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Emotional Expression and Depth Processing In Trauma Writing: Impact on HIV/AIDS-Targeted Quality of Life

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Expressive writing has been linked to positive psychological and health outcomes in general and medical populations, but research examining this intervention in HIV is limited. Higher levels of emotional expression (EE) and depth processing (DP) during writing have been linked to better health status in HIV. Expressive writing has been shown to improve health-related quality of life (HRQoL) in other populations, but has not been examined in HIV. HRQoL is often compromised in HIV+ individuals and therefore improvements in this area are an appropriate goal of psychosocial interventions.

This longitudinal study used HLM analyses to examine the relationship between levels of EE and DP during trauma writing and the rate of change in HRQoL over six months in an ethnically diverse sample of 106 HIV+ men and women. Three subscales of the HIV/AIDS-targeted Quality of Life measure were examined: Overall Healthy Functioing (HRQoL-Overall), Without Health Worries (HRQoL-Health), and Life Satisfaction (HRQoL-Life). All longitudinal analyses controlled for demographic (age, gender, race/ethnicity, education), medical (CD4 and VL) and psychological (stressful life events) factors.

No significant effects were found for EE/DP to predict changes in HRQoL over time for the full sample. When men and women were examined separately, there was a non-significant tendency for men to decrease in HRQoL over time and for women to

increase over time, and a number of EE/DP variables were significant predictors of rate of change in HRQoL. As hypothesized, for women (n = 44) higher level of Experiential Involvement DP predicted greater increase in HRQoL-Overall and HRQoL-Life, and higher negative EE also predicted greater increase in HRQoL-Life over time. Opposite of the direction hypothesized, higher Self Esteem DP predicted a lower level of increase in HRQoL-Life for women. For men (n = 62), findings appeared to be in the opposite direction of women, with greater Self Esteem DP working as a buffer to decreases in HRQoL-Life and HRQoL-Health over time. Furthermore, higher Experiential Involvement and negative EE appeared detrimental for men as both predicted greater decreases in HRQoL-Life over time and Experiential Involvement also predicted greater decreases in HRQoL-Health. Results should be interpreted with caution, as the overall slopes did not show significant change in HRQoL over time. The reasons for observed gender differences are not known. This is the first study to examine the impact of EE and DP in expressive trauma writing on HRQoL in HIV+ individuals. Implications and limitations are discussed.

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Chapter 1: Introduction

Across the globe, there are an estimated 33 million people currently living with human immunodeficiency virus (HIV), and over two million acquired immunodeficiency syndrome (AIDS) related deaths were estimated in 2007 (UNAIDS Report on the Global AIDS Epidemic, 2008). On a national level, an estimated 1.2 million Americans are infected with HIV, and the annual death toll was estimated at 22,000 in 2007. Although the global pandemic has been spreading at an alarming rate over the past two decades, recent reports bring hope that prevention efforts have effectively helped stabilize the transmission of HIV, with new infection rates dropping from an estimated 3 million in 2001 to 2.7 million in 2007 (UNAIDS Report on the Global AIDS Epidemic, 2008). While these recent statistics are promising, the HIV/AIDS pandemic continues to be one of the most devastating public health crises of our time.

Since the mid 1990's notable advances have been made in the pharmacological treatment of HIV. Due to the introduction of highly active antiretroviral therapy (HAART), an HIV-positive diagnosis has changed from being perceived by patients as a "death sentence" to a manageable chronic illness. Now, HIV-positive individuals in "wealthy" countries who are compliant to HAART regimens can typically expect to live about as long as the general public (The Antiretroviral Therapy Cohort Collaboration, 2008). Unfortunately, living longer and physically healthier lives has not fully protected this population from the psychological stress that often accompanies the diagnosis and management of HIV. Mental health problems, including depression and posttraumatic stress disorder (PTSD) have been observed as disproportionately affecting HIV-positive individuals (Ciesla & Roberts, 2001; reviewed in Brief et al., 2004). Researchers and

mental health practitioners working with this population have increasingly turned their attention towards managing mental health difficulties and improving the overall quality of life for HIV-positive individuals. One intervention strategy that has been suggested and implemented with this goal in mind is emotional disclosure through writing (O'Cleirigh et al., 2003; Rivkin, Gustafon, Weingarten, & Chin, 2006).

The present study aims to examine an emotional expression trauma-writing intervention in individuals living with HIV. It is posited that this intervention is an appropriate treatment for improving health-related quality of life (HRQoL) in this population. In particular, the relationship between level of emotional expression and depth processing of traumatic experiences during writing and changes in HRQoL over time will be examined. Psychosocial variables including depression and PTSD will also be examined as potential mediators of the relationship between processing of traumatic experiences and HRQoL. To familiarize the reader with these constructs, a review of the emotional expression literature will be followed by a discussion of the current research evidence examining HRQoL in HIV.

Emotional Expression

Emotional disclosure to others following a stressful or traumatic event has long been considered a normal and healthy process by the general public as well as mental health professionals. Every-day phrases such as "getting something off my chest" or "I just need to vent" reflect the ubiquity of this behavior in society, while the process of emotional inhibition is reflected in popular metaphors such as "keeping skeletons in my closet." However, the disclosure process was not formally researched until the 1980's, when Pennebaker and Beall (1986) ran a preliminary investigation to examine the

feasibility of a written emotional disclosure task to impact long-term measures of physical health in addition to short-term impacts on negative mood and physiological arousal. The inspiration for this research arose from a growing body of theory and evidence pointing to the idea that inhibiting one's emotions requires physiological work. Further, Seyle's (1976) model of stress highlighted the theory that active emotional or cognitive inhibition places stress on the body over time and can increase the probability of developing stress-related illness.

Therefore, Pennebaker and Beall (1986) felt compelled to examine whether simply writing about stressful/traumatic events would be successful in ameliorating long- and short-term stress and stress-related disease factors. In this preliminary study, 46 undergraduate students were randomly assigned to one of four groups: a trauma-fact group (writing about the events of a trauma/stressful event while using no emotion), a trauma-emotion group (writing about the emotions involved in a trauma/stressful event without actually discussing the event), a trauma-combination group (a combination of the first two groups described), and a control group who wrote about trivial topics. Results of this innovative study showed that individuals in the trauma-combination group had a decrease in illness-related doctor's visits several weeks following the intervention, a result that was not found in the other three groups. This finding fueled the hypothesis that the disclosure of thoughts and feelings involved in a traumatic experience could have a positive impact on objectively measured indicators of physical health, and opened up the door for further research in the area. The conclusions of this study were best described in a statement by Pennebaker and Beall (1986), "we have raised more questions than we have answered."

A plethora of work in this area by psychology researchers followed over the course of two decades and aimed at answering questions about disclosure including why, how and for whom it is effective (Frattaroli, 2006). The majority of emotional expression studies have followed methodology similar to that used in the original Pennebaker and Beall study (1986). Participants generally come into the research lab for three to five sessions lasting 15-20 minutes each, and are randomly assigned to write about either a traumatic or stressful event in an expressive manner, or about a neutral topic without emotion. Participants are typically measured on several psychosocial and/or health variables both before the writing intervention and then again immediately following the intervention or several weeks/months following the last writing session. The core aspects of this methodology continue to be used in the majority of expressive writing studies being conducted today (Frattaroli, 2006).

The populations studied have been diverse, but the initial groups examined were primarily college students and healthy populations (Pennebaker, Colder, & Sharp, 1990; Greenburg, Wortman, & Stone, 1996; King & Minor, 2001), followed by a focus on people who had experienced a major stressor or upsetting event (Spera, Buhrfeind, & Pennebaker, 1994; Richards, Beal, Seagal, & Pennebaker, 2000). Eventually, the focus also turned to research with various medical populations (Smyth et al., 1999; Stanton et al., 2002; Petrie et al., 2004) and most recently, to individuals with psychiatric diagnoses or psychological problems (Rosenburg, et al., 2002; Gidron et al., 2002). Outcome measures have also varied and have been expanded over the course of research in emotional expression, and have included physiological measures of health, as well as

measures of health behaviors, perceived health, general functioning, and a myriad of psychosocial variables (Frattaroli, 2006).

Various methods have been used to identify and measure the important elements of emotional expression within written essays. Pennebaker's Linguistic Inquiry and Word Count (LIWC; Francis & Pennebaker, 1993) is the most commonly used method for essay scoring. The LIWC is a computer software program that calculates percentage totals for 61 selected affective and structural language elements from a word-by-word analysis of written text, into four domains: Emotional Expression, Cognitive Strategies, Content Domains, and Language Composition. Each broad domain is then further divided into subcategories. For example, within the Emotional Expression category there is an Anxiety subcategory that would include words such as nervous, afraid and uneasy. Researchers have begun to use other approaches to capture emotional expression as well as other constructs in written essays, including non-computer based scoring by trained technicians (O'Cleirigh et al., 2003). This method potentially allows for the measurement of constructs not captured using the LIWC, including subjective ratings of depth processing measures such as cognitive appraisal, self esteem, experiential involvement (extent of cognitive/affective involvement in the process of writing about a trauma), and adaptive coping strategies. Also, content analysis has been used to measure constructs such as self-affirmation, cognitive processing, and discovery of meaning in essays (Creswell et al., 2007). Each coding procedure comes with its own set of strengths and weaknesses, and the relative usefulness of each is an area for investigation in future research.

The current literature for the emotional expression paradigm is quite expansive. Therefore, a review of meta-analyses will provide a more succinct and focused examination of the current state of information in this area. Several articles pertaining to the theories postulated in explaining the benefits of emotional expression will also be discussed.

Meta-analyses

About ten years after Pennebaker and Beall's (1986) initial study set off the "boom" in written emotional expression research, Smyth (1998) conducted a meta-analysis to objectively evaluate results from the growing body of literature in this area. A total of 13 studies were identified as meeting his inclusion criteria and were included in the meta-analysis. Each study needed to: 1) involve an experimental manipulation of written emotional disclosure, 2) have a control group writing about neutral topics and an experimental group writing about a traumatic event, 3) involve an outcome measure of health (i.e., mental, physical or general functioning), and 4) contain statistical information used for calculating an effect size. It is noted that all 13 studies included in Smyth's analysis were conducted with samples that were both physically and psychologically healthy, as this intervention had not yet been studied in medical or psychiatric populations.

The results of Smyth's meta-analysis included a statistically significant mean weighted effect size across all 13 studies of $r = .230$, which represents an improvement of 23% in the experimental (trauma writing) group in comparison to the control group, when examining all outcome types collectively. Smyth notes that this effect size is commensurate with other psychological, behavioral, or educational treatments. The

results did vary across outcome type, with psychological well-being and physiological functioning having the highest effect sizes, followed by reported health and general functioning measures, all of which showed significant improvements for the experimental groups. Health behaviors were the only outcome type that did not have a statistically significant effect size. Regarding short-term outcomes, an increase in short-term distress was found post-writing for the experimental groups. This finding was attributed to Pennebaker's (1993) theory that there is a link between short-term distress and long-term improvement when working through traumatic memories.

Smyth also examined several potential moderator variables to explain characteristics for which the emotional writing task may have been most effective. Regarding participant characteristics, results indicated that this intervention may be more effective for college student participants versus non-students, and more effective for males than for females. It was also found that a longer length of time between the multiple writing sessions may increase the beneficial effects of the trauma writing task. Finally, the specific type of instructions given to participants was also related to effect size. Participants instructed to write about current traumas had higher well-being outcomes in comparison to participants instructed to write about any trauma (i.e., past or present), specifically in the area of greater physiological outcomes. Smyth's suggestions following his meta-analysis included the need for studies further examining the ongoing affective, cognitive and physiological changes occurring during the intervention, in order to test the hypothesis that the writing task works by facilitating cognitive processing and assimilation of traumatic memories. This article also suggests further investigations of writing parameters (e.g., use of insight words), the usefulness of this intervention for

different trauma types, and the effectiveness in medical and psychiatric populations.

Several years after Smyth's (1998) meta-analysis of written emotional expression studies, a meta-analysis looking at the effects of this intervention on health outcomes specifically in clinical populations was conducted by another group of researchers (Frisina, Borod & Lepore, 2004). The main goal of this meta-analysis was to examine the magnitude and significance of expressive writing effects in people with physical or psychological disorders, as these populations were not represented in Smyth's meta-analysis. A total of nine studies met the inclusion criteria of this analysis, and included samples of individuals with physical (e.g., cancer, asthma and rheumatoid arthritis) and psychological (e.g., PTSD, depression) disorders, and examined health outcomes measured at least one month after the last writing session.

Results of the meta-analysis by Frisina et al. (2004) indicated a statistically significant mean weighted effect size of $r = .10$ across all outcome measures examined (both physical and psychological). However, results showed that the mean effect size for physical health outcomes was significant at $d = .21$, while only a marginal increase in psychological health outcomes was observed and was not significant with an effect size of $d = .07$. Therefore, the results did not parallel those of Smyth's (1998) analysis in that the expressive writing intervention did not appear to improve psychological health outcomes in clinical populations as it had in healthy populations. A more in-depth examination of the individual psychological health outcome measures included in the analysis showed that the intervention did produce improvements in a few of these measures, including depression, mood, anxiety, and sleep quality in the clinical populations studied. It was also noted that the expressive writing intervention appeared

somewhat more effective for physically ill populations in comparison to psychiatric populations. Possible explanations for this last finding were discussed, including the idea that the intervention was not sufficient in facilitating the cognitive processing needed to change distorted cognitions commonly seen in patients with PTSD. These authors also suggested further examinations of expressive writing in clinical populations based on the promising results of their meta-analysis.

The most thorough meta-analysis of studies in the emotional expression paradigm was recently conducted by Frattaroli (2006). This analysis involved less conservative inclusion criteria than the two previous meta-analyses, with the aim of increasing the scope of generalizability and therefore allowing for the use of a random effects approach. In addition to examining whether this intervention is effective and how effective it may be Frattaroli also looked at a number of potential moderator variables to explain "when" and "for whom" the intervention is most effective. Potential moderator variables included factors such as setting, participant type, methodology, and details of the treatment itself. A total of six outcome types were included in the overall analysis of effect size and also examined separately for effect size: psychological health (e.g., depression), physiological functioning (e.g., immune parameters), reported health (e.g., number of doctor visits), health behaviors (e.g., medication adherence), general functioning (e.g., school outcomes), and subjective impact of the intervention (e.g., perceived effectiveness of disclosure). After meeting inclusion criteria, the number of studies included in this meta-analysis was 146, with a total number of participants combined across studies of 10,994.

Results of the Frattaroli study (2006) revealed a positive and significant overall weighted mean effect size of $r = .063$ (overall unweighted mean effect size, $r = .075$).

Further, the majority of studies (70%) had a positive effect size, while 25% had a negative effect size and only 5% had an effect size of zero. Regarding the six individual outcome categories, psychological health, physiological health, reported health, subjective impact of intervention, and general functioning all had significant and positive effect sizes. The health behaviors category was the only of the six dimensions that did not have a significant effect size. Frattaroli (2006) interprets this null finding as a possible indication that health behavior change may require more cognitively-oriented intervention components; the more emotion-focused components of emotional disclosure interventions may not be sufficient for changes in that realm.

Analyses of hypothesized moderator variables indicated several interesting findings (Frattaroli, 2006). In the area of setting variables, studies recruiting only participants with a physical health problem had significantly higher effect sizes in reported health variables versus studies without this inclusion criterion. Also, studies with college student samples had a marginally higher effect size for psychological health, but did not differ from other samples on overall, reported health, or subjective impact effect sizes. Privacy conditions were also a significant moderator variable, in that studies where disclosure sessions were held in a private room had greater overall and psychological effect sizes in comparison to studies where participants disclosed in a room with other participants present. Regarding participant characteristics that were examined, between-studies analyses indicated that age, gender, ethnicity, and education level were not significant moderator variables. Participants with higher levels of stress measured at baseline showed greater benefits for overall effect size, and people with poorer health at baseline showed greater benefits in health outcomes after the intervention. Individuals

labeled as pessimists at baseline were more likely to benefit in psychological and reported health outcomes versus people labeled as optimists.

The only methodological variable found to be a significant moderator was the timing of follow-up or posttest measures. Studies that followed participants for at least one month or longer after the intervention had larger overall and psychological health effect sizes. Moderator analyses for treatment variables indicated that studies with at least three writing sessions were more effective than studies with fewer sessions, and studies where sessions lasted 15 minutes or longer were more effective than those with shorter sessions. Further, Frattaroli (2006) found that studies in which participants wrote about more recent traumas/stressors had larger effect sizes, and studies where participants were given directed questions in the instruction set were also more effective.

The Frattaroli (2006) meta-analysis concludes that experimental disclosure interventions do have beneficial effects for participants, and should be considered a "worthwhile activity". The overall effect size calculated from this analysis (r = .063) is somewhat smaller than the previous analyses conducted by Smyth (r = .230; 1998) and Frisina et al. *(*r = .10; 2004), but the discrepancy is potentially attributed to the inclusion of a much higher number of unpublished studies in the Frattaroli article, which tend to have smaller effect sizes inherently. Frattaroli also notes the importance of considering the fact that this intervention has minimal costs (i.e., free, noninvasive, and viewed as helpful by participants) and yet has notable benefits, which speaks to its value on a more practical level.

Theories Related to Emotional Expression

While meta-analyses have provided information to support the effectiveness of emotional disclosure interventions, researchers have also been developing theoretical perspectives to help explain why this process works. These theories have helped to direct empirical investigations to support or discount various hypotheses throughout the course of research in this area and continue to point out new areas for investigation in the future.

One of the first theories postulated is the emotional inhibition theory, drawn from Freud's theory of catharsis and the "talking cure" (Freud, 1904/1954). This theory suggests that inhibition of thoughts and feelings related to a stressful event can be harmful because it potentially requires physiological work and may exacerbate psychosomatic processes, which in turn may increase the risk of stress-related mental and physical disturbances. Pennebaker (1989) hypothesized that the release of these pent-up thoughts and feelings, through talking or writing, may reduce the stress produced from inhibition, and subsequently translate to improvements in health outcomes.

The connection between inhibition and increased risk of physical ailments is supported by studies linking emotional inhibition to various minor ailments (Pennebaker, 1990), increased sympathetic arousal (Gross & Levenson, 1993, 1997), and inhibited anger and hostility to cardiovascular issues such as hypertension and coronary heart disease (Smith, 1992; Steptoe, 1993). Significant improvements in physical and immune functioning (as measured by biochemical markers) have been shown in a number of emotional expression studies (Pennebaker, Kiecolt-Glaser, & Glaser, 1988; Esterling, Antoni, Fletcher, Marguiles, & Schneiderman, 1994; Petrie, Booth, Pennebaker, Davison, & Thomas, 1995).

However, other studies have provided evidence that contradict the inhibition theory. Individuals who wrote about previously disclosed traumas benefited in health outcomes just as much as a group who wrote about previously undisclosed traumas (Greenburg & Stone, 1992). Further evidence along this line comes from a study where individuals who wrote about deep emotions related to an imaginary trauma benefited as much as individuals who wrote using the same methods about an actual experienced trauma (Greenburg, Wortman, & Stone, 1996). Further, Frattaroli's (2006) meta-analysis produced results with very little support for the inhibition theory. In fact, disclosure of more recent traumatic events was positively related to effect size. If the release of inhibited emotions was the mechanism of action, it would be expected that more chronically inhibited, older traumas would have been related to greater effect size. Also, there was insufficient evidence that individuals with more emotionally inhibited personalities or groups of individuals with higher tendency to inhibit (i.e., Asians and men) benefited more from the disclosure intervention, as would be expected under this theory. Therefore, Frattaroli (2006), along with other authors reviewing the emotional expression literature (Sloan & Marx, 2004; Pennebaker, 1997; Baikie & Wilhelm, 2005) all agree that the inhibition theory is an unlikely explanation of the effectiveness of emotional expression, and note that researchers are turning their investigations in other directions.

