

Expressive Writing to Cope with Hate Speech: Assessing Psychobiological Stress Recovery and
Forgiveness Promotion for LGBTQ Victims of Hate Speech

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Abstract

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Research has linked hate speech and discrimination to numerous negative physiological and psychological health outcomes (e.g., Williams, Neighbors, & Jackson, 2003; Williams & Mohammed, 2009). Scholars have identified hate speech as a traumatic event for recipients (Jay, 2009), yet few studies have identified successful emotional-coping methods for treating the negative health effects associated with such speech. Research on forgiveness suggests that ruminating and holding grudges can also have negative health effects, whereas increasing forgiveness generally improves physical and psychological health (Witvliet, Ludwig, & Vander Laan, 2001). Because holding grudges and ruminating requires active suppression of negative affect, emotional expression may mobilize forgiving feelings and healthy outcomes for recipients of hate speech (Romero, 2008). The present study examined whether an expressive

writing design could help lesbian, gay, bisexual, or queer (LGBQ) hate speech victims (a) increase forgiveness for offenders, and (b) allay the physiological stress resulting from a recall discussion task in which victims described a hate speech experience in detail. Participants ($N = 46$) were assigned to a benefit-finding, traumatic disclosure writing, or control condition. The findings indicate that expressive writing increased forgiveness and accelerated cortisol recovery. Specifically, benefit-finding helped participants' forgiveness and reduced cortisol levels, whereas traumatic disclosure writing only accelerated cortisol recovery. Analyses of the linguistic features of victims' narratives revealed that the amount of emotion-related words related to cortisol recovery, whereas the greater use of cognitive words was related with forgiveness. Implications for theory, methodological comparison, and future research are discussed.

Keywords: hate speech, discrimination, forgiveness, expressive writing, physiological stress, salivary cortisol, salivary α -amylase, benefit-finding, traumatic disclosure, interpersonal transgression, LIWC.

TABLE OF CONTENTS

	Page
.....	
List of Figures.....	ii
List of Tables.....	iii
Acknowledgments.....	iv
Chapter I:.....	1
Disinhibition theory.....	4
Self-Regulation theory.....	7
Forgiveness.....	9
The Effect of Forgiveness of Psychological Health.....	11
The Effect of Discrimination on the Endocrine and Sympathetic Nervous System.....	16
Direct Effect on Sympathetic Nervous System.....	16
Direct Effect on Sympathetic Hypothalamus Pituitary Axis.....	18
The Effects of Expressive Writing on Physiological Stress Recovery.....	19
Chapter II.....	25
Exclusion Criteria.....	27
Pre Experimental Procedures.....	28
Pre-manipulation Measures and Discussion.....	29
Post-manipulation Measures and Discussion.....	35
Determination of Salivary Biomarkers.....	36
Manipulation Checks.....	38
Measures.....	39
Chapter III.....	40
Manipulation Checks.....	41
Hypotheses & Research Questions.....	47
Forgiveness Outcomes: Baseline to Post Treatment.....	47
Salivary Cortisol and Salivary α -Amylase Recovery: Pre-treatment to Post Treatment.....	51
Chapter IV.....	56
Effects on Forgiveness Promotion Across Experimental Conditions: Evidence for Self-Regulation Theory.....	57
The Effects of the Intervention on HPA and SNS Reactivity.....	60
Limitations and Directions for Future Research.....	62
Conclusion.....	67
References.....	69

LIST OF FIGURES

Figure Number.....	Page
1. Post-treatment Forgiveness by Condition	49
2. Post-treatment Cortisol by Condition	53

LIST OF TABLES

Table Number.....	Page
1. Manipulation Check, Post Recall Discussion Task	42
2. Correlation Table	46
3. ANCOVA Summary, Forgiveness.....	48
4. Adjusted/Unadjusted Means, Forgiveness.....	48
5. ANCOVA Summary, Cortisol	52
6. Adjusted/Unadjusted Means, Cortisol	52

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Expressive Writing to Cope with Hate Speech: Assessing Psychobiological Stress Recovery and Forgiveness Promotion for LGBTQ Victims of Hate Speech

Chapter 1

Lesbian, gay, bisexual, and queer (LGBTQ) individuals experience substantial health risks (Garofalo, Wolf, Wissow, Woods, & Goodman, 1999; Struble, Lindley, Montgomery, Hardin, & Burcin, 2011). Discrimination is considered a leading cause of these health disparities due to the stress that it imposes on members of these communities (Pascoe & Richman, 2009). Messages that convey injustice or unfairness, for instance, are shown to trigger negative stress-related reactions (De Vogli, Brunner, & Marmot, 2007; Tabibnia, Satpute, & Lieberman, 2008). Indeed, meta-analyses on discrimination reveal that the chronic and acute stress associated with perceived discrimination leads to dysregulation of emotional and physiological functioning (Pascoe & Richman, 2009; Williams & Mohammed, 2009).

Persistent stimulation of physiological systems that are responsible for regulating the body's stress responses is associated with poor immune functioning and cardiovascular disease (Boren & Vexsler, 2011; Kiecolt-Glaser, 1999), and studies reveal that LGBTQ populations are at increased risk for cardiovascular disease (Conron, Mimiaga, & Landers, 2010). The linkages between discrimination, stress, and illness have led agencies such as the National Institutes of Health, the Institute of Medicine, and government health initiatives like Healthy People 2020 to call for health interventions that improve LGBTQ individuals' resiliency to discrimination.

The goal of this study was to develop an intervention to help LGBTQ individuals improve their physiological and psychological functioning after recalling the details of an experience in which they were victimized by hate speech directed at their sexual orientation. Hate speech can

be defined as “speech that denigrates a person on the basis of their race or ethnic origin, religion, gender, age, physical condition, disability, sexual orientation, and so forth” (Leets, 2002, p. 342). In contrast to other forms of discrimination (e.g., indirect, covert), hate speech is *direct discrimination*; that is, it refers to messages that, when communicated, inflict harm upon another person’s identity (Leets & Giles, 1997). As such, hate speech is considered to be a traumatic event for recipients (Jay, 2009).

Research on coping with hate speech is scant, though a growing literature suggests that helping recipients of severe interpersonal transgressions find forgiveness for their offenders can reduce physiological stress (Lundahl, Taylor, Stevenson, & Roberts, 2008). Expressive writing about interpersonal transgressions has been associated with forgiveness promotion (Romero, 2008) and reductions in physiological stress (Horan & Booth-Butterfield, 2011). Expressive writing studies, however, have focused almost exclusively on transgressions committed within close personal relationships (e.g., close friends, family members, romantic partners). Forgiveness in close relationships is inherently interpersonal, a process where both victim and offender contribute (Rusbult, Hannon, Stocker, & Finkel, 2007). Given that hate speech often occurs between *non-intimate ties* (e.g., strangers, acquaintances, coworkers), it is more likely that victims need to find *unilateral* forgiveness, which occurs through internal processes (Hammond, Hudson Banks, & Mattis, 2006). It is still unclear whether expressive writing can promote forgiveness for victims of transgressions committed by non-intimate offenders.

This study is intended to further clarify the effects of expressive writing interventions on forgiveness-promotion and adaptive physiological stress responses for LGBTQ individuals who

report having experienced hate speech targeted at their sexual orientation from non-intimate offenders. Specifically, two expressive writing designs that have been hypothesized to promote forgiveness, *benefit-finding* and *traumatic disclosure writing*, are compared, not only in terms of their ability to promote forgiveness in victims, but also in their ability to accelerate the recovery of two biological markers of psychological stress, salivary cortisol and salivary α -amylase. These markers were measured following a recall discussion task in which participants are asked to describe the details of their hate speech experience. The paper begins with an overview of two theoretical frameworks that help explain the positive health effects associated with benefit-finding and traumatic disclosure writing. Then, both expressive writing designs are compared in terms of their ability to promote improved outcomes for three dependent variables: forgiveness, salivary cortisol, and salivary α -amylase.

Expressive Writing

Little dispute exists over whether expressive writing is an effective method of health promotion. Frattaroli's (2006) meta-analysis of 146 expressive writing studies confirmed that expressive writing is effective, with an average r -effect size of .075. Much less consensus exists with respect to why expressive writing works, however, although some theories have garnered more attention than others. Two influential theories that explain the relationship between expressive writing and health are *disinhibition* (Pennebaker & Beall, 1986) and *self-regulation* (King, 2002). The following section will introduce these two theories as well as the expressive writing designs that are most often linked with either framework: traumatic disclosure writing and benefit-finding. These expressive writing designs are compared in the present study in

terms of their ability to promote forgiveness and physiological health for LGBTQ victims of hate speech.

Disinhibition Theory

Studies that examine the effects of expressive writing within a disinhibition framework typically ask participants to confront, in a narrative writing format, the negative emotions they harbor for past traumatic events. This type of expressive writing design is often termed *traumatic disclosure writing*. Writing instructions generally ask participants to “really let go and discuss their deepest thoughts and feelings related to the experience,” and “not to worry about spelling punctuation and grammar” (Crowley, Faw, & Parks, 2012). Topics are often pre-selected by the investigator or, in some cases, participants are asked to more generally “write about the worst thing that has happened to them” (e.g., Greenberg, Wortman, & Stone, 1996). Participants write by hand or computer for 15-25 minutes in solitude. The duration of these interventions can be a single session (Crowley et al., 2012) to multiple sessions over several months (Shim, Capella, & Han, 2011).

The theory of *disinhibition* is the earliest explanation offered to account for the health effects associated with expressive writing. It is based on the idea that unresolved or undisclosed feelings are mentally and physically toxic, and simply releasing these feelings can increase individuals’ overall well-being. The link between emotional inhibition and illness was first hypothesized by Freud (1917/1977) and has since received substantial support. Suppressed expression is linked with depression (Keenan, Hipwell, & Hinz, 2009), binge eating disorder (Dingemans, Martijn, Jansen, & van Furth, 2008), mood disorders (Cambell Sills, Barlow, Brown, & Hofman, 2006), and anxiety (Iwamitsu, Shimoda, Abe, Okawa, & Buck, 2005). Traumatic

disclosure writing is thought to promote health by offering people an opportunity to put their unresolved feelings into words. Many studies have demonstrated the salubrious effects of writing about the negative aspects of traumatic experiences. Findings suggest that traumatic disclosure writing can improve joint functioning for rheumatoid arthritis sufferers (Kelley, Lumley, & Leisen, 1997), decrease hospitalized days for patients suffering with cystic fibrosis (Taylor, Wallander, Anderson, Beasley, & Brown, 2003), and increase immune system functioning (Petrie, Booth, & Pennebaker, 1998).

Despite these findings, the fundamental premise underlying disinhibition theory has received little support in meta-analyses (Frattaroli, 2006). Two research findings, in particular, challenge the idea that simply expressing negative emotion is sufficient to benefit from expressive writing. First, Greenberg, Wortman, and Stone (1996) discovered that asking participants to disclose about an imaginary trauma promoted health benefits comparable to writing about actual trauma. These findings challenged directly the proposition that expressing unresolved emotion is necessary to achieve the benefits of expressive writing, suggesting that it may be another process. Further evidence to dispute the idea that catharsis is the underlying mechanism behind the healing power of expressive writing emerged from studies that discovered how writing about positive experiences could increase participants' well-being. Burton and King (2004) asked participants to write about, for example, the "most wonderful experiences in your life," and discovered health benefits. Similarly, Baikie, Geerligs, and Wilhelm (2012) demonstrated how asking participants to write about the "most intensely positive experience of your entire life" increased psychological and physical health.

So when and how might disinhibition theory be most applicable? Fratarolli's (2006) meta-analysis identified two ingredients that are present within many studies that confirm the central tenets of disinhibition theory: the amount of time that has passed since the traumatic experience occurred, and individuals' history of emotional inhibition.

Frattaroli (2006) predicted that disinhibition would most likely catalyze health benefits in cases where people disclosed about experiences that had occurred a long time ago. Her findings indicated, instead, that the more recent the traumatic event, the larger the effect sizes were for health outcomes. Though Frattaroli did not offer an interpretation for this finding, a possible explanation is that feelings and emotions associated with traumatic events are more malleable shortly after the experience, whereas, left undisclosed, they can become more deeply entrenched in the psyche and body of the victim overtime.

Second, because disinhibition theory rests on the assumption that inhibition is unhealthy, it may be most effective for people who have a history of inhibition. Frattaroli's (2006) meta-analysis did not find support for this hypothesis; however, she only investigated its effects among Asians and men, groups who historically report high inhibiting personalities. Not included in her analysis were studies that test disinhibition theory among non-Asian minority groups. It is well substantiated that people within those minority groups, such as LGBTQ individuals, are disposed towards emotional distress due to high levels of emotional inhibition (Almeida, Johnson, Corliss, Molnar, & Azrael, 2009) and therefore this group might be more likely to experience the benefits of disinhibition.

