessed here-in play a role in individual responses to bias crime events, future studies designed to carefully parse these differences are advised.

Of particular interest would be: examining the intersectionality of identities (e.g., sexual orientation, racial, economic, and gender) in vicarious responses to bias crimes, especially given evidence that perceptions of event severity for personally-experienced LGBT bias-motivated events may vary according to race and socioeconomic status (Meyer, 2010). Individual differences in addition to social identity (e.g., neuroticism), should also be evaluated, given observed small to large correlations between neuroticism and many of the outcome variables

examined. Similarly, given the high rates of past bias victimization endorsed by the LGB participants in this sample, additional studies assessing a range of types and severity of bias victimization within this context would be critical for parsing apart responses due to cued activation of existing fear structures in individuals with significant trauma histories (Lanius et al., 2011; McTeague et al., 2010; Pitman et al., 1987; Pole, 2007), versus vicarious activation of threat response in individuals without significant trauma history. Finally, although distal mental health outcomes were not examined in the present study, they are proposed to be associated with the effects of repeated exposure to information about bias crime events (Lannert, 2014). As such, future studies could examine correlations between cumulative exposure to such information (e.g., through participants' reports of how often they have heard of these events) and symptoms of psychological distress in order to begin disentangling those relations.

Conclusions

In conclusion, this thesis presents a novel and carefully-planned study designed to examine how heterosexual and LGB individuals respond to information about bias crimes, and whether these responses constitute a traumatogenic response. This study was partially successful in achieving its aims. Present results suggest that LGB individuals likely experience bias crimes differently from heterosexual individuals, and that their experience involves some degree of defensive mobilization against threat. There is no evidence that these responses are consistent with a traumatogenic response based on the present findings, however, and links between the responses observed in the present study and long-term mental health outcomes are unclear. Limitations of the present study, including small sample size, methods of group categorization, and the absence of some measures at the pre-task assessment, precluded more in-depth assessment of the data such as comparison using different grouping methods. These results

tentatively suggest, however, that some response process unique to individuals who endorse more than incidental same-sex fantasy, attraction, and behavior is occurring when exposed to bias crime information, and that this process involves both central and peripheral nervous system stress responses believed to be linked to distal mental health outcomes over time. Future research is strongly suggested in order to more fully explicate these findings and to more closely examine the clinical implications of bias-motivated violence and discrimination against sexual minorities.

APPENDICES

APPENDIX A

Participant Consent Form

PARTICIPANT INFORMATION AND CONSENT FORM

Michigan State University

Department of Psychology

1. What is the purpose of the research? You are being asked to participate in a research study of individual differences in responses to different types of news stories. We hope to learn how individuals respond to different types of news information, including physical, emotional, and cognitive reactions. We are also interested in how individual differences such as identity, personality, sexual orientation, and past life experiences affect responses to different types of news information. You must be 18 years of age to participate in this study. If you choose to participate in the study, your participation will take about 1 hour to 1.5 hours.

2. What will I do as a participant? If you consent to participate in the study, we will attach sensors to the fingers of your left hand, under your left eye, and your forehead using a mild adhesive and a small amount of water-based conductive gel. These sensors are not dangerous and should not be painful or uncomfortable in any way. Once the sensors are attached, we will ask you to complete a computer task during which you will wear headphones and be presented with different auditory clips of news stories. We will ask you to focus on the stories and to imagine the events of the stories as they are described. As you listen, we will record your physical responses (muscle activity and nervous system arousal) through the sensors placed on your skin. At different times during the news clips you will also hear brief and random bursts of white noise. After you listen to each news clip, you will answer some questions about your feelings and thoughts during the clip before listening to the next news clip. After you have heard

all of the news clips, we will remove the sensors and you will complete questionnaires on demographic information, identity, personality, beliefs about the world, stressful past life experiences, and negative thoughts about stressful experiences.

3. What are the possible benefits of participating? You will not directly benefit from participation in this study. However, your participation in this study may contribute to the understanding of social group and individual differences in responses to different types of news information, and so may have benefits for society as a whole.

4. What are the possible risks of participating? The risks of participating in this study are minimal and include some possible temporary anxiety or discomfort from exposure to news information that you may find difficult or emotional, such as news information about violent crimes. You may also experience some possible mild discomfort answering questionnaires about sensitive topics such as stressful life experiences. If you experience more than mild or transient discomfort during this study, we can provide you with information about counseling resources that are available to you as an MSU student.

5. **How will you protect my privacy and confidentiality?** Your responses in this study will remain entirely anonymous. We will assign you an identification number and will not collect or store personal information such as your name. The study staff will not directly enter attendance in HPR or in any other way be exposed to any of your identifying information. All data will be electronic and will be stored on a secure server within the Psychology Department, marked by an ID number, and password-protected. Only trained study staff will have access to the data. The results of this study may be published or presented at professional meetings, but the identities of all research participants will remain anonymous. No member of the study staff will be able to link your responses to identifying information.

6. Can I say no, choose not to answer questions, or stop participating if I want?

Participation in all or part of this study is entirely voluntary. You can choose not to participate in the study, can participate in all parts of the study, or participate in just some parts of the study. You have the right to withdraw from this study at any point if you change your mind, with no penalty or negative consequences. Your decision about whether to participate or not will not affect your relationship with Michigan State University. If you choose to withdraw from the study early, you may receive only partial HPR credit for your time. Whether you choose to participate or not will have no effect on your grade.

7. How will I be compensated for my participation? For completing the study, you will receive **3** HPR credits. These credits may be used to fulfill course requirements or as extra credit, depending on the requirements set by your course instructor. If you would rather complete an alternative assignment than participate in research studies, please consult your instructor.

In addition, upon completion of this study your HPR Id will be entered into a raffle for the opportunity to win an iPod shuffle (value: $49). At the end of the semester, the HPR Ids of all participants who completed this study will be entered into an Excel spreadsheet. Random numbers will be generated for each HPR ID and compared to a single, separate, randomly-generated number. The participant whose randomly-generated ID number is closest to the randomly-generated second number will be contacted by Leslie Baldwin (HPR Administrator) and asked to pick up their iPod shuffle. At no time during the raffle process will study staff see your identifying information; only HPR Ids will be used during this process.

Only 1 iPod shuffle will be awarded by raffle. The raffle will be conducted following the closure of the HPR system at the end of the semester. Each participant is estimated to have a 1 in 120 chance of winning the raffle.

8. What if I have further questions or concerns? If you have concerns or questions about this study, such as scientific issues, how to do any part of it, or to report an injury, please contact the researchers:

Brittany Lannert, M.A.	Dr. Alytia Levendosky
316 Physics Rd., Room 44	316 Physics Rd., Room 107C
East Lansing, MI 48824	East Lansing, MI 48824
Phone: (918) 857-7024	Phone: (517) 353-6396
Email: lannertb@msu.edu	Email: levendo1@msu.edu

If you have questions or concerns about your role and rights as a research participant, would like to obtain information or offer input, or would like to register a complain about this study, you may contact, anonymously if you wish, the Michigan State University's Human Research Protection Program at (517) 355-2180, Fax (517) 432-4503, or email irb@msu.edu or regular mail at 207 Olds Hall, MSU, East Lansing, MI 48824.

Your participation today does not obligate you to participate in any future studies. You will be given a copy of this form to keep.

If you choose not to consent to participate in this study, you may leave at this time. If you choose to consent to participation in this study, your decision to begin the study indicates your consent. You may choose to withdraw from the study at any time without penalty, but may not receive full HPR credit for your participation and may not be entered into the raffle.

APPENDIX B

Copies of Measures

Global Screening Sexual Orientation Items

Lab Protocol

SAM Subjective Task Ratings

Demographics Questionnaire

Post-Traumatic Cognitions Inventory – Negative Beliefs about the World Subscale

Sexual Orientation Identity Questionnaire

World Assumptions Questionnaire

Multidimensional Inventory of Sexual Orientation Identity

IP-IP Neuroticism Scale

Post-Traumatic Cognitions Inventory

Past Victimization Experiences Scale

Global Screening Questionnaire (HPR)

1. Are you age 18 or older?

   _____ Yes

   _____ No

2. What is your gender?

   _____ Male

   _____ Female

   _____ Other

3. Based on your reactions and experiences over your entire life, how would you describe your sexual orientation?

   _____ Lesbian

   _____ Gay

   _____ Bisexual

   _____ Heterosexual

   _____ Queer

   _____ Asexual

   _____ Other

4. Based on your history of sexual experiences (kissing, fondling, intercourse), how would you describe the gender of your sexual partners?

   _____ All men

   _____ Mostly men, some women

   _____ Equal numbers of men and women

   _____ Mostly women, some men

_____ Equal numbers of men and women

_____ All women

_____ I have not had any sexual experiences

5. Considering your history of attraction and fantasy across your entire life, how would you describe your sexual orientation?

_____ Exclusively heterosexual

_____ Mostly heterosexual, only incidentally homosexual

_____ Mostly heterosexual, but more than incidentally homosexual

_____ Equally heterosexual and homosexual

_____ Mostly homosexual, but more than incidentally heterosexual

_____ Mostly homosexual, only incidentally heterosexual

_____ Exclusively homosexual

_____ Non-sexual/Asexual

Lab Protocol

(Portions in quotes "" are to be read to participants. *Italicized* segments are instructions for research staff.)

Greet participants and review information about the study provided in the consent form. Answer any participant questions and ensure that they understand the information contained in the consent form. If they choose to participate in the study, ask them to sign and date the consent form. Provide the participant with a blank copy of the consent form to take with them.

"Thank you for coming today and for agreeing to participate in this study. Today, we will ask you to complete two tasks. First, we will ask you to complete a computer task where you will listen to clips of news reports while you imagine the events described by the clips in as much detail as possible. At random times during each clip, you will hear a short burst of white noise. After each news report, you will rate how you felt while listening to the clip using the computer. The listening task should take approximately 35-40 minutes. After you have listened to all of the audio clips, you will be asked to complete a series of questionnaires on the computer."

"During the listening task, we will be recording your muscle activity and nervous system functioning using six small sensors that we will attach to your skin with a mild adhesive." *Show the participant the electrodes and the adhesives.* "We will also apply a small amount of this water-based gel to help conduct the signal." *Show the participant the conductive gel.* "You should not feel any discomfort from the sensors, and most people report that they do not notice them after a short time. The gel that we use is like a thick saltwater and should not cause any irritation to your skin. We will attach one sensor to the index finger of your left hand, one sensor to the middle finger of your left hand, two sensors below your left eye, and two sensors on your forehead. Do you have any questions about this?"

Answer any questions about the physiological recording. When the participant indicates that they are comfortable with the equipment, attach the electrodes in the specified locations, making sure to perform a gentle debriding of the electrode sites with a cotton swab prior to application. As you attach the electrodes, explain to the participant what you are doing ("Okay, now I'm going to put a sensor on your left index finger") to help them remain comfortable during set-up. When the electrodes are attached, check for signal quality and make any adjustments as necessary. When recording is of sufficient quality, start the computer program. Show the participant the headphones.

"During the listening task, you will be wearing these headphones. For now, we will keep the headphones off while we explain your task. You will be asked to listen to nine audio clips of news reports that are similar to the sort of news story that you might hear on your local evening news. While listening to each clip, we would like you to try and imagine the events described in as much detail as possible. Please listen carefully, because after each clip you will be asked to answer a few questions about the information provided in the clip. You will also be asked to rate how you felt as you listened after each clip."

Display the SAM scales.

"Look at these set of figures. Each of these figures is arranged along a continuum. We call this set of figures SAM, and you will be using these figures to rate how you felt while listening to each clip. You will use all three scales – making three ratings – for each auditory clip. SAM shows three different kinds of feelings: Happy vs. Unhappy, Excited vs. Calm, and Controlled vs. In Control."

Display the first SAM figure. Point to the appropriate parts of the scale and the computer keyboard as you read the following description.

"You can see that each SAM figure varies along each scale, and each SAM figure has a number underneath it ranging from 1 to 9. The first SAM scale is the happy-unhappy scale, which ranges from a smile to a frown. At one extreme of the happy vs. unhappy scale, you felt happy, pleased, satisfied, contented, hopeful. If you felt completely *happy* while listening to the clip, you can indicate this by pressing a '9' on the keyboard when you see this scale. The other end of the scale is when you felt complete unhappy, annoyed, unsatisfied, melancholic, despaired, bored. You can indicate feeling completely *unhappy* by pressing a '1' on the keyboard when you see this scale. If you felt completely neutral, neither happy nor sad, select the figure in the middle by pressing a '5' on the keyboard. This figure also allows you to describe intermediate feelings of pleasure, by choosing any of the other numbers. This allows you to make more finely graded ratings of how you felt while listening to the clips."

Display the second SAM figure. Point to the appropriate parts of the scale and the computer keyboard as you read the following description.

"The excited vs. calm dimension is the second type of feeling displayed here. At one extreme of the scale you felt stimulated, excited, frenzied, jittery, wide-awake, aroused. If you felt completely *aroused* while listening to the clip, press a '9' on the keyboard when you see this scale. The other end of the scale is when you felt completely relaxed, calm, sluggish, dull, sleepy, unaroused. You can indicate you felt completely *calm* by choosing a '1' on the keyboard when you see this scale. As with the happy-unhappy scale, you can represent intermediate levels by selecting any of the other figures. If you are not at all excited nor at all calm, press '5' on the keyboard to select the figure in the middle of the row."