Another theory widely examined as a potential explanation of the benefits from emotional expression is the cognitive processing or cognitive adaptation theory. This theory was brought to light when Pennebaker (1993) created a text-analysis program (LIWC; Francis & Pennebaker, 1993) to examine the results of the first five experiments

with written disclosure, and found that individuals who benefited most from the intervention had a significant increase across writing sessions in causation words (i.e., because, effect, reason), and insight words (i.e., know, understand). He concluded that the mechanism of action in writing interventions included the processes of making sense of the event, increasing insight about the stressful event, and organizing and integrating the stressful experience into one's self-schema.

In support of the cognitive processing theory, Pennebaker and Francis (1996) found that increases in insight and causal words across writing sessions were related to improvements in physical health. While the cognitive processing theory has been noted as somewhat difficult to examine empirically, some evidence has been supportive, including the finding that narrative formation and coherence were necessary for writing to be beneficial (Smyth, True, & Souto, 2001). The beneficial outcome of improvements in positive growth due to expressive writing was mediated by cognitive processing words in a study of college undergraduates (Ullrich & Lutgendorf, 2002). Park and Blumberg (2002) found improvements in measures of appraisal related to the traumatic event from pre-writing to a four-month follow-up, including changes in appraisal of uncontrollability, threat, stressfulness, intrusions and avoidance. However, the Park and Blumberg study had several limitations, and outcomes indicated that the emotional disclosure group did not show significant improvements in measures of emotional or physical health.

Frattaroli (2006) also failed to find evidence to support the cognitive processing theory in her recent meta-analysis. Specifically, studies that used theory-driven cognitive-processing disclosure instructions were no more beneficial to participants than studies

that did not use these modified instructions. Also, studies that used a longer period of time between writing sessions, which could have allowed for greater processing of the trauma in between sessions, did not show greater effect sizes for outcomes. Frattaroli (2006) argues that results indicating these factors as significant moderators would have supported the cognitive processing theory, a theory which was not borne out by the data analyzed in her thorough meta-analysis. While evidence to support the cognitive processing theory is limited, this may be influenced by the noted difficulties in testing this particular process empirically. Further research, including studies using innovative methods for measuring cognitive processing in written essays, are needed to further clarify the accuracy of the cognitive processing theory.

The third theory receiving a good deal of attention in potentially explaining the benefits of written emotional expression is the exposure or emotional processing theory. This theory presents the idea that emotional disclosure may work similarly to exposure or flooding therapy, such as Prolonged Exposure therapy (Foa & Rothbaum, 1998), widely used for treatment of posttraumatic stress disorder. By repeatedly confronting, describing, and essentially reliving the stressful event, the individual is encouraged to face previously avoided or suppressed thoughts, memories, and distressing feelings. It is suggested that the individual may experience habituation and eventual distinction of the distressing thoughts and feelings related to the event. The trauma-writing process may also tap into the "fear structure" related to the traumatic event, consequently providing the individual with corrective information about the stimuli, responses and meanings related to the trauma (Lepore, Greenburg, Bruno, & Smyth, 2002). Sloan and Marx (2004) note that

this conceptualization applied to written disclosure interventions may also support the evidence seen in some studies that cognitive changes occur during the writing process.

Support for the exposure theory in emotional expression studies has been mixed. Sloan and Marx (2004) argued that several pieces of evidence from research in this area should be observed to help confirm the accuracy of this theory. Specifically, it should be observed that emotional disclosure is particularly effective for individuals with a history of trauma, and it should lead to a reduction in posttraumatic stress symptoms. Also, two treatment dosage factors should be related to the effectiveness observed, with studies involving a greater number of sessions and longer lasting sessions being the most effective. A recent meta-analysis found evidence confirming all four of these criteria (Frattaroli, 2006), and concluded that exposure theory has the most support of all theories examined to date. However, in a review article Sloan and Marx (2004) point out that the evidence in individual studies has been mixed. Regarding outcomes related to PTSD symptoms, some studies have shown reductions in intrusive thoughts and images as well as avoidance-related symptoms (Klein & Boals, 2001; Schoutrop, Lange, Hanewald, Davidovich, & Salomon, 2002). Other studies have found no effect from written disclosure on these two outcomes (de Moor et al., 2002; Stroebe, Stroebe, Zech, & van den Bout, 2002) and a few have even found an increase in avoidance symptoms post-writing (Gidron, Peri, Connonlly, & Shalev, 1996; Smyth et al, 2001). While the exposure theory is promising, further evidence in future studies is needed to fully support its accuracy in explaining the benefits of emotional disclosure interventions.

In summary, despite the increasingly abundant research evidence that emotional disclosure is an effective treatment for a variety of physical and psychological outcomes,

the underlying mechanisms are still not well understood. In addition to the inhibition theory, cognitive processing theory, and exposure theories described above, a number of other theories have been proposed, including the social integration theory and self-regulation theory, and have been examined and supported to varying degrees (Frattaroli, 2006). As noted by Sloan and Marx (2004) it is quite possible that unexplored alternative theories may underlie these mechanisms, and the full explanation of how emotional disclosure works may in truth include a combination of many of the theories being examined.

Emotional Expression in Medical Populations

While much of the research with written emotional disclosure has been in either student populations or groups of individuals with psychological difficulties or who have experienced a traumatic event, there has been a noticeable increase in studies with medical populations over the past several years. It is arguable that medical populations may be especially well-suited to this intervention as it has been shown to improve various objective and self-reported health-related outcomes. Conversely, it is possible that writing about traumatic/stressful events is not "strong" enough to have meaningful benefits for outcomes in populations already experiencing significantly compromised health functioning. In addition to health outcomes, researchers have also looked at psychological outcomes that may be relevant for medical populations, including health-related quality of life (HRQoL). A review of the literature will highlight findings from emotional expression interventions in medical populations, with a particular focus on studies examining HRQoL.

One of the first published studies examining emotional disclosure in a medical population involved a sample of individuals with either asthma or rheumatoid arthritis (Smyth, Stone, Hurewitz, & Kaell, 1999). Results showed clinically meaningful improvements in health status for the emotional disclosure writing group compared to a control group, including improvements in lung functioning for asthma patients and improvements in overall disease activity for rheumatoid arthritis patients. These promising results set the ground work for the possibility that emotional disclosure may have benefits for chronically ill populations in objective and physician-rated indices of disease severity.

The effect of emotional disclosure writing has also been examined in several cancer populations. In a sample of men with prostate cancer, emotional expression through writing was related to significant improvements in physical symptoms and amount of health care utilization compared to a control group (Rosenberg et al., 2002). However, the experimental group did not evidence benefits in measures of immunocompetence or psychological well-being, including measures of health- and cancer-related quality of life. In a study with early-stage breast cancer survivors, content analysis was used to measure self-affirmation, cognitive processing, and discovery of meaning in essays where participants disclosed cancer-related thoughts and feelings (Creswell et al., 2007). Results indicated a significant reduction in physical symptoms at 3-month follow-up, and level of self-affirmation during writing fully mediated the relationship between emotional expression and physical symptoms. Cognitive processing and discovery of meaning did not, however, predict improvements in physical symptoms. Self-affirmation may be one mechanism underlying the benefits to health observed

following expressive writing, possibly by helping to increase self-esteem and self-efficacy to deal with a trauma or stressor. This study also highlighted the value of using novel content analysis procedures to evaluate essays in emotional expression studies.

Different specific types of emotional writing tasks have been examined in health populations as well. In a study of individuals with lupus or rheumatoid arthritis, the impact of writing about "benefit finding" related to having a rheumatic disease was compared with the standard emotional writing protocol and a control group (Danoff-Burg, Agee, Romanoff, Kremer, & Strosberg, 2006). Results indicated that both treatment groups had lower levels of fatigue three months after the intervention compared to the control group, while there were no significant group effects for measures of disability or psychological functioning. Interestingly, the benefit finding writing seemed effective in reducing pain level for individuals with high trait anxiety, while individuals with low trait anxiety benefitted most from standard emotional writing.

Similarly, a study with early-stage breast cancer patients compared a standard emotional expression group with a group who wrote about their positive thoughts and feelings regarding the experience of having breast cancer (i.e., benefit finding), as well as with a control group (Stanton et al., 2002). At a 3-month follow-up, both intervention writing groups had significant decreases in negative physical symptoms and in cancer-related medical appointments versus the control group. Further, the impact on psychological function outcomes seemed to be dependent on another participant factor: level of cancer-related avoidance. Specifically, expressive disclosure was more beneficial for women with low cancer-related avoidance and the benefit finding writing was more beneficial for women high in cancer-related avoidance. The results of these two

studies (Danoff-Burg et al., 2006; Stanton et al., 2002) sheds light on the possibility that specific types of emotional expression writing may be more effective for individuals with particular characteristics or personality traits than for others.

The time course of the benefits gained from emotional disclosure has also been an important point of examination in medical populations. In a sample of female fibromyalgia patients, written emotional disclosure was effective in decreasing levels of pain, fatigue, and increasing psychological well-being (i.e., HRQoL, depression, and anxiety) compared to individuals in a control or usual care group (Broderick, Doerte, Junghaenel, & Schwartz, 2005). The benefits were observed at 4-months post-treatment, but did not hold up at a 10-month follow-up, which calls into question the long term effects of this intervention. Further research is needed to determine if modifications in the intervention design may help confer longer-lasting benefits, including the possibility of "booster" sessions several months past the original writing sessions, which might be particularly helpful for individuals facing chronic medical conditions.

Chronic medical conditions often impact not only the patient, but the stress of providing care and support may take a toll on the psychological and physical well-being of family members and caregivers as well. Schwartz and Drotar (2004) examined an emotional expression intervention in caregivers (mostly parents) of children who were hospitalized for chronic illnesses. Results indicated that in comparison to a control group writing about neutral topics, caregivers who wrote about traumatic experiences showed significant improvements in HRQoL at a four-month follow-up. Specifically, it was found that within the trauma writing group, an increase in cognition related words and a

decrease in negative emotional words from the first to third writing session was related to greater improvements in the physical health dimension of HRQoL.

In conclusion, emotional expression has been effective in improving physical and psychological health outcomes in a number of populations experiencing compromised health. Specifically, HRQoL was improved for individuals with fibromyalgia (Broderick et al., 2005), and caregivers of children with chronic illness (Schwartz & Drotar, 2004). The body of literature examining an assortment of outcomes and constructs related to emotional disclosure in various medical populations exists and continues to expand.

Emotional Expression in HIV/AIDS

While the research literature pertaining to emotional disclosure in various healthy and medical populations is quite expansive, there have been only a few studies examining this construct in individuals living with HIV/AIDS. The paucity of literature in this area is surprising, considering that HIV-positive individuals have higher incidence of trauma and related symptoms versus healthy populations (Ciesla & Roberts, 2001; reviewed in Brief et al., 2004). A related construct, emotional inhibition or concealment of potentially stigmatizing personal information, has been looked at in two studies with HIV-positive individuals. In a sample of HIV-positive gay men, greater concealment of sexual identity was related to increased disease progression as measured by three indicators: time to critically low CD4 cell count, time to AIDS diagnosis, and time to AIDS-related mortality (Cole, Kemeny, Taylor, Visscher, & Fahey, 1996). This variation in disease progression could not be explained by differences in demographic variables, health behaviors, sexual behavior, level of depression and anxiety, social support, or antiretroviral therapy, all of which the study statistically controlled for in analyses. The

impact of disclosing HIV status was also examined in a study with HIV-positive children (Sherman, Bonanno, Wiener, & Battles, 2000). Results indicated that children who did disclose their status to friends had greater increases in CD4 cell counts during a one-year follow-up period versus a group who chose to not disclose their status. Although observational and not experimental in nature, these two studies provide some insight to the possible link between the processes of expression (versus inhibition) and improved health status in HIV-positive individuals.

A study with HIV-positive women looked at measures of verbalized emotional expression and inhibition during a structured interview about the impact of HIV, including questions about HIV-related stressors, thoughts about the future, coping with uncertainties about the future, meaning, and goals (Eisenberger, Kemeny, & Wyatt, 2003). Participants with a higher percentage of "inhibition" words (i.e., inhibit, restrain, avoid) during the interview had significantly lower CD4 cell counts compared to those who used less inhibition words, after controlling for ethnicity, SES, eating and exercise habits, drug use, time since HIV diagnosis, HIV symptoms and use of protease inhibitors. These researchers also looked at measures of emotional expression in the interviews (i.e., percentage of positive and negative emotional words), but found no significant relationship with CD4 cell count. The authors' interpretation of this finding included the possibility that expressive processes may be less important than inhibitory processes in relation to health outcomes. Noted limitations of this study include the cross-sectional design, which is especially limiting when examining immunological parameters such as CD4 cell count. Also, this study used the LIWC (Francis & Pennebaker, 1993) scoring program to measure emotional expression and inhibition, which is noted by the authors as

limited in its ability to truly capture how an individual expresses or inhibits their emotions (Eisenberger et al., 2003). It is also possible that the processes of emotional expression and inhibition work somewhat differently during a verbal interview, versus the written essays typically used in research studies.

There have been a few studies with HIV-positive individuals looking at the effects of written emotional disclosure. A group labeled as "Long Term Survivors" (LTS) who had survived four or more years past diagnosis with an AIDS-defining symptom prior to starting protease inhibitors were compared to an HIV-positive comparison group of individuals in the mid-range of typical disease progression (O'Cleirigh et al., 2003). Participants from both groups were instructed to write for 20 minutes during one session about the most stressful or traumatic situation or feelings they had dealt with since being diagnosed with HIV, including finding out that they were HIV-positive. Essays were scored for emotional expression (number of positive and negative emotional words) and depth processing which consisted of four specific processes reflected to varying degrees in the essays (positive cognitive appraisal change, experiential involvement, self-esteem improvements, and adaptive coping strategies). Results showed that the LTS group essays included significantly higher emotional expression and depth processing than the comparison group. Further, the relationship between emotional expression and long-term survival status was mediated by depth processing. For women only, greater emotional expression was related to favorable immune parameters, including lower HIV viral load and greater CD4 cell count, and greater depth processing was also related to higher CD4 cell count. Conclusions of this study include insights on the importance of depth processing and not just emotional expression of traumatic events for HIV-positive

individuals, which was further supported by the finding that depth processing (and not emotional expression) was related to greater medication adherence and social support and lower perceived stress in this sample.

A similar study examined the written emotional expression of another group of HIV-positive individuals displaying favorable disease progression (O'Cleirigh, Ironson, Fletcher, & Schneiderman, 2008). The "Healthy Survivors" group consisted of 37 individuals with AIDS who remained asymptomatic despite very low CD4 cell counts (< 50) for at least nine months and without the use of protease inhibitors during that period. In comparison to an HIV-positive group of individuals at an earlier stage of disease progression, the Healthy Survivors wrote significantly more total words, positive emotion words, negative emotion words, and displayed significantly more depth processing during a 20-minute trauma writing exercise. Again, depth processing was found as a mediator of the relationship between emotional expression and group membership (i.e., Healthy Survivor status). Further, Natural Killer cell number was found to be a significant mediator of the relationship between depth processing and Healthy Survivor status, and is suggested as a potential explanation of the absence of symptoms observed in this group.

Results of the two studies conducted by this group of researchers were not due to differences between groups on a number of demographic variables or seriousness of the topic disclosed, on which the groups were equivalent (O'Cleirigh et al., 2003; O'Cleirigh et al., 2008). Although somewhat limited by cross-sectional design, the findings of these two studies point to the potential benefits of expressive writing for immune functioning and health outcomes in people living with HIV/AIDS, and especially highlight the importance of depth processing of traumas during the writing process.

Another study with HIV-positive individuals followed the more standard design for emotional expression studies by comparing an intervention group writing about traumatic/stressful events with a control group. This study involved a relatively small sample ($N = 37$) of mostly Caucasian males with HIV, and examined the impact of written emotional expression on CD4 cell count and HIV viral load (Petrie, Fontanilla, Thomas, Booth, & Pennebaker, 2004). Participants were randomly assigned to write about the most traumatic/stressful experiences in their lives, which could include HIV-related topics or other issues of emotional importance to them (intervention group), or to a control group writing about daily activities without using emotion. Results indicated that participants in the intervention group had significantly increased CD4 cell counts over the 6-month follow-up period, while this result was not observed in the control group. No sustained improvement in HIV viral load was observed for either group.

The authors of this study note that the mechanism by which emotional expression writing is beneficial to HIV disease progression is not clearly understood (Petrie et al., 2004). A possible neuroendocrine mechanism is postulated and recommended for examination in future research with this population. Also, it is suggested that cognitive changes and higher levels of emotional expression (use of emotion words) during writing may be related to health improvements based on studies with other medical populations, and should also be looked at in future work with HIV-positive individuals. Other notable limitations of this study were the small and rather homogenous sample. Further research is needed with a larger and more diverse (i.e., gender, ethnicity) group of people living with HIV to understand if these benefits will generalize to other types of people living with this illness.

Another group of researchers noted that emotional expression interventions might be particularly helpful for people living with HIV due to the often stigmatizing experience of having this illness, which may make it difficult topic to discuss with others (Rivkin, Gustafson, Weingarten, & Chin, 2006). These researchers studied an ethnically diverse group of 79 HIV-positive men and women who were randomly assigned to write about "their deepest thoughts and feelings about being HIV-positive" (emotional expression group) or about a neutral topic (control group). The first writing session was held in the research lab, and participants were instructed to complete three more writing sessions at home using a journal over the course of three weeks. Pennebaker's LIWC scoring program (Francis & Pennebaker, 1993) was used to compare the two groups on various aspects of essay content. Results showed that the emotional expression group used significantly more affect words, positive emotion words, negative emotion words, and cognitive mechanism words (i.e., causation, insight, discrepancy, tentative and certainty words) in comparison to the control group. However, analyses indicated that the writing intervention had no significant effect on changes in a number of outcomes from baseline to 2- and 6-month follow-ups, including: depression, immune function as measured by beta2-microglobulin (B2-M), and a self-report of positive or negative changes in one's life related to being HIV-positive.

Although no significant differences in outcomes were found between the two groups, within-group analyses of the expressive writing group did indicate some interesting results (Rivkin et al., 2004). At the 2-month follow-up individuals with writing that showed increased use of causation and insight words (indicating increased cognitive processing) from first to fourth writing session had lower B2-M (indicating

better immune control) after controlling for baseline levels, and also reported fewer negative changes in their lives related to being HIV-positive. Individuals who increased their use of social words across writing sessions also had increased B2-M at the 2-month follow-up and reported more positive changes related to HIV at the 6-month follow-up.

One noted limitation of this study was the use of B2-M as an indicator of systemic immune activation; use of immune parameters such as CD4 cell count and HIV viral load are suggested as more sensitive measures of immune function in future studies of this type (Rivkin et al., 2004). The authors also note that control group participants often wrote about challenges in their daily lives in ways that involved expression of emotions and related thoughts. This unexpected outcome potentially brought benefit to the control group which may have contributed to the lack of differences between conditions. Perhaps a more neutral writing topic for the control group or statistical methods that might control for level of expression amongst the control group would be helpful in future study designs. Another unique aspect of this study was that intervention group participants were specifically instructed to write about traumas/stressors related to having HIV. It is possible that the intervention may work differently in studies where participants are free to write about topics related to HIV or other stressful life events.

The research evidence examining emotional expression interventions in HIV-positive individuals remains sparse. In this population, emotional inhibition has been linked to poorer immune function, while higher levels of emotional expression have been generally related to improved immune status and health status. Higher levels of depth/cognitive processing during expressive writing has also been related to health status in HIV-positive individuals, and further research is needed to examine whether

these processes might be one pathway through which emotional expression confers health benefits. There remains a paucity of studies looking at the impact of emotional expression on psychological health outcomes for people living with HIV, and no studies to date that have examined the potential for this intervention to improve health-related quality of life in this population.