Two studies have demonstrated the healing power of traumatic disclosure writing for sexual orientation minorities. A study by Lewis, Derlega, Clarke, Kuang, Jacobs, and McElligott

(2005) demonstrated the positive benefits of traumatic disclosure writing for lesbian-related stress. Specifically, these authors found that lesbians who reported high inhibiting personalities experienced reductions in psychological stress, whereas lesbian women who were less inhibiting experienced increased psychological stress. A recent study likewise examined the effects of expressive writing within a disinhibition framework for gay men to determine if disclosing about gay-related thoughts and feelings could encourage health benefits. Those findings indicate that, compared to a control group who wrote objectively, men who expressed their thoughts and feelings related to being gay experienced reduced avoidance and improved health outcomes (Swanbon, Boyce, & Greenberg, 2008). Taken together, it is expected in the present study, that due to generally high levels of concealed expression, LGBTQ individuals who experienced hate speech recently (within two years of their participation) will experience psychological and physiological health benefits from traumatic disclosure writing.

Self-Regulation

As noted previously, research raises the possibility that writing about the positive aspects of a traumatic event, also known as benefit-finding (McCullough, Root, & Cohen, 2006; Romero, 2008; Zechmeister & Romero, 2002), can promote psychological and physical health. This research has focused generally on how writing about the perceived benefits of an interpersonal transgression can help heal wounds, both physical and psychological, that result from relational betrayal and conflict. Participants who wrote about the benefits of marital infidelity, for instance, experienced a decrease in marital and psychological stress while also increasing forgiveness for their partners (Gordon, Baucom, & Snyder, 2004).

A theory of *self-regulation* is often used to explain the effects of benefit-finding. A foundational principle of self-regulation theory is that the act of revising and developing a cogent narrative to explain traumatic events can bring a sense of closure to the matter, allowing individuals to move forward with their lives (King & Miner, 2000). King (2002) described emotion as a feedback system that informs individuals about their mastery and control over life events and future goals. When a traumatic event occurs, it can disturb individuals' sense of control such that goals that had before seemed easily achievable might appear more challenging. King argued that expressive writing allows individuals to self-regulate and make sense of the goal incongruence in more productive ways.

King and Miner (2000) concluded that writing about either the negative or positive aspects of trauma provides participants with an opportunity to regulate their affect; that is, it affords individuals methods by which to obtain positive affect and minimize stress and negative feeling states. Proponents of the benefit-finding approach, however, argue that although traumatic disclosure writing produces similar results, benefit-finding allows participants the opportunity to reap the same rewards of writing but also avoiding the hurt and pain that follows deeply investigating past trauma (McCullough et al., 2006). Given such conflicting explanations, Frattaroli (2006) sought to uncover answers about the relationship between emotional valence (i.e., positivity or negativity) of the writing intervention topic and variances in effect sizes. In her meta-analysis of 56 experimental disclosure studies, she found no significant effect size differences between the expressive disclosures of positive or negative emotion.

A primary outcome of studies that examine benefit-finding through an expressive writing framework is their ability to help victims of interpersonal transgressions find forgiveness for their offenders (Romero, 2008). To date, only one study has looked at the ability for traumatic disclosure writing to improve victims' feelings for non-intimate offenders. This study found traumatic disclosure writing to increase *closeness* for offenders (Harber & Wenberg, 2005). It is still unclear, however, if a traumatic writing design can help victims find forgiveness similar to that shown through the benefit-finding framework. The next section will introduce an operational definition of forgiveness and then offer predictions related to the effect of benefit-finding and traumatic disclosure writing for LGBTQ hate speech victims' forgiveness of their non-intimate offenders.

Forgiveness

Whereas myriad definitions of forgiveness exist, researchers principally disagree about whether forgiving necessarily involves the introduction of positive responses towards an offender. Some scholars view forgiveness as a reduction in negative affect revealed through measures of revenge and avoidance (McCullough, Rachal, Sandage, Worthington, Wade-Brown, & Hight, 1998; McCullough, Root, & Cohen, 2006). Others conceptualize forgiveness as enhanced positive experiences (Fincham, Hall, & Beach, 2005). Along those lines, Subkoviak, Enright, Wu, Gassin, Freedman, Olson, and Sarinopoulos (1995) argued,

In forgiving, a person overcomes resentment toward an offender, but does not deny him/herself the moral right to such resentment. The forgiver tries to have a new stance of benevolence, compassion, and even love toward the offender, even though the latter has no moral right to such a merciful response. (p. 62)

Researchers have begun to argue that, rather than pursuing a comprehensive definition of forgiveness, scholars should adopt a forgiveness framework that accounts for the nature of the transgression committed (Worthington, 2005). Many victims of hate speech, for instance, are unlikely to engage in dialogue with the offender about the offense because of the non-intimate nature of their relationships. Without an opportunity to negotiate any residual hurt feelings through discussion, the introduction of positive responses for the offender may be less likely. At the broadest level, the importance of defining forgiveness within the context of non-intimate relationships must account for the possibility that positive emotions can develop as a result of forgiving; however, they are not necessarily conditions of that forgiveness.

Consistent with Rye, Loiacono, Folck, Olszewski, Heim, and Madia (2001, p. 261), forgiveness is therefore defined in this study as “a response toward an offender that involves letting go of negative affect (e.g., hostility), cognitions (e.g., thoughts of revenge), and behavior (e.g., verbal aggression), and may also involve positive responses toward the offender (e.g., compassion).” This definition is utilized because it is more inclusive of transgressions that occur between non-intimate partners and also assumes that, within non-intimate relationships, a necessary condition for forgiveness is that victims reduce negative affect (Worthington, Van Oyen Witvliet, Pietrini, & Miller, 2007). This assumption is based on previous research that has found the arousal of negative emotions to partially mediate the deleterious effects that interpersonal transgressions have on victims’ psychological and physiological health (Worthington & Scherer, 2004).

The Effect of Forgiveness on Psychological Health

Forgiveness has been shown to improve psychological functioning through the reduction in negative affect. The evidence for this relationship is abundant, as studies find forgiveness to improve life satisfaction, mood, and overall well-being consistently (e.g., Bono, McCullough, & Root, 2007; Breen, Kashdan, Lenser, & Fincham, 2010).

Over the past decade, scholars have sought to develop methods of forgiveness promotion that can be used in both clinical and nonclinical populations. The most successful of these methods are expressive writing interventions (Frattaroli, 2006). Research on the effects of expressive writing for forgiveness promotion is still in its infancy, however, and no study has looked at whether expressive writing can both help recipients of hate speech (a) find forgiveness for their offender, and (b) buffer the negative physical effects associated with hate speech.

Expressive writing studies have typically adopted one of two expressive writing frameworks to promote forgiveness. The first framework reflects a *process approach* (Baskin & Enright, 2004; Waldron & Kelley, 2008) that suggests victims need to first confront their negative emotions for a transgression before they can forgive an offender. The central tenets of the process approach are closely related to those of disinhibition theory such that they both underscore the need for victims to release unresolved emotions before more prosocial responses can be introduced. Harber and Wenberg (2005), for example, had victims engage in a traumatic disclosure writing intervention, in which they expressed thoughts and feelings related to an interpersonal transgression. This finding suggests that, compared to a control group where victims described their offender in an emotionally neutral way (e.g., described their

physical features), confronting negative emotions increased closeness towards the offender, which the authors argued is an “important index of the forgiveness process” (Harber & Wenberg, 2005, p. 735).

The second framework is referred to as a *decisional approach* (Worthington & Scherer, 2004) and reflects the principles of self-regulation theory. Specifically, the decisional approach argues that victims of interpersonal transgressions can achieve forgiveness by finding the benefits that they have gained through the transgression and making a decision to forgive. That is, if victims can pay more attention to the benefits of a transgression, as opposed to potential costs, they may feel that their offenders “owe them smaller debts” (McCullough et al., 2006, p. 888). The focus on making a decision to forgive should encourage hate speech victims to frame their transgression in a more positive manner, facilitating a sense of mastery and control over their ability to cope with such adverse events. Consistent with self-regulation theory, then, this reappraisal should minimize a victim’s desire to seek revenge and/or avoid their offender, both of which are motivations that are known to obstruct forgiveness (McCullough et al., 2006).

Two studies have examined the effects of benefit-finding for victims of interpersonal transgressions and found it to be at least as successful as traumatic disclosure writing for promoting forgiveness (McCullough et al., 2006; Romero, 2008). The victims in these two benefit-finding studies, however, primarily experienced interpersonal transgressions committed in close personal relationships. In the McCullough et al. (2006) study, for instance, the vast majority were romantic partners (52%), friends (28%), relatives (15%), or in another close relationship (4%). Romero’s (2008) offender population also consisted primarily of family members (32.3%), friends (32.3%), or romantic partners (19.4%), whereas non-intimate ties

(authorities, acquaintances, strangers) made up only 15.8% of the sample. As such, it is unclear to what extent the victims in these studies had engaged in dialogue with the offender prior to the study and whether these discussions had allayed some of their negative affect for the offense. Scholars have argued, “forgiveness of strangers or people with whom one does not want nor expect continuing contact is fundamentally different from forgiving a loved one” (Worthington, Witvliet, Pietrini, & Miller, 2007, p. 292). It is therefore important to examine how victims of interpersonal transgressions can find forgiveness for non-intimate offenders.

Furthermore, benefit-finding studies examined a range of interpersonal transgressions (e.g., infidelity, rejection, insults from friends/nonfriend). Studies have shown, however, that victims are likely to respond differently to different interpersonal transgressions, and, thus, collapsing all transgressions under one category may make it difficult to detect important differences about how victims respond to them (Leets, 2002). LGBTQ victims, for instance, tend to adopt passive strategies in response to hate speech (Leets, 2002). LGBTQ victims often view silence as taking a higher moral ground, and victims most often attribute hate speech to offenders’ ignorance, repressed hostility, and social learning or lack thereof (Leets, 2002).

Because reconciliation of the hate speech through discussions with the offender is an unlikely outcome for LGBTQ victims of hate speech, it is critical to examine how victims can find *unilateral forgiveness* for offenders, a process that occurs internally rather than interpersonally with the offender (Hammond, Hudson Banks, & Mattis, 2006). This study offers two sets of predictions for victim’s forgiveness of hate speech. First, victims will increase forgiveness following both expressive writing designs (benefit-finding and traumatic disclosure) compared

to a control group that writes about emotionally neutral material. Hence, the following two hypotheses are offered:

H₁: After recalling a painful experience as a victim of hate speech, engaging in a benefit-finding writing intervention will promote greater forgiveness for their offenders compared to a control group that describes an emotionally neutral topic.

H₂: After recalling a painful experience as a victim of hate speech, engaging in a traumatic disclosure writing intervention will promote greater forgiveness for their offenders compared to a control group that describes an emotionally neutral topic.

Second, based on the theory of self-regulation (King, 2002), it is expected that victims in the benefit-finding condition will report higher forgiveness scores than victims in the traumatic disclosure writing condition. This will occur for two reasons. First, the writing instructions for the benefit-finding condition will influence participants' sense making in ways that promote forgiveness. Victims will be asked to forgive their offender, to take their perspective, and try and empathize with their situation. These instructions should help victims to clarify their feelings about their offenders. As a result, instead of harboring grudges, they may become more pro-socially motivated toward their offender.

Second, it is expected that the benefit-finding writing prompt will encourage more cognitive processing words because it asks participants to develop a rationale to explain why an offender deserves forgiveness, which is arguably a more complex narrative than the traumatic disclosure condition. Cognitive processing words (e.g., cause, know, ought) reflect active thinking and suggest that individuals have developed a coherent narrative about an event (Pennebaker & Chung, 2011). Research on the linguistic features of writing that are

instrumental in finding forgiveness is still in its infancy, however, a study by McCullough et al. (2006) discovered that participants' use of cognitive-processing words mediated the effect of the expressive writing on forgiveness. It is therefore predicted that forgiveness will be partially mediated by the frequency of cognitive words used within the participants' narratives.

Therefore, the following two hypotheses are advanced:

H₃: Victims in the benefit-finding writing intervention will report greater post treatment forgiveness scores than victims in the traumatic disclosure writing intervention or the control condition.

H₄: The frequency of cognitive words used in participants' narratives will partially mediate the effects of benefit-finding on forgiveness.

With respect to the effects of negative and positive emotion words on forgiveness, however, the findings are less clear. One of the few studies that examined the effects of expressive writing on discrimination victims' feelings of forgiveness for their offenders found that a high use of emotion-related words (both positive and negative) predicted increased feelings of closeness (Harber & Wenberg, 2005). The single-item scale (Aron, Aron, & Smollan, 1992) used to assess closeness in Harber and Wenberg's (2005) study, however, could not adequately assess whether victims experienced either or both a reduction of negative affect and introduction of positive responses towards their offenders. There is strong likelihood that forgiveness of non-intimate offenders, for instance, involves only a reduction in victims' negative affect (Worthington, 2005). Although scholars have viewed closeness as an index of forgiveness (McCullough et al., 1998), given these limitations, it is unclear whether the linguistic

features that predicted closeness will also predict forgiveness. Therefore, the following research question is posed:

RQ₁: What effects, if any, will participants' use of emotion-related words have on their feelings of forgiveness for their offender following the discussion recall task?