Display the third SAM figure. Point to the appropriate parts of the scale and the computer keyboard as you read the following description.

The last SAM scale that you will rate is the dimension of controlled vs. in control. At one end of the scale you have feelings characterized as completely controlled, influenced, cared-for, awed, submissive, guided. Please indicate feeling *controlled* by pressing a '1' on the keyboard when you see this figure. At the other extreme of this scale, you felt completely controlling, influential, in control, important, dominant, autonomous. You can indicate you felt *dominant* by pressing a '9' on the keyboard. Note that when the figure is large, you feel important and influential, and that it will be very small when you feel controlled and guided. If you feel neither in control nor controlled you should press '5' to select the middle figure. Remember, you can also represent your feelings between these endpoints by pressing any other number on the scale."

Click the space bar to progress to the WARMTH scale.

"Finally, you will be asked to rate how you feel about other people using this number scale. We call this scale the 'warmth' scale. At one end of the scale you have feelings characterized as extremely cold, uninterested in others, disengaged, withdrawn, and flat. Please indicate feeling extremely cold toward others by pressing the "1" on the scale. At the other end of the scale you have feelings characterized as extremely warm, interested in others, engaged, connected, and affiliative. When you feel extremely warm toward others, please press the "9" on the scale. As with the SAM scales, if you feel neither warm nor cold toward others press the "5" in the middle of the scale. You can also represent your feelings between these points by pressing the other numbers on the scale."

"Some of the news clips may prompt emotional experiences; others may seem relatively neutral. Your rating of each clip should reflect your <u>immediate</u> personal experience – that is, how you felt in the moment - and no more. Please rate each one *as you actually felt while listening to the clip*."

Cue the computer program to the start screen.

"In a minute, we will ask you to put on the headphones and we will leave the room while you complete the task. Remember, while listening to the clips please do your best to imagine the events described and pay close attention to the information that you are given by each clip. If at any time you wish to stop the study, please knock on the mirror on this wall and we will discontinue your participation. If we need you to stop momentarily so that we can check the equipment, we will knock on the mirror. When you have listened to all of the clips and rated your responses for each, you will see a screen telling you that you have completed this portion of the experiment. At that time, we will get you started on the questionnaires. Are there any questions before we begin?"

Answer participant questions, if any.

"Okay, once we have left the room, please put on the headphones. You may begin the task at any time by pressing the space bar."

Leave the room and monitor participant performance and physiological recordings from the adjoining room. When the participant completes the listening task, re-enter the testing room and proceed to the questionnaires.

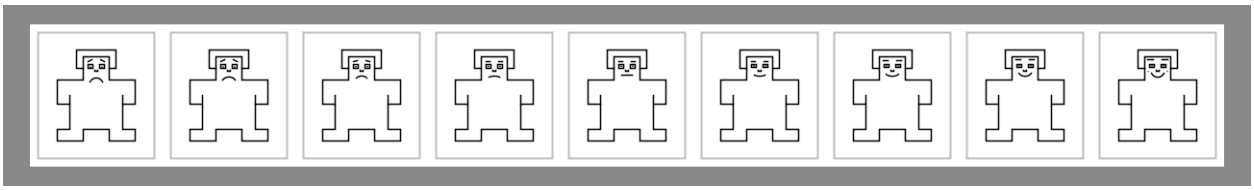
"Please complete the questionnaires as accurately and completely as possible. If you have any questions about any of the items, please let us know."

When they have completed the questionnaires, thank the participant for their time and provide them with a copy of the consent form (with contact information) to take with them.

SAM Ratings (Lab, Computer Task)

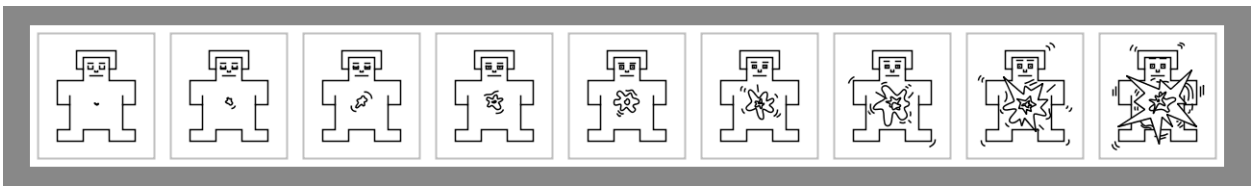
Figure 7.

Self-Assessment Manikin (SAM) Visual Figures and Rating Scales for Self-Report Ratings of Affective Arousal, Valence, Dominance, and Interpersonal Warmth.



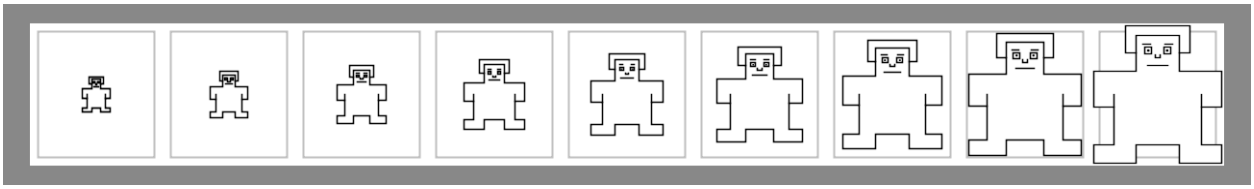
1 2 3 4 5 6 7 8 9

Less Happy More Happy



1 2 3 4 5 6 7 8 9

Less Aroused/Excited More Aroused/Excited



1 2 3 4 5 6 7 8 9

Less Dominant/In Control More Dominant/In Control

WRM

1 2 3 4 5 6 7 8 9

Less Warm/Connected More Warm/Connected

Demographics Questionnaire (Lab)

1) Age: _____ years

2) Sex: ____M ____F

3) Gender identification: _____ Male

_____ Female

_____ Transgender

_____ Other

4) Current year at MSU: _____ Freshman

_____ Sophomore

_____ Junior

_____ Senior

_____ Graduate Student

5) Prior to enrolling at MSU, what is the highest level of education you had completed?

_____ Some high school

_____ High school/GED

_____ Associate's degree

_____ Bachelor's degree

_____ Master's degree

_____ Doctorate

_____ Other professional degree

Please specify: _____

6) What is your family's average annual income? Please estimate:

_____ Less than $20,000

_____ $20,000 - $39,999

_____ $40,000 - $59,999

_____ $60,000 - $79,999

_____ $80,000 - $99,999

_____ $100,000 - $119,999

_____ More than $120,000

7) Would you describe yourself as Hispanic or Latino/a?

_____ Yes, I am Hispanic or Latino/a

_____ No, I am not Hispanic or Latino/a

8) How would you describe yourself?

_____ American Indian/Native American

_____ Asian/Asian American/Pacific Islander

_____ Black/African American

_____ Latino/Hispanic/Chicano

_____ Biracial/Multiracial

Please specify: _____

_____ White/Caucasian

_____ Other

Please specify: _____

9) How would you describe the place where you grew up (spent the greatest amount of time during your childhood and adolescence)?

_____ A rural area

_____ A small town

_____ A suburban area

_____ A small city

_____ A City

_____ Other:

_____

10) If you grew up within the United States, how would you describe the region of the country where you grew up (spent the greatest amount of time during your childhood and adolescence)?

_____ New England (Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut)

_____ Mid-Atlantic (New York, Pennsylvania, New Jersey)

_____ East North Central Midwest (Wisconsin, Michigan, Illinois, Indiana, Ohio)

_____ West North Central Midwest (Missouri, North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Iowa)

_____ South Atlantic (Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida)

_____ East South Central (Kentucky, Tennessee, Mississippi, Alabama)

_____ West South Central (Oklahoma, Texas, Arkansas, Louisiana)

_____ West Mountain Region (Idaho, Montana, Wyoming, Nevada, Utah, Colorado, Arizona, New Mexico)

_____ Pacific West (Alaska, Washington, Oregon, California, Hawaii)

_____ I did not grow up within the United States

11) What is your religious affiliation?

_____ Protestant Christian

_____ Roman Catholic

_____ Evangelical Christian

_____ Jewish

_____ Muslim

_____ Atheist/Agnostic

_____ Other

12) How important would you say your religion is in your life?

1	2	3	4	5	6	7
Not at all important						Extremely Important

WAQ

Please rate the following statements on how much you agree or disagree with them using the following scale:

1 = Strongly Agree

2 = Agree

3 = Slightly Agree

4 = Slightly Disagree

5 = Disagree

6 = Strongly Disagree

_____ 1. Most people can be trusted.

_____ 2. I don't feel in control of the events that happen to me.

_____ 3. You usually can know what is going to happen in your life.

_____ 4. It is difficult for me to take most of what people say at face-value.

_____ 5. It is very difficult to know what others are thinking.

_____ 6. Anyone can experience a very bad event.

_____ 7. People often behave in unpredictable ways.

_____ 8. People are less safe than they usually realize

_____ 9. For the most part, I believe people are good.

_____ 10. I have a great deal of control over what will happen in my life.

_____ 11. You never know what's going to happen tomorrow.

_____ 12. Other people are usually trustworthy.

_____ 13. People's lives are very fragile.

_____ 14. It is hard to know exactly what motivates another person.

_____ 15. Most people cannot be trusted.

_____ 16. People fool themselves into feeling safe.

_____ 17. It is hard to understand why people do what they do.

_____ 18. Most of what happens to me happens because I choose it.

_____ 19. Terrible things might happen to me.

_____ 20. It is ultimately up to me to determine how events in my life will happen.

_____ 21. It can be very difficult to predict other people's behavior.

_____ 22. What people say and what they do are often very different things.

PTCI-WBS

Please read each statement carefully and tell us how much you AGREE or DISAGREE with each statement, using the scale below. There are no right or wrong answers to these statements. Just tell us how you feel **right now**.

1 Totally Disagree

2 Disagree Very Much

3 Disagree Slightly

4 Neutral

5 Agree Slightly

6 Agree Very Much

7 Totally Agree

_____ 1. People can't be trusted.

_____ 2. I have to be on guard all the time.

_____ 3. You can never know who will harm you.

_____ 4. I have to be especially careful because you never know what can happen next.

_____ 5. The world is a dangerous place.

_____ 6. I can't rely on other people.

_____ 7. People are not what they seem.

MISOI (Lab)

The following are a series of statements about possible thoughts, feelings, and beliefs that you might have about being a heterosexual, gay, lesbian, or bisexual person, and about people who have the *same* sexual orientation as you do. Please indicate your agreement or disagreement with these statements using the scale on the right.

	Strongly Disagree			**Neutral**			**Strongly Agree**
1. Overall, my sexual orientation has very little to do with how I feel about myself.	1	2	3	4	5	6	7
2. I feel good about other people who share my sexual orientation.	1	2	3	4	5	6	7
3. Overall, people of my sexual orientation are considered good by others.	1	2	3	4	5	6	7
4. In general, my sexual orientation is an important part of my self-image.	1	2	3	4	5	6	7
5. I am happy that I am of my sexual orientation.	1	2	3	4	5	6	7
6. I feel that people who share my sexual orientation have made	1	2	3	4	5	6	7

major accomplishments and advancements.							
7. My destiny is tied to the destiny of other people who share my sexual orientation.	1	2	3	4	5	6	7
8. My sexual orientation is unimportant to my sense of what kind of person I am.	1	2	3	4	5	6	7
9. In general, others respect people of my sexual orientation.	1	2	3	4	5	6	7
10. Most people consider people of my sexual orientation, on average, to be more ineffective than other people.	1	2	3	4	5	6	7
11. I have a strong sense of belonging to people who share my sexual orientation.	1	2	3	4	5	6	7
12. I often regret my sexual orientation.	1	2	3	4	5	6	7
13. I have a strong attachment to other people of my sexual orientation.	1	2	3	4	5	6	7

14. My sexual orientation is an important reflection of who I am.	1	2	3	4	5	6	7
15. My sexual orientation is not a major factor in my social relationships.	1	2	3	4	5	6	7
16. People of my sexual orientation are not respected by the broader society.	1	2	3	4	5	6	7
17. In general, other groups view people of my sexual orientation in a positive manner.	1	2	3	4	5	6	7
18. I am proud of my sexual orientation.	1	2	3	4	5	6	7
19. I feel that the community of people with my sexual orientation has made valuable contributions to this society.	1	2	3	4	5	6	7
20. Society views people of my sexual orientation as an asset.	1	2	3	4	5	6	7

IP-IP-N (Lab)

Please rate how well each of the following statements describes you using the scale below:

1 = Very Inaccurate

2 = Moderately Inaccurate

3 = Neither Inaccurate nor Accurate

4 = Moderately Accurate

5 = Very Accurate

_____ 1. I often feel blue.

_____ 2. I dislike myself.

_____ 3. I am often down in the dumps.

_____ 4. I seldom feel blue.

_____ 5. I have frequent mood swings.

_____ 6. I feel comfortable with myself.

_____ 7. I rarely get irritated.

_____ 8. I am not easily bothered by things.

_____ 9. I panic easily.

_____10. I am filled with doubts about things.

_____ 11. I am very pleased with myself.

_____ 12. I feel threatened easily.

_____ 13. I am relaxed most of the time.

_____ 14. I seldom get mad.

_____ 15. I am not easily frustrated.

_____ 16. I get stressed out easily.

_____ 17. I fear for the worst.

_____ 18. I remain calm under pressure.

_____ 19. I rarely lose my composure.

_____ 20. I worry about things.

PTCI (Lab)

We are interested in the kind of thoughts which you may have had after a stressful or traumatic life experience. Stressful or traumatic life experiences may include events in which you were at risk of serious bodily injury or death, events in which you witnessed someone at risk of serious bodily injury or death, the sudden and unexpected loss of someone close to you, times when you felt threatened by a person or situation, sudden or dramatic life changes, or other experiences that you found highly stressful.