Emotional Expression and Psychological Well-being

An increasing number of studies are beginning to look at the impact of emotional expression/disclosure writing on symptoms of depression and posttraumatic stress disorder (PTSD). It is possible that improvements in these symptoms might be one mechanism through which emotional expression leads to better health outcomes and overall well-being. Pennebaker and Seagal (1999) have pointed to the ability of this intervention to promote cognitive processing of traumatic/stressful events, including increased reflection on the meaning of the event and greater sense of coherence involved in the event. This cognitive processing may help convert traumatic memories into memories that elicit less arousal, decrease intrusive thoughts and promote emotional regulation over time (Koopman et al., 2005). These potential changes related to the traumatic memory may help to reduce symptoms of PTSD. In relation to depression, emotional expression may be beneficial in its potential to reduce ruminative and intrusive thoughts which are often linked to depressive symptoms, as will be described next.

Emotional Expression & Depression

Emotional disclosure has been proposed as an appropriate intervention for decreasing symptoms of depression, particularly in individuals with high levels of rumination, defined as a dysfunctional attempt to cope with distress where an individual

"repeatedly and passively focuses on distress and its possible consequences," and which has been linked to higher risk for depression (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008; Sloan, Marx, Epstein, & Dobbs, 2008). In this line, it is proposed that emotional expression writing may fall in the category of suggested treatments which encourage confrontation of painful images and emotions, promote active problem solving, and challenge irrational and hopeless thoughts with the goal of decreasing psychological and behavioral difficulties in people who tend to ruminate.

In a sample of individuals preparing to take a stressful examination, participants who completed an emotional expression writing session showed significantly lower levels of depressive symptoms as the exam date approached in comparison to participants who wrote about neutral topics (Lepore, 1997). An exploration of potential mechanisms for this attenuation of symptoms showed that emotional writing led to a reduction in the negative emotional impact of intrusive thoughts, while the number of intrusive thoughts related to the exam was not in itself decreased.

Another group of individuals experiencing a generally stressful life event (beginning their first year of college) was studied to further understand the potential impact of emotional expression on depressive symptoms (Sloan et al., 2008). Follow-ups at two-, four-, and six-months after the intervention revealed significantly decreased levels of depression in the emotional expression group while the control group showed no change in these symptoms. Interestingly, this effect was especially strong for individuals identified as high in brooding type of rumination as assessed at baseline.

Gortner, Rude and Pennebaker (2006) examined written emotional expression in a sample of undergraduate students who were not currently reporting elevated symptoms of

depression, but who were identified as vulnerable to depression based on past reports of elevated symptoms. As predicted, participants in the emotional expression writing group showed significantly lower symptoms of depression at a 6-month follow-up versus the control group, but only for individuals identified as high in emotional suppression. Further, it was found that these changes in depression symptoms were mediated by a reduction in a measure of brooding, defined as a type of rumination particularly focused on self-judgment.

Emotional expression has also been considered a potential treatment for survivors of intimate partner violence/domestic violence, as women who have gone through this experience show high levels of depression (Campbell & Lewandowski, 1997). In a sample of women who were survivors of intimate partner violence, emotional expression writing did not have a significant main effect on depression in comparison to a neutral writing control group (Koopman et al., 2005). However, a significant moderation was found, indicating that women with higher levels of depression at baseline did show significantly lower levels of depression at a follow-up four months after the intervention. The effectiveness of emotional expression in decreasing depression may depend on the severity of symptoms.

Most studies examining the impact of emotional expression interventions on depression have been conducted in groups with a vulnerability to depression either due to past history or because they were experiencing a stressful event (i.e. starting college, taking an exam) that had the potential to increase depressive symptoms. It appears that this intervention may be most effective in decreasing level of depressive symptoms by impacting dysfunctional cognitive processes such as brooding and intrusive thoughts. In

future research it will be interesting to see if this intervention is powerful enough to make a significant impact on symptoms for people currently experiencing clinical levels of depression.

Emotional Expression and PTSD

A few studies have shown promising results regarding the potential for emotional expression to decrease symptoms of PTSD. One study examined the effects of expressive writing on PTSD symptoms in a sample of 57 undergraduate students who reported having experienced a traumatic event that was still troubling them (Deters & Range, 2003). Surprisingly, participants in both the emotional expression and neutral writing groups showed similar improvements in measures of PTSD symptoms, impact of the traumatic events, and dissociative symptoms at a 6-week follow-up. However, the timeline of improvements in PTSD symptom and impact scores was different for the two groups, with the emotional expression group getting worse at posttest and then improving to beyond their baseline level at the 6-week follow-up while the neutral writing control group showed improvements at posttest that were maintained at six weeks. The exact mechanism explaining this observation is unknown, however it may be that individuals who participate in trauma writing exhibit higher levels of PTSD-related symptoms initially after treatment and eventually habituate to the stressor with time, similar to patterns seen in other exposure therapies for PTSD (Foa & Rothbaum, 1998).

Gebler and Maercker (2007) compared standard trauma writing to a modified "existential" writing procedure that encouraged existential reflections during writing in a group of individuals who reported having experienced a traumatic event in the past. Results indicated a trend towards greater reduction in PTSD and depression symptoms

for the existential writing group compared to the standard expressive writing group, although this finding was not statistically significant potentially due to small sample size. Perhaps modifications to the typical trauma writing instructions may increase the ability of this intervention to improve trauma-related symptoms.

Although some studies have shown positive results, a number of studies have indicated a null effect in the ability of emotional expression writing to impact symptoms of PTSD. Expressive writing did not significantly improve symptoms of PTSD in comparison to a neutral writing control group at a four-week follow-up in survivors of intimate partner violence (Koopman et al., 2005), and at 3- and 6-month follow-ups for traumatic injury patients identified as "at risk" for developing PTSD (Bugg, Turpin, Mason, & Scholes, 2009). Similarly, expressive writing did not lead to a significant decrease in PTSD symptom severity relative to a control writing group at a 3-month follow-up in 25 individuals with verified diagnosis of PTSD (Smyth, Hockmeyer, & Tulloch, 2008). However, patients in the intervention group did show greater improvements at follow-up in a measure of post-traumatic growth and in mood. Interestingly, this study also conducted salivary cortisol assays and found that the expressive writing group had a significantly attenuated neuroendocrine response to induced trauma-related memories at follow-up, indicating an improvement in their ability to regulate responses to trauma on a physiological level. The latter result is promising in the potential for this intervention to impact physiological responses to trauma.

One study with 14 individuals who survived a variety of past traumatic events indicated a possible negative consequence of written emotional disclosure (Gidron, Peri, Connolly, & Shalev, 1996). Participants in the emotional disclosure group reported

relatively larger increases in avoidance symptoms related to the trauma at a 5-week follow-up, as well as an increase in health care visits, versus the control group who reported a slight decrease in both. While this finding calls into question the appropriateness of this intervention for treatment of PTSD, several notable limitations should be considered. In addition to the small sample size examined, the authors also suggest that a larger "dose" of disclosure writing (i.e., more and longer writing sessions) may be needed to see improvements in symptoms relevant to PTSD (i.e., avoidance). Further, the relatively short follow-up period (5 weeks) may not have provided enough time for the intervention to lead to improvements in trauma resolution.

In summary, studies looking at the impact of expressive writing interventions on PTSD symptoms and severity have produced mixed results. There is a clear need for further research in this area, with future studies including larger sample sizes, longer follow-up periods, and use of measures sensitive to change in PTSD symptoms over time. The majority of studies have been conducted with people who had experienced a past traumatic event but did not necessarily meet criteria for PTSD or had an elevation of related symptoms. Similar to research with depression in this domain, it will be interesting to see if emotional expression is successful in reducing PTSD symptoms and severity in individuals experiencing clinical levels. Further, there is a need for research examining the ability of this intervention in decreasing symptoms of both PTSD and depression in medical populations such as HIV, where high levels of these psychological difficulties have been observed (Ciesla & Roberts, 2001; reviewed in Brief et al., 2004). A reduction in these psychological symptoms could be one pathway through which

emotional expression might improve general well-being and quality of life for these populations.

Quality of Life in HIV/AIDS

As previously mentioned, advances in the pharmacological treatment of HIV with highly active antiretroviral medications (HAART) has changed the face of the illness from an inevitably fatal condition to a chronic, manageable disease (Simon, Ho, & Karim, 2006). However, the majority of people infected with HIV continue to deal with a variety of uncertainties in their lives including financial insecurity, alterations in relationships, and discrimination or stigma in addition to maintenance of their health status (Buseh, Kelber, Hewitt, Stevens, & Park, 2006). All of these factors have the potential to negatively impact quality of life (QoL; Buseh, Kelber, Stevens, & Park, 2008). Amongst researchers and clinicians alike, the focus has in many ways shifted from "preparing people to die, to preparing them to live with HIV" (Westburg & Guindon, 2004), which includes efforts to improve QoL. In their review of QoL issues in HIV/AIDS, Wong and Ussher (2008) warn against the temptation of medical professionals and researchers to dwell on quantitative aspects of HIV management and monitoring, which may disembody the individual living with the illness by focusing only on number of t-cells and amount of virus in the blood as indicators of "health". Further, they note that there can be a significant difference between "feeling good" and having "good results". Hence, an increase in research examining the measurement, contributing factors, and appropriate interventions related to QoL in HIV/AIDS has been suggested and produced over the last several years.

Upon reviewing the literature pertaining to QoL in HIV, a particular challenge emerges in the recognized lack of consensual definition of the term (Hunt, 1997; Katsching, 1997). Farquhar (1995) notes that the concept of QoL is often used, however, the definition is often missing or inconsistent. Perhaps this inconsistency arises from the observation that "quality of life means different things to different people at different times in life" (Boswell, Dawson, & Heininger, 1998). However, one characteristic common to most measures of QoL is multidimensionality, and the commonly measured dimensions in HIV-positive samples include physical and health functioning, mental health and psychological functioning, social and role functioning, and general well-being (Clayson et al., 2006). The majority of QoL studies in HIV have focused on health-related QoL, which is appropriate considering the undeniable likelihood that the illness itself will impact an individual's life experience and general well-being. Therefore, the current project will focus on health-related quality of life (HRQoL) from here forth.

A number of instruments have been used to measure HRQoL in people living with HIV. The majority have been either measures developed for use in a variety of medical populations (i.e., Medical Outcomes Study Short-Form Health Survey (SF-36); Ware & Sherbourne, 1992) or measures developed specifically for use with HIV-positive individuals (HIV/AIDS-Targeted Quality of Life Instrument (HAT-QoL); Holmes & Shea, 1998). While more generic formats are strong in their utility for comparing measures of HRQoL across various medical populations, HIV/AIDS specific measures may capture dimensions of HRQoL that are unique to this illness population. Instruments that have included HIV-positive individuals and HIV medical practitioners in the process of development may be particularly "spot on" in capturing QoL dimensions most relevant

for this population while excluding those that are irrelevant. The HAT-QoL is one such measure (Holmes & Shea, 1998), and a thorough review of its development and psychometric properties is included in the Method section.

Research has typically shown that HRQoL is significantly lower for individuals living with HIV versus general population norms (Sherbourne, et al, 2000; Ruiz et al., 2005). Additionally, HIV-positive individuals have been reported to have significantly lower physical and mental HRQoL in comparison to individuals with other chronic illnesses (Wachtel et al., 1992; Hays et al., 2000). Therefore, the need for continued research leading to a better understanding of interventions that may improve HRQoL in HIV-positive individuals is evident.

Demographic Factors

In her review article, Aranda-Naranjo (2004) highlights five psychosocial factors affecting QoL in HIV-positive individuals: poverty (and subsequent limited access to medical care), stigma, mental health concerns (i.e., depression), substance use, and domestic violence. This article also points to the need for HIV care providers to understand the diverse cultural beliefs of people in this population, especially as the illness continues to increasingly spread within marginalized populations (e.g., poor, homeless, ethnic minorities; Centers for Disease Control and Prevention, 2002), and differences in lifestyle, beliefs and culture can all impact QoL.

In line with this suggestion, results from a large (N = 3778 HIV-positive adults) study conducted at 9 sites across the United States concluded that lower scores of overall HRQoL were associated with being older, being female, being Black or Hispanic, having been infected via intravenous drug use, having a low CD4 cell count, having less than 12

years of education, lacking private health insurance, and having a low income (Campsmith, Nakashima, & Davidson, 2003). Results from another multi-site study suggested that sociodemographic and clinical factors influence HRQoL in people living with HIV/AIDS (Rao, Hahn, Cella, & Hernandez, 2007). Specifically, HIV-positive ethnic minorities may be particularly at risk for lower HRQoL in psychosocial domains while positive women may be especially vulnerable to adverse HRQoL impacts in the physical domains. Overall, demographic factors should be considered when examining HRQoL in HIV-positive individuals, as they often are related to this construct.

Psychosocial Factors

A number of psychosocial factors have been linked to variation in HRQoL for people living with HIV. Psychiatric symptoms including depression have been related to lower HRQoL in several studies (Gore-Felton et al., 2006; Haller & Miles, 2003; Elliott, Russo, & Roy-Byrne, 2002; Kemppainen, 2001). Various comorbid mood disorders (Sherbourne et al., 2000) and grief or complicated bereavement (Silverman et al., 2000; Hansen, Vaughan, Cavanaugh, Connell, & Sikkema, 2009) have been related to poorer HRQoL in this population as well. Greater report of hopelessness, a symptom often associated with depression, was also related to poorer HRQoL in HIV-positive individuals (Swindells et al., 1999).

A recent study with HIV-positive adults experiencing AIDS-related bereavement showed that personality disorder indications (e.g., borderline and antisocial personality disorder features) were related to lower HRQoL (Hansen et al., 2009). Other personality factors have been examined in relationship to HRQoL for HIV-positive individuals. For example, the personality trait neuroticism, characterized by a high degree of depression,

anxiety, anger and low self-confidence, was related to poor HRQoL in two studies with HIV-positive individuals (Burgess et al., 2000; Penedo et al., 2003). Penedo and colleagues (2003) also found that participants with higher conscientiousness and extraversion personality traits had higher levels of HRQoL. Therefore, it appears that both Axis I and Axis II psychological disorders and related symptoms may negatively impact HRQoL in this population. Clinical interventions to address these difficulties may not only have the potential to ameliorate the psychological disorder at hand, but may subsequently help to improve the individual's quality of life more generally.

Different coping styles used by individuals when confronted with stressful situations have been related to HRQoL in HIV-positive samples as well. Denial, avoidance and emotion-focused coping styles have all been related to poorer HRQoL, while problem-focused, active and cognitive coping strategies (i.e., acceptance and positive reframing) have consistently shown the opposite relationship (Lutgendorf, Antoni, Schneiderman, & Fletcher, 1994; Swindells et al., 1999; Burgess et al., 2000; Weaver et al., 2004). Results from the study by Weaver and colleagues (2004) further suggested that perceived stress mediated the relationship between coping style and HRQoL.

Measures of social stigma related to being HIV-positive have also been related to HRQoL. In a study with HIV-positive African American men approximately 40% of the variance in HRQoL was explained by reported levels of perceived social stigma (Buseh et al., 2008). An international study with 726 HIV-positive people showed a significant but much smaller contribution of stigma to the variation in HRQoL (Holzemer et al., 2009). In this study, after removing contributions of HIV-related symptoms and severity

of illness, stigma explained 5.3% of the variance in HRQoL. Taken together, these studies point to the negative impact social stigma has on HRQoL in people living with HIV, and the possibility that particular populations (i.e., African American men) may be especially impacted by stigma. On the other hand, positive social support has been shown as a protective factor in this population, with a number of studies showing higher social support being related to higher HRQoL (Burgess et al., 2000; Safren, Radomsky, Otto, & Salomon, 2002; Liu et al., 2006; Hansen et al., 2009). Psychosocial factors clearly impact the HRQoL for people living with HIV, and are therefore an important area of focus for intervention projects.

Medical & Behavioral Factors

A number of studies have produced evidence that illness severity is a strong predictor of HRQoL in HIV-positive individuals (Lenderking et al., 1997; Smith et al., 1996; Sowell et al., 1997). Tsevt and colleagues (1996) found that lower scores on the HRQoL dimensions of physical functioning, role limitations due to physical problems, and general health perceptions were all related to being in a later stage of HIV disease progression. Immunological indicators of disease progression, such as CD4 cell count, were related to the physical and social functioning scales of a HRQoL measure in another sample (Lamping, 1994). While a few studies have not found a significant relationship between disease progression and HRQoL scores (O'Keefe & Wood, 1996; Nokes, Wheeler, & Kendrew, 1994), the evidence overwhelmingly shows that a link between these constructs does exist.

In a study with over 2000 gay men, HIV-positive men with CD4 cell counts above 500 and who were asymptomatic had similar scores on the mental health

dimension but lower scores on the physical health dimension of HRQoL versus seronegative men (Bing et al., 2000). Furthermore, both mental and physical health dimensions were significantly lower in HIV-positive men who were symptomatic or had CD4 cell counts below 200 compared to seronegative men. While HIV-positive individuals in general seem to report lower HRQoL, this may be especially true for individuals facing later stages of disease progression and increased symptoms.

Other studies have shown a decrease in HRQoL for individuals experiencing more physical symptoms related to HIV infection (Cunningham et al., 1998; Murri et al., 1997; Lorenz, Cunningham, Spritzer, & Hays, 2006). For example, number of HIV symptoms has been related to physical functioning, social functioning, and energy/fatigue HRQoL scales (Lamping, 1994). In addition to number of symptoms, symptom distress has also been related to psychological and physical dimensions of HRQoL by a number of research studies (Wu et al., 1993; Wachtel et al., 1992). However, it is noted that many of these studies were conducted prior to the advent of HAART medications. Due to the efficacy of HAART in reducing HIV/AIDS symptoms, QoL research in this population has increasingly focused on understanding the impact of medication side effects, as well as the relationship between HRQoL and medication adherence.

A review article by Burgoyne and Tan (2008) describes the major drug toxicities related to use of antiretroviral therapy and its impact on quality of life. Conditions resulting from use of these medications identified as most related to decreases in HRQoL for HIV-positive individuals included diarrhea, anemia, and lipodystrophy. These authors conclude that in the HAART era, length of life and QoL are a “delicate system difficult to keep in balance” and they suggest that careful attention to management of disease

progression, illness symptoms and treatment side effects is needed in order to maintain or improve HRQoL for this population. In this same line, Nieuwkerk and colleagues (2001) examined changes in HRQoL for individuals participating in an antiretroviral treatment strategy protocol, and concluded that these medications have the potential to improve HRQoL over time, as long as they are effective and considered tolerable by the patient.

Another important concept related to HAART and HRQoL in HIV-positive individuals is medication adherence. A study with 116 HIV-positive men and women taking HAART found that higher scores on an overall functioning dimension of HRQoL and lower scores on a medication worries dimension were both related to higher rates of medication adherence (Penedo et al., 2003). A longitudinal study following HIV-positive adults for up to one year found that higher scores on a financial worries dimension of HRQoL at baseline was associated with worse antiretroviral adherence at follow-up (Holmes, Bilker, Wang, Chapman, & Gross, 2007). Given evidence from these recent studies, interventions to improve HRQoL may also help to improve medication adherence and therefore potentially contribute to better disease progression over time.

Substance use and dependence is another behavioral factor that has been associated with HRQoL in HIV. In a large sample of HIV-positive adults ($N = 951$) 37% reported current illicit drug use (Korthuis et al., 2008). Study results indicated that the mental health dimension of HRQoL was lower for current users (but not past users) versus individuals who had never used illicit drugs. For current users of all illicit drug types decreased mental HRQoL was observed, but this was especially true for users of amphetamines and non-prescription sedatives, who also had significant decreases in the physical dimension of HRQoL.