The Effects of Discrimination on the Endocrine and Sympathetic Nervous System

Studies on discrimination and health suggest that a chief concern for victims of hate speech is to manage the heightened stress that results from these traumatic events (Meyer, 2003). Chronic stress is precursor for numerous diseases and illness; however, not all stress is harmful. Stress researchers generally identify two different types of stress: individual and social stressors (McEwen & Stellar, 1993). Individual stressors are brought about when personal events require individuals to modify their life style practices. The discovery of an act of infidelity by one's romantic partner, for example, is an individual stressor. Social stress, on the other hand, is a term used to describe the stress that emanates from social structures such as norms and institutions. Stress is considered most harmful to health when it is related to events that are perceived to be uncontrollable and unpredictable. Discrimination is one such event and is viewed as a social stressor that can influence health through both a direct and indirect pathway (Pascoe & Richman, 2009).

Direct Effect on Sympathetic Nervous System (SNS) activity

Research suggests that discrimination has a direct effect on individuals' stress response, which, in turn, may increase their susceptibility to disease and illness. The experience of discrimination stimulates biological systems responsible for regulating the body's response to stress. Studies find perceived discrimination to correspond with elevated signals activated

within the sympathetic nervous system (SNS) (see Williams & Mohammed, 2009 for a review). The perception of a stressor stimulates the spinal cord and causes the release of stress hormones, norepinephrine and epinephrine, directly into the blood stream that translate messages about the stressor into physiological output (Boren & Vexsler, 2011). This output can be measured in numerous ways, but researchers have assessed SNS activity traditionally through heart rate, blood glucose, blood flow, and blood pressure activity (Rohleder & Nater, 2009). Increased reactivity in the SNS is associated with coronary heart disease and hypertension.

Perceived discrimination is shown to increase measures of SNS such as heart rate variability (Lampert, Ickovics, Horowitz, & Lee, 2005), systolic and diastolic blood pressure (Richman, Pek, Pascoe, & Bauer, 2010), as well as nocturnal blood pressure (Brondolo, Libby, Denton, Thompson, Beatty, & Schwartz, 2008). Thomas, Nelesen, Malcarne, Ziegler, and Dimsdale (2006), for instance, administered infused phenylephrine, an agent to increase blood pressure, intravenously in their participants to determine if perceived discrimination increased blood pressure sensitivity. Their results suggest that the more discrimination participants reported in their lives, the greater their increase in their blood pressure sensitivity. Given the high rates of discrimination reported in sexual orientation communities, it is not surprising that recent large-scale surveys have discovered increased cardiovascular disease risk among LGBQ individuals (Conron, Mimiaga, & Landers, 2010).

Assessing SNS activation is difficult due to the invasive nature of most measures, however. A less invasive technique shown to assess reliably the psychobiology of stress in SNS activation is measuring salivary α -amylase, a stress hormone produced orally in the mucus.

Secretions of salivary α -amylase follow a diurnal rhythm with low levels in the morning and a steady increase throughout the remainder of the day (.7% increase each hour after waking; Adam, Hoyt, & Granger, 2011). Increases in salivary α -amylase correspond primarily with levels of emotional arousal, and that it responds equally to both positively and negatively valenced emotion (Adam et al., 2011).

Direct Effect on Hypothalamus Pituitary Axis (HPA)

In addition to its effects on the SNS, chronic stress from discrimination can cause allostatic load on the hypothalamus pituitary axis (HPA), a component of the neuroendocrine system responsible for controlling physiological stress levels. During high allostatic load, the body is less resilient to disease (McEwen & Seeman, 1999). One product of HPA activation is the stress hormone cortisol. In addition to its role in aiding metabolic breakdown of fats and proteins, and as a natural anti-inflammatory, cortisol “interacts with other bodily systems such as the cardiovascular system and the SNS in order to mount an adaptive response to various stressors” (Boren & Vexler, 2011, p. 9). Chronic stress is shown to increase levels of salivary free cortisol in the body (Harrell, Hall, & Tariaferro, 2003), and cortisol levels are found to be particularly high when stressors are shown to be either uncontrollable or unpredictable, which is characteristic of experiences with discrimination and hate speech (Pascoe & Richman, 2009). Zeiders, Doana, and Roosa (2012), for instance, found that participants’ levels of perceived discrimination related positively to their cortisol reactivity. Elevated levels of cortisol in the body increase risk for cardiovascular illness and diseases (see Pascoe & Richman, 2009, for a review). Given the direct effect between discrimination and the HPA and SNS, the primary

dependent variables for *physiological* stress in the present study are salivary cortisol and salivary α -amylase.

The Effects of Expressive Writing on Physiological Stress Recovery

The existing research that has examined the outcomes associated with benefit-finding writing versus traumatic disclosure interventions has not yet examined how these expressive writing designs can help victims buffer the harmful physiological stress that results from discrimination, more broadly, and hate speech specifically. Recent research recommends, however, that, in addition to examining salivary cortisol as a biological measure of psychological stress, researchers should also analyze salivary α -amylase in order to get a more “complete picture of the physiological response to stress” (Afifi, Granger, Denes, Joseph, & Aldeis, 2009, p. 4). There are important differences between these two biomarkers. As noted previously, cortisol is a stress hormone, whereas α -amylase is an enzyme that is produced in mucus (Afifi, et al., 2009; Granger, Kivlighan, Blair, El-Sheikh, Mize, & Lisonbee, 2006). α -Amylase provides a more immediate stress response, whereas cortisol provides a delayed stress response that increases steadily over time (Afifi et al., 2009). Numerous studies have found that stress-related rises in cortisol do not significantly correlate with rises in salivary α -amylase (see Granger et al., 2006 for a review). Participants may respond very differently to stress associated with discrimination (Leets, 2002), and analyzing both salivary α -amylase and salivary cortisol in the present study helps improve the likelihood of detecting these important differences (Afifi et al., 2009).

Only one published study (King & Miner, 2000) has compared a benefit-finding condition against traumatic disclosure writing to see if victims of interpersonal transgressions achieved physical benefits. The results indicated that both treatments significantly decreased victims’ health center visits five months following the intervention compared to a control group, but

neither treatment was significantly more effective than the other in achieving this health outcome. Because hate speech is associated with increased stress, it is important to examine whether expressive writing interventions can help reduce physiological responses in the HPA and SNS.

The present study compares the physiological effects associated with benefit-finding and traumatic disclosure writing for victims of hate speech. Specifically, the study offers two sets of predictions. First, victims who write about both the benefits and traumatic aspects of an experience with hate speech will experience accelerated recovery of salivary cortisol and salivary α -amylase after exposure to an acute stressor in which they recall the details of the offense, specifically:

H₅: After recalling a painful experience as a recipient of hate speech, engaging in both a benefit-finding and traumatic disclosure writing intervention will increase HPA stress recovery, measured through salivary cortisol, for victims compared to a control group that writes about an emotionally neutral topic.

H₆: After recalling a painful experience as a recipient of hate speech, engaging in both a benefit-finding and traumatic disclosure writing intervention will increase SNS stress recovery, measured through salivary α -amylase, for victims compared to a control group that writes about an emotionally neutral topic.

Expressive writing studies consistently find that linguistic features of the writing moderate health outcomes (Shim et al., 2011). Research on the relationship between positive and negative emotion words on SNS present mixed findings. Low, Stanton, and Danoff-Burg (2006), on the one hand, discovered that a higher proportion of negative words in breast cancer

patients' narratives positively predicted heart rate habituation. Floyd, Mikkelsen, Hesse, and Pauley (2007), alternatively, found neither the high use of negative nor positive words to influence their participants' cholesterol levels.

No published study could be located that has looked specifically at the effects of linguistic features on measures of the HPA stress response. The two studies that examined the effects of expressive writing for stigmatized sexual minorities found support for disinhibition theory (Lewis et al., 2005; Swanbon, Boyce, & Greenberg, 2008). Given the central tenet of disinhibition theory is that the release of unresolved emotion promotes positive health outcomes, and that studies have found traumatic disclosure writing to produce more emotional narratives than benefit-finding (King & Miner, 2000), it is expected that frequency of emotion-related words will partially mediate the effect of traumatic disclosure writing on cortisol and α -amylase recovery following the discussion task. Therefore, the following four predictions are proposed:

H₇: Because traumatic disclosure writing will elicit more emotional narratives, it will also promote greater salivary cortisol recovery for LGBQ victims of hate speech than benefit-finding writing.

H₈: Because traumatic disclosure writing will elicit more emotional narratives, it will also promote greater salivary α -amylase recovery for LGBQ victims of hate speech than benefit-finding.

H₉: The use of more emotion-related words will partially mediate cortisol recovery following the discussion recall task.

H₁₀: The use of more emotion-related words will partially mediate α -amylase recovery following the discussion recall task will.

Early work by Pennebaker (1993; 2003) found that the construction of a coherent narrative is a primary ingredient in improved health effects and that a high proportion of cognitive processing words (e.g., because, then, therefore) are a strong indicator that participants developed coherent narratives surrounding their traumatic experiences. Although no prior study has examined the effects of cognitive processing word use on HPA stress reactivity, there is some evidence to suggest that the incidence of these words can increase adaptive responses on measures of SNS. Low, Stanton, and Danoff-Burg (2006), for example, discovered a positive relationship between the amount of cognitive word-use and greater heart rate habituation. The traditional traumatic disclosure writing prompt was altered slightly in the present study to encourage participants' constructions of a coherent narrative surrounding their hate speech experience. Two hypotheses regarding effect of cognitive words on HPA and SNS stress recovery are offered:

H₁₁: The use of cognitive words will partially mediate cortisol recovery following the discussion recall task.

H₁₂: The use of cognitive words will partially mediate α -amylase recovery following the discussion recall task.

The effects of forgiveness on physiological health are well established. Forgiveness, for instance, is found to increase adaptive responses in the SNS. Lawler, Younger, Piferi, Billington, Jobe, Edmondson, and Jones (2003) found forgiveness to positively predict recovery of several measures of the SNS after an interview in which participants discussed a time when they were

victims of interpersonal betrayal. Specifically, state forgiveness was related to lower blood pressure levels, heart rate, and rate pressure product. Other studies have established the beneficial effects on the SNS by asking participants to envision forgiving imagery. Witvliet, Worthington, Root, Sato, Ludwig, and Exline (2008), for example, found forgiving imagery to increase participants' heart rate recovery following an acute stressor.

Lawler et al. (2003) offered two explanations for the salutary effects of forgiveness on the SNS. The first is that forgiveness influences stress directly through its reduction to the allostatic load that result from experiences with interpersonal transgressions. The second is that forgiveness reduces the extent to which victims feel subjectively stressed, which indirectly promotes adaptive responses in victims' psychobiological stress output.

Finding forgiveness for offenders is also shown to promote healthy HPA functioning, in particular, cortisol reactivity; however, the findings are less consistent than with studies on the SNS (Witvliet, Ludwig, & Vander Laan, 2001). Berry and Worthington (2001) assessed participants' cortisol recovery after an imagery task and found that those who witnessed forgiving imagery demonstrated increased recovery. This positive impact of forgiveness on cortisol recovery has been replicated in subsequent studies (Tartaro, Lueken, & Gunn, 2005). Only one study discovered an insignificant relationship between cortisol recovery and forgiveness. Ward (2010) found forgiveness to have no effect on cortisol recovery after a laboratory stressor. Based on the extant research linking forgiveness to adaptive physiological responses, the following two hypotheses are offered:

H₁₃: Amount of forgiveness change from pre- to post-intervention will partially mediate salivary cortisol recovery following the recall discussion task.

H₁₄: Amount of forgiveness change from pre- to post-intervention will partially mediate α -amylase recovery following the recall discussion task.

Chapter 1 Summary

Because the focus of this dissertation is to develop an expressive writing intervention to help LGBTQ individuals cope with the negative health effects associated with hate speech, this chapter presented two influential theories of expressive writing, disinhibition and self-regulation, to hypothesize how each would account for victims' improvement on measures of psychological and physiological health. To accomplish the comparison of these theories, two expressive writing designs that are consistent with these theories, traumatic disclosure and benefit-finding, were compared in terms of their ability to promote health on three dependent measures: forgiveness, salivary cortisol, and salivary α -amylase. It was reasoned that although both designs will promote forgiveness, benefit-finding will encourage greater forgiveness because, consistent with self-regulation theory, it will help victims develop coherent narratives to account for their experience with hate speech. Similarly, it was predicted that both treatments will encourage adaptive physiological stress responses, however, traumatic disclosure writing will produce more pronounced effects because it affords victims an opportunity to release unresolved emotion and therefore receive the cathartic effects of disinhibition.