Please select the life experience which you found *most* stressful and which *still bothers you*, and complete the survey in reference to that experience. When you are done with the survey, please turn the last page over and write a brief description (2-3 sentences is okay) of the experience.

Please read each statement carefully and tell us how much you AGREE or DISAGREE with each statement. People react to these events in many different ways. There are no right or wrong answers to these statements.

1 Totally Disagree

2 Disagree Very Much

3 Disagree Slightly

4 Neutral

5 Agree Slightly

6 Agree Very Much

7 Totally Agree

_____ 1. The event happened because of the way I acted.

_____ 2. I can't trust that I will do the right thing.

_____ 3. I am a weak person.

_____ 4. I will not be able to control my anger and will do something terrible.

_____ 5. I can't deal with even the slightest upset.

_____ 6. I used to be a happy person but now I am always miserable.

_____ 7. People can't be trusted.

_____ 8. I have to be on guard all the time.

_____ 9. I feel dead inside.

_____ 10. You can never know who will harm you.

_____ 11. I have to be especially careful because you never know what can happen next.

_____ 12. I am inadequate.

_____ 13. I will not be able to control my emotions, and something terrible will happen.

_____ 14. If I think about the event, I will not be able to handle it.

_____ 15. The event happened to me because of the sort of person I am.

_____ 16. My reactions since the event mean that I am going crazy.

_____ 17. I will never be able to feel normal emotions again.

_____ 18. The world is a dangerous place.

_____ 19. Somebody else would have stopped the event from happening.

_____ 20. I have permanently changed for the worse.

_____ 21. I feel like an object, not a person.

_____ 22. Somebody else would not have gotten into this situation.

_____ 23. I can't rely on other people.

_____ 24. I feel isolated and set apart from others.

_____ 25. I have no future.

_____ 26. I can't stop bad things from happening to me.

_____ 27. People are not what they seem.

_____ 28. My life has been destroyed by the trauma.

_____ 29. There is something wrong with me as a person.

_____ 30. My reactions since the event show that I am a lousy coper.

_____ 31. There is something about me that made the event happen.

_____ 32. I will not be able to tolerate my thoughts about the event, and I will fall apart.

_____ 33. I feel like I don't know myself anymore.

_____ 34. You never know when something terrible will happen.

_____ 35. I can't rely on myself.

_____ 36. Nothing good can happen to me anymore.

PVQ (Lab)

For the questions below, please consider how many times you have had the following experiences *in your life*. If you are not sure, please give your best estimate. Please answer using numbers rather than phrases; that is to say, please estimate the *number* (0, 3, 4, 10, etc.) rather than saying "a few," "many," etc.

1. How many times have you been **verbally insulted** (yelled at, mocked, criticized) because you were, *or were thought to be*, lesbian, gay, or bisexual?

   Number: _____

   How many times has this occurred in the past year?

   Number: _____

   How many times has this occurred in the past month?

   Number: _____

2. How many times have you been **threatened with physical violence** because you were, or were thought to be, lesbian, gay, or bisexual?

   Number: _____

   How many times has this occurred in the past year?

   Number: _____

   How many times has this occurred in the past month?

   Number: _____

3. How many times have you **had an object thrown at you** because you were, or were thought to be, lesbian, gay, or bisexual?

   Number: _____

   How many times has this occurred in the past year?

Number: _____

How many times has this occurred in the past month?

Number: _____

4. How many times have you been **punched, kicked, or beaten** because you were, or were thought to be, lesbian, gay, or bisexual?

Number: _____

How many times has this occurred in the past year?

Number: _____

How many times has this occurred in the past month?

Number: _____

5. How many times have you been **threatened with a knife, gun, or other weapon** because you are, or were thought to be, lesbian, gay, or bisexual?

Number: _____

How many times has this occurred in the past year?

Number: _____

How many times has this occurred in the past month?

Number: _____

6. How many times have you been **attacked sexually** (forced to have a sexual experience, raped) because you are, or were thought to be, lesbian, gay, or bisexual?

Number: _____

How many times has this occurred in the past year?

Number: _____

How many times has this occurred in the past month?

Number: _____

APPENDIX C

Figures for Confirmatory Analysis of the Structure of the WAQ

Figure 8.

CFA model for the World Assumptions Questionnaire

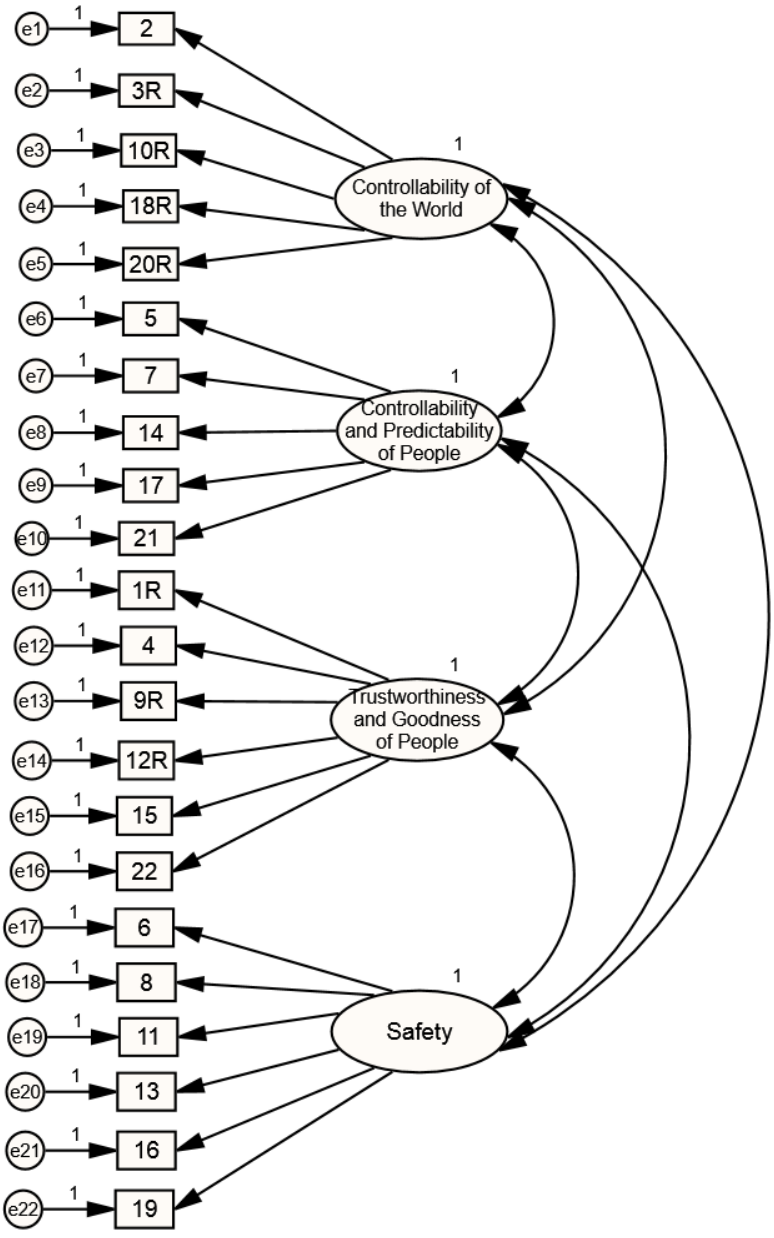


Figure 9.

Standardized Estimates for the World Assumptions Questionnaire within the Full Sample (N = 60)

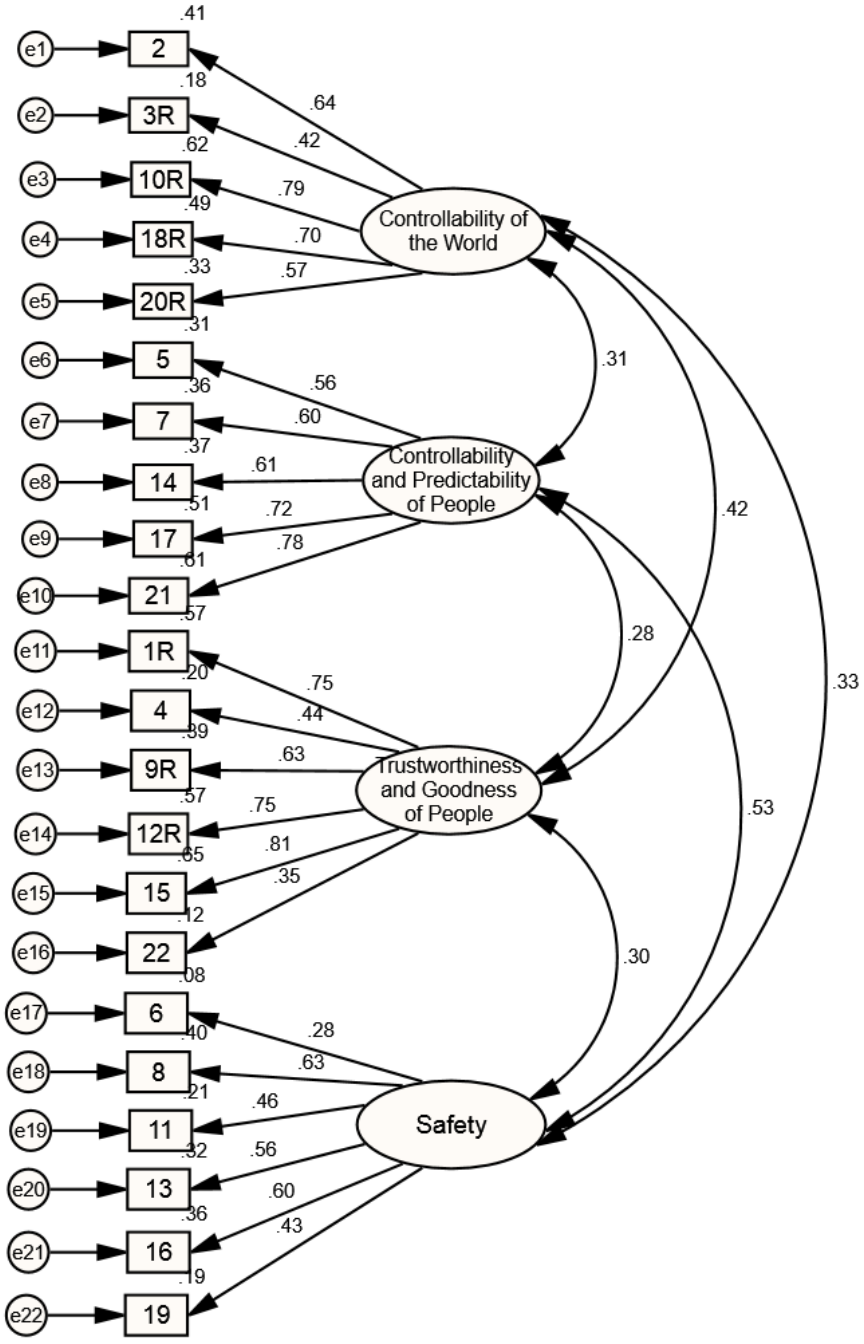


Figure 10.