In summary, medical factors including immunological parameters, stage of disease progression, and number of HIV-related symptoms have consistently been related to HRQoL for individuals with this illness. The impact of side effects related to the use of HAART medications on HRQoL is an increasingly important area of focus. Behavioral factors related to health (i.e., medication adherence and substance use) have also been linked to HRQoL in this population, and should be considered when examining this construct.

Interventions Impacting HRQoL in HIV/AIDS

Over a decade ago, research teams began to design and implement psychosocial interventions aimed at improving HRQoL in people living with HIV/AIDS. In a review article, Lutgendorf and colleagues (1994) describe the development of such interventions based on empirical evidence regarding the needs and difficulties faced by this population. Important areas of focus suggested for interventions included: helping individuals enhance their sense of control, learn adaptive coping strategies, improve their ability to elicit social support, and increase their ability to modify the way they think about stressors (cognitive processes), as well as strategies to help reduce maladaptive coping processes such as substance use and high-risk sexual behavior.

While a number of intervention studies have followed the suggestions outlined above in their design, only a few have implemented actual measures of HRQoL as an outcome of interest. The majority of these studies implemented cognitive-behavioral therapy (CBT) or cognitive-behavioral stress management (CBSM) techniques. In one study that did examine HRQoL, a cognitive-behavioral stress management (CBSM) intervention including modules in relaxation techniques, cognitive restructuring and

active coping skills training led to significant increases in the emotional well-being HRQoL dimension for HIV-positive men at a 6-week follow-up (McCain, Zeller, Cella, Urbanski, Novak, 1996). It was noted that decreases in HIV-related intrusive thoughts were also reported and may have contributed to the observed increases in emotional well-being.

A pilot study compared a 12-week cognitive-behavioral group therapy (CBT) to a peer support/counseling group therapy and a control group in a small sample of HIV-positive individuals in China (Molassiotis et al., 2002). At a 6-month follow-up, the CBT group showed significant improvements in HRQoL versus the other two groups. Similar gains in HRQoL were indicated in a study with 235 HIV-positive men and women who had experienced an AIDS-related loss (i.e., death) within the past 2 years (Sikkema, Hansen, Meade, Kochman, & Lee, 2005). Participants were randomly assigned to a 12-week cognitive-behavioral bereavement coping group (CBT) or to a comparison/control group in which participants were offered general individual counseling upon request. Results indicated that the CBT group showed significant increases in general health-related and HIV-specific QoL at a follow-up two weeks after the intervention ended, while the control group did not show improvements in these measures.

In a study with HIV-positive women reporting low to moderate HRQoL at baseline, participants were randomized to a 10-week CBSM group condition or to a time-matched individual psychoeducational condition (Lechner et al., 2003). The CBSM intervention was a group therapy with modules in stress management, supportive expressive therapy, and relaxation training. Overall HRQoL, as well as the cognitive functioning, health distress, and health perception dimensions of HRQoL improved in

both groups at a post-intervention assessment. However, only the CBSM group showed a significant improvement in the mental health dimension of HRQoL. While psychoeducational techniques may have been adequate in improving some dimensions of HRQoL, it appears that CBSM methods were necessary for gains in mental health HRQoL specifically.

A recent meta-analysis of randomized controlled trials involving stress management techniques with HIV-positive individuals examined the potential impact on various psychosocial and health outcomes, including HRQoL (Scott-Sheldon, Kalichman, Carey, & Fielder, 2008). Thirty-five studies involving a total of 3,077 HIV-positive adults met the inclusion criteria and were included in the meta-analysis. Results indicated that stress-management interventions significantly improved HRQoL relative to control groups, with an effect size of $d = .16$. Follow-up analyses indicated that observed effects were homogenous across studies.

Collectively, evidence from this recent meta-analysis (Scott-Sheldon et al., 2008) along with the results from individual studies show that psychosocial interventions are capable of significantly improving HRQoL for individuals living with HIV. However, there is a notable lack of studies exploring the mechanisms through which these interventions have been successful. Examination of factors including depression and anxiety in future research may help to elucidate potential pathways explaining how stress management interventions lead to improvements in this population. Further, while there is a substantial amount of evidence documenting the effectiveness of CBT and CBSM interventions, other intervention techniques (i.e., emotional expression via writing) have not been examined in their ability to improve HRQoL for HIV-positive individuals.

Summary and Conclusions

Emotional expression through writing has been studied in a number of healthy and medical populations and has generally been considered a "worthwhile" intervention based on results of individual studies as well as meta-analyses. Expressive writing studies have been shown to significantly impact a variety of outcomes including psychological health, physiological health, reported health, and general functioning, while the evidence for significant impact on health behaviors has been weak. The mechanisms through which emotional expression confers benefits is not well understood, although several theoretical models have been posited, with the cognitive processing and exposure/emotional processing theories receiving the most support.

In general, higher levels of emotional expression (i.e., number of negative and positive emotion words) and greater cognitive processing (i.e., use of casual and insight words) during writing have been related to higher gains in a variety of outcome measures. Pennebaker's computer-based LIWC scoring program is the most widely used methodology for measuring emotional expression and cognitive processing in written essays. However, limitations of this method have been noted, and novel qualitative scoring approaches have also been used. This study will use previously developed qualitative scoring methods to measure emotional expression and four subscales of depth processing (cognitive appraisal, self esteem, approach-oriented problem solving, and experiential involvement) which have been related to health status in previous studies with HIV-positive individuals (O'Cleirigh et al., 2003; O'Cleirigh et al., 2008).

While a few emotional expression studies with HIV-positive individuals have shown a positive impact on health factors, very few psychosocial variables have been

examined, and none have looked at HRQoL. Emotional expression interventions have been successful in improving HRQoL in other medical populations including fibromyalgia (Broderick et al., 2005), and in caregivers of children with chronic illness (Schwartz & Drotar, 2004). The literature supports the importance of developing interventions that improve HRQoL for people living with HIV, as it is found to be compromised compared to other general and medical populations. Psychosocial factors have been shown to impact HRQoL for HIV-positive individuals, so interventions that may target these variables, including symptoms of PTSD and depression, are appropriate for this population. Emotional expression is one intervention that may help fulfill this need.

Chapter 2: Objectives

The parent study with this sample and data has shown that the trauma-writing group had significant improvements in health-related quality of life (HRQoL) at the 6-month follow-up in comparison to the neutral-writing control group (Leserman, Ironson et al., in preparation). Specifically, results indicated that the trauma-writing group had significantly greater improvements on two particular HRQoL subscales over time: "Overall Health" and "Without Health Worry" on the HATQoL. Additionally, the Life Satisfaction subscale will be examined for the following analyses as the content of this subscale represents a more general aspect of HRQoL, which we believe is most likely to be impacted by our intervention. Therefore, the present study will focus on a further examination these three subscales. Throughout the remainder of this document, the term HRQoL will refer to the Health Related Quality of Life construct in general (including all three subscales being examined). If a specific subscale is being discussed it will be identified with the specific title ("HRQoL-Overall" for the Overall Health subscale; "HRQoL-Health" for the Without Health Worry subscale; and "HRQoL-Life" for the Life Satisfaction subscale). The present study aims to examine levels of emotional expression (EE) and depth processing (DP) during trauma-writing to understand how these constructs might explain the improvements in HRQoL over time observed in this group of HIV-positive individuals. These two constructs (EE and DP) can only be measured in the trauma-writing essays, and will therefore not be examined in the neutral-writing control group.

Of note, in the parent study the significant differences between control and treatment groups on HRQoL-Overall and HRQoL-Health were found only in women and not in men, indicating that the trauma-writing intervention may be most effective in increasing HRQoL in women with HIV (Leserman, Ironson et al., in preparation). The full sample of individuals completing the trauma-writing intervention (both men and women combined) will be examined in the present study because we expect that doing so will maintain greater variance and greater power due to the larger sample size. However, if significant effects are not found with the full sample, then models will be tested again with both genders examined separately, based on the possibility that the intervention may be more effective in women, as found in the parent study.

Potential mechanisms through which trauma writing confers benefits in HRQoL over time will also be examined. Specifically, the possibility that higher levels of EE results in increased DP which then leads to improvements in HRQoL will be examined. Other psychosocial factors will be examined as possible mediators of the relationship between EE/DP and changes in HRQoL over time, including symptoms of depression and PTSD.

Aims and Hypotheses

Aim 1. The relationship between level of EE during trauma-writing and improvements in HIV/AIDS-targeted quality of life (HRQoL) at a 6-month follow-up for HIV-positive individuals completing a trauma writing intervention will be examined. EE is measured by the number of positive emotion words and number of negative emotion words.

Aim 1 Hypotheses.

1a. Higher levels of EE (positive and negative words) will be related to higher baseline HRQoL.

1b. Higher level of positive emotion words will predict greater rate of improvement in HRQoL at follow-up, controlling for initial level of HRQoL and other covariates.

1c. Higher level of negative emotion words will predict greater rate of improvement in HRQoL at follow-up, controlling for initial level of HRQoL and other covariates. It is also possible that there will be a curvilinear relationship between number of negative emotion words and rate of HRQoL improvement at follow-up, controlling for initial HRQoL and other covariates. Specifically, individuals with a moderate number of negative emotion words will have greater rates of improvement in HRQoL at follow-up versus individuals with low or high number of negative emotion words. Therefore, negative emotion words will be examined as a potential predictor of either linear or quadratic slope in HRQoL over time.

Aim 2. The relationship between DP during the trauma-writing intervention and improvements in HRQoL at a 6-month follow-up will be examined. Scores on the four depth processing dimensions (cognitive appraisal, self esteem, approach-oriented problem solving, and experiential involvement) as well as the composite factor (average of all 4 dimensions) will be examined. The score for each dimension is the average of the scores for the 20 minute essay and the corresponding probe session (10 minute essays): cognitive appraisal in sessions 1 and 4, self esteem in session 2, and problem-solving in session 3. The average score for the four dimensions and total composite factor across all 4 writing sessions (20 and 10 minute essays) will be examined.

Aim 2 Hypotheses.

2a. Higher levels of DP will be related to higher HRQoL at baseline assessment.

2b. Higher levels of DP (all four scales examined separately) will predict greater rate of improvement in HRQoL at follow-up, controlling for initial level of HRQoL and other covariates.

2c. Higher overall DP (composite factor) will predict greater rate of improvement in HRQoL at follow-up, controlling for initial level of HRQoL and other covariates.

Aim 3. Potential mediators of the relationship between EE/DP during trauma-writing and rate of improvement in HRQoL at follow-up will be examined.

Aim 3 Hypotheses.

3a. DP will mediate the relationship between EE and improvements in HRQoL at follow-up.

3b. Symptoms of depression and PTSD will mediate the relationship between EE/DP and improvements in HRQoL at follow-up.

Aim 4. Level of baseline PTSD symptoms will be examined as a potential moderator of the relationship between level of EE and DP during trauma-writing and slope of HRQoL over time.

Aim 4 hypotheses.

4a. For individuals with higher levels of PTSD symptoms at baseline, higher levels of EE will be related to greater rate of improvement in HRQoL at follow-up in comparison to individuals with lower levels of PTSD at baseline (where we expect there will not be a relationship between emotional expression and quality of life).

4b. For individuals with higher levels of PTSD symptoms at baseline, higher levels of DP will be related to greater rate of improvement in HRQoL at follow-up in comparison to individuals with lower levels of PTSD at baseline (where we expect there will not be a relationship between depth processing and quality of life).

Proposed Statistical Analyses

The main statistical analyses in this study will use Hierarchical Linear Modeling (HLM; Raudenbush, Bryk, Cheong, & Congdon, 2002; Bryk & Raudenbush, 2002) to model change in HRQoL over time. HLM was chosen for these analyses due to a few key strengths. With the use of HLM, one has the ability to control for covariates at each time point (time dependent covariates), the ability to predict to slope versus just to a particular point in time, and the expected changes in HRQoL over a period of time can be calculated for each predictor variable (i.e., emotional expression and depth processing). HLM is also useful in longitudinal designs as unequal measurement occurrences within individuals is not a concern; the program is able to weight cases appropriately to account for missing time-points or variation in time between assessments (e.g., a 6-month time point that was not actually completed until 7 months after baseline for a particular participant).

Variance in HRQoL will be separated into two levels. At level 1, each individual is represented with a growth model capturing within person change in HRQoL over repeated measurements. At level 2, the model will represent the differences across individuals in parameters of individual change, and will use between-person characteristics (i.e., gender, amount of emotional expression during trauma writing) to

predict change. With the use of both models, systematic variability of the slopes and intercepts at level 1 are modeled by predictors at level 2.

Covariate Selection

Level 1 covariates will include time since baseline assessment (in months), and the disease progression markers CD4 cell count and HIV viral load (VL; as time-dependent covariates). Time since baseline will reflect the length in time each of the three repeated assessments (baseline, 1-month follow-up and 6-month follow-up) were conducted relative to baseline and will generate the structure of the latent slope and intercept. Disease progression markers (CD4 and VL) were selected as level 1 covariates based on theory and support from the literature that these variables may be related to HRQoL scores for individuals across time, and are variables that should be controlled for in analyses. VL will be coded as a categorical variable with two levels: undetectable VL (under 400 copies/mL) or detectable (above 400 copies/mL), and CD4 count will be left as a continuous variable.

Level 2 covariates will include the demographic variables of gender (coded 1 = male, 0 = female), age, education level (coded 0 = less than high school, 1 = some high school, 2 = high school graduate, 3 = trade school or some college, 4 = college graduate, 5 = graduate degree), and ethnicity. Ethnicity will be coded to reflect two levels: 0 = Non-Caucasian, 1 = Caucasian, Non-Hispanic. These level 2 covariates were selected a priori based on previous research showing their relevancy to HIV (Kiecolt-Glaser & Glaser, 1988; Ironson, et al., 2005). Education level was selected to represent SES as it is considered a relatively unbiased indicator of this construct and since income and employment have been noted as potentially affected by advancing HIV disease (Ironson,

et al., 2005). In addition to demographic factors, a measure of recent stressful life events (Life Events Scale; LES) will be included as a level 2 covariate, based on the potential for stressful life events to impact HRQoL. The LES measure used is an average score for the measurement at baseline and the 6-month follow-up (the scale was not measured at 1-month follow-up). Initial (baseline) level of HRQoL will also be controlled for in the level 2 model to account for the possibility that initial level of HRQoL may be related to change in this variable over time. These covariates will be included, a priori, in the level 2 model at the slope (the outcome of interest) and will remain in the model for subsequent analyses. Time since HIV-positive diagnosis and severity of the trauma/stressor discussed during writing sessions will also be examined as potential covariates based on their theoretical potential to affect HRQoL over time. Pearson correlations will be used to examine the relationship between these variables (time since diagnosis and severity of trauma) and HRQoL (dependent variable); if the correlation is significant, they will be included as covariates in the models tested.

Preliminary Analyses

The normality of data will be examined. Variables skewed more than a value of 2 or having a kurtosis value above 4 will undergo either log transformation or outlying scores will be Winsorized. Categorical variables will be coded with zero as the lowest level; continuous variables will be centered. Missing data on outcome variables will be dealt with by HLM parameter estimates which can account for missing data by using full maximum likelihood estimation. A preliminary factor analysis will be used to determine if the four depth processing dimensions all load onto one composite depth processing factor before conducting analyses with this composite score. The relationship between the

measurement of EE/DP variables in the first writing session (W1) and the average score across all four writing sessions (W1-W4; Average) will be examined prior to running main analyses. If the two measurements are highly correlated, analyses will be conducted for the Average scores only. If they are not highly correlated, all proposed analyses will be conducted with both the W1 and Average scores examined separately, as each may be capturing unique information with a different relationship to the outcome variable. The Statistical Package for Social Sciences (SPSS) and HLM for Windows will be used for all analyses.

Main Analyses

Hypothesis 1a. Pearson correlations will be used to examine the relationship between baseline HRQoL and EE during trauma writing (positive emotion words and negative emotion words separately).

Hypothesis 1b. Table 1 contains the basic equations along with an explanation of terms for the HLM model predicting HRQoL change/slope controlling for covariates. Positive emotion word count will be included in this model as a putative psychological variable predicting rate of change in HRQoL over time.

Hypothesis 1c. Table 1 contains the basic equations along with an explanation of terms for the HLM model predicting HRQoL change/slope controlling for covariates. Negative emotion word count will be included in this model as a putative psychological variable predicting rate of change in HRQoL over time. To test the hypothesis that there is a curvilinear relationship between negative emotion words and change in HRQoL, negative emotion word count as well as the quadratic term (negative emotion word count squared) will both be entered into the model as putative psychological variables. A

significant effect for the quadratic term when entered into the HLM model along with the linear term for negative emotion words will confirm the hypothesis of a curvilinear relationship.

Hypothesis 2a. Pearson correlations will be used to test the relationship between baseline HRQoL and the DP composite factor and four DP subscales (cognitive appraisal, self esteem, approach-oriented problem solving, and experiential involvement).

Hypothesis 2b. Table 1 contains the basic equations along with an explanation of terms for the HLM model predicting HRQoL change/slope controlling for covariates. The DP composite factor will be included in this model as a putative psychological variable predicting rate of change in HRQoL over time.

Hypothesis 2c. Table 1 contains the basic equations along with an explanation of terms for the HLM model predicting HRQoL change/slope controlling for covariates. The four DP subscales will be examined separately in this model as a putative psychological variable predicting rate of change in HRQoL.

Hypothesis 3a. The first step in examining DP as a mediator of the relationship between EE and HRQoL slope will be to determine whether DP (mediator variable) is significantly correlated with EE (independent variable), using a Pearson correlation statistic. The next steps to test for mediation will use the HLM model illustrated in Table 1. According to Baron and Kenny's (1986) criteria for testing mediation, the mediator must also significantly predict the outcome variable (HRQoL slope). Further, mediation will be indicated if DP remains a significant predictor of HRQoL slope and EE is no longer a significant predictor of HRQoL slope when both of these variables are entered into an equation together. Partial mediation is indicated if EE is still a significant

predictor in the equation with both variables included as predictors of HRQoL slope, but it is able to explain less of the variance in the outcome versus when looked at as a predictor of HRQoL slope without the mediator (DP) included in the equation. If mediation is indicated, a Sobel test (Sobel, 1982) will be used to determine whether the indirect effect of emotional expression on HRQoL slope via depth processing is significantly different from zero.

To determine that the relationship is not the other way around, with EE mediating the relationship between DP and HRQoL slope, the analyses will also be examined with EE as the independent variable and DP as the mediator variable in the steps outlined above.

Hypothesis 3b. The steps outlined for testing Hypothesis 3a above will also be followed for testing depression and PTSD as potential mediators of the relationship between EE/DP variables and HRQoL slope.

To address the potential argument that mediation analysis should include measurement of the mediator occurring at a later time point than the independent predictor variable, change scores for depression and PTSD will be used. Specifically, the difference scores for depression/PTSD measured at baseline and the one-month follow-up (B-F1) will be calculated and used as the mediator variable tested.

Hypothesis 4a. The HLM model presented in Table 1 will be used to test the hypothesis that level of baseline PTSD symptoms moderates the relationship between EE and change in HRQoL over time. First, z-scores will be calculated for EE variables being examined and for baseline PTSD scores. Then, the z-score for EE will be multiplied by the z-score for PTSD in order to form an interaction term to test the moderation

hypothesis. Both EE, PTSD, and the interaction term (EE x PTSD) will be entered into the basic model described in Table 1 to examine whether the interaction term is a significant predictor of change in HRQoL over time.