Chapter II: Methods

Participants

The sample was recruited through several strategies. Towards the beginning of the recruitment process, instructors in the Department of Communication at a large Northwestern

U.S. university were contacted and asked to provide in class time for a brief study announcement. Because of the strict exclusion criteria, ineligible students were encouraged through the announcement to contact individuals within their social networks who they thought might be interested and eligible participants. In addition, every two weeks an electronic announcement was distributed through an on-campus queer listserv and other large electronic mailing lists associated with the university. Physical flyers announcing the study were also posted in and around the campus and the large Northwestern city that surrounds the university. These flyers were distributed to local LGBTQI organizations whose mission it is to aid the health of sexual minority populations through counseling and support services. In some cases, these organizations agreed to distribute the study announcement through their listserv and/or business meetings. Lastly, two newspapers, a local print and online queer monthly newsletter and the Department of Communication's online newspaper, published stories delineating details about the study and instructions about how to become a participant. In addition to explicating the exclusion criteria for the study, the announcements explained that all participants were paid \$25 upon completion of the study.

The sample ($N = 46$) consisted of 26 females (56.5%) and 20 males (43.5%). They ranged in age from 18 to 53 years ($M = 23.93$, $SD = 6.37$) The two largest ethnic and racial groups were Caucasian ($n = 27$, 58.7%) and Asian/Pacific Islander ($n = 12$, 26.1%). With respect to sexual orientation, 28.3% of the population reported being gay ($n = 13$), 26.1% were bisexual ($n = 12$), 19.6% were lesbian ($n = 9$), 17.4% were queer ($n = 8$), and 8.7% ($n = 4$) decided not to identify with any of the above categories, but confirmed that they were not heterosexual.

Exclusion Criteria

Prospective participants received a one-page study description that directed interested persons to an online screening survey. Eligible participants had to identify with minority sexual orientations, of which the majority identified as lesbian, gay, bisexual, or queer. The first section of the screening survey asked questions related to a specific event in which participants experienced hate speech. All participants had to be able to recall an instance within the past two years where they were recipients of hate speech directed at their sexual orientation. The hate speech had to occur within an interpersonal setting, and participants had to view the experience as painful. In addition, participants could not have completely forgiven their offender for their offense.

The relationship between the participant and their offender was also an important consideration in the screening process. In order to avoid losing explanatory power by collapsing the relationship type between the recipient and their offender under a single category, the present study investigated only hate speech communicated within relationships that were non-intimate.

If participants met these criteria, they were asked a series of questions related to the presence of medical conditions, health practices, and physiological factors that are known to influence salivary cortisol and salivary α -amylase. These exclusionary criteria are consistent with other studies on emotional expression and biomarkers. Their influence is known to produce abnormal salivary cortisol or α -amylase levels. These factors include asthma, acquired immune deficiency syndrome, cancer, clinical depression, chrone's disease or ulcerative colitis, graves' disease, heart disease, hepatitis, high or low blood pressure, lupus, multiple sclerosis,

rheumatoid arthritis, and diabetes (type I or type II). Individuals were also excluded if they were presently taking any of the following medications: blood thinning agents, alpha-blockers, beta-blockers, or steroids. These medications are shown to influence the accuracy of salivary cortisol and salivary α -amylase values (Floyd et al., 2007; Rohleder & Nater, 2009). Eligible participants were contacted and scheduled for a laboratory appointment.

Pre-treatment Experimental Procedures

Once participants scheduled their laboratory appointments, they received an e-mail two days before with instructions illustrating dietary and exercise restrictions for their lab day and a link to a pre-treatment survey that was to be completed before the end of that day.

Participants were asked to refrain from eating, drinking liquids (other than water), and exercising at least an hour prior to their lab appointment. In addition, they were asked not to drink coffee or alcohol at least eight hours prior to their laboratory appointment. These restrictions are intended to control factors known to affect measures of salivary cortisol and/or α -amylase (Floyd et al., 2007; Rohleder & Nater, 2009; van Stegeren, Rohleder, Everaerd, & Wolf, 2008). If a subject did not meet these pre-study requirements, their data were either excluded from analysis, or they were rescheduled for another appointment. To establish a baseline, the e-mail contained a link to an online survey that included measures of forgiveness. Participants were asked to complete the questionnaire by midnight two days prior to the study. The two-day time lapse between taking the pre-treatment questionnaire and participating in the study was enforced to minimize the confounding effects of participants' short-term memory when completing the same measures in the post-treatment questionnaire.

Pre-Manipulation Measures and Discussion

All laboratory sessions were scheduled at least four hours after participants woke up in the morning. Cortisol follows a diurnal rhythmic pattern with peak production in the early waking hours, a sharp fall in the morning hours, and then a steady decline through the remainder of the day (Klimes-Dougan, Hastings, Granger, Usher, & Waxler, 2001). The steep decline of cortisol is shown to flatten approximately four hours after rising in the morning (Kudielka, Broderick, & Kirschbaum, 2003). Scheduling appointments with these time restrictions, then, allowed for increased ability to detect changes in cortisol due to the experimental design rather than to diurnal variation, which, researchers suggest, can account for up to 70% of the variance in observed changes in cortisol levels (Adam, 2005).

Upon arrival to the laboratory, participants were greeted, reminded of the voluntary nature of the study, and then consented. They were asked if they had complied with all of the pre-study restrictions (refraining from exercise, eating, consuming caffeine and alcohol, etc.). If they reported having complied, participants were asked to thoroughly rinse their mouths out with water in order to remove any debris that might affect the saliva samples (Rohleder & Nater, 2009). Then, participants provided a saliva sample in order to establish a pre-treatment baseline salivary α -amylase. Once the sample was completed, the investigator handed participants a 25-item pre-discussion questionnaire to complete while the investigator stored the baseline samples in a refrigerator. The questionnaire included three items that assessed psychological stress embedded among several other survey items (i.e., "I am feeling tense right now", "I am feeling relaxed right now" [recode], "I am feeling stressed right now"). After completion of the questionnaire, the investigator and the participant engaged in a ten-minute

semi-structured discussion task in which the investigator asked the participants several questions related to their experience, as recipients of hate speech. The three-item psychological stress assessment embedded in the pre- and post-discussion questionnaire served as a manipulation check for the discussion recall task.

The purpose of recall discussion task was to have participants re-imagine their experience. Because this study examined whether an expressive writing intervention can help victims reduce the stress associated with hate speech, participants were asked to refrain from discussing their feelings and emotions related to the offense during the recall task. That is, participants were asked only to discuss the *details* of their encounter with hate speech.

The discussion began with the investigator posing the following question to participants: “Please describe the events of your most recent experience as a victim of hate speech in chronological order and in as much detail as possible.” Given that participants were re-imagining a painful experience, it was expected that their physiological and psychological stress would increase as a result. This method of stress induction is not a traditional stimulus. As researchers move towards more realistic manipulations and conditions, however, the experimental stimuli will necessarily become less standardized. Still, the discussion task aimed to standardize participants’ stress responses in two ways. First, all participants were interviewed for ten minutes. Second, as noted, all participants were asked to recall only the details of the experience and to avoid expressing their feelings and emotions related the offense. This was enforced to further ensure that the observed outcomes of the intervention were due to the writing exercises and not to any cathartic or self-regulatory effect achieved through the discussion task.

All participants were asked to respond to a specific experience with hate speech that occurred within the past two years. Most participants reported experiencing hate speech within 16 months of their participation ($n = 38, 82.5\%$), and 7 participants cited experiencing hate speech 16 to 24 months prior to the study (15.2%).

A criterion for inclusion in this study was that participants had to feel as though the hate speech was painful. Pain resulting from hate speech was assessed on a 7 point scale with 1 being “no pain at all” and 7 being “very painful” ($M = 5.84, SD = 1.56$). Two additional qualities of the hate speech were assessed: the perceived severity and whether there was any physical violence inflicted. Perceived severity was evaluated on a 4-item scale from 1, “not severe at all” to 4 “very severe” ($M = 2.5, SD = .73$). Most participants reported having somewhat severe ($n = 25, 54.3\%$) and severe ($n = 13, 28.3\%$) experiences with hate speech. Of the total hate speech experiences; seven (15.2%) were characterized by physical violence. Finally, a criterion for inclusion was that participants’ offenders were classified as non-intimate. Offenders were categorized as strangers ($n = 21, 45.7\%$), acquaintances ($n = 11, 23.9\%$), coworker/classmates ($n = 10, 21.7\%$), and friends ($n = 3, 6.5\%$).

When the discussion ended, participants were asked to provide a second saliva sample to be assayed for salivary α -amylase and salivary cortisol. As peak cortisol levels reach saliva approximately 15-25 minutes after a stressor (Adam, 2005), this sample provided a baseline of cortisol. Salivary α -amylase, on the other hand, provides a more immediate measure of stress and could be therefore be assayed directly following the discussion task to indicate the stress associated with the discussion recall task (van Stegeren, Roheleder, Everaerd, & Wolf, 2005). After that, the investigator distributed the post-discussion questionnaire, which included the

same three-item psychological stress assessments embedded within a different set of survey items. The investigator returned to the laboratory after storing the sample in a freezer and then randomized the participant to one of two treatment conditions or a control group. Randomized assignments were established beforehand and sealed within an envelope by a third-party. The assignments were only revealed after the discussion tasks were finished so as not to influence the interview process.

Experimental manipulation. Participants were seated in front of a laptop and asked to read along with the investigator instructions that were typed into a Microsoft Word document. The investigator then left the participant to write alone on this topic for 15 minutes at which point the investigator returned to the room, saved the document, and shut down the computer. The instructions for each writing prompt included the following statement: “Below is a writing topic. Please begin writing on this topic for as long as you can. Try to write without stopping, and not to worry about spelling, punctuation, or grammar and write whatever comes to mind as long as it is related to the topic. After 15 minutes of writing, an investigator will come to escort you out of the room.”

Those in the experimental conditions were instructed to either (a) find the benefits associated with the experience for both themselves and the offender, or (b) express their thoughts and feelings in a letter written to the offender of the hate speech. Those in the control group were asked to write a letter on an emotionally neutral topic in which they described the interior of their house/apartment (Floyd et al., 2007). All three conditions were compared with respect to their levels of salivary free cortisol and salivary α -amylase, two biological markers of HPA and SNS stress.

Benefit-finding. The narrative for the benefit-finding condition was adapted from Romero's (2008) study. The writing prompt instructed participants to identify the benefits that their forgiveness might have for themselves and their offenders. They were encouraged to try and take the perspective of their offender and to empathize with them. Participants who were randomized to this condition received the following instructions that were provided both orally (read by the investigator) and in writing:

For the next 20 minutes, please write about your experience as a recipient of hate speech. Rather than focusing specifically on the way in which you were hurt by the experience, however, please write about the good things that might happen if you were to forgive this person. That is, think of any benefits that forgiving him or her would have, even though you haven't or may not wish to forgive this person right now. Importantly, try to write about possible benefits to yourself as well as for the other person. That will require taking the perspective of your offender, putting yourself in his or her shoes, and empathizing with how this person might feel. Then try to write about the ways that forgiveness could help both of you. Don't worry about spelling or grammar.

Traumatic disclosure. The traumatic disclosure writing prompt asked participants to express their deepest thoughts and feelings about the hate speech offense to their offender. Participants were instructed to convey clearly that the hate speech was a wrongful act of discrimination. The decision to ask participants to identify the hate speech as "discriminatory and wrong" is based on research that looks at which linguistic features of expressive writing can promote health benefits (Pennebaker & King, 1999). A general pattern in this research is that a coherent narrative together with the expression of negative emotions improves health effects

(McCullough et al., 2006; Pennebaker, 1993). Participants in the traumatic disclosure writing condition received the following instructions orally and in writing:

For the next 20 minutes, please express your thoughts and feelings associated with your most recent experience as a recipient of hate speech. Write this letter to the offender.

As you write, be sure to clearly convey to the offender that their behavior was discriminatory and wrong. Do not worry about punctuation or grammar, just really let go and write as much as you can about the experience.

Control condition. In the emotionally-neutral writing condition, participants were asked to describe either or both their present dwelling and typical day at work. These two neutral writing prompts were borrowed from previous studies that also incorporated them as control conditions (Crowley et al., 2012; Floyd et al., 2007). Participants in the control condition received the following two instructions orally (read by the investigator) and in writing. They were told to move to the second writing prompt if they had nothing left to describe about the first.

(a) Think about the house/apartment/dorm room in which you currently live. What does your residence look like, what is the layout, what furnishings do you have, etc.? On the next page, give a detailed description of your current residence. Focus on describing the place you live rather than your feelings about whether you like the place or what's in it.

(b) Think about your current job or the last job you held. What was your position? How did you spend your time at your job? What did your place of employment look like? On the next page, give a detailed description of how you spent your time at work and the

environment in which you worked. Just try to describe your job and the place where you worked rather than evaluating how much you like your job.