Standardized Estimates for the World Assumptions Questionnaire within the LGB Sample (N = 28)

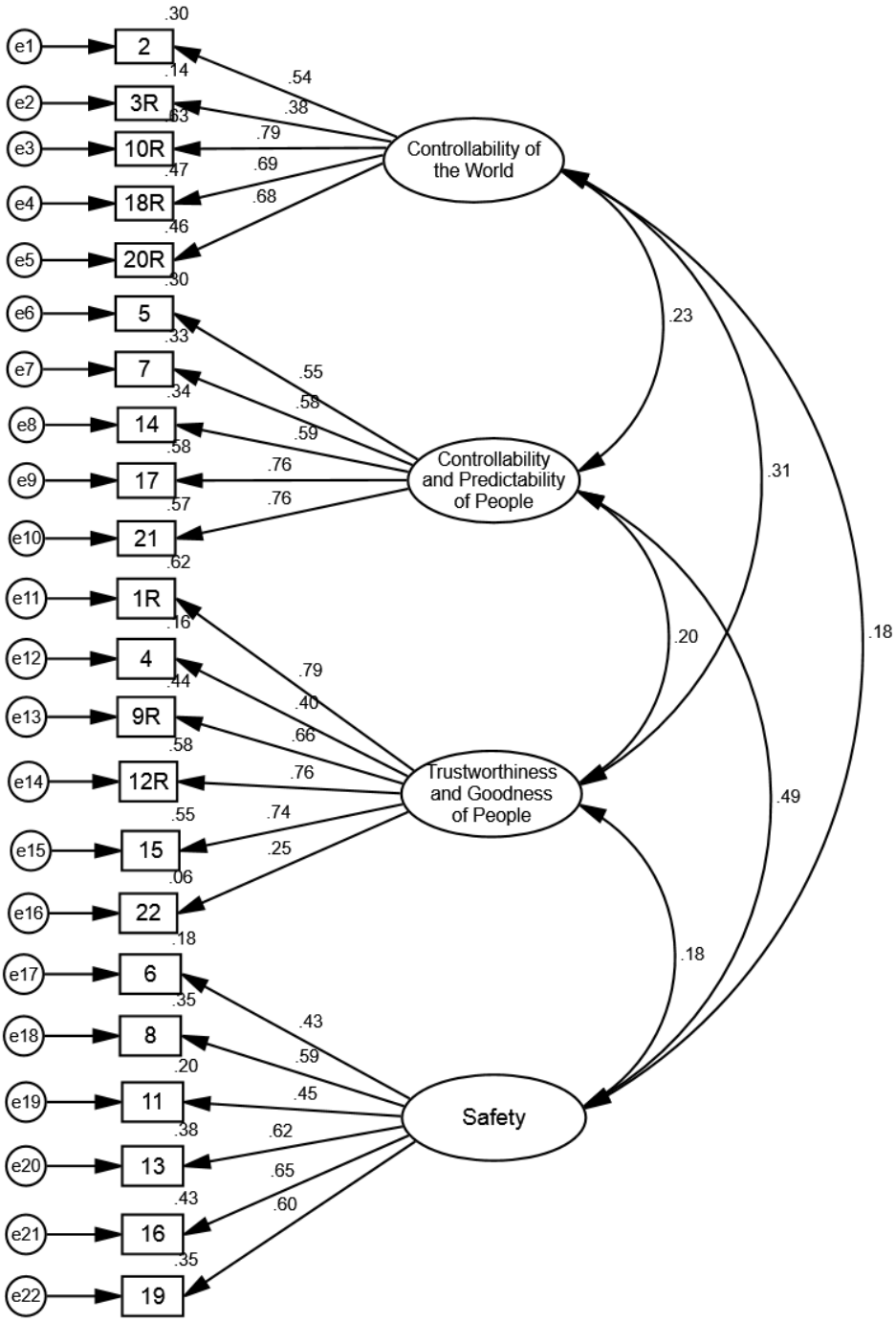
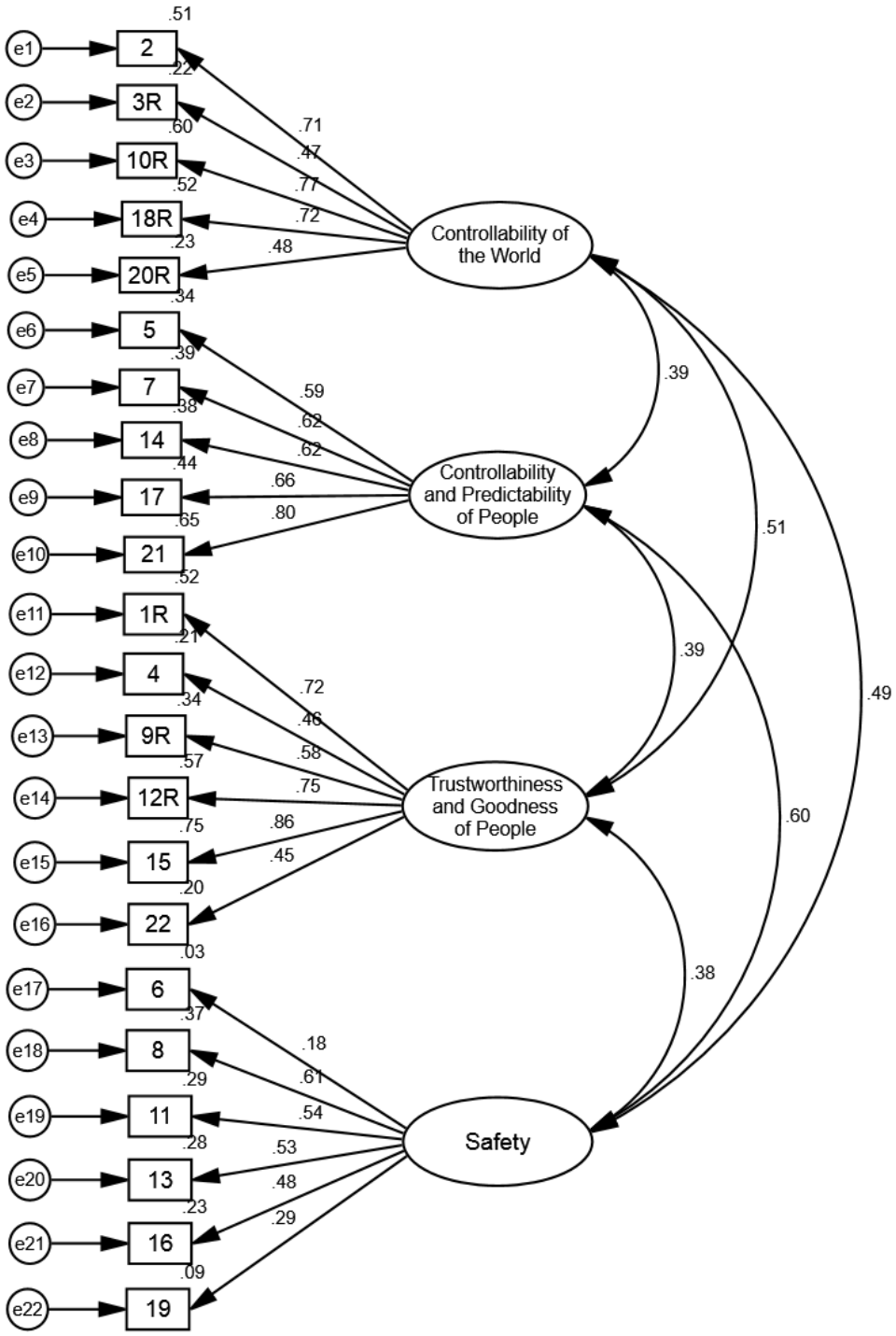


Figure 11.

Standardized Estimates for the World Assumptions Questionnaire within the Heterosexual Sample (N = 32)



APPENDIX D

Supplemental Tables for Main Variables of Interest

Descriptive Statistics

Table 16.

Means, Standard Deviations, and Ranges of Values for Skin Conductance Level (SCL), by Group (N = 60)

	Heterosexual		LGB	
Variable	*M (SD)*	Range	*M (SD)*	Range
Average SCL				
Neutral	51.15 (7.59)	38.73-61.55	46.24 (7.94)	38.46-61.43
General Threat	46.68 (7.98)	38.48-61.48	53.33 (7.91)	38.60-61.49
Bias Threat	52.17 (8.22)	38.47-61.52	50.42 (7.45)	38.86-61.49

Table 17.

Means, Standard Deviations, and Ranges of Values for Startle Reflex EMG, by Group (N = 57)

	Heterosexual ($N = 30$)		LGB ($N = 27$)	
Variable	*M (SD)*	Range	*M (SD)*	Range
Startle EMG				
Inter-trial Interval	53.90 (9.28)	37.33-64.77	51.26 (9.50)	37.29-64.88
Neutral	48.97 (7.10)	38.53-63.85	47.78 (6.56)	37.18-63.11
General Threat	50.95 (8.79)	36.60-63.59	50.60 (8.09)	38.24-64.96
Bias Threat	46.18 (7.97)	35.32-62.63	50.35 (10.26)	35.48-64.98

Table 18.

Means, Standard Deviations, and Observed Ranges of Values for Subjective Affective Responses, by Group (N = 60)

	Heterosexual ($N = 32$)		LGB ($N = 28$)	
Variable	*M (SD)*	Range	*M (SD)*	Range
Neutral				
Arousal	3.06 (1.44)	1.00-6.40	3.56 (1.32)	1.40-6.00
Valence	5.79 (1.13)	2.20-8.60	5.47 (.68)	3.00-7.00
Dominance	4.96 (1.97)	1.20-9.00	5.09 (1.11)	1.20-7.40
Warmth	5.83 (1.15)	2.00-7.40	5.61 (.87)	3.40-7.40
General Threat				
Arousal	4.65 (1.58)	1.33-6.67	5.02 (1.13)	2.33-7.33
Valence	3.74 (1.30)	1.33-7.00	3.56 (.75)	2.00-5.00
Dominance	4.65 (1.46)	1.67-9.00	4.56 (.87)	2.33-6.00
Warmth	4.42 (1.22)	1.67-6.33	4.32 (1.27)	2.00-7.33
Bias Threat				
Arousal	4.97 (1.96)	1.00-8.00	6.29 (1.38)	3.33-8.33
Valence	3.26 (1.43)	1.00-7.00	2.30 (.80)	1.00-4.00
Dominance	4.63 (1.66)	1.33-9.00	3.74 (1.37)	1.67-6.33
Warmth	4.49 (1.60)	1.00-8.00	3.80 (1.99)	1.33-9.00

Table 19.

Means, Standard Deviations, and Observed Ranges of Values for Pre- and Post-Task PTCI Negative Cognitions about the World, by Group (N = 60)

	Heterosexual		LGB	
Variable	*M (SD)*	Range	*M (SD)*	Range

Table 19 (cont'd)

Neg. Cognitions				
Pre-Task	4.29 (0.70)	3.00-5.29	4.63 (0.77)	3.43-6.71
Post-Task	4.03 (0.89)	1.86-5.71	4.25 (0.78)	2.29-5.43

Table 20.

Means, Standard Deviations, and Observed Ranges of Values for Sexual Orientation Centrality, Private Regard, and Public Regard (N = 60)

	Heterosexual		LGB			
Variable	*M (SD)*	Range	*M (SD)*	Range	*t*(*p*)	*d*
Centrality	3.81 (0.96)	2.00-5.38	3.50 (1.08)	1.00-5.50	1.18 (.24)	.31
Private Regard	5.56 (1.01)	3.00-7.00	5.15 (0.97)	3.17-7.00	1.59 (.12)	.41
Public Regard	5.64 (1.01)	2.67-7.00	3.64 (1.26)	2.00-6.50	6.83 (<.01)	1.77

Table 21.

Correlations between Average Skin Conductance Level (SCL) and Startle Reflex EMG across Clip Conditions in the LGB Subsample (in Plain Text; N = 27) and Heterosexual Subsample (in Bold; N = 30)

	1	2	3	4	5	6
1. Neutral SCL	-	-.56*	-.47*	.25	.04	-.08
2. GT SCL	**-.44***	-	-.47*	.02	.15	.04
3. Bias SCL	**-.49***	**-.56***	-	-.28	-.21	.04
4. Neutral Startle	**.04**	**.00**	**-.04**	-	-.02	-.23
5. GT Startle	**.08**	**-.29**	**.20**	**-.06**	-	-.55*
6. Bias Startle	**-.14**	**.14**	**-.01**	**-.43***	**-.35**	-

*$p < .05$

Table 22.

Correlations between Average Skin Conductance Level (SCL) and Subjective Ratings of Arousal across Clip Conditions in the LGB Subsample (in Plain Text; N = 28) and Heterosexual Subsample (in Bold; N = 32)

	1	2	3	4	5	6
1. Neutral SCL	-	-.56*	-.47*	.33	-.25	-.46*
2. GT SCL	**-.44***	-	-.47*	-.36	.08	.15
3. Bias SCL	**-.49***	**-.56***	-	.03	.17	.33
4. Neutral Arousal	**-.24**	**-.06**	**.27**	-	.33	.18
5. GT Arousal	**-.03**	**-.15**	**.18**	**.49***	-	.41*
6. Bias Arousal	**.18**	**.01**	**-.17**	**.32**	**.63***	-

*$p < .05$

Table 23.

Correlations between Average Skin Conductance Level (SCL) and Subjective Ratings of Affect Valence across Clip Conditions in the LGB Subsample (in Plain Text; N = 28) and Heterosexual Subsample (in Bold; N = 32)

	1	2	3	4	5	6
1. Neutral SCL	-	-.56*	-.47*	.22	.44*	.28
2. GT SCL	**-.44***	-	-.47*	-.08	-.22	.07
3. Bias SCL	**-.49***	**-.56***	-	-.15	-.24	-.37
4. Neutral Valence	**.02**	**.04**	**-.06**	-	.47*	.17
5. GT Valence	**-.25**	**.17**	**.07**	**.01**	-	.58*
6. Bias Valence	**-.18**	**.04**	**.12**	**-.02**	**.82***	-

*$p < .05$

Table 24.