Hypothesis 4b. The same methods described in hypothesis 4a will be followed to test the hypothesis that level of PTSD symptoms at baseline moderates the relationship between DP and HRQoL over time.

Chapter 3: Method

Participants

The present study recruited HIV-positive adults living in the South Florida area between 2004 and 2009. Study recruitment was conducted via flyers and presentations at locations including community organizations (e.g., HIV support service offices), physician's offices, STD clinics, relevant events (e.g., Pride Fest, AIDS Walk Miami), gay social gathering places (e.g., bars, bookstores) and by word of mouth. All participants were enrolled on a voluntary basis and were monetarily compensated for participation in each study visit.

Inclusion and Exclusion Criteria

Inclusion criteria for the study included an HIV-positive status with a previous health history involving no more than one AIDS defining symptom (i.e., Category C symptoms as defined by the CDC, 1997). Individuals enrolled in the study were required to have recent (within one month of enrollment) CD4 T-lymphocyte counts between 100 and 600 and the majority of individuals currently had a detectable viral load (above 400). The rationale for these disease-related inclusion criteria is two-fold. With the exclusion of individuals with relatively stable HIV infection (i.e., high CD4 count and undetectable viral load), potential ceiling effects were removed by eliminating individuals with "no room for improvement" in these immune parameters. Also, the exclusion of individuals with advanced stages of HIV infection (i.e., CD4 below 150 or AIDS defining symptoms), eliminated patients for whom disease factors or medication interventions might have overshadowed the expected benefits due to this psychosocial intervention.

Other exclusion criteria included the following: 1) individuals who were younger than 18 or older than 60 years of age, 2) had less than 8 years of education, were illiterate, or non-English speaking/writing, 3) had active physical or mental health conditions that could potentially interfere with participation (i.e., heart, lung, kidney, liver, diabetes, cancer, stroke, seizures, psychotic disorders, malnutrition, surgery in the past 6 months, current pregnancy, deafness, and blindness, 4) current alcohol or substance dependence, and 5) were planning to initiate or change HIV medications in the next 6 months or recently changed HIV medications in the past 2 months.

Randomization

Individuals meeting inclusion and exclusion criteria during an initial phone screen were asked to come in for a baseline assessment and were equally randomized to either an emotional expression/trauma writing intervention (T group) or a trivial/daily writing control group (D group). In order to ensure equal representation of gender, HIV medication use, and education level in both treatment groups, participants were stratified by gender and block randomized by use of HAART/no HAART and education level (HS degree or lower; some college or higher). For the purposes of the present study, only participants who were randomized to the trauma writing (T) group who completed at least one follow-up session (1-month and/or 6-month) will be examined.

Interview and Writing Procedures

During the initial interview session (baseline), the basic elements of the research study and issues of confidentiality were described to participants and they were asked to sign informed consent forms agreeing to participate in the study. Participants also completed a battery of demographic and psychosocial measures and a collection of

biological samples (i.e., urine, blood and saliva samples) for biological assays (i.e., cortisol in urine and CD4 cells and VL in blood). Participants also completed a 20-minute essay writing task about a neutral topic to ensure their literacy and writing abilities met criteria for continued participation in the study.

Following baseline assessment, participants were scheduled for four writing sessions (W1, W2, W3, W4) over the course of the next two weeks. During the four writing sessions, participants in the T group were asked to write for 30 minutes about their emotions, feelings and thoughts concerning a stressful, traumatic or upsetting event they had experienced. The 30 minutes of writing were split into two parts. For the first 20 minutes T group participants were asked to write using general emotional disclosure concerning the stressful experience of their choice, following directions based on those used in studies following the Pennebaker paradigm of emotional disclosure (see Appendix A for specific instructions). Next, T group participants were asked to write about specific facets of their reaction to the stressor/trauma including issues of: how (s)he *makes sense* of the trauma; how the trauma has affected his/her *self-esteem*; and how the trauma has helped him/her to *cope* with future stressors (see Appendix A for 10-minute probe instructions). Participants randomized to the control group were asked to write about factual descriptions of how they spend their time for 30 minutes, broken into 20- and 10-minute sections for consistency with the T group instructions (see Appendix B for specific control group instructions). Pre- and post-writing psychological distress and salivary cortisol measures were collected during each writing session for both groups. These measures were collected to allow for estimation of habituation to the stressor by examining physiological and emotional distress reactivity to the exposure.

Participants in both treatment groups were asked to return for follow-up visits at 1-, 6-, and 12-months (F1, F6, F12) after completing the four writing sessions. During the 1- and 12-month follow-up sessions, participants were asked to spend 30 minutes reading through the four sets of essays written during the course of the study. Salivary cortisol and psychological distress measures (POMS and SUDS) were again collected before and after reading the essays. During all three follow-up sessions, participants also completed a battery of psychosocial measures and collection of urine and blood samples. The majority of the psychosocial measures (including the HAT-QoL) were completed by participants prior to reading their essays during the F1 and F12 sessions.

All study sessions were implemented by a team of master's, doctoral, or post-doctoral level students and were supervised by a licensed clinical psychologist. Study clinicians and a psychologist were available during all sessions to answer questions as they arise and to provide brief counseling when necessary. Referrals to appropriate resources (e.g., clinical psychologists in the community) were provided for participants who needed additional attention after the session. Interactions between the study clinicians and participants were kept at a minimum unless the participant became upset or needed assistance.

Measures

With regards to the present study, the following measures will be examined or controlled for as covariates in analyses: the Emotional/Cognitive Processing Scale (O'Cleirigh & Ironson, 2004); the HIV/AIDS-Targeted Qualify of Life Scales (HATQoL, revised version; Holmes & Ruocco, 2008); the Beck Depression Inventory (BDI; Beck, Steer, & Garbin, 1988); the Davidson PTSD Scale (DAV; Davidson et al., 1997); the Life

Events Scale (LES; Sarason, Johnson, & Siegel, 1978); and for biological markers, CD4 cell count and HIV viral load (VL). A short demographic questionnaire was also completed, and collected information including: age, race/ethnicity, gender, education level obtained, income, current medications (including antiretrovirals), and sexual orientation.

Emotional/Cognitive Processing Scale (see Appendix C). The Emotional/Cognitive Processing Scale measures level of depth processing and amount of emotional expression in written essays. Four separate dimensions comprise the depth processing (DP) factor: 1) Adaptive/Realistic Cognitive Appraisal; 2) Self-Esteem; 3) Approach-Oriented Problem Solving; 4) Experiential Involvement. Each dimension is scored using a seven-point Likert-type scale with a score of seven indicating the highest level of depth processing on that dimension. All four dimensions are scored for the 20-minute emotional expression essays. The 10-minute essays were designed to probe on specific aspects of depth processing (see Appendix C). Therefore, only the corresponding dimension for each time point is scored in 10-minute essays as follows: W1 and W4) Adaptive/Realistic Cognitive Appraisal; W2) Self-Esteem; W3) Approach-Oriented Problem Solving. Additionally, Experiential Involvement is scored for each 10-minute essay as it can be assessed regardless of the probe. The DP scores used for analyses in the present study consist of those derived from both the 20- and 10-minute essays, combined together into one average score per writing session. Additionally, average scores across all four writing sessions were created for each of the four DP dimensions to be used for analyses of the present study.

The *Realistic/Adaptive Cognitive Appraisal* dimension measures the extent to which the material (written essay) shows realistic cognitive appraisal of the traumatic/stressful event, a reflection on the problem, a deeper understanding of the problem, reviewing the problem in a more adaptive way, or identifying causal relationships. The *Self-Esteem* dimension measures the extent the material shows the individual's view of themselves and positive or negative feelings about him/herself in relation to the traumatic/stressful event. The *Approach-Oriented Problem Solving* dimension measures the extent to which the material shows the individual has adopted an approach-oriented response to the traumatic/stressful event, including problem solving or adaptive behaviors (e.g., expressing feelings to others or actively pursuing a plan) versus avoidant behaviors. The *Experiential Involvement* dimension measures the extent to which the material shows the individual's involvement in discussing the various aspects of the traumatic or stressful event in a substantial way (without detachment) or display of cognitive/affective involvement in the process (see Appendix C for thorough descriptions of the four dimensions).

These four depth processing dimensions were selected a priori based on a theoretical conceptualization suggesting these factors as indicators of the depth at which an individual is working through and resolving emotions and thoughts related to a traumatic/stressful event. This conceptualization (described in detail in O'Cleirigh et al., 2003) is based on Antoni's two-stage model (1995) and is consistent with Horowitz's avoidance/intrusion cycle of trauma processing (1986), and with elements of Cognitive Processing Therapy, an empirically supported treatment of trauma for sexual assault victims (Resick & Schnicke, 1996). Further, previous studies have linked these depth

processing dimensions to improvements in cellular immunity (Esterling et al., 1994; Lutgendorf, Antoni, Kumar, & Schneiderman, 1994) and health status in HIV (O'Cleirigh et al., 2003; O'Cleirigh et al., 2008). The compilation of the four dimensions into one composite factor (EE Composite) for analyses is based on results from a prior study where one "depth processing" factor emerged ($\alpha = .91$) when the four dimensions were subjected to a principle component factor analysis (O'Cleirigh et al., 2003). An average score representing the Composite DP factor across all four writing sessions was also created for analyses of the present study.

Emotional expression (EE) is measured in written essays as the number of positive and negative emotional words predicated on the writer (e.g., "I was unhappy" not "my mother was unhappy with me"). In addition to standard emotion words (e.g., happy, sad, angry), phrases that convey emotions are also counted (e.g., "I felt on top of the word", "I wanted to die", "my blood boiled"). Expressions that negate a positive (e.g., I was not happy) will be counted as a negative word and vice versa for expressions that negate a negative. The EE scores used for analyses in the present study consist of those derived from both the 20- and 10-minute essays, combined together into one average score per writing session. Additionally, average scores across all four writing sessions were created for PEE, NEE and Total EE to be used for analyses of the present study.

The Emotional/Cognitive Processing Scale also includes an indication of whether the trauma/stressor written about occurred in the past or continues in the present, as well as an indication of whether the event occurred during childhood or adulthood. The severity of the trauma written about is also recorded for every 20-minute essay, and is rated using a seven-point Likert scale with a score of seven representing the most serious

trauma severity (i.e., death of child or spouse/partner; see Appendix C for a full list). An average score for Trauma Severity across all four writing sessions was created for analyses of the present study.

Inter-Rater Reliability. One doctoral level (R.R.) and one master's level (J.A.) graduate students were trained by Dr. Ironson and Dr. O'Cleirigh in scoring essays for emotional expression and depth processing with the use of the Emotional/Cognitive Processing Scale, as described above. The training included three rounds of both raters scoring a set of 10 essays from a previous study using similar essay prompts, as well as several meetings with Dr. Ironson for review, until an adequate level of inter-rater reliability was established. Next, 50 essays from the present study were scored by both raters to determine a sufficient level of inter-rater reliability with the present sample. The 50 essays were chosen from the larger sample based on achieving equal representation across several dimensions in order to ensure that the raters were reliable for all types of essays represented in the full sample. First, the sample was divided into thirds; 1/3 straight women (n = 18); 1/3 gay men (gay, n = 17), and 1/3 straight men (n = 17). Within each of these demographic groups, about ½ of the individuals had Davidson Trauma Scale (DTS) scores below 30 at baseline, and the other ½ had DTS scores equal to or above 30 at baseline (DTS < 30, n = 27; DTS ≥ 30, n = 23). Of the 50 essays, 30 were 20-minute essays and 20 were 10-minute probes. Furthermore, the essays were selected to equally represent each of the four writing time points (W1, n = 12; W2, n = 14; W3, n = 12; and W4, n = 12).

Since only two subscales are scored for each 10-minute essay (the subscale which corresponds with the writing time point, and the experiential involvement subscale), the

number of essays used for inter-rater reliability on different dimensions varies accordingly (minimum $n = 35$). An inter-rater reliability of $p < .01$ was obtained on all dimensions of the Emotional/Cognitive Processing Scales (see Table 3). After reliability was established, the remaining essays (approximately 850 essays) were evenly split between the two reliably trained raters for scoring. All W1 20-minute essays were scored before continuing to W2, W3 and W4 essays, respectively. Similarly, the scoring of 10-minute essays began with the W1 time point, and then continued with W2, W3, and W4 to ensure that scores on a participant's previous essays did not influence scores on subsequent essays.

Health-related Quality of Life. The revised version of the HIV/AIDS-Targeted Quality of Life (HAT-QoL) measure was used to assess health-related quality of life (HRQoL) issues relevant to individuals living with HIV/AIDS (Holmes & Ruocco, 2008; see Appendix D). The HAT-QoL assesses nine dimensions of HRQoL including: Overall Function, Life Satisfaction, Health Worries, Financial Worries, Medication Worries, HIV Mastery, Disclosure Worries, Provider Trust, and Sexual Functioning. This 34-item self-report instrument uses a 5-point Likert-type scale ranging from 0 (*none of the time*) to 4 (*all of the time*) to measure the degree to which the participant experienced satisfaction or difficulty in each of the nine dimensions over the past 4 weeks. Each dimension is transformed to a scale from 0 to 100, with higher scores indicating higher level of HRQoL.

The HAT-QoL was developed based on content generated during interviews with HIV-positive men and women about what factors affect their HRQoL. The original 42-item version of the HAT-QoL (Holmes & Shea, 1998) was revised to develop the

shortened version that is used in the present study. The revision process corrected for psychometric issues in the original version on the Provider Trust, Sexual Function, and Medication Worries dimensions (Holmes & Ruocco, 2008) by adding some new items and removing several items from the measure. Again, these revisions were informed by interviews with HIV-positive men and women regarding what factors they believe impact their HRQoL. The updated version has internal consistency reliability coefficients (Cronbach's alphas) ≥ .80 on all nine dimensions. Only one (Provider Trust) of the nine dimensions had significant test-retest difference (+5.9, p = .05), and all other dimensions did not show significant test-retest difference in scores. All nine dimensions had intraclass correlation coefficients ≥ .064. The updated version was shown to have very few ceiling effects, and the decreased number of items (34) is noted as unlikely to elicit respondent burden. Preliminary responsiveness data indicated that the HAT-QoL will capture HIV-related health changes in both directions (Holmes & Ruocco, 2008).

Depression. The Beck Depression Inventory is a 21-item self-report instrument (BDI; Beck, Steer, & Garbin, 1988) used as a measure of cognitive, affective, and behavioral symptoms of depression over the past week. The BDI has subscales measuring affective (items #1-13) and somatic (items #14-21) depression subscale symptoms and consists of items that are scored on a range of 0 to 3, with higher scores indicating higher level of depression.

PTSD symptoms. The Davidson Trauma Scale (DTS; Davidson et al., 1997) was used as a measure of posttraumatic stress disorder (PTSD) symptoms. The DTS is a 17-item clinician administered measure, based on PTSD symptom clusters defined by the DSM-IV, which has demonstrated good test-retest reliability and internal consistency as

well as sensitivity to treatment effects. Each item is rated from 0 to 4 for both frequency and severity during the past one week. Items are summed for total severity and frequency scores, and three subscale scores: reexperiencing, avoidance, and arousal.

Life Events Stress. A modified version of the Life Events Survey (LES; Sarason et al., 1978; Sarason & Johnson, 1976) was used to measure the presence of stressful life events occurring in the past 6 months (before baseline, and F6, respectively). This measure has been shown to correlate with poor health-related functioning in a large sample of HIV-positive adults (Leserman et al., 2005). This was a modified version of the original LES which included only events considered moderate to severely stressful, and that were also shown to be related to disease progression and decline in immune function in HIV-positive populations (Leserman et al., 1997; Leserman et al., 2002). For the current analyses, total number of stressful life events was used and participants' ratings of perceived distress were ignored to avoid potential confounding with mood. Participants were queried by study clinicians about the presence or absence of 43 stressors in the past 6 months, including: change in relationships (e.g., marriage, divorce, estrangement from

family), death or serious illness of family members or close friends, work/financial problems (e.g., unemployment, worked long hours, large drop in income), illness (non-HIV), accidents or safety issues (e.g., physical or sexual assault), crime or legal problems (e.g., subject or close relative arrested, burglarized), and other life changes (e.g., you or partner became pregnant, moved residence more than once).

CD4 and viral load. CD4 cell count and HIV viral load (VL) were examined as indicators of HIV disease progression. Flow cytometry was used to enumerate CD3+CD4

lymphocytes. These analyses were conducted by staining whole blood samples with saturating concentrations of fluorochrome conjugated monoclonal antibodies in a four color system. The stained erythrocytes were then lysed and the samples were fixed overnight with Optilyse C reagent (Immunotech, France). Samples were then washed in phosphate buffered saline, pH 7.4 and analyzed on a Coulter XL-MCL flow cytometer. The Roche Amplicor RT/PCR assay was used as an ultra sensitive measure of viral load for HIV-1; this technique measures as low as 50 copies of HIV RNA in plasma.

Chapter 4: Results

Participant Characteristics

A total of 106 participants met inclusion criteria and will be examined in the proposed analyses. All participants in the sample for analyses completed at least one follow-up session (either F1 and/or F6). Of study participants who completed a Baseline session and were randomized to the Trauma-writing treatment group, 11 participants did not complete at least one follow-up session (F1 or F6) and were therefore excluded from the present analyses. Independent samples t-tests were conducted to examine potential differences between participants excluded due to no follow-up session, and the 106 participants represented in the present sample, on the Baseline measure of the outcome variable (HRQoL subscales). Results indicated that the excluded participants were not significantly different from the included participants on any of the outcome variable subscales: Baseline HRQoL-Overall ($t(113) = 1.35$, $p = 1.80$), HRQoL-Health ($t(113) = .433$, $p = .666$), or HRQoL-Life ($t(113) = .641$, $p = .523$). Of the 106 included participants, 95 individuals completed an F1 session but did not complete F6, and 3 individuals did not complete an F1 session but did complete F6.

Eight participants of the present sample were missing one of the four trauma-writing essays. In order to include these participants in analyses, their scores derived from the essays (i.e., Depth Processing, Emotional Expression, and Trauma Severity variables) were calculated by taking an average of the scores from the three essays that were completed. These calculated average scores were used in the present analyses. One of these 8 participants was not included in W1 analyses due to missing the W1 essay.

The individuals comprising the present sample (N = 106) ranged in age from 25 to 67 years old and with an approximate mean age of 44 (SD = 8.12). Forty-four of the participants are women (41.5%) and 62 are men (58.5%). The sample is ethnically diverse. Over half of the participants identified themselves as African American, while Hispanic/Latino, and Caucasian non-Hispanic individuals were also well-represented in the sample. With reduced categories for ethnicity, 17% of the sample is Caucasian non-Hispanic (n = 18), and 83% is "Other" ethnicity (n = 88). In regards to education, about half the sample reported High School degree or less for highest level of education obtained. The sample is also relatively diverse in regards to sexual orientation, with approximately half of the sample identifying as heterosexual, one third identifying as predominantly homosexual, and the remainder identifying as another sexual orientation (see Table 3 for detailed demographic information). At baseline the average CD4 count (cells/mm^3) was M = 407.08 (SD = 209.61) and average VL (log transformation) was M = 2.77 (SD = 1.81) with about half of participants (48.1%) having undetectable VL at baseline (below 400 copies/mL). About three-fourths of the sample was taking antiretroviral medications at baseline, and more specifically, over half were taking HAART therapy. The average length of time since HIV-positive diagnosis was 10.81 years (SD = 6.84) (see Table 4 for detailed medical information).