Post Experimental Measures and Procedures

After completion of the writing exercise, participants provided another saliva sample to be assayed twice for α -amylase and cortisol. The α -amylase measurement reflected participants' stress post experimental condition, whereas the cortisol measure, as it is delayed 15-25 minutes, assessed the stressful nature of the discussion recall task. Once the third sample was collected, participants were then asked to sit alone and relax for 15 minutes. During this time, they completed a brief survey containing manipulation checks and the forgiveness measure (Rye, Loiacono, Folck, Olszewski, Heim, & Madia, 2001). The investigator returned to the lab 15 minutes later for a final saliva sample to be assayed for salivary cortisol. This sample assessed participants stress following their writing exercise.

The investigator then debriefed the participant about any questions or concerns they had relating to the study and whether they were feeling distressed. If participants expressed distress, they were provided with a list of counseling and psychological services. In addition, it was required by the university's Human Subjects Division to have a licensed clinical psychologist serve as an advisory role in the event that participants became upset or distressed from their participation in this study. In no cases did participants request to meet with the licensed clinical psychologist. Finally, participants were paid \$25 for their participation in this study.

Determination of Salivary Biomarkers

Participants' saliva samples were collected using the free drool method (Granger et al., 2007; Rohleder & Nater, 2009), which involved several steps. Participants first rinsed their mouths with water and then swallowed any remaining saliva. They were then instructed to pool saliva in their mouths for 1-2 minutes and to transfer it through a straw into a sterile test tube. The investigator was not present in the room during the saliva collection. Once the participants collected their saliva, they threw the straw away, capped the test tube, and informed the investigator who was waiting outside of the laboratory that they were finished. The investigator then brought the sample to a refrigerator where it was stored at 4°C, until transport to a laboratory and centrifuged to avoid contamination at -70°C. The lab technician responsible for assaying the samples was blind to the all hypotheses and experimental condition.

Salivary cortisol. All samples were assayed using ELISA kits obtained from commercial sources. In this study, the High-Sensitivity Salivary Cortisol Enzyme immunosorbent assay kit was utilized (Salimetrics, LLC, StateCollege, PA). Enzyme-linked immunosorbent assays (ELISAs) are 96-well plate-based assays that contain antibodies specific for cortisol covalently bound to the well surface. In brief, 25ul of undiluted saliva or control standards were added to each well. Following this, a competitor antigen which had been linked to horseradish peroxidase (HRP) was also added and the reaction mixture incubated for one hour at room temperature. After washing away the unbound antigens, a colorimetric substrate, tetramethylbenzidine (TMB) was added to all the wells. This reaction produces a blue color. A yellow color is formed after stopping the reaction with dilute sulfuric acid. The plate is then optically read with a

spectrophotometer using a detection wavelength of 405 nm. The amount of cortisol present in the sample is inversely proportional to the amount of cortisol present and is calculated from a standard curve generated in each experiment using known controls. The range of detection using this method is from .005 $\mu\text{g}/\text{dL}$ to 3 $\mu\text{g}/\text{dL}$. The intraassay and interassay coefficient of variation (CV) using this method were 8.4% and 9.2%, respectively. Assay results that produced CV values outside this normal range or which had coefficients of variation (CV) above 10% were determined unreliable and rerun. In total, 19 samples were treated in this manner.

Salivary α -amylase. Saliva samples were assayed using test kits obtained from commercial sources. In this study, I utilized the Salivary α -amylase kit (Salimetrics, LLC, StateCollege, PA), which uses a kinetic colorimetric reaction in order to determine presence of antigen. This method incorporates a chromagenic substrate, 2-chloro-p-nitrophenol linked with maltotriose. The enzymatic action of α -amylase on this substrate yields 2-chloro-p-nitrophenol, which can be detected and measured in a spectrophotometer using a wavelength of 405 nm. In this experiment, a 1:200 dilution of sample was added to an uncoated microwell plate. Following this, a heated solution of substrate is added and the plate is allowed to incubate at 37 degrees Celsius for one minute. A spectrophotometer reading is then taken and stored. Then samples are then further incubated for an additional 2 minutes at 37 degrees Celsius. Following this, a second reading is taken. The difference between the two time-point values represents the activity of the enzyme present in the sample. Coefficient of variance based on control standards run with each experiment (interassay: 4.5%; Intra-assay: 5.8%).

Manipulation Checks

Recall discussion. To assess the stressful nature of the recall discussion task and the three experimental conditions, participants were asked three Likert-type questions embedded in two 25-item surveys distributed directly before and after the recall discussion task and then again during the post survey. These three items (i.e., “I am feeling tense right now,” “I am feeling stressed right now,” and “I am feeling relaxed right now”) asked participants to identify on a six-point Likert-type scale, ranging from 0 (strongly disagree) to 5 (strongly agree), how stressful they were feeling at the time. Larger numbers on this scale indicated increased stress. The Cronbach’s *alpha* coefficient for these items was .74 in the pre-recall discussion survey, .82 in the post-recall discussion survey, and .81 for the post survey. Due to a clerical error, psychological stress was assessed for only 24 participants of the total population ($N = 46$) in the post-survey.

Experimental condition. To ensure that participants in the benefit-finding and traumatic disclosure writing condition wrote about a non-intimate offender, a six-point scale from 0 “Strongly disagree” to 5 “Strongly agree” was used to describe how well they knew their offender, with higher items reflecting a greater familiarity. Sample items included, “I don’t know this person at all” (reverse coded) and “I speak to this person often.” The five-item scale was reliable and yielded an *alpha coefficient* of .78.

Participants in the control condition used a six-point scale from 0 “Strongly disagree” to 5 “Strongly agree” to describe their feelings regarding their dwelling, with higher items reflecting a greater feeling of dislike for their offenders. Representative items included, “I like the way the

place I'm living is decorated" and "I enjoy spending time where I'm living right now". The six items comprising this scale were averaged together to yield a reliable *alpha* at .95.

Linguistic features of the writing. The Linguistic Inquiry and Word Count (LIWC) software (Pennebaker, Francis, & Booth, 2001) was utilized to assess features of the participants' writing. Analysis of the words supported two main goals. The first goal was to establish a manipulation check of the experimental conditions; that is, to ensure that participants' in the benefit-finding condition used more positive emotion words, those in the traumatic disclosure writing condition used more negative emotion words, and those in the control condition demonstrated less emotion-related word use than either of the two treatment conditions. The second goal was to determine whether either or both frequency of emotion-related word use and cognitive processing words influenced the primary dependent variables: forgiveness, salivary α -amylase, and salivary cortisol. Previous research has demonstrated that the data produced through LIWC is reliable (Pennebaker et al., 2001).

Other Measures

Forgiveness. The forgiveness scale employed by Rye et al. (2001) was used to measure participants' feelings of forgiveness for their offender in both the pre- and post-surveys. The scale consists of 15 items that ask victims about their feelings towards a specific offender using a five-point Likert scale that ranges from (1) *Strongly disagree* to (5) *Strongly agree*. The two subscales assess victims' absence of negative affect (e.g., "I can't stop thinking about how I was wronged by this person"[recoded], "I spend time thinking about ways to get back at the person who wronged me") and presence of positive affect (e.g., "I have compassion for the person who wronged me," "I hope the person who wronged me is treated fairly by others in the future").

The alpha coefficient for the pre-treatment survey was .79 and .77 for the post-treatment survey.

Chapter III: Results

The analyses began by examining the cortisol and α -amylase value distributions for deviations from normality. Of the 46 participants, one of the α -amylase post-manipulation values was excluded as an outlier because it was outside the acceptable range of detection. In addition, one of the α -amylase baseline values was not calculated because the sample was insufficient to use. Based on previous research, deviations from normality were corrected in the physiological values by conducting log transformations for cortisol (Keene, 1995) and square root transformations for α -amylase (Granger, Kivlighan, El-Sheikh, Gordis, & Stroud, 2007). The square root transformation addressed moderate skew in α -amylase scores (average skewness = 1.38, $SE = .35$; transformed skew = .14, $SE = .35$) and the natural log transformation addressed moderate skew in cortisol scores (average skewness = 2.52, $SE = .35$; transformed skew = -.21, $SE = .35$).

Hate speech description. Characteristics of participants' experiences with hate speech were reported in Chapter II. There were no significant differences between sexual orientation of the participant or offender type across conditions ($p > .05$). Independent sample t-tests were used to examine the relationships between variables that assessed participants' experiences with hate speech. The t-tests produced no significant differences among the condition for perceived severity of the hate speech, accumulated pain from the hate speech, or the length of time since the hate speech occurred ($p > .05$).

Manipulation Checks

Recall discussion task. The purpose of the discussion task was to have participants re-imagine their experiences with hate speech. It was expected that participants' stress would increase after recalling details about their experience. The study included two manipulation checks to examine participants' stress. To assess physiological stress, a one-factor repeated measures ANOVA was utilized to examine changes for α -amylase and cortisol from pre-discussion to post-discussion. The first ANOVA indicated a significant increase for α -amylase from pre- ($M = 10.28, SD = 4.30$) to post-recall discussion ($M = 11.74, SD = 4.06$), $F(1, 43) = 4.70$, $p = .04$, partial $\eta^2 = .10$. The same procedure was used to test the main effect for cortisol. The initial test revealed no significant main effect for cortisol from pre- to post-discussion $F(1, 44) = .417$, $p > .05$. Assuming that the prior exposure participants had discussing this experience with others in their social network may influence the stressful nature of the recall task, a variable assessing participants' depth of disclosure with the social network member to whom they spoke the most with about this event was entered into the model as a covariate. This one-way repeated measures ANCOVA indicated a significant increase in cortisol, $F(1, 37) = 8.08$, $p = .007$, partial $\eta^2 = .18$ from pre- ($M = -.98, SD = .37$) to post-discussion ($M = -1.11, SD = .38$), with no significant interaction between cortisol and depth of discussion $F(1, 37) = 3.54$, $p = .07$.

As an additional manipulation check, participants answered three questions pre- and post-discussion that measured psychological stress. Data analysis involved a one-factor repeated measure ANOVA with psychological stress, pre- and post-discussion, as the within subjects factor. The results indicate a main effect for time on psychological stress $F(1,44) = 10.34$, $p = .003$, partial $\eta^2 = .20$ such that participants' stress increased from pre- ($M = 3.94, SD =$

2.09) to post-discussion ($M = 4.99, SD = 2.58$). Overall, the manipulation checks indicate that the discussion recall task had the intended effect on participants' psychological and physiological stress. Descriptive information for the cortisol, α -amylase, and psychological stress scores are presented in Table 1.

Table 1.

Manipulation Check, Recall Discussion Task

		Psychological		α -amylase		Cortisol	
Variable	Time	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Stress	Pre	3.94	2.03	10.28	4.31	-.98	.37
	Post	4.99	2.50	11.73	4.06	-1.11	.38

Pre-treatment forgiveness. An important exclusion criterion for the study was that participants had not forgiven their offender for their offense. Overall, participants reported somewhat low levels of pre-treatment forgiveness ($M = 2.28, SD = .79$) for their offenders on a scale from 0 "strongly disagree" to 5 "strongly agree." There was no significant difference in the pre-treatment forgiveness means for the items assessing subscales for reduction in negative affect ($M = 2.62, SD = .92$) compared to the items assessing increase in positive affect ($M = 1.59, SD = 1.01$), though the relationship approached significance $t(45) = .29, p = .06$. Moreover, the three experimental conditions did not differ significantly on the means for either the pre-treatment forgiveness subscales (i.e., reduction of negative affect or introduction of positive affect) or the aggregated pre-treatment forgiveness scale ($p > .05$).

Experimental condition. Participants in the treatment conditions used a six-point scale 0 "Strongly Disagree" to 5 "Strongly Agree" to assess how well they knew the individual they

wrote about in their narrative. This measure was included to both (a) ensure that participants were in non-intimate relationships with their offenders, and (b) ensure that participants in the treatment conditions wrote on the appropriate topic. Across treatment conditions, the mean for this scale was low ($M = .37, SD = .46$), indicating that participants did not feel intimately associated with their offenders. An independent samples t-test was utilized to assess whether there were significant differences across treatment conditions with respect to participants' familiarity with their offender. The t-test produced no significant differences between participants in the benefit-finding ($M = 1.28, SD = .29$) and traumatic disclosure ($M = 1.29, SD = .26$) conditions, $t(24) = .05, p > .05$. Finally, to ensure that the control condition encouraged emotionally neutral writing, participants in the control group completed a 6-item scale from 0 "Strongly Disagree" to 5 "Strongly Agree" that measured their feelings about their current place of residence. Means for these items were slightly above the midpoint ($M = 3.62, SD = 1.53$).