Correlations between Average Skin Conductance Level (SCL) and Subjective Ratings of Dominance across Clip Conditions in the LGB Subsample (in Plain Text; N = 28) and Heterosexual Subsample (in Bold; N = 32)

	1	2	3	4	5	6
1. Neutral SCL	-	-.56*	-.47*	.13	.13	.07
2. GT SCL	**-.44***	-	-.47*	-.20	-.05	.35
3. Bias SCL	**-.49***	**-.56***	-	.07	-.09	-.44*
4. Neutral Dominance	**.10**	**.20**	**-.29**	-	.35	-.27
5. GT Dominance	**.14**	**.01**	**-.14**	**.45***	-	.37
6. Bias Dominance	**.20**	**-.12**	**-.08**	**.39***	**.84***	-

*$p < .05$

Table 25.

Correlations between Average Skin Conductance Level (SCL) and Subjective Ratings of Interpersonal Warmth across Clip Conditions in the LGB Subsample (in Plain Text; N = 28) and Heterosexual Subsample (in Bold; N = 32)

	1	2	3	4	5	6
1. Neutral SCL	-	-.56*	-.47*	.28	.17	.13
2. GT SCL	**-.44***	-	-.47*	-.05	-.08	.05
3. Bias SCL	**-.49***	**-.56***	-	-.25	-.10	-.19
4. Neutral Warmth	**.08**	**-.01**	**-.06**	-	.04	-.23
5. GT Warmth	**-.23**	**.15**	**.07**	**-.09**	-	.78*
6. Bias Warmth	**.02**	**-.13**	**.11**	**-.05**	**.53***	-

*$p < .05$

Table 26.

Correlations between Average Skin Conductance Level (SCL) across Clip Conditions and Pre- to Post-task PTCI Negative Cognitions about the World Subscale Scores in the LGB Subsample (in Plain Text; N = 28) and Heterosexual Subsample (in Bold; N = 32)

	1	2	3	4	5	6
1. Neutral SCL	-	-.56*	-.47*	-.11	.21	.46*
2. GT SCL	**-.44***	-	-.47*	-.21	-.41*	-.29
3. Bias SCL	**-.49***	**-.56***	-	.34	.21	-.18
4. Pre-Task PTCI	**-.13**	**.14**	**-.01**	-	.75*	-.33
5. Post-Task PTCI	**.12**	**.12**	**-.23**	**.72***	-	-.38*
6. Change in PTCI	**.31**	**.02**	**-.31**	**-.11**	**.62***	-

*$p < .05$

Table 27.

Correlations between Startle Reflex EMG and Subjective Ratings of Arousal across Clip Conditions in the LGB Subsample (in Plain Text; N = 27) and Heterosexual Subsample (in Bold; N = 30)

	1	2	3	4	5	6
1. Neutral Startle	-	-.02	-.23	.03	-.22	-.19
2. GT Startle	**-.06**	-	-.55*	.09	.25	.13
3. Bias Startle	**-.43***	**-.35**	-	-.10	.18	-.13
4. Neutral Arousal	**-.05**	**.01**	**-.35**	-	.33	.18
5. GT Arousal	**-.16**	**.26**	**-.27**	**.49***	-	.41*
6. Bias Arousal	**.07**	**-.05**	**-.13**	**.32**	**.63***	-

*$p < .05$

Table 28.

Correlations between Startle Reflex EMG and Subjective Ratings of Affect Valence across Clip Conditions in the LGB Subsample (in Plain Text; N = 27) and Heterosexual Subsample (in Bold; N = 30)

	1	2	3	4	5	6
1. Neutral Startle	-	-.02	-.23	-.13	.16	-.16
2. GT Startle	**-.06**	-	-.55*	.05	.20	.33
3. Bias Startle	**-.43***	**-.35**	-	.06	-.11	.22
4. Neutral Valence	**.09**	**.12**	**.18**	-	.47*	.17
5. GT Valence	**-.38***	**.04**	**.18**	**.01**	-	.58*
6. Bias Valence	**-.32**	**.05**	**.12**	**-.02**	**.82***	-

*$p < .05$

Table 29.

Correlations between Startle Reflex EMG and Subjective Ratings of Dominance across Clip Conditions in the LGB Subsample (in Plain Text; N = 27) and Heterosexual Subsample (in Bold; N = 30)

	1	2	3	4	5	6
1. Neutral Startle	-	-.02	-.23	.18	-.27	-.09
2. GT Startle	**-.06**	-	-.55*	-.14	-.07	.03
3. Bias Startle	**-.43***	**-.35**	-	-.13	.10	.16
4. Neutral Dominance	**-.40***	**-.13**	**.30**	-	.35	-.27
5. GT Dominance	**-.02**	**-.29**	**.04**	**.45***	-	.37
6. Bias Dominance	**.05**	**-.27**	**-.10**	**.39***	**.84***	-

*$p < .05$

Table 30.

Correlations between Startle Reflex EMG and Subjective Ratings of Interpersonal Warmth across Clip Conditions in the LGB Subsample (in Plain Text; N = 27) and Heterosexual Subsample (in Bold; N = 30)

	1	2	3	4	5	6
1. Neutral Startle	-	-.02	-.23	-.14	-.20	-.20
2. GT Startle	**-.06**	-	-.55*	.29	.14	-.06
3. Bias Startle	**-.43***	**-.35**	-	-.07	-.36	-.18
4. Neutral Warmth	**.28**	**-.03**	**.10**	-	.04	-.23
5. GT Warmth	**-.05**	**.01**	**.10**	**-.09**	-	.78*
6. Bias Warmth	**.17**	**.02**	**-.19**	**-.05**	**.53***	-

*$p < .05$

Table 31.

Correlations between Startle Reflex EMG across Clip Conditions and Pre- to Post-task PTCI Negative Cognitions about the World Subscale Scores in the LGB Subsample (in Plain Text; N = 27) and Heterosexual Subsample (in Bold; N = 30)

	1	2	3	4	5	6
1. Neutral Startle	-	-.02	-.23	-.19	.15	.47*
2. GT Startle	**-.06**	-	-.55*	-.29	-.22	.08
3. Bias Startle	**-.43***	**-.35**	-	.23	-.07	-.41*
4. Pre-Task PTCI	**.11**	**.06**	**-.21**	-	.75*	-.33
5. Post-Task PTCI	**-.07**	**.00**	**-.22**	**.72***	-	-.38*
6. Change in PTCI	**-.23**	**-.06**	**-.08**	**-.11**	**.62***	-

*$p < .05$

Table 32.

Correlations between Subjective Ratings of Arousal across Clip Conditions and Pre- to Post-task PTCI Negative Cognitions about the World Subscale Scores in the LGB Subsample (in Plain Text; N = 28) and Heterosexual Subsample (in Bold; N = 32)

	1	2	3	4	5	6
1. Neutral Arousal	-	.33	.18	.04	.07	.04
2. GT Arousal	**.49***	-	.41*	-.09	-.28	-.27
3. Bias Arousal	**.32**	**.63***	-	.07	-.11	-.25
4. Pre-Task PTCI	**-.11**	**.12**	**-.14**	-	.75*	-.33
5. Post-Task PTCI	**.06**	**.10**	**.02**	**.72***	-	-.38*
6. Change in PTCI	**.22**	**.00**	**.18**	**-.11**	**.62***	-

*$p < .05$

Table 33.

Correlations between Subjective Ratings of Affect Valence across Clip Conditions and Pre- to Post-task PTCI Negative Cognitions about the World Subscale Scores in the LGB Subsample (in Plain Text; N = 28) and Heterosexual Subsample (in Bold; N = 32)

	1	2	3	4	5	6
1. Neutral Valence	-	.47*	.17	.18	.25	.11
2. GT Valence	**.01**	-	.58*	.05	.29	.34
3. Bias Valence	**-.02**	**.82***	-	-.26	-.26	-.01
4. Pre-Task PTCI	**.06**	**-.08**	**.01**	-	.75*	-.33
5. Post-Task PTCI	**-.05**	**-.01**	**.05**	**.72***	-	-.38*
6. Change in PTCI	**-.13**	**.07**	**.06**	**-.11**	**.62***	-

*$p < .05$

Table 34.

Correlations between Subjective Ratings of Dominance across Clip Conditions and Pre- to Post-task PTCI Negative Cognitions about the World Subscale Scores in the LGB Subsample (in Plain Text; N = 28) and Heterosexual Subsample (in Bold; N = 32)

	1	2	3	4	5	6
1. Neutral Dominance	-	.35	-.27	.14	.32	.26
2. GT Dominance	**.45***	-	.37	.43*	.40*	-.03
3. Bias Dominance	**.39***	**.84***	-	.09	-.11	-.28
4. Pre-Task PTCI	**-.18**	**-.09**	**-.30**	-	.75*	-.33
5. Post-Task PTCI	**.07**	**-.20**	**-.34**	**.72***	-	-.38*
6. Change in PTCI	**.30**	**-.19**	**-.14**	**-.11**	**.62***	-

*$p < .05$

Table 35.

Correlations between Subjective Ratings of Interpersonal Warmth across Clip Conditions and Pre- to Post-task PTCI Negative Cognitions about the World Subscale Scores in the LGB Subsample (in Plain Text; N = 28) and Heterosexual Subsample (in Bold; N = 32)

	1	2	3	4	5	6
1. Neutral Dominance	-	.04	-.23	.03	.17	.19
2. GT Dominance	**-.09**	-	.78*	.20	.28	.11
3. Bias Dominance	**-.05**	**.53***	-	-.02	.00	.02
4. Pre-Task PTCI	**-.05**	**.08**	**.08**	-	.75*	-.33
5. Post-Task PTCI	**-.06**	**-.05**	**-.15**	**.72***	-	-.38*
6. Change in PTCI	**-.03**	**.16**	**-.30**	**-.11**	**.62***	-

*$p < .05$

Collective Identity Analyses

Table 36.

Results of a 2x3 Mixed Model Repeated Measures Analysis of Covariance Comparing the Interactive Effects of Sexual Orientation Group, Clip Condition, and Collective Identity Variables on Average Skin Conductance Level (N = 60)

	df	*F*	*p*	η_p^2	Power (obs.)
Main effects					
Group	1	2.92	.09	.05	.39
Condition	2	.31	.74	.01	.09
Two-way interactions					
Group*Condition	2	.49	.61	.01	.13
Centrality*Condition	2	.47	.63	.01	.12
Private Reg.* Con.	2	.20	.82	.00	.08
Public Reg.*Con.	2	.29	.75	.01	.07
Three-way interactions					
Group*Centr*Con	2	.15	.87	.01	.07
Group*PubReg*Con	2	.75	.47	.02	.18
Four-way interaction					
Gp*Cent*PubR*Con	4	1.19	.32	.05	.36

Figure 12.

Estimated Marginal Means of Average Skin Conductance Level across Task Conditions and Kinsey Groups, Controlling for Centrality, Private Regard, and Public Regard (N = 60)

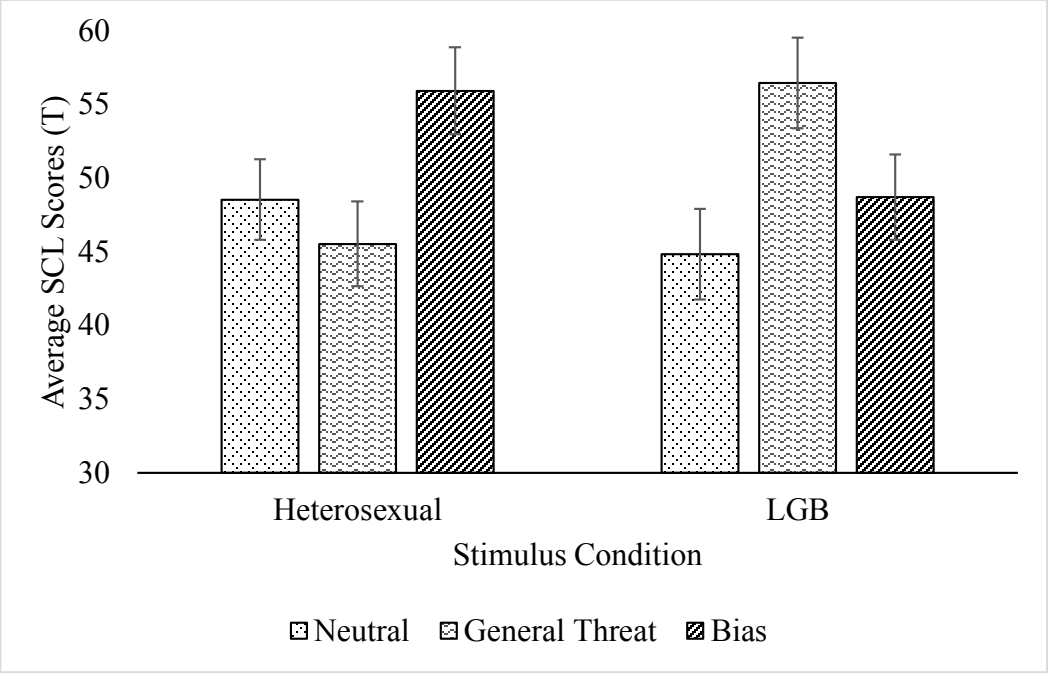


Table 37.