The means and standard deviations for predictor variables (EE and DP) are presented in Table 5. Pearson correlations were conducted to examine the interrelationships between the W1 score and computed Average score (W1-W4) for each EE and DP variable. Results indicated that the W1 score was highly correlated with the Average score on all seven of the EE and DP variables being examined ($p < .001$; see

Table 5). Therefore, only the Average EE/DP scores will be examined in study analyses. The means and standard deviations for study outcome variables (HRQoL subscales) at Baseline, F1, and F6 were also examined for the total sample as well as for men and women separately (Table 6). Graphs depicting the mean scores for the total sample, men only, and women only on each of the three HRQoL subscales over the course of the study (i.e., Baseline, F1, F6) are presented in Figures 1-3. The means and standard deviations for potential covariates and mediator variables (psychological variables) were also examined, and are presented in Table 7.

The characteristics of male and female participants were also examined separately. To examine if men and women differed on demographic, medical and psychological variables, t-tests were used to examine continuous variables and Chi-square tests were used for categorical variables. Regarding demographic variables, men and women were significantly different on education level ($\chi^2 = 23.13$; $p < .001$), with male participants having generally higher levels of education than women. The ethnicity of male participants also differed significantly from that of female participants ($\chi^2 = 25.80$; $p = .001$), with the majority of female participants identifying as African American (81.8%), while the male participants consisted of 38.7% African Americans, 24.2% Caucasian, non-Hispanics, and 29.0% Hispanics. Lastly, the groups differed in regards to sexual orientation ($\chi^2 = 77.52$; $p < .001$), with about ½ of the male participants identifying as exclusively homosexual (51.7%) and the majority of the female participants (82.1%) identifying as exclusively heterosexual. Men and women were not significantly different in age (see Table 3 for more detailed demographic information).

The male and female participants only differed on one medical variable examined, with women having higher CD4 cell counts at baseline in comparison to men $t(102) = 3.008$; $p = .003$). Male and female participants were not significantly different on time since diagnosis with HIV, VL(log) at Baseline, antiretroviral medication use at Baseline, or alcohol/substance use within the past month prior to Baseline (i.e., alcohol, crack cocaine, intranasal cocaine, and injection heroin use). See Table 4 for more detailed information on medical variables.

Regarding psychological variables examined in this study, men and women only differed on one variable. A significantly higher percentage of women (48.8%) than men (21.1%) reported a history of sexual abuse (i.e., rape or sexual assault) during adulthood ($\chi^2 = 6.551$; $p = .010$). There were not significant differences between male and female participants on measures of life event stress, depression at Baseline or F1 (measured by the BDI), PTSD symptoms at Baseline or F1 (measured by the Davidson Trauma Scale), or history of childhood sexual abuse. See Table 7 for more detailed information on psychological variables.

The trauma/stressor topics participants chose to write about in their essays were also examined. Specific topics were reduced to five broad categories: HIV-related trauma/stressor; death of a loved one; childhood trauma; adult sexual/physical trauma; and "other" trauma or stressor. The "other" category consisted of traumas/stressors during adulthood that did not fit into the other categories, including: relationship stressors, financial stressors, or trauma to a loved one, and other types of trauma/stressor. The mean trauma severity score (average across all 4 writing sessions) was ($M = 4.39$, $SD = 1.06$) on a scale from 1-7, with higher scores representing higher severity.

Results of an independent samples t-test show that men and women were not significantly different on the severity of trauma/stressor written about, $t(104) = -.175$, $p = .861$; men $M = 4.40$ ($SD = 1.11$); women $M = 4.36$ ($SD = .99$). However, Chi-square analyses indicated that men and women were significantly different on the topic of trauma/stressor disclosed during the writing intervention ($\chi^2(4) = 11.01$, $p = .027$). A significantly higher frequency of men wrote about HIV-related trauma compared to women ($p = .021$), and a significantly higher frequency of women wrote about childhood trauma compared to men ($p = .005$). The two groups were not significantly different on the other trauma topic categories: death of a loved one, adulthood physical/sexual trauma, or "other" traumas. See Table 8 for a full description.

Preliminary Analyses

Continuous variables were examined for normality. Variables with a skew above 2 and/or a kurtosis above 4 were considered non-normal. Viral load had unacceptable skewness and kurtosis, and it was therefore decided to examine this as a dichotomous variable (i.e., detectable vs. undetectable VL). Detectable VL (> 400 copies/mL) was coded as 1, and undetectable (< 400 copies/mL) was coded as 0. Additionally, CD4 cell count at F1 and F6 time-points had unacceptable skew and kurtosis. Therefore, individual scores at least 3.5 SDs above the group mean were Winsorized. Specifically, the participant's CD4 scores on the other two time-points was average, and the mean and standard deviation of that average was calculated. This mean score was added to 2.5 x the SD, and that value was used to replace the skewed data-point. These methods were used to correct outlying scores for two participants at the F1 time-point and one participant at

the F6 time-point. The corrected CD4 variables were examined and found to have acceptable skewness and kurtosis.

A factor analysis was conducted on the four DP scales using principle component extraction with varimax rotation. There was one eigenvalue above 1 ($\lambda = 2.09$) suggesting one factor was predominant. The percent of variance explained by this factor was 52.3%. Cronbach's alpha was .682 which is minimally acceptable. In the majority of main study analyses, however, the four DP factors were examined separately.

Prior to running main analyses, the relationship between main study variables was examined. Bivariate correlations were conducted to examine the relationship between the predictor variables (EE and DP scales, Average score) and dependent variables (HRQoL subscales at Baseline, F1 and F6) for the total sample ($n = 106$) and are presented in Tables 9-11. For the Baseline measurement of HRQoL, results indicate a significant correlation between Experiential Involvement and HRQoL-Health ($r = .189$, $p = .054$), and a significant and negative correlation between Experiential Involvement and HRQoL-Life ($r = -.194$, $p = .049$), and between Negative Words and HRQoL-Life ($r = -.231$, $p = .018$). All other correlations between EE/DP and HRQoL-Baseline were not significant. For the F1 measurement of HRQoL results indicate a significant correlation between HRQoL-Health and Cognitive Appraisal ($r = .202$, $p = .042$), HRQoL-Life and Cognitive Appraisal ($r = .234$, $p = .018$), and between HRQoL-Life and Self-Esteem ($r = .419$, $p = .000$). Significant negative correlations were also found at F1 between HRQoL-Life and Experiential Involvement ($r = -.348$, $p = .000$), and between HRQoL-Life and Negative Emotion Words ($r = -.426$, $p = .000$). All other correlations between EE/DP and the HRQoL at F1 were not significant. For the F6 measurement of HRQoL significant

correlations were found between the following: HRQoL-Overall and Cognitive Appraisal (r = .281, p = .037), HRQoL-Overall and Experiential Involvement (r = .234, p = .025), HRQoL-Overall and Depth Processing-Composite Factor (r = .245, p = .019), HRQoL-Health and Cognitive Appraisal (r = .230, p = .028), and HRQoL-Health and Experiential Involvement (r = .189, p = .054). Additionally, significant negative correlations were found between HRQoL-Life and Experiential Involvement (r = -.224, p = .032), and between HRQoL-Life and Negative Emotion Words (r = -.254, p = .015). All other correlations between EE/DP and HRQoL-F6 were not significant.

The correlations between the EE/DP variables and HRQoL subscales (Overall, Health, and Life) for men at Baseline, F1, and F6 are presented in Tables 12-14. For men, the Baseline measurement of HRQoL showed that the HRQoL-Life subscale was significantly correlated with Self Esteem (r = .260, p = .043) and significantly negatively correlated with Experiential Involvement (r = -.429, p = .001) and Negative Emotion Words (r = -.388, p = .002). For the F1 measurement, HRQoL-Life was significantly correlated with Cognitive Appraisal (r = .277, p = .035) and Self Esteem (r = .464, p < .001), and was significantly negatively correlated with Experiential Involvement (r = -.408, p = .001) and Negative Emotion Words (r = -.406, p = .002). The F6 measurement of HRQoL was significantly correlated with Self Esteem (r = .314, p < .001), and significantly negatively correlated with Experiential Involvement (r = -.364, p = .007) and Negative Emotion Words (r = -.319, p = .020). All other correlations between EE/DP and HRQoL for men were not significant (p > .50; see Tables 12-14).

The correlations between the EE/DP variables and HRQoL subscales (Overall, Health, and Life) for women at Baseline, F1, and F6 are presented in Tables 15-17. For

women, the Baseline measurement of HRQoL showed that the HRQoL-Health subscale was significantly negatively correlated with Experiential Invovlement (r = -.340, p = .025). At F1, HRQoL-Overall was significantly correlated with Experiential Involvement (r = .324, p = .034), and HRQoL-Life was significantly negatively correlated with Negative Emotion Words (r = -.322, p = .035). A number of significantly correlations were present for the measurement of HRQoL at F6, including: positive correlations between HRQoL-Overall and Cognitive Appraisal (r = .408, p = .010), Experiential Involvement (r = .517, p = .001), and the DP Composite score (r = .429, p = .006), as well as between HRQoL-Health and Experiential Involvement (r = .438, p = .005) and a negative correlation between HRQoL-Life and Self Esteem (r = -.326, p = .043). All other correlations between EE/DP and HRQoL for men were not significant (p > .50; see Tables 15-17).

Bivariate correlations were conducted to examine the relationship between the EE and DP variables (Table 18). The majority of all of the EE and DP variables were significantly correlated. However, Negative Emotion Words was not significantly correlated with Positive Emotion Words, Problem Solving, or the Depth Processing Composite Factor. The relationships between these variables were also examined for men (n = 62) and women (n = 44) separately. Results indicate a similar pattern of relationships as the total sample, with a few exceptions, as depicted in Tables 19 and 20.

To examine potential differences based on gender, men and women were compared on the study predictor and outcome variables prior to main analyses. Independent samples t-tests were used to compare men and women on DP and EE scores (Average scores W1-W4). Men were found to be significantly higher than women on the

Experiential Involvement scale (men $M = 4.53$, $SD = .83$, women $M = 4.07$, $SD = .93$, $t = -2.68$, $p = .009$) and Negative Emotion Words (men $M = 6.29$, $SD = 3.82$, women $M = 4.10$, $SD = 3.31$, $t = -3.07$, $p = .003$), and significantly lower than women on the Self Esteem scale (men $M = 3.58$, $SD = 1.08$, women $M = 4.08$, $SD = .91$, $t = 2.51$, $p = .013$). Means, standard deviations, and t-test results are presented in Table 21.

Partial correlations were conducted to examine the relationship between gender and each of the three HRQoL subscales at F1 and F6 follow-up sessions, controlling for the Baseline measure of that HRQoL subscale. Results indicated a significant correlation between gender and HRQoL-Health at F6 ($r = -.238$, $p = .028$). An independent samples t-test indicated that women had higher scores than men on this dimension at F6, although this difference was not significant (men $M = 67.41$ $SD = 28.27$, women $M = 76.39$ $SD = 26.12$, $t = 1.55$, $p = .12$). A significant correlation was also found between gender and HRQoL-Life at both F1 ($r = -.239$, $p = .028$) and F6 ($r = -.412$, $p = .000$). Independent samples t-test indicated that women scored significantly higher than men on this subscale at F1 (men $M = 61.21$, $SD = 23.81$, women $M = 74.52$, $SD = 21.91$, $t = 2.87$, $p = .005$) and at F6 (men $M = 59.24$, $SD = 22.93$, women $M = 80.77$, $SD = 20.35$, $t = 4.67$, $p = .000$). Gender was not significantly correlated with HRQoL-Overall at F1 or F6 (see Table 22 for a summary of results).

Preliminary analyses were conducted to determine whether the following variables should be included in HLM model analyses as covariates: Time Since Diagnosis with HIV, and Trauma Severity (severity of trauma/stressor written about in essays) (see Table 23). Results of bivariate correlations indicated that Trauma Severity was significantly correlated with three predictor variables: Cognitive Appraisal ($r = 2.68$,

p = .006), Problem Solving (r = .192, p = .048), and DP Composite (r = .245, p = .011). However, Trauma Severity was not significantly correlated with any of the outcome variables (HRQoL subscales). Therefore, it was decided that this variable would not be included as a covariate in HLM models. Time Since Diagnosis was not significantly correlated with any of the predictor or outcome variables, and therefore was also not included as a covariate in HLM models. The following covariates will be included in HLM analyses: gender, age, ethnicity, education, and Life Event Stress (LES), as well as CD4 count and VL as time-varying covariates. These covariates were selected a priori based on theory and previous research with a similar HIV-positive sample (Ironson, et al., 2005) and were therefore not examined in preliminary analyses.

Main Analyses

Prediction to HRQoL-Overall Change Over Time.

*Basic Model***.** The basic equations as well as explanations of terms for the HLM model are presented in Table 1. The results and significance tests for the basic model predicting HRQoL-Overall change/slope controlling for covariates is presented in Table 24. There is not a significant change in slope of HRQoL-Overall over time (γ_{10}) controlling for covariates. Results for this model indicate that the average HRQoL-Overall score at Baseline was 68.243 for minority women of low education level (categorical demographic covariates coded 0), and this decreased (although not significantly) by .102 point per month beyond the effects of the covariates. There was significant individual variation in initial HRQoL-Overall score (χ^2 (102) = 353.839, p < .001), but there was not significant variation between individuals for change in HRQoL-Overall over time (χ^2 (96) = 107.738, ns).

Covariates. At level 2, being male was significantly related to greater decreases in HRQoL-Overall over time (γ_{11} = -1.33, (t(97) = -2.19, p = .031). All other level 1 and level 2 covariates were not significantly related to HRQoL-Overall change in this model (see Table 24).

Contribution of EE and DP Variables. Rate of change in HRQoL-Overall was not significantly predicted by any EE or DP variables. However, there was a trend for higher scores on Cognitive Appraisal (γ_{17} = .044, t(96) = 1.70, p = .092), Experiential Involvement (γ_{17} = .65, t(96) = 1.86, p = .065), and Depth Processing-Composite Factor (γ_{17} = .69, t(96) = 1.73, p = .086) to predict less steep decreases in HRQoL-Overall over time (see Table 25).

Prediction to HRQoL-Health Change Over Time.

Basic Model. Results and significance tests for the basic model predicting HRQoL-Health controlling for covariates is presented in Table 26. This subscale also did not have a significant change in slope (γ_{10}) over time controlling for covariates. At Baseline, the average HRQoL-Health score was 77.292 for minority women of low education level, with a non-significant increase of .173 points per month beyond the effects of the covariates. There was significant individual variation in initial HRQoL-Overall score (χ^2 (102) = 311.512, p < .001), but there was not significant variation between individuals for change in HRQoL-Overall over time (χ^2 (96) = 92.733, ns).

Covariates. Undetectable VL was significantly associated with greater rate of increase in HRQoL-Health at level 1 (γ_{30} = -11.835, t(97) = -2.996, p = .003). At level 2, lower Baseline HRQoL-Health was significantly associated with greater HRQoL-Health

increase over time (γ_{16} = -.056, (t(97) = -3.363, p < .001). The results for all covariates are presented in Table 26.

Contribution of EE and DP Variables. Rate of change in HRQoL-Health was not significantly predicted by any EE or DP variables (Table 27).

Prediction to HRQoL-Life Change Over Time.

Basic Model. Results and significance tests for the basic model predicting HRQoL-Life controlling for covariates is presented in Table 28. There was a significant linear increase in HRQoL-Life slope over time (γ_{10} = 1.688, t(97) = 2.345, p = .021) controlling for covariates. Average score at Baseline was 70.380 for minority women of low education level, and this increased at a rate of 1.688 points on the subscale per month beyond the effects of covariates. Individual variation in Baseline HRQoL-Life score was significant (χ^2 (102) = 289.446, p < .001), but there was not significant variation between individuals for slope over time (χ^2 (96) = 90.547, ns).

Covariates. At level 2, being female was significantly related to greater increases in HRQoL-Life over time (γ_{11} = -2.983, t(97) = -4.619, p < .001). Lower Life Event Stress (LES) (γ_{15} = -.109, t(97) = -2.603, p = .011) and lower Baseline HRQoL-Life scores (γ_{16} = -.046, t(97) = -3.624, p = .001) were also significantly associated with greater increase in slope over time. All other level 1 and level 2 covariates were not significantly related to HRQoL-Life change in this model (see Table 28).

Contribution of EE and DP Variables. Rate of change in HRQoL-Life was not significantly predicted by any EE or DP variables (Table 29).

Gender as Moderator between EE/DP and HLOC

HLM analyses were conducted to test the hypothesis that gender moderates the relationship between study predictor variables (EE/DP) and outcome variables (HRQoL subscale slopes). The z-score was calculated for each of the EE/DP scores by subtracting the group mean on the respective variable from the individual's score on that variable, and dividing by the standard deviation for the group on that variable. The z-scores for each EE/DP variable were multiplied by the gender variable (coded 0 = women, 1 = men) to create interaction terms. Next, each interaction term was entered separately into the HLM model being examined along with gender and the respective EE or DP variable (centered). The terms were entered into the Basic Model for each HRQoL subscale being examined (Overall, Health, and Life; previously presented in Tables 18, 20, and 22, respectively) for the total sample ($N = 104$). A significant moderation effect was indicated when the interaction term significantly predicted slope of HRQoL in the model while controlling for covariates and Baseline HRQoL.

Results indicated that gender was not a significant moderator between any of the EE/DP variables and slope of the HRQoL-Overall subscale over time. Gender was a significant moderator of the relationship between both Experiential Involvement DP ($\gamma_{18} = -1.628$, $t = -2.056$, $p = .042$) and Negative Emotion Words ($\gamma_{18} = -1.840$, $t = -2.493$, $p = .015$) and the slope of HRQoL-Health subscale over time. Lastly, gender was also a significant moderator of the relationship between Self Esteem DP ($\gamma_{18} = 2.142$, $t = 3.493$, $p < .001$), Experiential Involvement DP ($\gamma_{18} = -1.693$, $t = -3.024$, $p = .004$), and Negative Emotion Words ($\gamma_{18} = -1.989$, $t = -2.721$, $p = .008$) and slope of HRQoL-Life subscale over time. All of the above relationships were examined in models controlling for

covariates and Baseline HRQoL. The other interaction terms examined were not significant, indicating that gender did not moderate the relationship between all other EE/DP variables and HRQoL slopes over time, as summarized in Tables 30-32.

Main Analyses by Gender

Next, each HLM model (i.e., EE/DP variables predicting to HRQoL Overall, Health, and Life) was tested for men and women separately to further examine the patterns of relationships for each gender.

Women Only: Prediction to HRQoL-Overall Change Over Time.

Basic Model. Results and significance tests for the basic model predicting HRQoL-Overall controlling for covariates in the sample of women (n = 43) is presented in Table 33. There was not a significant linear change in HRQoL-Overall slope over time (γ_{10}) controlling for covariates. Average score at Baseline was 62.911 for minority women of low education level, with a non-significant increase of .961 points per month beyond the effects of covariates. Individual variation in Baseline HRQoL-Overall score was significant (χ^2 (42) = 225.196, $p < .001$), and there was significant variation between individuals for slope of HRQoL-Overall over time (χ^2 (96) = 58.129, p = .015).

Covariates. None of the level 1 or level 2 covariates were significantly associated with HRQoL-Overall over time in the model examining women only (see Table 33).

Contribution of EE and DP Variables. Higher level of Experiential Involvement (γ_{16} = 1.405, t(36) = 2.590, p = .014) predicted greater increase in HRQoL-Overall over time. There was also a trend for higher Problem Solving (γ_{16} = .733, t(36) = 1.721, p = .093) and DP-Composite (γ_{16} = 1.212, t(36) = 1.727, p = .092) to predict greater increases in HRQoL-Overall over time for women (Table 34).

Women Only: Prediction to HRQoL-Health Change Over Time.