Linguistic inquiry and word count. As noted previously, participants' essays were analyzed for frequency of positive emotion words, negative emotion words, and cognitive processing words. Paired sample t-tests were conducted to determine the effect of condition on the linguistic features of the participants' writing. Features of writing were first assessed within the experimental conditions. The results indicated that participants in the benefit-finding condition wrote more positive ($M = 3.72, SD = 1.06$) than negative ($M = 2.64, SD = .97$) emotion words, $t(16) = 3.25, p = .005$, and more cognitive words ($M = 11.84, SD = 3.03$) than either positive words, $t(16) = 10.07, p < .001$, or negative emotion words, $t(16) = 11.07, p < .001$. Within the traumatic disclosure writing condition, participants wrote more cognitive words ($M = 9.90, SD = 2.18$) than either positive emotion words ($M = 2.94, SD = 1.53$), $t(13) = 9.73, p < .001$, or

negative emotion words ($M = 2.88, SD = 1.16$), $t(13) = 11.06, p < .001$. The t-tests indicated no significant difference between the means for positive emotion words and negative emotion words written in the traumatic disclosure condition, $t(13) = .10, p > .05$. Finally, participants in the control condition expressed more positive ($M = 1.27, SD = .90$) than negative emotion words ($M = .41, SD = .52$), $t(14) = 6.28, p < .001$, and more cognitive words ($M = 2.37, SD = 1.19$) than either positive, $t(14) = 3.64, p = .003$, or negative, $t(14) = 6.97, p < .001$, emotion words.

It was expected that the benefit-finding and traumatic disclosure writing conditions would encourage more emotion-related and cognitive processing words than the control condition. The t-tests indicated that traumatic disclosure writing encouraged more positive emotions words, $t(27) = 3.62, p < .001$, negative emotion words, $t(27) = 7.48, p < .001$, and cognitive words, $t(27) = 11.36, p < .001$, than the control condition. Similarly, benefit-finding produced more positive emotion words, $t(30) = 6.95, p < .001$, negative emotion words, $t(30) = 7.96, p < .001$, and cognitive words $t(20) = 11.16, p < .001$, than the control condition. Finally, t-tests were used to examine differences between words used in the treatment conditions, expecting that benefit-finding would produce more positive emotion words and cognitive words, and that traumatic disclosure writing would produce more negative emotion words. The results demonstrate that the mean differences for positive emotion word use between benefit-finding and the traumatic disclosure were not significant, $t(29) = 1.64, p > .05$. The mean differences for cognitive word use, however, between benefit-finding ($M = 11.84, SD = 3.04$) and traumatic disclosure writing ($M = 9.90, SD = 2.18$) approached significance, $t(29) = 1.99, p = .06$. Furthermore, the t-test demonstrated that amount of negative emotion word did not differ significantly between the benefit-finding and traumatic disclosure writing conditions $t(29) = .63,$

$p > .05$. The correlations between cortisol and α -amylase and all predictors are provided in Table 2.

Table 2.

Descriptive Information for Primary Variables in the Main Analysis

	<i>M</i>	<i>(SD)</i>	<i>n</i>	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	
1. Cort1	.13	(0.14)	45	--										
2. Cort2	.11	(0.11)	45	.47**	--									
3. Cort3	.12	(0.15)	45	.11	.22	--								
4. α -a1	1.24	(1.04)	44	.12	-.04	-.09	--							
5. α -a2	1.52	(8.92)	45	-.02	.15	-.15	.46**	--						
6. α -a3	1.40	(1.01)	45	-.07	-.21	-.06	.64**	.64*	--					
7. Forg1	2.26	(.79)	44	.11	.01	.10	.11	.23	.22	--				
8. Forg2	2.47	(.78)	45	.12	-.13	.11	.15**	.26	.12	.62**	--			
9. Pos	2.70	(.55)	45	-.14	-.12	-.24	-.10	-.11	-.17	.03	.18	--		
10. Neg	1.28	(.68)	45	-.24	-.11	-.28	-.05	.07	-.02	-.16	.08	.50**	--	
11. Cog	8.16	(.96)	45	-.09	-.03	-.29	-.08	.12	-.03	-.25	.13	.59**	.64**	--

Note. Cort1 = pre-manipulation ; Cort2 = post-manipulation ; Cort3 = post treatment; α -a = α -amylase pre; α -a1 = pre-manipulation ; α -a2 post-manipulation ; α -a3 post treatment; Forg = forgiveness; Forg1 = pre-manipulation ; Forg2 = post-manipulation ; pos = positive emotion words; neg = negative emotion words; cog = cognitive processing words; * $p < .05$, ** $p < .01$, *** $p < .001$

Hypotheses and Research Questions

Forgiveness Outcomes: Baseline to Post Treatment

Hypotheses 1 and 2 postulated that participants assigned to the benefit-finding and traumatic disclosure writing conditions would experience a significant increase in forgiveness for their offender compared with the control group following their expressive writing intervention. To examine the effects of expressive writing condition on forgiveness change, a one-way ANCOVA was utilized with the post-treatment forgiveness score as the within subjects dependent variable, condition as the between subjects factor, and pre-treatment forgiveness score as the covariate. After adjusting for the group means of the pre-treatment forgiveness measure, the main effect for condition was marginally significant $F(2,45) = 3.02, p = .06$. Cell comparisons indicated that benefit-finding ($M = 2.74, SD = .14$) increased participants' forgiveness significantly more than the control group ($M = 2.24; SD = .15$), $p = .02$.

A second ANCOVA was run including the length of time since the hate speech occurred in addition to the pre-treatment forgiveness score as covariates. As indicated in the ANCOVA summary table (Tables 3 & 4), pre-treatment forgiveness was significantly related to the post-treatment forgiveness score, $F(1,45) = 34.53, p < .001, \eta^2 = .46$. Finally, after adjusting for group means of the pre-treatment forgiveness score and length of time since participants experienced hate speech, condition revealed a significant main effect on post-treatment forgiveness, $F(2, 45) = 3.77, p = .03, \eta^2 = .16$. Participants in the benefit-finding condition ($M = 2.64, SD = .73$) were significantly more likely than those in the control condition ($M = 2.38, SD = .63$) to find forgiveness ($p = .01$) for their offender (see Figure 1). Hence, hypothesis 1 is supported.

Table 3.

ANCOVA Summary Table with Post-treatment Forgiveness (Hypotheses 3, 4, & 5)

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	η^2
Between Treatments	12.56	4	3.14	9.77	.001	.49
Months Passed Since Hate Speech	.62	1	.62	1.94	.17	.05
Pre-treatment Forgiveness	11.09	1	11.09	34.53	.001	.46
Effect by Condition	2.42	2	1.21	3.77	.03	.16
Error	12.86	40	.321			
Total	297.91	44				

Table 4.

Adjusted and Unadjusted Group Means for Post-treatment Forgiveness By Condition

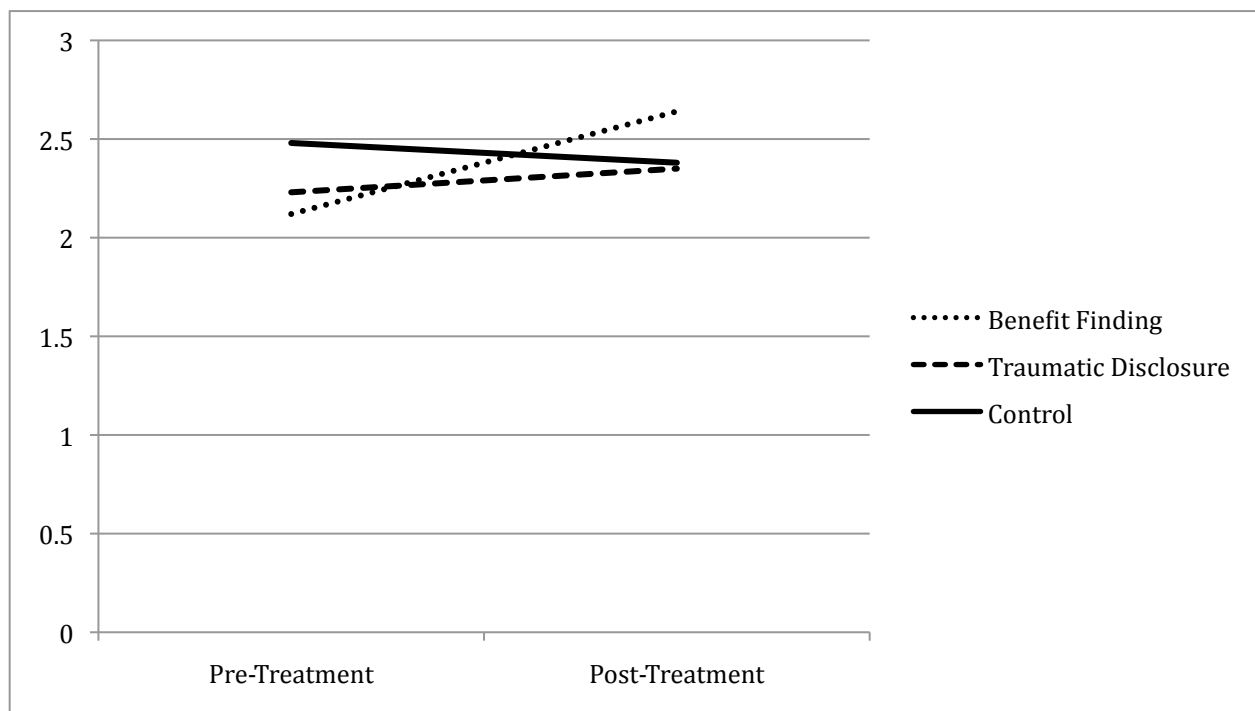
	Adjusted <i>M</i>	Unadjusted <i>M</i>
Benefit-finding	2.78	2.63
Traumatic Disclosure Writing	2.37	2.35
Control	2.21	2.38

It was also predicted that traumatic disclosure writing would have a significant effect on post-treatment forgiveness, compared with the control group (H_2), but benefit-finding

condition would have a stronger effect on forgiveness than the other two conditions (H_3).

Analysis of the cell comparisons indicated that traumatic disclosure writing ($M = 2.35$, $SD = .91$) was not more likely to increase forgiveness than the control ($M = 2.38$, $SD = .63$) condition ($p > .05$). Hypothesis 2 was therefore not supported. Analysis of the cell contrasts demonstrated, however, that the relationship between the effects by traumatic disclosure condition compared with the effects by benefit-finding condition on participants' post-treatment forgiveness score approached significance ($p = .06$). That is, benefit-finding encouraged more forgiveness than both the control and traumatic disclosure writing condition (see Figure 1). Therefore, hypothesis 3 received marginal support.

Figure 1. *Change in Forgiveness Score Across Condition*



Effects of Linguistic Features on Forgiveness Change

Multiple linear regression with hierarchical predictor entry was utilized to examine the effects of the linguistic features of participants' narratives on post-treatment forgiveness score. The correlation ($r = .50$) between positive and negative emotion word count indicated potential multicollinearity. A recommendation for dealing with collinearity is to average the collinear variables (Tabachnick & Fidell, 2007). Therefore, a variable reflecting the average of positive and negative emotion words was created to assess the effect of emotion-related words on the dependent variables. Pre-treatment forgiveness was entered into the model first and accounted for significant variance in post-treatment forgiveness score, $R^2 = .39$, $F(1,43) = 27.69$, $R^2_{\text{adjusted}} = .37$, $p = .001$. Cognitive words and emotion-related words were then entered simultaneously into the model and with a zero order correlation of .14 for cognitive words and .08 for emotion-related words, and, together with pre-treatment forgiveness score, it accounted for 50% of the variance in post-treatment forgiveness (as shown in Table 8) $F(2,41) = 13.27$, $R^2_{\text{adjusted}} = .46$, $p = .02$. Hypothesis 4 predicted that cognitive words would mediate the effect of the intervention on victims' forgiveness. Cognitive words was uniquely predictive of post-treatment forgiveness score, $\beta = .47$, $SE = .03$, $t(41)=2.70$, $p = .01$, and therefore hypothesis 4 received support. These results indicate that for every cognitive word written, victims' post-treatment forgiveness score increased .47 points from their pre-treatment forgiveness score.

Research question 1 asked about the effect, if any, that emotion-related words had on post-treatment forgiveness score. Emotion-related words, however, did not account for a

significant amount of variance on post-treatment forgiveness score, $\beta = -.20$, $SE = .12$, $t(41) = -1.19$, $p > .05$.

A second hierarchical regression model was run with pre-treatment forgiveness score and cognitive word count as the first variable entered simultaneously into the model, and it accounted for 48% of the variance in post-treatment forgiveness, $R^2 = .48$, $F(2,43) = 19.66$, $R^2_{\text{adjusted}} = .46$, $p < .001$. Cognitive word use alone accounted for significant unique variation in post-treatment forgiveness score, $\beta = .31$, $SE = .02$, $t(41) = 2.74$, $p = .009$. Once emotion-related word use was entered in addition to pre-treatment forgiveness and cognitive word use, the overall model was not significant, $F(1,41) = 13.71$, $R^2_{\text{adjusted}} = .46$, $p > .05$. Therefore, the model of post-treatment forgiveness performed best when pre-treatment forgiveness and cognitive word were included as predictor variables.