Results of a 2x4 Mixed Model Repeated Measures Analysis of Covariance Comparing the Interactive Effects of Sexual Orientation Group, Clip Condition, and Collective Identity Variables on Startle Eyeblink Reflex Magnitude (N = 57)

	df	*F*	*p*	η_p^2	Power (obs.)
Main effects					
Group	1	.11	.74	.00	.06
Condition	3	.99	.32	.00	.06
Two-way interactions					

Table 37 (cont'd)

Group*Condition	3	2.62	.08	.05	.51
Centrality*Condition	3	2.03	.12	.12	.49
Private Reg.* Con.	3	.56	.65	.04	.16
Public Reg.*Con.	3	2.16	.11	.12	.52
Three-way interactions					
Group*Centr*Con	3	.97	.42	.06	.24
Group*PubReg*Con	3	1.27	.30	.08	.32
Four-way interaction					
Gp*Cent*PubR*Con	6	1.16	.33	.07	.44

Figure 13.

Estimated Marginal Means of Startle Reflex Magnitude across Task Conditions and Kinsey Groups, Controlling for Centrality, Private Regard, and Public Regard (N = 57)

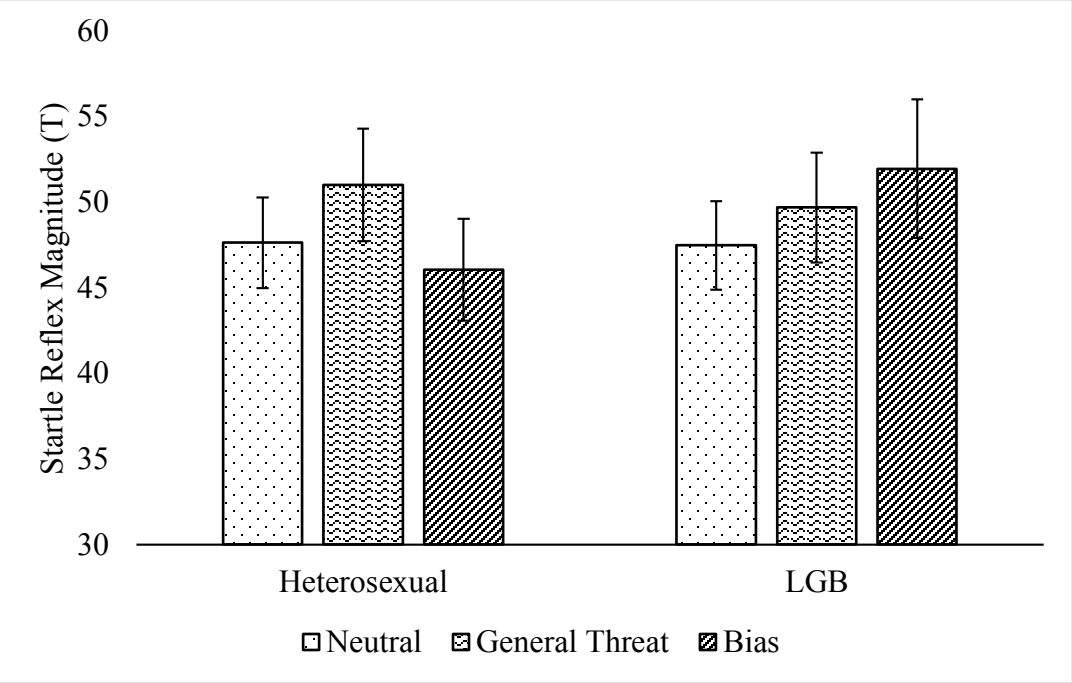


Table 38.

Results of a 2x3 Mixed Model Repeated Measures Analysis of Covariance Comparing the Interactive Effects of Sexual Orientation Group, Clip Condition, and Collective Identity Variables on Subjective Ratings of Arousal (N = 60)

	df	*F*	*p*	η_p^2	Power (obs.)
Main effects					
Group	1	.03	.87	.00	.05
Condition	1.66	1.20	.30	.02	.23
Two-way interactions					
Group*Condition	1.66	2.27	.11	.04	.41
Centrality*Condition	1.66	2.57	.19	.03	.32
Private Reg.* Con.	1.66	1.37	.39	.02	.19
Public Reg.*Con.	1.66	1.00	.49	.01	.15
Three-way interactions					
Group*Centr*Con	1.66	5.55	.06	.07	.67
Group*PubReg*Con	1.66	4.37	.07	.05	.56
Four-way interaction					
Gp*Cent*PubR*Con	3.31	4.12	.06	.10	.74

Table 39.

Results of a 2x3 Mixed Model Repeated Measures Analysis of Covariance Comparing the Interactive Effects of Sexual Orientation Group, Clip Condition, and Collective Identity Variables on Subjective Affect Valence (N = 60)

	df	*F*	*p*	η_p^2	Power (obs.)
Main effects					
Group	1	.82	.37	.02	.15
Condition	1.41	2.97	.08	.06	.39
Two-way interactions					
Group*Condition	1.41	2.94	.08	.06	.47
Centrality*Condition	1.41	1.99	.16	.04	.34
Private Reg.* Con.	1.41	.43	.58	.01	.11
Public Reg.*Con.	1.41	1.02	.34	.02	.19
Three-way interactions					
Group*Centr*Con	1.41	3.69	.04	.07	.56
Group*PubReg*Con	1.41	2.68	.09	.05	.43
Four-way interaction					
Gp*Cent*PubR*Con	2.83	1.90	.14	.07	.46

Figure 14.

Estimated Marginal Means of Subjective Arousal and Affect Valence Ratings across Task Conditions and Kinsey Groups, Controlling for Centrality, Private Regard, and Public Regard (N = 60)

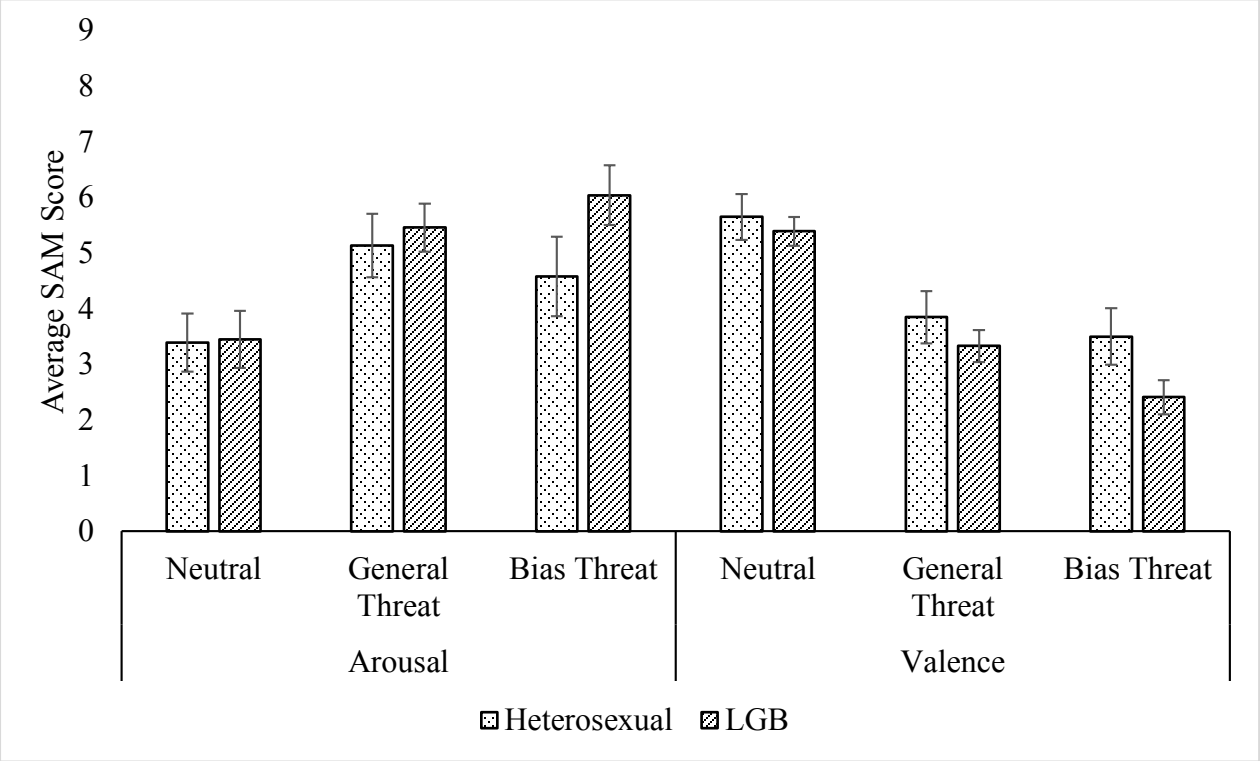


Table 40.

Results of a 2x3 Mixed Model Repeated Measures Analysis of Covariance Comparing the Interactive Effects of Sexual Orientation Group, Clip Condition, and Collective Identity Variables on Subjective Dominance (N = 60)

	df	*F*	*p*	η_p^2	Power (obs.)
Main effects					
Group	1	.29	.59	.01	.08

Table 40 (cont'd)

Condition	1.42	1.80	.18	.03	.31
Two-way interactions					
Group*Condition	1.42	.10	.84	.00	.06
Centrality*Condition	1.42	1.60	.21	.03	.28
Private Reg.* Con.	1.42	1.31	.27	.03	.24
Public Reg.*Con.	1.42	2.24	.13	.04	.37
Three-way interactions					
Group*Centr*Con	1.42	.22	.73	.00	.08
Group*PubReg*Con	1.42	.26	.70	.01	.08
Four-way interaction					
Gp*Cent*PubR*Con	2.83	2.48	.07	.09	.58

Table 41.

Results of a 2x3 Mixed Model Repeated Measures Analysis of Covariance Comparing the Interactive Effects of Sexual Orientation Group, Clip Condition, and Collective Identity Variables on Interpersonal Warmth (N = 60)

	df	*F*	*p*	η_p^2	Power (obs.)
Main effects					
Group	1	3.26	.08	.06	.43
Condition	1.51	.27	.70	.01	.09
Two-way interactions					
Group*Condition	1.51	.02	.95	.00	.05

Table 41 (cont'd)

Centrality*Condition	1.51	.51	.55	.01	.12
Private Reg.* Con.	1.51	.06	.90	.00	.06
Public Reg.*Con.	1.51	.92	.38	.02	.18
Three-way interactions					
Group*Centr*Con	1.51	.12	.83	.00	.07
Group*PubReg*Con	1.51	.14	.82	.00	.07
Four-way interaction					
Gp*Cent*PubR*Con	3.02	1.46	.23	.05	.37

Figure 15.

Estimated Marginal Means of Subjective Dominance and Interpersonal Warmth Ratings across Task Conditions and Kinsey Groups, Controlling for Centrality, Private Regard, and Public Regard (N = 60)