Basic Model. Results and significance tests for the basic model predicting HRQoL-Health controlling for covariates in the sample of women (n = 43) is presented in Table 35. There was not a significant linear change in HRQoL-Health slope over time (γ_{10}) controlling for covariates. Average score at Baseline was 78.123 for minority women of low education level, with a non-significant increase of 1.723 points per month beyond the effects of covariates. Individual variation in Baseline HRQoL-Health score was significant (χ^2 (42) = 141.229, $p < .001$), but there was not significant variation between individuals for slope of HRQoL-Health over time (χ^2 (37) = 29.354, ns).

Covariates. At level 1, undetectable VL was significantly associated with greater rate of increase in HRQoL-Health (γ_{30} = -16.144, t(111) = -2.434, p = .017). The other level 1 and level 2 covariates were not significantly associated with HRQoL-Health over time in the model examining women only (Table 35).

Contribution of EE and DP Variables. Rate of change in HRQoL-Health was not significantly predicted by any EE or DP variables in the sample of female participants (Table 36).

Women Only: Prediction to HRQoL-Life Change Over Time.

Basic Model. Results and significance tests for the basic model predicting HRQoL-Life controlling for covariates in the sample of women (n = 43) is presented in Table 37. There was not a significant linear change in HRQoL-Life slope over time (γ_{10}) controlling for covariates. Average score at Baseline was 78.139 for minority women of low education level, with a non-significant increase of 1.901 points per month beyond the effects of covariates. For the sample of female participants, individual variation in

Baseline HRQoL-Life score was significant (χ^2 (42) = 135.845, $p < .001$), but there was not significant variation between individuals for slope of HRQoL-Life over time (χ^2 (37) = 39.626, ns).

Covariates. Level 1 and level 2 covariates were not significantly associated with HRQoL-Life over time in the model examining women only (Table 37).

Contribution of EE and DP Variables. In the sample of women, greater levels of Experiential Involvement (γ_{16} = 1.030, $t(36)$ = 2.194, p = .035), and Negative Emotion Words (γ_{16} = .265, $t(36)$ = 2.144, p = .039) were related to greater rate of increase in HRQoL-Life over time. Lower scores on the Self Esteem Depth Processing measure significantly predicted greater increases in HRQoL-Life (γ_{16} = -1.142, $t(36)$ = -2.732, p = .010) over time for women (see Table 38).

Men Only: Prediction to HRQoL-Overall Change Over Time.

Basic Model. Results and significance tests for the basic model predicting HRQoL-Overall controlling for covariates in the sample of men (n = 61) is presented in Table 39. Results indicate that there was a significant linear decrease in HRQoL-Overall slope over time (γ_{10}= -2.040, $t(55)$ = -.391, p = .020) controlling for covariates. Average score at Baseline was 70.355 for minority men of low education level, with a significant decrease of 2.040 points per month beyond the effects of covariates. Individual variation in Baseline HRQoL-Overall score was significant (χ^2 (59) = 128.849, $p < .001$), although there was not significant variation between individuals for slope of HRQoL-Overall over time (χ^2 (54) = 53.828, ns).

Covariates. At level 2, higher level of education was significantly related to less steep decrease in HRQoL-Overall over time (γ_{12} = .549, $t(55)$ = 2.000, p = .050). No

other level 1 or level 2 covariates were significant in the model examining men only (Table 39).

Contribution of EE and DP Variables. None of the EE or DP variables significantly predicted rate of change in HRQoL-Overall for the male sample. There was a trend for higher level of Self Esteem to predict less steep decrease in HRQoL-Overall slope over time (γ_{16} = .491, $t(54)$ = 1.881, p = .065) (Table 40).

Men Only: Prediction to HRQoL-Health Change Over Time.

Basic Model. Results and significance tests for the basic model predicting HRQoL-Health controlling for covariates in the sample of men (n = 61) is presented in Table 41. The linear change for HRQoL-Health slope over time was not significant, although there was a trend (γ_{10} = -2.129, $t(55)$ = -1.709, p = .093) for decrease over time controlling for covariates. Average score at Baseline was 77.051 for minority men of low education level, with a non-significant decrease (trend) of 2.129 points per month beyond the effects of covariates. Individual variation in Baseline HRQoL-Health score was significant (χ^2 (59) = 180.547, p < .001). Variation between individuals for slope of HRQoL-Health over time was not significant in this model (χ^2 (54) = 54.550, ns).

Covariates. At level 1, undetectable VL was significantly associated with less steep decrease in HRQoL-Health over time (γ_{30} = -9.791, $t(159)$ = -1.965, p = .051). At level 2, higher age (γ_{11} = .232, $t(55)$ = 3.276, p = .002), and lower HRQoL-Life at Baseline (γ_{15} = -.087, $t(55)$ = -3.936, p < .001) were both significantly related to less steep decrease in HRQoL-Health over time (Table 41).

Contribution of EE and DP Variables. Higher scores on the Self Esteem Depth Processing scale predicted less steep decrease in HRQoL-Health for males (γ_{16} = .790,

$t(54) = 2.261$, $p = .028$). Higher Negative Emotion Words significantly predicted greater decreases in HRQoL-Health over time for this sample ($\gamma_{16} = -.446$, $t(54) = -3.682$, $p = .001$; Table 42).

Men Only: Prediction to HRQoL-Life Change Over Time.

Basic Model. Results and significance tests for the basic model predicting HRQoL-Life controlling for covariates in the sample of men ($n = 61$) is presented in Table 43. The linear change for HRQoL-Life slope over time was not significant, although there was a trend for decrease over time ($\gamma_{10} = -1.507$, $t(55) = -1.797$, $p = .077$) controlling for covariates. Average score at Baseline was 63.773 for minority men of low education level, with a non-significant (trend) decrease of 1.507 points per month beyond the effects of covariates. For the sample of male participants, individual variation in Baseline HRQoL-Life score was significant (χ^2 (59) = 160.292, $p < .001$), but there was not significant variation between individuals for slope of HRQoL-Life over time (χ^2 (54) = 47.532, ns).

Covariates. At level 2, higher level of Life Event Stress (LES) was significantly related to greater decreases in HRQoL-Life over time ($\gamma_{14} = -.190$, $t(55) = -3.116$, $p = .003$). Higher Baseline level of HRQoL-Life was also related to greater decreases in slope ($\gamma_{15} = -.070$, $t(55) = -4.260$, $p < .001$). All other level 1 and level 2 covariates were not significantly related to HRQoL-Life in the model examining men only (see Table 43).

Contribution of EE and DP Variables. In the sample of male participants, higher scores on the Self Esteem Depth Processing scale were associated with less steep decrease in HRQoL-Life over time ($\gamma_{16} = .783$, $t(54) = 2.499$, $p = .016$). Higher scores on the Experiential Involvement scale ($\gamma_{16} = -1.413$, $t(54) = -3.505$, $p = .001$) and on

Negative Emotion Words (γ_{16} = -.334, $t(54)$ = -2.976, p = .005) were both related to greater rate of decrease in HRQoL-Life over time (see Table 44).

Mediation Analyses.

DP as Potential Mediator between EE and HRQoL. Depth Processing variables were examined as a potential mediator in the relationship between Emotional Expression variables and the outcome variables (HRQoL subscales). This hypothesized mediation pathway was only tested for models that met two initial criteria for the Baron and Kenny mediation guidelines (1986), where both the predictor variable and mediator variable must significantly predict the outcome variable. Therefore, the mediation pathway was examined only for models where both a DP variable and an EE variable significantly predicted a particular HRQoL subscale for the total sample, men only, or women only. The following models met this initial criteria: Self Esteem (DP) mediating the relationship between Negative Emotion Words (EE) and HRQoL-Health in men; both Self Esteem (DP) and Experiential Involvement (DP) mediating the relationship between Negative Emotion Words (EE) and HRQoL-Life in men; and both Self Esteem (DP) and Experiential Involvement (DP) mediating the relationship between Negative Emotion Words (EE) and HRQoL-Life in women (5 potential mediation models total). Another initial criterion as outlined by Barron and Kenny (1986) is that the predictor and mediator variables must be significantly correlated. Pearson correlations indicated highly significant ($p < .001$) correlations between all combinations of EE and DP variables being examined in mediator models (see Tables 19 and 20).

According to Baron and Kenny (1986), significant mediation is indicated when the mediator remains significant and the predictor variable is no longer significant when

both are added to the model together. Partial mediation is suggested when the predictor variable is still significant, but the amount of variance in the outcome variable explained is less when the potential mediator is controlled for in the model compared to when the variable was entered as a predictor without the mediator variable included in the model. A Sobel test is then used to determine whether the mediation effect is significantly different from zero (Sobel, 1982). Therefore, the EE and DP variable combinations as described above were entered simultaneously into the appropriate HLM models specified earlier (controlling for covariates and Baseline HRQoL) to test hypothesized mediation pathways.

For men, Self Esteem did not mediate the relationship between Negative Emotion Words and HRQoL-Health slope, as Negative Emotion Words continued to significantly predict the outcome (γ_{17} = -.400, $t(53)$ = -2.772, p = .008), while Self Esteem was no longer significant (γ_{16} = .299, $t(53)$ = .709, ns). These results brought into question the possibility that the mediation pathway was working in the opposite direction, with Negative Emotion Words acting as a mediator of the relationship between Self Esteem and HRQoL-Health in men. However, a Sobel test analysis indicated that this was not a significant mediation effect (z = -1.365, p = .172), and the interpretation of this hypothesized mediation pathway was not continued. A similar pattern of results was found when both Self Esteem and Negative Words were entered into the model predicting HRQoL-Life for men, where Self Esteem (proposed mediator variable) was no longer significant (γ_{16} = .475, $t(53)$ = 1.518, ns), but Negative Emotion Words (proposed predictor variable) remained a significant predictor (γ_{17} = -.266, $t(53)$ = -2.166, p = .035). Again, this result suggested a potential pathway in the opposite direction of the

hypothesized pathway, where Negative Emotion Words mediates the relationship between Self Esteem and HRQoL-Life in men. However, the Sobel test also determined that this was not a significant mediation effect (z = -.693, p = .466) and therefore the interpretation of this pathway was not continued (see Table 45).

For the analysis examining Experiential Involvement as a mediator between Negative Emotion Words and HRQoL-Life in men, both variables remained as significant predictors of the outcome when entered in the model together (Experiential Involvement γ_{16} = -.979, t(53) = -2.342, p = .023; Negative Emotion Words γ_{17} = -.228, t(53) = -1.992, p = .051), with higher scores on each predicting greater decrease in HRQoL-Life over time (see Figure 4 for a path diagram). However, the strength of the relationship for Negative Emotion Words to predict HRQoL-Life was lower in this model (p = .051) than when this variable was entered as a predictor without Experiential Involvement entered into the model as well (p = .005), potentially suggesting partial mediation. A Sobel test analysis indicated a significant (partial) mediation effect (z = 2.045, p = .041; see Table 45).

For women, Self Esteem was not a significant mediator of the relationship between Negative Emotion Words and HRQoL-Life slope, as both variables were no longer significant predictors of the outcome when entered into the model together (Self Esteem γ_{16} = -1.005, t(35) = -1.689, ns; Negative Emotion Words γ_{17} = .076, t(35) = .446, ns). A similar pattern of results was found for the model testing Experiential Involvement as a mediator between Negative Emotion Words and HRQoL-Life for women, where both variables were no longer significant predictors of the outcome when entered into the model together (Experiential Involvement γ_{16} = .793, t(35) = 1.587, ns;

Negative Emotion Words γ_{17} = .154, $t(35)$ = 1.089, ns; see Table 46 for a summary of results).

Depression and PTSD as Potential Mediators. Depression and PTSD symptoms were also examined as potential mediators of the relationship between the predictor variables (EE/DP) and the outcome (HRQoL subscales slopes). To represent depression, change scores were calculated using the BDI (Baseline BDI score – F1 BDI score). PTSD symptoms were represented by the change scores for the Davidson Trauma scale (Baseline Davidson score – F1 Davidson score). Following the methods of Baron and Kenny (1986), mediation analyses were conducted only for models where an EE or DP variable (predictor) significantly predicted the slope of an outcome variable (HRQoL subscale) for the total sample, men only, or women only. Therefore, the following models met the first criteria in women: Experiential Involvement predicting HRQoL-Overall, as well as Experiential Involvement, Self Esteem, Negative Emotion Words predicting HRQoL-Life. For men, the following models met the first criteria: Self Esteem and Negative Emotion Words predicting HRQoL-Health, and Self Esteem, Experiential Involvement, and Negative Emotion Words predicting HRQoL-Life.

Following the criteria as outlined by Baron and Kenny (1986) the mediator variable must significantly predict the outcome variable. To examine whether depression and PTSD significantly predicted HRQoL, they were added to the appropriate HLM Basic models described previously. Results indicated that for women, depression (γ_{16} = .13, $t(35)$ = 3.36, p = .002) and PTSD (γ_{16} = .064, $t(35)$ = 3.17, p = .004) both significantly predicted slope of HRQoL-Overall when controlling for covariates and Baseline HRQoL-Overall. However, neither depression (γ_{16} = -.03, $t(35)$ = -.57, ns) or

PTSD (γ_{16} = .01, t(35) = .16, ns) predicted slope of HRQoL-Life when controlling for covariates and Baseline HRQoL-Life. For men, results indicated that slope of HRQoL-Health was not significantly predicted by depression (γ_{16} = .04, t(51) = -.053, ns), or PTSD (γ_{16} = .02, t(51) = .80, p = ns), and HRQoL-Life was not also not significantly predicted by depression (γ_{16} = .09, t(52) = .97, ns), or PTSD (γ_{16} = -.01, t(52) = -.07, ns).

Based on the results of step one, the model predicting HRQoL-Overall slope for women was the only model appropriate for mediation analysis. The Experiential Involvement DP scale was the only EE/DP variable that significantly predicted HRQoL-Overall for women in the main analyses. Therefore, the specific pathways examined were depression and PTSD as potential mediators between Experiential Involvement and slope of HRQoL-Overall for women. However, PTSD was not significantly correlated with Experiential Involvement (r = .185, p = .234), while depression was significantly correlated with this predictor variable (r = .352, p = .021). Therefore, the mediation analysis was only conducted for depression potentially mediating the pathway between Experiential Involvement and HRQoL-Overall slope for women, as it met the Baron and Kenny (1986) criteria of correlation between the mediator and predictor variables, as well as the other initial criterion (see Table 47).

The predicted mediation pathway was not confirmed by results when both depression and Experiential Involvement were included in the model predicting slope of HRQoL-Overall for women, as the predictor (Experiential Involvement) continued to significantly predict the outcome (γ_{16} = .1.427, t(34) = 2.315, p = .027), while the mediator (depression) was no longer significant (γ_{17} = .062, t(34) = 1.291, ns; see Table 47). These results point out the possibility of the opposite pathway, with Experiential

Involvement acting as a mediator of the relationship between depression and HRQoL-Overall slope in women. However, this opposite pathway is not interpretable, because the suggested mediator variable (Experiential Involvement) was measured during the intervention sessions (W1-W4) which were prior to the second measurement of the suggested predictor variable (F1). For accurate mediation analyses, there should be evidence of the mediator variable being measured either simultaneously or after the measurement of the predictor variable. Therefore, it was concluded that change in depression and PTSD scores from Baseline to F1 were not significant mediators of any relationships between study predictor variables (EE/DP) and outcome variables (HRQoL subscale slopes).

PTSD Moderation Analyses

HLM analyses were conducted to test the hypothesis that level of PTSD symptoms at Baseline moderates the relationship between study predictor variables (EE/DP) and outcome variables (HRQoL subscale slopes). The z-score was calculated for Baseline PTSD symptoms and EE/DP scores by subtracting the group mean on the respective variable from the individual's score on that variable, and dividing by the standard deviation for the group on that variable. The z-scores for PTSD were multiplied by each EE/DP variable to create interaction terms. The interaction term was entered into the HLM model along with Baseline PTSD score (centered) and the respective EE or DP variable (centered). The terms were entered into the Basic Model for each HRQoL subscale being examined (Overall, Health, and Life; previously presented in Tables 18, 20, and 22, respectively) for the total sample ($N = 104$). A significant moderation effect

was indicated when the interaction term significantly predicted slope of HRQoL in the model while controlling for covariates and Baseline HRQoL.

Results indicated a significant moderation effect for the interaction of Baseline PTSD and Positive Emotion Words predicting to HRQoL-Overall slope for the total sample while controlling for covariates and Baseline HRQoL-Overall (γ_{19} = -.738, t = -2.957, p = .004). All other interaction terms were not significant indicating that Baseline PTSD symptoms did not moderate the relationship between all other EE/DP variables and HRQoL slope over time, as summarized in Tables 48-50.

To better understand the significant moderation effect described above, follow-up analyses were conducted. The total sample was split at the median score for Davidson Trauma Scale at Baseline into "High" PTSD (scores ≥ 20) and "Low" PTSD (scores < 20) groups. Results and significance tests for the basic model predicting HRQoL-Overall controlling for covariates for participants with High Baseline PTSD (n = 51) is presented in Table 51, and for participants with Low Baseline PTSD (n = 52) in Table 52. For participants with High Baseline PTSD, HRQoL-Life slope indicated there was no significant change in this variable over time for this group (γ_{10} = .323, t(45) = .350, ns) controlling for covariates and Baseline HRQoL-Overall. There was also not a significant change in slope over time for HRQoL-Overall in the Low Baseline PTSD group (γ_{10} = -.831, t(45) = -.869, ns).

Next, the Positive Emotion Words variable was entered into each of these HLM models at level 2. For participants with High Baseline PTSD there was only a trend for higher Positive Emotion Words to predict less steep increase in HRQoL-Overall over time (γ_{17} = -.377, t(45) = -1.697, p = .096). However, for participants with Low Baseline

PTSD, higher Positive Emotion Words was a strong predictor of greater increase in HRQoL-Overall over time ($\gamma_{17} = .595$, $t(44) = 3.424$, $p = .002$). Therefore, Positive Emotion words appears to be a significant predictor of greater increase in HRQoL-Overall over time for individuals with low levels of PTSD at Baseline, but has only a weak effect on this outcome for individuals with high Baseline PTSD.

Chapter 5: Discussion

The main goal of this study was to examine emotional expression (EE) and depth processing (DP) constructs as derived from trauma-writing essays to understand how these variables might be related to changes in health-related quality of life (HRQoL) over time in a sample of HIV-positive individuals. Prior analyses from the parent study indicate that female participants from this sample who completed trauma-writing essays showed significant improvements in HRQoL subscales over the course of six months in comparison to the control group who wrote about neutral topics (Leserman & Ironson, et al., in preparation). More specifically, it was found that women in the treatment group improved in comparison to women in the control group on two particular subscales of the HIV/AIDS-Targeted Quality of Life (HATQoL) measure: Overall Healthy Functioning (HRQoL-Overall), and Without Health Worries (HRQoL-Health). Results indicated that men in the treatment group did not differ from men in the control group on HRQoL over time.

The two subscales mentioned above (HRQoL-Overall and HRQoL-Health) were examined, as well as the Life Satisfaction (HRQoL-Life) subscale. Although not found to be significantly different between the treatment and control groups in the parent study, the HRQoL-Life scale was selected for examination in the present study as it represents a more general aspect of HRQoL that we believe to be an important focus of investigation. Therefore, the present study sought to further examine how specific processes occurring during the trauma-writing intervention (i.e. EE and DP) might explain how, why, and for whom the intervention is impacting HRQoL over time. The ability for EE and DP to predict changes in slope of HRQoL subscales over time was examined in the full sample

of trauma group participants, as well as for men and women separately, based on prior results with this sample indicating a gender difference. Additionally, several mediation and moderation pathways were examined to further understand the relationships between EE/DP and HRQoL over time.

Main Analyses: Full Sample

The hypothesis that level of EE and DP would be significantly correlated with HRQoL at baseline was supported in only three relationships. In the direction hypothesized, higher levels of HRQoL-Health were associated with higher levels of Experiential Involvement. In the direction opposite of those hypothesized, higher levels of Experiential Involvement and Negative Emotion Words were associated with lower scores on HRQoL-Life for the total sample (men and women combined).