Salivary Cortisol and Salivary α -Amylase Recovery: Pre-treatment to Post Treatment

The fifth hypothesis postulated that participants within the traumatic disclosure and benefit-finding conditions would experience significant salivary cortisol recovery, compared with the control group, following the recall discussion task. To examine the effects of expressive writing on cortisol recovery, a one-way ANCOVA was utilized with the post-treatment cortisol score as the within subjects factor, condition (benefit-finding, traumatic disclosure, control) as the between subjects factor, and the post-manipulation cortisol score as the covariate. The ANCOVA results indicated that pre-treatment cortisol was related to post-treatment cortisol score $F(1, 44) = 10.62$, $p = .002$, partial $\eta^2 = .21$. After adjusting for the group means for pre-treatment cortisol, the effect of condition on post-treatment cortisol was significant, $F(2, 44) = 3.77$, $p = .03$, partial $\eta^2 = .16$. As indicated in the ANCOVA summary (Tables 5 and 6),

participants in the benefit-finding condition ($M = -1.23, SD = .32, p = .01$) and traumatic disclosure condition ($M = -1.13, SD = .27, p = .04$) were more likely than the control group ($M = -.93, SD = .45$) to experience salivary cortisol recovery following the discussion recall task (see Figure 2). Thus, hypothesis 5 was supported.

Table 5.

ANCOVA Summary Table with Post-treatment Cortisol (Hypotheses 6 & 7)

Source	SS	df	MS	F	p	η^2
Between Treatments	1.78	3	.59	5.83	.01	.30
Pre-treatment Cortisol	1.08	1	1.08	10.62	.01	.21
Effect by Condition	.77	2	3.83	3.77	.05	.16
Error	4.07	40	1.02			
Total	59.29	44				

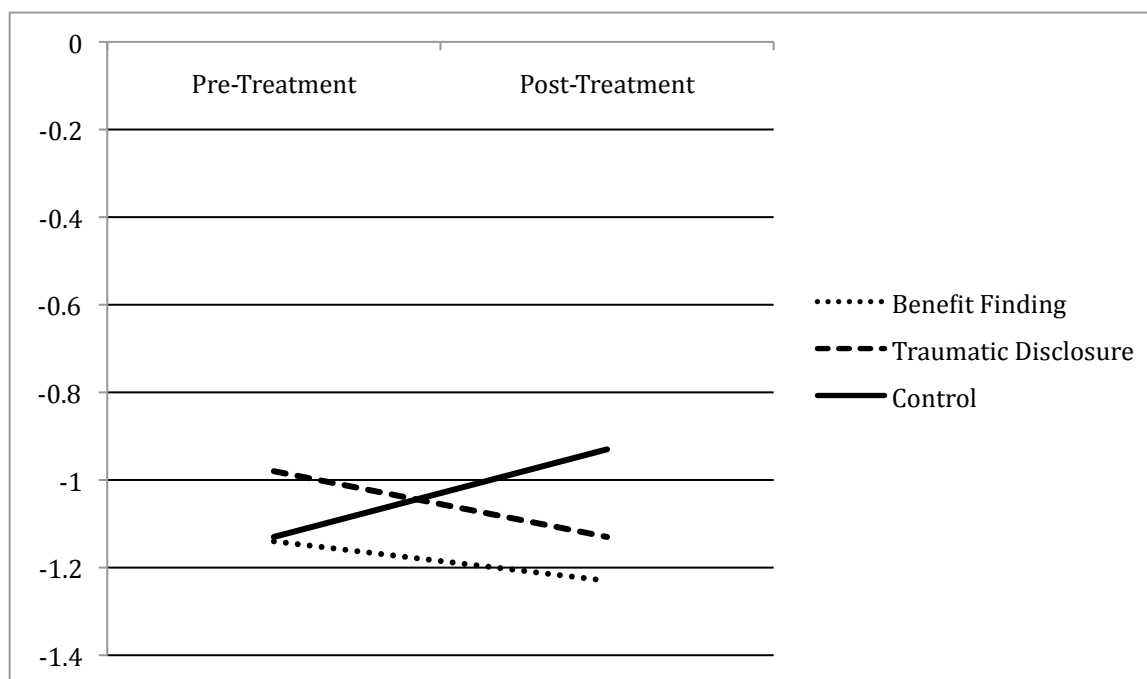
Table 6.

Adjusted and Unadjusted Group Means for Post-treatment Cortisol By Condition

	Adjusted M	Unadjusted M
Benefit-finding	-1.21	-1.23
Traumatic Disclosure Writing	-1.17	-1.12
Control	-.91	-.92

Hypothesis 6 predicted traumatic disclosure writing would result in greater cortisol recovery than would benefit-finding. The post hoc cell comparisons among conditions were assessed. Traumatic disclosure writing was no more or less likely than benefit-finding writing to promote cortisol recovery (see Figure 2) after the recall discussion task ($p > .05$). Thus, hypothesis 6 was not supported.

Figure 2. *Post-treatment Cortisol Across Condition.*



The third ANCOVA assessed the effects of benefit-finding and traumatic disclosure condition on participants' α -amylase recovery after the discussion task. To test this model, a one-way analysis of covariance was utilized with the post-treatment α -amylase score as the within subjects factor, condition as the between subjects factor, and pre-treatment α -amylase score. The ANCOVA produced a significant relationship between α -amylase score pre-treatment and post-treatment $F(1, 45) = 17.98, p = .001$, but no significant effect for post-treatment α -amylase score by condition ($p > .05$). Hypotheses 7 and 8 were therefore not supported.

Effects of Linguistic Features on Physiological Stress Recovery

To investigate the relationship between linguistic features and post-treatment cortisol scores, multiple regression with hierarchical entry was utilized, with emotion-related words and cognitive words as predictor variables. Pre-treatment cortisol was entered into the first model and accounted for a significant amount of variance in post-treatment cortisol $R^2 = .17$, $F(1,42) = 8.80$, $R^2_{\text{adjusted}} = .15$, $p = .005$. The next two variables entered simultaneously into the model were emotion-related word use and cognitive word use with a zero-order correlation of $-.33$ for emotion-related word use and $-.25$ for cognitive word use, it accounted for 26% of the variance in post-treatment cortisol score, $F(1,41) = 4.67$, $R^2_{\text{adjusted}} = .20$, $p = .11$. Neither emotion-related words, $\beta = -.23$, $SE = .06$, $t(40) = -1.14$, $p > .05$, or cognitive word use, $\beta = -.08$, $SE = .02$, $t(40) = -.38$, $p > .05$, were significantly uniquely predictive of post-treatment cortisol score.

A second hierarchical regression model was utilized with pre-treatment cortisol score and emotion-related word use as the first variable entered into the model, and it accounted for 26% of the variance in post-treatment cortisol, $R^2 = .26$, $F(2,41) = 7.08$, $R^2_{\text{adjusted}} = .22$, $p = .002$. Hypothesis 9 predicted that the proportion of emotion-related words would have a unique effect on post-treatment cortisol score. The results indicated that emotion-related word use accounted for significant unique variation in post-treatment logged cortisol score, $\beta = -.29$, $SE = .04$, $t(40) = -2.14$, $p = .04$. Specifically, for each emotion-related word written, victims' post-treatment logged cortisol score reduced $-.29$ from their pre-treatment logged cortisol score. Therefore, hypothesis 9 received support. Hypothesis 11 predicted that cognitive words would partially mediate pre- to post-treatment cortisol recovery. Once cognitive word use was

entered in addition to pre-treatment cortisol and emotion-related word use, the overall model was not significant, $F(1,40) = 4.67$, $R^2_{\text{adjusted}} = .20$, $p > .05$. Cognitive word use did not account for significant unique variation in post-treatment cortisol, $\beta = -.08$, $SE = .02$, $t(40) = -.38$, $p > .05$. Hypothesis 11 was therefore not supported. The model of post treatment cortisol performed best when pre treatment forgiveness and emotion-related word use were included as predictor variables.

Hierarchical regression was then used to test hypotheses 10 and 12, which predicted that emotion-related words (H_{10}) and cognitive words (H_{12}) would partially mediate the effect of the intervention on victims' post-treatment salivary α -amylase score. Pre-treatment α -amylase was entered into the model first and accounted for a significant amount of variance in post-treatment α -amylase $R^2 = .29$ $F(1,43) = 18.35$, $R^2_{\text{adjusted}} = .28$, $p = .001$. Emotion-related word use and cognitive word use were then entered simultaneously into the model and the overall model was not significant, $F(2,41) = 5.93$, $p > .05$. A second hierarchical model was run with pre-treatment α -amylase and emotion-related word use as the predictor variables. The results indicate that emotion-related words did not account for significant unique variation in post treatment α -amylase, $\beta = -.05$, $SE = .63$, $t(44) = -.425$, $p > .05$. Similarly, the results indicated that cognitive word use had no significant influence on post treatment α -amylase, $\beta = -.04$, $SE = .17$, $t(44) = -.20$, $p > .05$. Therefore, hypotheses 10 and 11 were not supported.

The data also indicated substantial multicollinearity between variables assessing cognitive word use and positive emotion word use ($r = .59$), as well as cognitive word use and negative word use ($r = .64$). To further ensure that reductions in cortisol were being accounted for by unique features of the participants' writing and not the total word count of participants'

narratives, multiple regression with sequential entry was utilized to assess whether the total word count of significantly influenced cortisol recovery. After controlling for the influence of pre-treatment logged cortisol, total word count had no influence on post-treatment logged cortisol, $F(1,41) = .25$, $R^2_{\text{adjusted}} = .14$, $p > .05$.

Finally, hypotheses 13 and 14 predicted that forgiveness would partially mediate participants' pre- to post-cortisol and α -amylase scores. After holding pre-treatment cortisol score constant, forgiveness change, calculated as a difference score (post – pre-treatment forgiveness), was entered into the model next and was not uniquely predictive of post-treatment logged cortisol score, $F_{\text{change}}(1,41) = .25$, $p > .05$. Hypothesis 13 did not receive support. Similarly, once pre-treatment α -amylase was accounted for, forgiveness change had no effect on post-treatment α -amylase, $F_{\text{change}}(1,41) = .002$, $p > .05$. Hypothesis 14 was also not supported.

Chapter IV: Discussion

Previous research suggests that discrimination leads to substantial health risks for LGBTQ individuals (Meyer, 2003). This study sought to develop an intervention to help LGBTQ victims of hate speech find forgiveness for their offenders, expecting that expressive writing would promote forgiveness and facilitate adaptive recovery in the sympathetic nervous system (SNS) and the hypothalamus pituitary axis (HPA) after a discussion task in which victims recalled the details of their experiences. The results of this study support expressive writing as a method by which LGBTQ victims can find forgiveness and accelerate cortisol recovery. Currently no single theory can account for the health outcomes of this writing intervention, but, instead, victims' forgiveness outcomes are consistent with self-regulation and their cortisol recovery with

emotional disinhibition. The findings of this study present a model to guide future research in the development of expressive writing interventions that help victims cope with the negative health effects associated with interpersonal transgressions.

Effects on Forgiveness: Evidence for Self-Regulation Theory

Consistent with the predictions, benefit-finding helped victims find forgiveness for their offenders. Traumatic disclosure, on the other hand, had no effect on forgiveness. There are at least four noteworthy implications about this finding. First, the most notable implication was that the proportion of cognitive processing words victims used in their narratives accounted for 48% of the variance in post-treatment forgiveness score. Furthermore, the benefit-finding condition encouraged significantly more cognitive words than either the traumatic disclosure condition or the control. Taken together, these findings suggest that benefit-finding is superior to traumatic disclosure writing in helping victims to find forgiveness, because it promotes cognitive word use.

According to Pennebaker and Miner (1999) cognitive processing words connote active thinking. They underscore attempts by writers to explain cause and effect (causal words) and to engage in self-reflection (insight words) (for a more complete summary see Pennebaker & Miner, 1999). The link between cognitive words and forgiveness is consistent with the principles of self-regulation theory (King, 2002). Specifically, the high frequency of cognitive word use indicates that victims who forgave developed coherent narratives to explain their experiences with hate speech, which allowed them a sense of mastery and control over their responses to this event.

This conclusion is further supported by the absence of any effect for emotion-related words on forgiveness. That is, hate speech victims who forgave maintained distance from their emotions in order to create their forgiving narratives, rather than through a cathartic release of unresolved emotions, as would be consistent with disinhibition theory. In fact, the results suggest that the presence of emotion-related words in victims' narratives potentially reduced the likelihood that they forgave their offenders. The benefit-finding condition likely encouraged forgiveness because it required victims to think more critically about their responses to their offenders than did the traumatic disclosure condition. Victims in the benefit-finding condition were asked to consider how they might benefit from forgiving their offender, and perhaps this response, as potentially atypical, allowed for more cognitive processing.