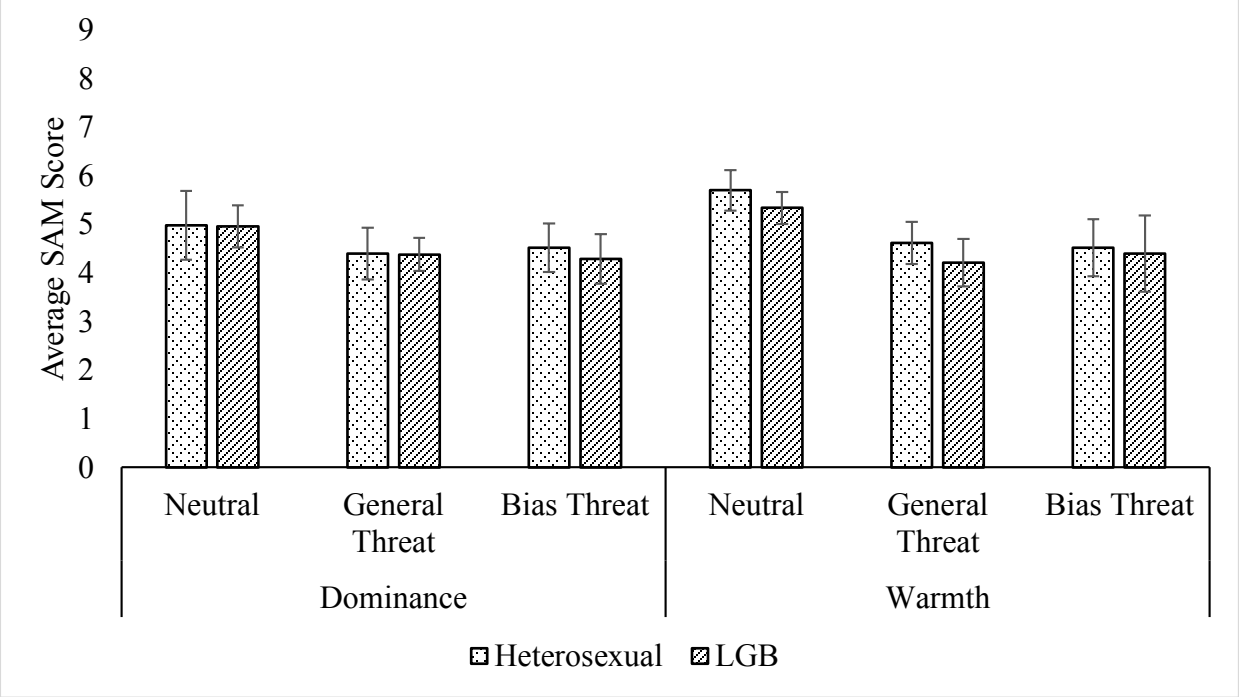


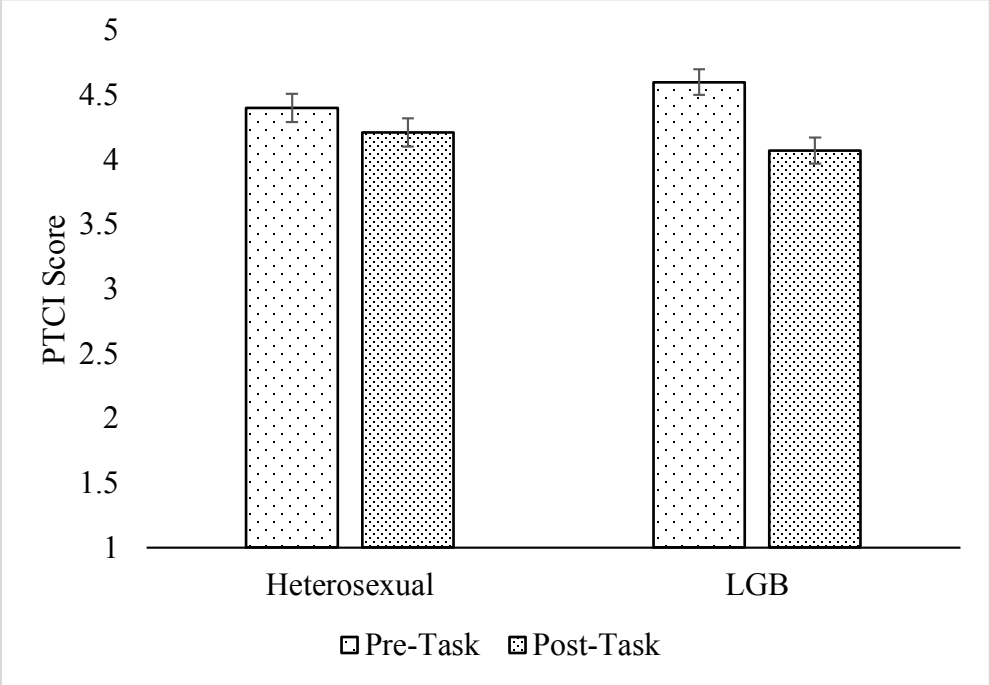
Table 42.

Results of a Mixed Model Repeated Measures Analysis of Covariance Comparing the Interactive Effects of Sexual Orientation Group, Clip Condition, and Collective Identity Variables on Pre-Task to Post-Task PTCI Negative Cognitions about the World Subscale Scores (N = 60)

	df	*F*	*p*	η_p^2	Power (obs.)
Main effects					
Group	1	.50	.48	.01	.11
Time	1	.10	.75	.00	.06
Two-way interactions					
Group*Time	1	.03	.88	.00	.05
. Centrality*Time	1	.02	.89	.00	.05
Private Reg.* Time	1	.61	.44	.01	.12
Public Reg.*Time	1	.06	.82	.00	.06
Three-way interactions					
Group*Centr*Time	1	.01	.92	.00	.05
Group*PubReg*Time	1	.03	.86	.00	.05
Four-way interaction					
Gp*Cent*PubR*Time	2	.27	.76	.01	.09

Figure 16.

Estimated Marginal Means of Pre- and Post-Task PTCI Negative Cognitions about the World Subscale Scores by Kinsey Group, Controlling for Centrality, Private Regard, and Public Regard (N = 60)



APPENDIX E

Supplementary Variables of Interest

Secondary Analyses

Supplementary variables - descriptive data and comparisons.

Descriptive data for supplementary variables are presented in Table 43. T-tests were used to assess whether continuous variable means differed across groups. A chi-square test was used to assess whether past bias victimization (yes/no) frequencies varied across groups. Presence of bias victimization varied across group, with a greater proportion of LGB individuals reporting that had experienced any type of past victimization that they believed to be motivated by bias.

Table 43.

Descriptive Data and Group Comparisons for Supplementary Questionnaire Variables (N = 60)

	Heterosexual *M* (*SD*)	LGB *M* (*SD*)	*t* (df)	*p*	*d*
Neuroticism	2.63 (.63)	2.93 (.72)	-1.76 (58)	.08	.46
Range	1.40-3.80	1.75-4.35			
Sum Life Events	3.16 (2.41)	2.93 (2.11)	.39 (58)	.70	.10
Range	1-17	4-17			
Other PTCI Self	2.20 (.77)	2.40 (1.27)	-.74 (57)	.47	.20
Range	1.05-3.90	1.00-5.62			
Other PTCI World	4.22 (1.06)	4.07 (1.29)	.49 (57)	.63	.13
Range	2.00-6.00	1.14-6.29			
Other PTCI Self-Blame	2.63 (1.14)	2.44 (1.39)	.56 (57)	.58	.15
Range	1.00-4.80	1.00-6.40			

Table 43 (cont'd)

	N (%)	*N* (%)	X^2	*p*	ϕ
Bias Victimization History (Yes/No)	8 (25)	22 (79)	17.14	<.001	.54

Bivariate correlations between secondary variables of interest and average skin conductance level across clip conditions, by sexual orientation group, are presented in Table 44. Some notable interrelations between secondary variables of interest were observed. Within both groups, PTCI subscales were moderately to strongly interrelated, and neuroticism was strongly correlated with negative beliefs about the self and moderately correlated with negative world beliefs. Other stressful life events were only negligibly related to other variables of interest. Groups differed with regard to self-blame following a self-identified past stressful life event, negative beliefs about the self, and bias victimization. Within the LGB sample, self-blame was strongly correlated with neuroticism, whereas no such relation was observed in the heterosexual sample. Having personally experienced bias victimization was weakly correlated with negative beliefs about the self and self-blame in the LGB sample. In the heterosexual sample, bias victimization was moderately positively correlated with neuroticism and negative beliefs about the world, and weakly related to negative beliefs about the self.

Secondary variables of interest were correlated with average SCL (Table 44) as follows: For both groups, neuroticism and PTCI Negative Cognitions about the Self were weakly negatively correlated with SCL during general threat clips. Within the heterosexual sample, no other notable relations were observed. However, within the LGB sample additional relations were observed between average SCL across clip conditions and other-event PTCI subscales. The Negative Cognitions about the Self subscale was weakly positively correlated with average SCL

during bias crime clips. The Negative Cognitions about the World subscale showed a weak positive correlation with SCL during neutral clips, a strong negative correlation with SCL during general threat clips, and a moderate positive correlation with SCL during bias crime clips. Finally, the Self Blame subscale was weakly positively correlated with neutral SCL and weakly negatively correlated with general threat SCL for LGB individuals.

Table 45 presents bivariate correlations between secondary variables of interest and startle reflex magnitude. No shared correlation trends were observed between sexual orientation groups. For the LGB subsample, negative beliefs about the world were moderately negatively correlated with startle reflex magnitude during general threat clips. A weak positive correlation was also observed between the Self-Blame subscale of the PTCI and startle reflex magnitude during neutral clips. For the heterosexual sample, neuroticism and PTCI Negative Cognitions about the Self were weakly negative correlated with startle reflex magnitude during general threat clips. Negative beliefs about the world were weakly negatively correlated with bias startle. Finally, the PTCI Self-Blame subscale was moderately positively correlated with neutral startle and moderately negatively correlated with bias startle.

Tables 46-49 present bivariate correlations between secondary variables of interest and self-rated dimensions of affective response during each clip condition. A number of differences were observed across groups. Some select observations: For heterosexual participants, self-reported arousal was associated negatively with life events (in the bias condition) and self-blame (in the general threat and bias conditions). For LGB participants, arousal in the bias condition was negatively associated with neuroticism and positively associated with bias victimization. For heterosexual participants, stressful life events were positively associated with ratings of affect valence in both threat conditions, while this relationship was negative for the LGB participants.

For LGB participants, negative beliefs about the world were negatively associated with reported valence in the bias condition. Reported dominance in the general threat condition was positively associated with past stressful life events and negatively associated with negative self-cognitions, negative world beliefs, and past bias victimization for the heterosexual group. It was positively associated with negative world beliefs and past bias victimization for the LGB group. Dominance in the bias threat condition was negatively associated with bias victimization for the heterosexual participants, and negatively associated with negative self-cognitions and self-blame for the LGB group. Reported interpersonal warmth in the bias condition was positively associated with stressful life events, negative self-cognitions, and self-blame for heterosexual participants, and negatively associated with past bias victimization for LGB participants.

Finally, Table 50 presents bivariate correlations between additional variables of interest and task-linked PTCI Negative Cognitions about the World subscale scores. For both groups, neuroticism, negative self-cognitions, and self-blame were weakly positively associated with pre-task PTCI scores. Neuroticism was moderately associated with post-task scores for the heterosexual group and strongly associated with post-task scores for the LGB group. Bias victimization was weakly positively associated with post-task PTCI scores for both groups. Within the LGB group, change in PTCI scores was weakly positively associated with neuroticism and self-blame, and moderately positively associated with bias victimization.

Table 44.

Bivariate Correlations between Secondary Variables of Interest and Average Skin Conductance Level across Clip Conditions, within the LGB Subsample (in Plain Text; N = 27) and Heterosexual Subsample (in Bold; N = 30)

	Neuroticism 1		Sum Life Events 2		PTCI Self 3		PTCI World 4		PTCI Blame 5		Bias Victim 6		SCL Neutral 7		SCL Gen. Threat 8		SCL Bias Threat 9	
	r	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*R*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*
1.	-	-	.03	(.88)	.75	(<.01)	.35	(.06)	.49	(<.01)	.20	(.32)	.08	(.70)	-.20	(.32)	.13	(.52)
2.	**.03**	**(.89)**	-	-	-.13	(.52)	.08	(.71)	.12	(.54)	.14	(.47)	.17	(.38)	-.29	(.14)	.12	(.52)
3.	**.53**	**(<.01)**	**-.05**	**(.81)**	-	-	.54	(<.01)	.72	(<.01)	.30	(.12)	.04	(.85)	-.23	(.25)	.20	(.30)
4.	**.32**	**(.08)**	**-.13**	**(.47)**	**.45**	**(.01)**	-	-	.44	(.02)	.23	(.25)	.23	(.24)	-.54	(<.01)	.33	(.09)
5.	**.10**	**(.59)**	**-.18**	**(.34)**	**.51**	**(<.01)**	**.41**	**(.02)**	-	-	.26	(.18)	.22	(.27)	-.24	(.22)	.02	(.91)
6.	**.41**	**(.01)**	**.12**	**(.52)**	**.35**	**(.05)**	**.33**	**(.07)**	**.12**	**(.53)**	-	-	-.00	(.99)	.09	(.63)	-.10	(.62)
7.	**.11**	**(.56)**	**-.18**	**(.33)**	**.10**	**(.58)**	**.07**	**(.70)**	**.03**	**(.87)**	**-.07**	**(.69)**	-	-	-.56	(<.01)	-.47	(.01)
8.	**-.20**	**(.28)**	**.15**	**(.41)**	**-.20**	**(.28)**	**-.12**	**(.53)**	**-.04**	**(.85)**	**-.07**	**(.71)**	**-.44**	**(.01)**	-	-	-.47	(.01)
9.	**.09**	**(.62)**	**.02**	**(.91)**	**.10**	**(.60)**	**.05**	**(.80)**	**.01**	**(.98)**	**.13**	**(.47)**	**-.49**	**(<.01)**	**-.56**	**(<.01)**	-	-

Table 45.

Bivariate Correlations between Secondary Variables of Interest and Average Startle Reflex Magnitude across Clip Conditions, within the LGB Subsample (in Plain Text; N = 28) and Heterosexual Subsample (in Bold; N = 32)

	Neuroticism 1		Sum Life Events 2		PTCI Self 3		PTCI World 4		PTCI Blame 5		Bias Victim 6		Startle Neutral 7		Startle General Threat 8		Startle Bias Threat 9	
	r	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*
1.	-	-	.03	(.88)	.75	(<.01)	.35	(.06)	.49	(<.01)	.20	(.32)	-.10	(.62)	.08	(.68)	-.11	(.60)
2.	**.03**	**(.89)**	-	-	-.13	(.52)	.08	(.71)	.12	(.54)	.14	(.47)	.00	(.99)	.15	(.45)	-.19	(.34)
3.	**.53**	**(<.01)**	**-.05**	**(.81)**	-	-	.54	(<.01)	.72	(<.01)	.30	(.12)	.00	(.99)	-.03	(.88)	-.17	(.34)
4.	**.32**	**(.08)**	**-.13**	**(.47)**	**.45**	**(.01)**	-	-	.44	(.02)	.23	(.25)	-.07	(.74)	-.32	(.10)	-.01	(.97)
5.	**.10**	**(.59)**	**-.18**	**(.34)**	**.51**	**(<.01)**	**.41**	**(.02)**	-	-	.26	(.18)	.22	(.26)	.06	(.77)	-.11	(.60)
6.	**.41**	**(.01)**	**.12**	**(.52)**	**.35**	**(.05)**	**.33**	**(.07)**	**.12**	**(.53)**	-	-	-.07	(.73)	.19	(.34)	-.09	(.64)
7.	**-.12**	**(.53)**	**-.33**	**(.08)**	**.10**	**(.62)**	**.15**	**(.43)**	**.34**	**(.07)**	**-.03**	**(.89)**	-	-	-.02	(.93)	-.23	(.25)
8.	**.33**	**(.07)**	**.14**	**(.45)**	**.18**	**(.36)**	**.01**	**(.96)**	**-.17**	**(.37)**	**.10**	**(.59)**	**-.06**	**(.77)**	-	-	-.55	(<.01)
9.	**-.25**	**(.19)**	**.15**	**(.43)**	**-.26**	**(.17)**	**-.22**	**(.26)**	**-.31**	**(.10)**	**.10**	**(.59)**	**-.43**	**(.02)**	**-.35**	**(.06)**	-	-

Table 46.