An attempt was made to encourage the construction of coherent narratives within the traumatic disclosure condition by asking participants to clearly convey to their offender how their actions were discriminatory and wrong. Still, however, the emphasis of the traumatic disclosure condition is primarily the participants' expression of their thoughts and feelings related to the transgression. Arguably, these writing instructions require less active thinking on the part of victims and might help explain why these participants did not express more cognitive words and experience more forgiveness.

Second, the forgiveness ANOVA model was only marginally significant until a covariate, assessing the amount of months that had passed since the hate speech occurred, was included. Previous research has shown that time can effectively cause a transient reduction in victims' motivations to avoid and exact revenge and increase benevolent intentions towards offenders (McCullough, Fincham, & Tsang, 2003). Participants were prescreened on the basis that they

had experienced hate speech within two years; however, it appears that, for some, this time span had naturally encouraged forgiving responses. Third, the reduction of negative affect and introduction of positive responses were equally effective in helping victims forgive their offenders. Scholars have argued that forgiveness in non-intimate relationships is characterized primarily by reductions in negative affect (e.g., Worthington et al., 2007). The findings in this study, however, suggest that participants who forgave effectively became both more positively oriented towards their offender and reduced their unforgiving feelings.

Fourth, although a significant amount of research has associated forgiveness with improvements on measures of SNS and HPA activity (e.g., Witvliet, Ludwig, & Vander Laan, 2001) the results of this study suggest that forgiving victims were no more or less likely to reap physiological benefits from the expressive writing intervention. Importantly, however, participants in both treatments generally experienced cortisol recovery following their recall discussion task. A possible explanation for the lack of effect that finding forgiveness had on the physiological stress response is that victims who forgave experienced decisional rather than process-oriented forgiveness. As noted, the results of the linguistic analysis indicate that emotion-related words had no effect on forgiveness and the proportion of cognitive words had a strong effect. Scholars have argued that decisional forgiveness is less emotional than process-oriented forgiveness, and, as a result, these two processes may be linked with different health outcomes (Worthington et al., 2007). Worthington et al. (2007, p. 292) argued that, although decisional forgiveness might reduce negative affect, it does not necessarily have a direct effect on physiological stress. The results of this dissertation provide initial evidence that decisional forgiveness does not influence the physiological stress response directly; however, future

research is needed to assess the indirect effect decisional forgiveness has on individuals' health over time.

The Effects of the Intervention on HPA and SNS Reactivity: Evidence for Disinhibition Theory

Hypothalamus pituitary axis. As hypothesized, cortisol values recovered significantly for participants in both the traumatic disclosure writing and benefit-finding conditions compared with the control group. The prediction that those in the traumatic condition would experience more accelerated recovery than the benefit condition, however, was not supported. Three factors were hypothesized to partially mediate the effect of expressive writing on adaptive stress recovery: forgiveness, cognitive words, and emotion-related words. As noted previously, change in forgiveness pre- to post-treatment had no effect on cortisol. In addition, cognitive words were not uniquely predictive of cortisol recovery. The results indicate that the frequency of emotion-related words used in the narratives, however, did account for a significant amount of variance explained in post-treatment cortisol scores.

Researchers have argued that positive and negative emotion words have differing effects on health outcomes. Crowley, Faw, and Parks (2012), for instance, found that expressing negative emotions (e.g., dislike) to a close network member increased cortisol reactivity, whereas expressing positive emotions (e.g., love) had no effect on cortisol response compared to a control group. The findings of this study suggest that there are virtually no differences in the extent to which positive and negative emotion word use accounts for physiological recovery of the HPA axis following a stressful recall discussion task. That is, there were no significant differences in the amount of positive or negative emotion words written in the treatment conditions, and still victims in both conditions generally experienced accelerated cortisol

recovery compared to the control group. Victims' expression of emotion, therefore, catalyzed health recovery, a conclusion that is consistent with the central tenets of disinhibition theory. Advocates of disinhibition theory argue that the inhibition of unresolved emotions can become toxic and their expression, in turn, reaps health benefits for the expresser.

It should be noted that once victims' cognitive word use was accounted for, the effects of emotion-related word use on cortisol recovery was no longer significant. These findings may demonstrate that a moderate amount of cognitive word use combined with the expression of emotion-related words might be an additional ingredient for victims to cope adequately with the physiological stress associated with interpersonal transgressions. That is, in order to reap the physiological benefits of expressive writing, victims might need to couch their emotional expression within a framework of a coherent narrative. Although intriguing, these conclusions are still speculative and await future investigation.

Sympathetic nervous system. The intervention had little effect on salivary α -amylase, a measure of stress reactivity in sympathetic nervous system. The one significant effect on α -amylase was shown before and after the recall discussion task. Research suggests that α -amylase might be related to the arousal of emotion, more generally, than the specific valence of the emotion (positive or negative). Adam, Hoyt, and Granger (2011), for instance, found salivary α -amylase to respond only to *non-specific* arousal. It may be that the recall discussion task encouraged increased arousal, which triggered reactivity in participants' SNS. Based on Adam et al.'s (2011) "arousal hypothesis," the lack of reactivity on salivary α -amylase post-treatment is attributable to the lack of emotional arousal produced by the treatment conditions (p. 172). The resultant cortisol recovery would instead suggest that the treatment conditions

reduced *emotion-specific* stress. This finding is consistent with a recent meta analysis that shows cortisol to react with specific emotional responses (Denson, Spanovic, & Miller, 2009).

Limitations and Directions of Future Research

The present study illustrates the benefits of expressive writing for LGBTQ hate speech victims' psychological and physiological health, but it is not without its limitations. Perhaps the most glaring limitation of the current study is the absence of measures assessing psychological health beyond forgiveness. Although a host of studies have linked forgiveness to psychological health (see Kendler et al., 2003), the present analysis can only assume that increased forgiveness supports mental wellness. Furthermore, it is unclear which indices are improved by forgiveness specifically. Future research should include additional measures to determine the integrity and specificity of the association between forgiveness and mental health outcomes. Additionally, the results indicate that victims who reported that they forgave experienced decisional forgiveness and achieved no immediate physiological benefits. Research suggests that decisional forgiveness may indirectly relate to physical health through improved relationships and mental wellness (Worthington, Witvliet, Pietrini, & Miller, 2007). Future research should conduct longitudinal studies that examine the progress of victims' health recovery overtime to determine whether there are any indirect health benefits associated with decisional forgiveness.

An additional limitation is the amount of time that had lapsed between victims' hate speech experiences and their participation in the study. The results suggest that victims might have experienced some temporal forgiveness for their offenders (McCullough, Fincham, &

Tsang, 2003). Future research could restrict the time range to six months to limit the confounding effects of time on forgiving responses.

Moreover, the implication that disinhibition theory is most germane for victims who have experienced recent trauma and who have a history of inhibition is interesting. The design of the study supports previous research that finds an effect for disinhibition theory when traumatic events are more recent (Frattaroli, 2006). No scale was included in this study to measure victims' propensity to inhibit their emotions, however, and therefore the association between LGBTQ individuals and an inhibiting personality is tenuous and awaits further investigation. Future research should include measures to assess victims' trait inhibition to see if this personality quality mediates health outcomes.

Whereas the majority of manipulations in this study had the intended effect, the results indicate that the traumatic disclosure condition did not encourage more negative words or less positive words than benefit-finding condition. This outcome is surprising given that one would expect a higher proportion of negative emotion words to appear in narratives where victims of severe interpersonal offenses, such as hate speech, wrote to a non-intimate offender who they had not yet forgiven. A possible explanation for this result is that asking victims in the traumatic disclosure writing condition to describe how the hate speech was "discriminatory and wrong" promoted writing about the contrasts of wrong versus right. That is, while victims correctly addressed how offenders were wrong and discriminatory, they also explicated how they were right in their responses. The following testimonial by one male participant illustrates this right versus wrong contrast in his traumatic disclosure letter written to his offender:

But that doesn't mean what you said and what you did, didn't hurt. It hurt because you

did it at all, and it hurt because we realized there are people out there who don't think we deserve love, who are saying we are less human than they are because of who we have chosen to love. It hurt because there was no other way to feel about it. We couldn't hate you, because we don't hate people for choosing different life styles, we couldn't really feel anything but that numb kind of hurt that comes from unexpected forceful hatred. I hope you go on, and find in your life a way to not judge other people's lives, not try to edit them so they're more like yours. I hope you find a way to be yourself, and just be happy with being yourself.

This participant followed the instructions of the writing prompt by expressing his hurt and describing how the hate speech was discriminatory and wrong. He depicts himself as right and his offender as wrong with statements such as, "We couldn't hate you, because we don't hate people for choosing different life styles." This pattern in the writing is further illustrated in the final two statements where the participant expresses his hopes for the offender going forward. This style of writing may help explain the lack of difference between the proportion of positive and negative words written in the traumatic disclosure letters. An additional explanation is that, given strict norms prohibiting the expression of negative emotions in western culture, victims were uncomfortable expressing negative emotions in their narratives.

Moreover, victims in the benefit-finding condition did not express more positive than negative emotion words. It is possible that strictly expressing positive emotions to an offender who committed severe transgressions is difficult without leakage of the victims' sincere feelings of resentment and negativity. The following testimonial depicts the struggles some participants encountered when writing a benefit-finding letter to their offender:

I don't want to forgive these assholes. They were disrespectful to me as a person, me as a woman and me as a lesbian. They were disrespectful to other men who are considerate of women and of the LGBT community. They were disrespectful to men in general. But I know that I should forgive these men because they were probably raised in a household where respect for women and for LGBT was not emphasized.

This female participant is clearly uncomfortable forgiving her offenders and writes several negative words within this paragraph. Although she followed the instructions of the benefit-finding prompt, and began to take the perspective of her offenders, emotional leakage like this would produce substantial negative emotion words within these narratives. These conclusions are speculative, however, and await further investigation. A more nuanced analysis of the emotion-related word use, including discrete negative emotions (e.g., anger, sadness, contempt) and discrete positive emotions (e.g., joy, empathy, compassion) might reveal differences in the linguistic features of the treatment groups that are consistent with their intended effects.

Finally, a limitation of the current study is the possible multicollinearity among the variables assessing cognitive and emotion-related words use (positive and negative). Two steps were taken to address problems with collinearity. First, the variables for positive and negative emotion word use were transformed into a single variable reflecting the average of these two constructs. This technique for addressing collinearity was proposed by Tabachnick and Fidell (2007). Second, to ensure that the amount of words written was not accounting for the reduction in post-treatment cortisol instead of the unique features of the writing, a regression was used to assess the effect of total word count on physiological recovery. As noted

previously, this model was not significant. Although these steps increased confidence regarding multicollinearity, future research should endeavor to investigate the independent effects of positive, negative, cognitive word use to ensure that findings are attributable to their unique features.

The results of this study suggest that the benefits of expressive writing cannot be solely attributed to a current design (benefit-finding or traumatic disclosure writing) or theory (self-regulation or disinhibition). Instead, future research should try and develop writing prompts that (a) facilitate victims' expression of emotions related to their traumatic experience (both positive and negative) in order to achieve the physiological benefits of disinhibition, (b) help victims to express their emotions in ways that maintain consistency with respect to a narrative pertaining to the event, as this may influence the degree of physiological recovery, and (c) encourage victims to frame their experience in a coherent way to allow for a sense of closure and the resulting rewards of self-regulation, such as forgiveness. The findings of this investigation suggest that long-standing arguments regarding the efficacy of disinhibition and self-regulation theory as explanatory mechanisms should be replaced with a more comprehensive theory that accounts for the power of such theories to account for different health outcomes.

Conclusion

This study demonstrates that expressive writing can help LGBTQ victims of hate speech find forgiveness for non-intimate offenders and experience accelerated cortisol recovery following a discussion task in which they recall specific details about their hate speech experience. More importantly, the study offers evidence that cognitive words can promote forgiveness while emotion-related words encourage improvements on measures of HPA reactivity. Future research should therefore focus on developing theory that can adequately explain the differing effects of self-regulation and disinhibition on health outcomes associated severe interpersonal transgressions.

The findings of the study hold important practical implications for expressive writing research. Specifically, researchers should consider designing writing prompts that reflect convergence between benefit-finding and traumatic disclosure writing. Victims might benefit most from prompts that guide them through a series of steps in which they are able to first disinhibit and then self-regulate. One approach might be to ask victims to express negative emotion for their offender, and then to express positive emotion either about their offender or the way in which they effectively coped with the transgression. Based on the findings in this study, the proportion of emotion words, both positive and negative, would result in adaptive physiological reactivity. Finally, the prompt could then encourage victims to frame the transgression in ways that allows them to move forward with their lives. Through developing coherent narratives to structure their experiences, victims would be able to experience increased forgiveness and positive affect. The extent to which this model will prove successful

across a variety of interpersonal transgressions is an empirical question, however, that awaits further investigation.

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