Bivariate Correlations between Secondary Variables of Interest and Subjective Ratings of Arousal across Clip Conditions, within the LGB Subsample (in Plain Text; N = 28) and Heterosexual Subsample (in Bold; N = 32)

	Neuroticism 1		Sum Life Events 2		PTCI Self 3		PTCI World 4		PTCI Blame 5		Bias Victim 6		Neutral Arousal 7		GT Arousal 8		Bias Arousal 9	
	r	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*
1.	-	-	.03	(.88)	.75	(<.01)	.35	(.06)	.49	(<.01)	.20	(.32)	-.07	(.74)	-.31	(.11)	-.29	(.13)
2.	**.03**	**(.89)**	-	-	-.13	(.52)	.08	(.71)	.12	(.54)	.14	(.47)	.12	(.56)	.15	(.45)	-.11	(.57)
3.	**.53**	**(<.01)**	**-.05**	**(.81)**	-	-	.54	(<.01)	.72	(<.01)	.30	(.12)	.17	(.39)	-.39	(.04)	-.14	(.48)
4.	**.32**	**(.08)**	**-.13**	**(.47)**	**.45**	**(.01)**	-	-	.44	(.02)	.23	(.25)	.25	(.21)	-.27	(.16)	-.01	(.95)
5.	**.10**	**(.59)**	**-.18**	**(.34)**	**.51**	**(<.01)**	**.41**	**(.02)**	-	-	.26	(.18)	.16	(.42)	-.15	(.44)	-.08	(.68)
6.	**.41**	**(.01)**	**.12**	**(.52)**	**.35**	**(.05)**	**.33**	**(.07)**	**.12**	**(.53)**	-	-	-.07	(.71)	-.02	(.94)	.20	(.32)
7.	**.18**	**(.32)**	**-.05**	**(.81)**	**.01**	**(.96)**	**.13**	**(.48)**	**.18**	**(.33)**	**.06**	**(.75)**	-	-	.33	(.09)	.18	(.37)
8.	**.14**	**(.44)**	**-.10**	**(.58)**	**.06**	**(.76)**	**.15**	**(.42)**	**-.21**	**(.26)**	**-.04**	**(.83)**	**.49**	**(<.01)**	-	-	.41	(.03)
9.	**-.07**	**(.71)**	**-.26**	**(.15)**	**-.12**	**(.54)**	**.15**	**(.43)**	**-.35**	**(.06)**	**-.15**	**(.41)**	**.32**	**(.07)**	**.63**	**(<.01)**	-	-

Table 47.

Bivariate Correlations between Secondary Variables of Interest and Subjective Ratings of Affect Valence across Clip Conditions, within the LGB Subsample (in Plain Text; N = 28) and Heterosexual Subsample (in Bold; N = 32)

	Neuroticism 1		Sum Life Events 2		PTCI Self 3		PTCI World 4		PTCI Blame 5		Bias Victim 6		Neutral Valence 7		GT Valence 8		Bias Valence 9	
	r	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*
1.	-	-	.03	(.88)	.75	(<.01)	.35	(.06)	.49	(<.01)	.20	(.32)	.06	(.76)	.37	(.05)	.15	(.45)
2.	**.03**	**(.89)**	-	-	-.13	(.52)	.08	(.71)	.12	(.54)	.14	(.47)	-.40	(.04)	-.12	(.53)	-.16	(.43)
3.	**.53**	**(<.01)**	**-.05**	**(.81)**	-	-	.54	(<.01)	.72	(<.01)	.30	(.12)	.08	(.68)	.34	(.07)	-.11	(.57)
4.	**.32**	**(.08)**	**-.13**	**(.47)**	**.45**	**(.01)**	-	-	.44	(.02)	.23	(.25)	.25	(.21)	.19	(.34)	-.36	(.06)
5.	**.10**	**(.59)**	**-.18**	**(.34)**	**.51**	**(<.01)**	**.41**	**(.02)**	-	-	.26	(.18)	.12	(.55)	.31	(.11)	-.09	(.64)
6.	**.41**	**(.01)**	**.12**	**(.52)**	**.35**	**(.05)**	**.33**	**(.07)**	**.12**	**(.53)**	-	-	.16	(.42)	.12	(.54)	-.02	(.91)
7.	**-.26**	**(.15)**	**.13**	**(.49)**	**-.58**	**(<.01)**	**-.09**	**(.63)**	**-.34**	**(.07)**	**-.27**	**(.14)**	-	-	.47	(.01)	.17	(.38)
8.	**.02**	**(.93)**	**.55**	**(<.01)**	**-.11**	**(.55)**	**-.10**	**(.61)**	**.12**	**(.53)**	**.10**	**(.59)**	**.01**	**(.97)**	-	-	.58	(<.01)
9.	**-.04**	**(.82)**	**.51**	**(<.01)**	**-.13**	**(.47)**	**-.18**	**(.34)**	**.12**	**(.53)**	**.08**	**(.66)**	**-.02**	**(.90)**	**.82**	**(<.01)**	-	-

Table 48.

Bivariate Correlations between Secondary Variables of Interest and Subjective Ratings of Dominance across Clip Conditions, within the LGB Subsample (in Plain Text; N = 28) and Heterosexual Subsample (in Bold; N = 32)

	Neuroticism 1		Sum Life Events 2		PTCI Self 3		PTCI World 4		PTCI Blame 5		Bias Victim 6		Neutral Dominance 7		GT Dominance 8		Bias Dominance 9	
	r	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*
1.	-	-	.03	(.88)	.75	(<.01)	.35	(.06)	.49	(<.01)	.20	(.32)	.04	(.86)	.20	(.30)	-.05	(.81)
2.	**.03**	**(.89)**	-	-	-.13	(.52)	.08	(.71)	.12	(.54)	.14	(.47)	-.30	(.13)	.12	(.56)	.19	(.34)
3.	**.53**	**(<.01)**	**-.05**	**(.81)**	-	-	.54	(<.01)	.72	(<.01)	.30	(.12)	.19	(.33)	.02	(.92)	-.43	(.02)
4.	**.32**	**(.08)**	**-.13**	**(.47)**	**.45**	**(.01)**	-	-	.44	(.02)	.23	(.25)	.34	(.08)	.40	(.04)	-.24	(.22)
5.	**.10**	**(.59)**	**-.18**	**(.34)**	**.51**	**(<.01)**	**.41**	**(.02)**	-	-	.26	(.18)	.11	(.59)	-.05	(.82)	-.24	(.21)
6.	**.41**	**(.01)**	**.12**	**(.52)**	**.35**	**(.05)**	**.33**	**(.07)**	**.12**	**(.53)**	-	-	-.09	(.66)	.21	(.29)	-.12	(.53)
7.	**-.15**	**(.41)**	**-.08**	**(.67)**	**-.41**	**(.02)**	**-.09**	**(.63)**	**-.19**	**(.31)**	**-.26**	**(.15)**	-	-	.35	(.07)	-.27	(.17)
8.	**-.19**	**(.29)**	**.20**	**(.28)**	**-.31**	**(.10)**	**-.09**	**(.65)**	**.03**	**(.89)**	**-.26**	**(.15)**	**.45**	**(<.01)**	-	-	.37	(.05)
9.	**-.27**	**(.13)**	**.08**	**(.66)**	**-.24**	**(.19)**	**-.20**	**(.29)**	**.11**	**(.55)**	**-.31**	**(.09)**	**.39**	**(.03)**	**.84**	**(<.01)**	-	-

Table 49.

Bivariate Correlations between Secondary Variables of Interest and Subjective Ratings of Interpersonal Warmth across Clip Conditions, within the LGB Subsample (in Plain Text; N = 28) and Heterosexual Subsample (in Bold; N = 32)

	Neuroticism 1		Sum Life Events 2		PTCI Self 3		PTCI World 4		PTCI Blame 5		Bias Victim 6		Neutral Warmth 7		GT Warmth 8		Bias Warmth 9	
	r	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*
1.	-	-	.03	(.88)	.75	(<.01)	.35	(.06)	.49	(<.01)	.20	(.32)	-.02	(.91)	.20	(.32)	.13	(.50)
2.	**.03**	**(.89)**	-	-	-.13	(.52)	.08	(.71)	.12	(.54)	.14	(.47)	-.11	(.57)	.12	(.55)	.01	(.97)
3.	**.53**	**(<.01)**	**-.05**	**(.81)**	-	-	.54	(<.01)	.72	(<.01)	.30	(.12)	-.01	(.95)	.01	(.98)	-.15	(.45)
4.	**.32**	**(.08)**	**-.13**	**(.47)**	**.45**	**(.01)**	-	-	.44	(.02)	.23	(.25)	.12	(.54)	.29	(.13)	-.01	(.97)
5.	**.10**	**(.59)**	**-.18**	**(.34)**	**.51**	**(<.01)**	**.41**	**(.02)**	-	-	.26	(.18)	-.02	(.94)	.01	(.94)	-.14	(.47)
6.	**.41**	**(.01)**	**.12**	**(.52)**	**.35**	**(.05)**	**.33**	**(.07)**	**.12**	**(.53)**	-	-	.32	(.10)	.02	(.93)	-.23	(.24)
7.	**-.36**	**(.04)**	**-.06**	**(.75)**	**-.42**	**(.02)**	**-.03**	**(.87)**	**-.23**	**(.22)**	**-.50**	**(<.01)**	-	-	.04	(.85)	-.23	(.24)
8.	**.11**	**(.56)**	**.50**	**(<.01)**	**-.06**	**(.77)**	**-.01**	**(.96)**	**-.05**	**(.81)**	**.24**	**(.19)**	**-.09**	**(.61)**	-	-	.78	(<.01)
9.	**.03**	**(.89)**	**.26**	**(.15)**	**.20**	**(.28)**	**-.03**	**(.90)**	**.22**	**(.25)**	**-.06**	**(.76)**	**-.05**	**(.80)**	**.53**	**(<.01)**	-	-

Table 50.

Bivariate Correlations between Secondary Variables of Interest and Pre-task Negative Cognitions about the World (PTCI), Post-Task PTCI, and Change in PTCI (Post – Pre), within the LGB Subsample (in Plain Text; N = 28) and Heterosexual Subsample (in Bold; N = 32)

	Neuroticism 1		Sum Life Events 2		PTCI Self 3		PTCI World 4		PTCI Blame 5		Bias Victim 6		Pre-World Cog. 7		Post-World Cog. 8		Change in World Cog. 9	
	r	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*	*r*	*(p)*
1.	-	-	.03	(.88)	.75	(<.01)	.35	(.06)	.49	(<.01)	.20	(.32)	.26	(.19)	.41	(.03)	.23	(.25)
2.	**.03**	**(.89)**	-	-	-.13	(.52)	.08	(.71)	.12	(.54)	.14	(.47)	.11	(.58)	.12	(.54)	.02	(.91)
3.	**.53**	**(<.01)**	**-.05**	**(.81)**	-	-	.54	(<.01)	.72	(<.01)	.30	(.12)	.25	(.20)	.46	(.01)	.31	(.11)
4.	**.32**	**(.08)**	**-.13**	**(.47)**	**.45**	**(.01)**	-	-	.44	(.02)	.23	(.25)	.70	(<.01)	.87	(<.01)	.27	(.17)
5.	**.10**	**(.59)**	**-.18**	**(.34)**	**.51**	**(<.01)**	**.41**	**(.02)**	-	-	.26	(.18)	.24	(.21)	.44	(.02)	.28	(.14)
6.	**.41**	**(.01)**	**.12**	**(.52)**	**.35**	**(.05)**	**.33**	**(.07)**	**.12**	**(.53)**	-	-	.04	(.84)	.25	(.20)	.30	(.12)
7.	**.24**	**(.18)**	**-.02**	**(.90)**	**.24**	**(.20)**	**.74**	**(<.01)**	**.20**	**(.29)**	**.18**	**(.34)**	-	-	.75	(<.01)	-.33	(.08)
8.	**.32**	**(.08)**	**-.07**	**(.70)**	**.28**	**(.12)**	**.84**	**(<.01)**	**.23**	**(.22)**	**.20**	**(.26)**	**.72**	**<.01)**	-	-	.38	(.05)
9.	**.18**	**(.33)**	**-.08**	**(.69)**	**.11**	**(.55)**	**.28**	**(.13)**	**.08**	**(.66)**	**.09**	**(.61)**	**-.11**	**(.56)**	**.62**	**(<.01)**	-	-

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