For the total sample, there was a significant increase in HRQoL-Life over time. The other two subscales did not show an overall change in slope over time, but there was a non-significant tendency for decrease on the HRQoL-Overall subscale, and a non-significant tendency for increase on the HRQoL-Health subscale. The main study hypotheses were not supported for the full sample, as HLM analyses indicated that emotional expression and depth processing variables did not significantly predict to changes in any of the three HRQoL subscales over the course of six months.

However, a number of factors supported an examination of these relationships for men and women separately. As previously mentioned, the parent study found the trauma-writing intervention beneficial for women only on HRQoL outcomes (Leserman & Ironson, et al., in preparation). Additionally, the parent study indicated that the trauma-writing intervention was beneficial for women versus the control group on psychosocial

(i.e., depression and PTSD) and health (i.e., physical symptoms) outcomes. Men generally showed improvements in these outcomes over time as well, but men in the treatment group did not show a significantly greater level of improvement in comparison to men in the control group (Ironson, et al., in preparation).

Preliminary analyses of the present study showed a significant relationship between gender and HRQoL at one- and six-month follow-ups (controlling for baseline) on the Health and Life subscales. At baseline, there were a number of significant associations between HRQoL-Life and EE/DP there were not observed for women. Specifically, higher levels of Cognitive Appraisal and Self Esteem were related to higher levels of HRQoL-Life, and higher levels of Experiential Involvement and Negative Emotion Words were related to lower levels of HRQoL-Life. For women, the only significant association observed at baseline was a positive relationship between higher levels of Experiential Involvement and HRQoL-Health. At F1, both men and women had a significant association between higher levels of Negative Emotion Words and lower levels of HRQoL. Additionally, men had a number of other significant associations between EE/DP and HRQoL-Life at F1 that were not observed in women, including a relationship between higher level of Cognitive Appraisal and Self Esteem and higher HRQoL-Life, while higher levels of Experiential Involvement and Negative Emotion Words was related to lower levels of HRQoL-Life. Additionally, there was a significant association between higher level of Experiential Involvement and higher HRQoL-Overall for women at F1 that was not observed for men. At the F6 time-point, there was a significant association between higher Self Esteem and lower HRQoL-Life, while men showed a significant association in the opposite direction, with higher Self Esteem being

related to higher HRQoL-Life. Additionally, higher Cognitive Appraisal was associated with higher HRQoL-Overall, and higher Experiential Involvement was related to higher levels of both HRQoL-Overall and HRQoL-Health for women at F6, whereas none of these relationships were observed for men at that time-point. Lastly, men had a number of significant associations not observed for women at the F6 time-point, including a relationship between higher Self Esteem and higher HRQoL-Life as well as a relationship between higher scores on both Experiential Involvement and Negative Emotion Words and lower HRQoL-Life.

Furthermore, several dimensions of EE and DP were significantly different between men and women. Women used less negative emotion words, and displayed higher levels of processing on the Self Esteem and Experiential Involvement scales in comparison to men. In sum, it was hypothesized that men and women may express emotions and process traumatic events differently, and the relationship between EE/DP and HRQoL may work differently for men versus women. Therefore, gender was examined as a moderator of the relationship between the EE/DP variables and the slopes of HRQoL subscales. A number of significant moderation effects for gender were found. Gender moderated the relationship between Experiential Involvement DP and Negative Emotion Words and the slopes of two of the HRQoL subscales (Health and Life). Additionally, gender was a significant moderator of the relationship between Self Esteem DP and change in HRQoL-Life over time. Based on the moderation findings and preliminary analyses indicating that the relationship between EE/DP and HRQoL may work differently for men and women, HLM analyses were applied to the gender groups separately as well.

Analyses by Gender

Women had a tendency for increases over time on all three HRQoL subscales, consistent with the hypothesized direction of the slopes (see Figures 2-4), although these changes were not statistically significant. Men had a significant decrease in scores on the Overall Healthy Functioning subscale, and a trend for decrease on the Without Health Worries and Life Satisfaction subscales, indicating the opposite direction of results from what was hypothesized (see Figures 2-4). The exact reasons for the difference in the direction of HRQoL slope for men and women over the course of the study are not known.

The majority of emotional disclosure studies in the literature have not examined whether men and women were different in their response to this treatment and/or in their levels of emotional expression and processing occurring during the writing process. In a recent meta-analysis, Frattaroli (2006) concluded that studies with higher percentage of male participants were not significantly more likely to have higher effect sizes for improvements in psychological health or reported physical health outcomes. This meta-analysis sites a total of nine emotional disclosure writing studies that examined gender as a moderator, with seven finding no effect for gender (Booth et al., 1997; Donnelly & Murray, 1991; Kelley, et al., 1997; Russ, 1992; Sheese, Brown & Graziano, 2004; Van Middendorp, 2004), including one study with HIV-positive individuals (Rivkin et al., 2004). However, two studies did find that women benefitted more than men from the treatment (Crow, 2000; Pennebaker et al., 1990). In contrast, a prior meta-analysis by Smyth (1998) indicated that studies with more male participants produced higher effect sizes for psychological health and reported health outcomes versus those with lower

proportion of male participants. In one of the few previous emotional disclosure studies with HIV-positive individuals, there was a positive association between higher emotional expression (positive and negative emotion words) and depth processing (composite factor) and better immune function in women, while this association was not observed in men (O'Cleirigh, et al., 2003). However, men and women in that study did not significantly differ on mean levels of EE or DP. While results at this time are mixed, Frattaroli (2006) does conclude that there is a need for more emotional disclosure writing studies to examine gender as a potential factor influencing the effects of this intervention.

An examination of the effects of specific EE and DP variables on the slope of HRQoL may shed some light on why the intervention worked differently for women versus men. For women, higher levels of Experiential Involvement processing were related to greater increases on the HRQoL-Overall subscale over time. This finding suggests that for women, greater involvement in discussing the various aspects of the traumatic or stressful event (without using detachment) and/or displaying a significant degree of cognitive/affective involvement in the process may confer benefits in HRQoL. Specifically, an increase in the Overall Healthy Functioning subscale indicates a greater ability to function physically and a lack of physical/functional impairment due to illness, fatigue and/or pain. This is consistent with the emotional disclosure literature, where writing interventions have resulted in improvements in reported aspects of physical functioning and/or the physical functioning scale of HRQoL for a number of health populations (Smyth, et al., 1999; Schwartz & Drotar, 2004; Broderick, et al., 2005; Stanton et al., 2002; Rosenberg et al., 2002). Frattoroli's (2006) meta-analysis of emotional disclosure writing studies also indicated a significant effect size for

improvements in reported health outcomes. The aspect of HRQoL measured by the HATQoL Overall Healthy Functioning scale would be best categorized within the "reported health outcomes" category examined in Fratarolli's (2006) meta-analysis.

Higher level of Experiential Involvement also predicted greater increases on the Life Satisfaction subscale for women, indicating that women with more in-depth processing during the trauma-writing intervention reported greater improvements in contentment with their level of social activity, health, feelings of control over their life, and general enjoyment. Higher levels of Negative Emotion Words also predicted greater rate of increase in the Life Satisfaction subscale over time for women. These findings are consistent with Frattaroli's meta-analysis of emotional disclosure studies, which found a significant effect size for psychological functioning outcomes including constructs similar to those measured by the HRQoL-Life Satisfaction subscale such as life satisfaction and "positive human functioning" (Frattaroli, 2006). However, many of the studies included in the meta-analysis were of students or healthy populations. Only a few studies have examined the impact of emotional disclosure writing on HRQoL in medical populations, with positive results being found for general HRQoL improvements in a sample of fibromyalgia patients (Broderick, et al., 2005), and parents with children hospitalized for medical conditions (Schwartz & Drotar, 2004), while no significant improvements were observed for cancer-related HRQoL versus the control group in a sample of men with prostate cancer (Rosenberg et al., 2002).

In line with the inhibition theory of emotional expression (Pennebaker, 1989), for women it may be therapeutic to release negative emotions through a writing exercise. The combination of expressing negative emotions along with high levels of processing

(Experiential Involvement) may be particularly beneficial. Women may be able to "vent" their negative emotions and then make better sense of them and discover how the traumatic/stressful event has impacted their life, and then move on from it. This is consistent with previous findings in HIV-positive individuals, where results indicated that both high levels of emotional expression and high levels of processing were necessary for beneficial outcomes (O'Cleirigh, et al., 2003).

Interestingly, lower levels of the Self Esteem Depth Processing dimension were significantly predictive of greater increase in HRQoL-Life over time for women. This finding is surprising, as higher level of self-esteem is generally considered to be adaptive and it was hypothesized that higher scores on this dimension would be related to greater increases in Life Satisfaction. Of note, the women in this sample may have had a generally high level of self-esteem, as preliminary analyses indicated they had significantly higher scores on the Self Esteem DP scale in comparison to men. It is possible that women who were already high in self-esteem did not benefit as much from this trauma-writing intervention in regards to Life Satisfaction improvements, whereas for women with low self-esteem the writing process may have initiated new and possibly more positive ways of thinking about themselves in relationship to the traumatic/stressful event. The benefit of this process may have therefore been evidenced for women with low self-esteem while the women with high self-esteem had a ceiling effect or "no room for improvement" on this domain.

The impact of Self Esteem DP on change in HRQoL over time for men was in the more typically expected direction. Higher scores on Self Esteem DP predicted a less steep decrease in HRQoL on both the Without Health Worries (HRQoL-Health) and Life

Satisfaction (HRQoL-Life) subscales. In other words, having higher levels of self-esteem related to traumatic/stressful events discussed during trauma-writing appeared to help buffer the decrease in both aspects of HRQoL for men. The implications for this "buffering" effect may be particularly relevant for the Without Health Worries subscale as men were found to be significantly more likely than women to write about HIV-related (i.e, health-related) traumas/stressors in their essays. As this is an especially salient stressor for men, there is a noted need for processes that may help reduce their health-related worry and concern. This finding was in the opposite direction of that observed for women, where higher levels of Self Esteem DP predicted less increase in HRQoL-Life (i.e., less favorable results) over time. As previously mentioned, men in this sample had significantly higher scores overall on the Self Esteem DP measure than women, which may help explain the observed discrepancies. However, the reasons for this discrepancy are not known, and this difference between men and women on the Self Esteem depth processing scale was not observed in a prior emotional expression study with HIV-positive individuals (O'Cleirigh, et al., 2003).

Men were found to express significantly higher levels of negative emotion words in comparison to women. For men this appeared to be detrimental, as it predicted a greater decline in two aspects of HRQoL (Without Health Worries and Life Satisfaction subscales). Specifically, men who used more negative emotion words in their trauma essays were more likely to have an increase in their worry and concern about their health, including HIV-specific issues and death. This finding is somewhat concerning since men appear to be especially impacted by HIV/health-related stressors, as previously noted in the finding that they more frequently chose to write about this topic in their trauma essays

in comparison to women. The significant effect of Negative Emotion Words predicting greater decrease Life Satisfaction for men indicates that men using high levels of negative emotional expression in their essays were also more likely to have a greater decrease in their satisfaction with life including their sense of control, health, social activity, and general enjoyment. These findings are in the opposite direction of the hypothesized effect and are inconsistent with the majority of the literature showing positive impacts of emotional expression and processing on psychological functioning including life satisfaction and anxiety/worry (Frattaroli, 2006).

Although women as a whole expressed less negative emotions than men, women who did express greater amounts of negative emotion words showed a significantly greater improvement in Life Satisfaction over time within their own gender sample. One possible explanation of the seemingly opposite effect of negative emotional expression for men versus women is that the particular content of the words being expressed may have differed by gender. A study of women using an Internet-based support board found that those who expressed more anger had improvements in quality of life and depression, while higher expression of anxiety and fear was associated with worse response on these outcomes, and expression of sadness showed no significant relationships (Lieberman & Goldstein, 2006). While this study is in line with the hypothesis that particular types of emotional expression may be more beneficial than others, it does not add information about these relationships for men. Again, men and women were not significantly different on their levels of emotional expression and depth processing in another study examining a trauma-writing intervention with HIV-positive individuals, (O'Cleirigh, et al, 2003). The reasons for a gender difference on levels of EE and DP and the relationship of these

variables with HRQoL slope over time in the present sample are unknown. The emotion words examined in the present study were not yet separated by specific type of emotion (i.e., anger versus fear), and it is possible that differences between men and women in type of emotions expressed may help explain these observed gender differences.

High levels of Experiential Involvement also showed unfavorable results for men, specifically, greater decreases in Life Satisfaction HRQoL over time. The similar pattern of results for both higher levels of Negative Emotion Words and higher Experiential Involvement leading to greater decrease in HRQoL-Life for men may be explained by a potential overlap of the two variables. One of the actual indicators of a "moderate" level (i.e., 4 on a scale of 1-7, see Appendix A) of Experiential Involvement is that the participant uses a substantial amount of emotion words in their writing. Lower level scores on this DP scale indicate that the participant only described the events of the trauma and their behaviors without expressing their emotions related to the event. Higher level scores on this scale indicate more complex cognitive processes such as questioning why a trauma/stressor occurred or exploring how it has impacted their view of the world and dynamics with others. While Experiential Involvement is a measure of how involved an individual becomes in the description and interpretation of the trauma/stressor, it does not necessarily indicate that they are doing so in a positive or beneficial way. If an individual becomes highly involved and detailed in concert with the use of primarily negative expression and an inability to make adaptive cognitions (Cognitive Appraisal DP scale) and behavior changes (Problem Solving DP scale) in relationship to the event, they may experience worse outcomes than if using low levels of involvement in the processing. Again, this relationship differs from that observed for women, where higher

levels of Experiential Involvement and higher levels of Negative Emotion words both predicted greater improvements in HRQoL-Life over time. Perhaps women were using high levels of expression along with the more "helpful" types of involvement in trauma processing as described above.

Mediation and Moderation

A number of mediation pathways were examined in an attempt to better explain how levels of emotional expression and depth processing may impact HRQoL over time. Based on previous research with HIV-positive individuals, depth processing was hypothesized to mediate the relationship between emotional expression and the outcome variable (HRQoL) (O'Cleirigh, et al., 2003; O'Cleirigh, et al., 2008). While a number of pathways met the initial criteria for testing mediation, only one was found to indicate a significant mediation effect. For men, higher levels of Experiential Involvement partially mediated the relationship between higher levels of Negative Emotion Words and greater decline in HRQoL-Life Satisfaction over time.

As previously described, Negative Emotion Words and Experiential Involvement are highly correlated and there may be in fact some overlap in the actual information being measured by both variables. Therefore, this mediation effect should be interpreted with caution. It may be that both variables are significantly predicting to changes in HRQoL simultaneously instead of higher levels of negative emotional expression actually causing greater levels of involvement in processing, which would be implied by a true mediation effect.

The hypotheses that changes in symptoms of PTSD and depression (from baseline to 1-month follow-up) would mediate the relationship between emotional expression

and/or depth processing and changes in HRQoL over time were not borne out. Therefore, the changes in HRQoL slope as a function of greater emotional expression and depth processing, as described above, cannot be explained by subsequent reductions in PTSD and depression.

It was hypothesized that individuals with higher levels of baseline PTSD would show a relationship between higher EE/DP and greater improvements in HRQoL over time while individuals with low baseline PTSD would not. In other words, it was predicted that people with high levels of trauma-related symptoms may be most likely to benefit from this trauma-writing intervention. While this hypothesis was not supported, there was however one significant moderation finding in the somewhat opposite direction. For participants with lower levels of PTSD symptoms at baseline, expressing more positive emotion words in their essays was related to greater increase in HRQoL-Overall Healthy Functioning. In this subset of participants, expressing positive emotions may be beneficial in improving satisfaction with their ability to function physically and a lack of disability related to pain, fatigue, and/or illness. However, this relationship between higher positive emotion words and greater increase in HRQoL-Overall was not observed for individuals with high levels of PTSD at baseline. It may be that expressing positive words was not a powerful enough process to impact this aspect of functioning for individuals with more significant PTSD symptoms. Also, participants in the "high" PTSD group may have experienced more severe traumas requiring deeper levels of expression and processing beyond that of positive emotions in order to confer benefits in physical functioning domains of HRQoL.

Contributions and Clinical Implications

The results of the present study suggest that level of emotional expression and depth of processing during trauma-writing helps explain the benefits of this intervention for women with HIV. Previous studies have found this intervention to be beneficial for disease progression factors (Petrie, et al., 2004) and related to protected health status (O'Cleirigh, et al., 2003, O'Cleirigh, et al., 2008) in HIV. However, this is the first study to our knowledge that has examined the impact of a written emotional disclosure intervention on HRQoL in HIV-positive individuals. The parent study indicated that for HIV-positive women, the treatment improves two domains of HRQoL (Overall Healthy Functioning and Without Health Worries) over time in comparison to the control group while men did not differ from the control group (Leserman & Ironson, et al., in preparation). The present study indicated that one of the reasons for these improvements may be that the intervention encourages higher emotional expression and processing of past traumatic, which appears to be beneficial for women. However, men may not benefit from these higher levels of processing and expression related to past traumas/stressors and in fact may show decreases in HRQoL as a function of these factors.

The majority of emotional disclosure studies to date have not examined gender effects although the need for this research has been noted (Frattaroli, 2006). This study adds to the literature by providing detailed analyses for men and women separately to better understand potential differences. Our finding that the intervention works quite differently for women in comparison to men in regards to HRQoL points to the need for future studies to better elucidate gender effects. This study also added to the literature by examining EE/DP with a novel scoring approach that addresses some of the limitations of the LIWC scoring system (Francis & Pennebaker, 1993). Furthermore, our intervention

design included an augmentation to the traditional prompts used on the majority of emotional expression/disclosure studies. Specifically, we also implemented depth processing probes during trauma-writing sessions that encouraged greater degree of involvement in trauma/stressor processing such as insights into the impact on self-esteem, changes in beliefs related to the event, and changes in ability to problem-solve new challenges as a result of the traumatic/stressful experience.

The improvement of HRQoL in people living with HIV is relevant area of clinical interventions, as this population has been shown to have deficits in quality of life related to a number of demographic (Campsmith, et al., 2003; Rao, et al., 2007) medical (Lenderking et al., 1997; Bing et al., 2000; Lorenz, et al., 2006) and psychological (Gore-Felton et al., 2006; Haller & Miles, 2003; Elliott, et al., 2002; Kemppainen, 2001) factors. While HAART has helped extend the life span of HIV-positive individuals, there is an ongoing need for treatments that may help improve the quality of those extended number of years (Westburg & Guindon, 2004). Furthermore, studies have shown a relationship between lower HRQoL and poor antiretroviral medication adherence (Penedo et al., 2003), pointing to another potential benefit of interventions that may improve this variable in HIV-positive individuals.

Cognitive behavioral stress management (CBSM) interventions have been shown effective in improving HRQoL for HIV-positive individuals (Lechner et al., 2003; Scott-Sheldon, et al., 2008), and it has been previously suggested that emotional disclosure writing may be a good augmentation to clinical intervention protocols for the treatment of this population (O'Cleirigh, et al., 2003). Trauma-focused interventions are well-suited for HIV-positive individuals based on the high levels of traumatic experiences and PTSD

observed in this population. It is noted that 31% of the men and 44% of women in our sample did report history of childhood sexual abuse, and 21% of men and 48% of women reported history of sexual abuse/assault in adulthood. While an examination of the actual rates of PTSD diagnosis in our sample is beyond the scope of the present study, the rates of sexual trauma reported by participants in this sample appear generally consistent with the alarmingly high rates reported by HIV-positive individuals in previous research, where reported rates of PTSD have ranged from 22-64% (Brief et al., 2004). For African American women with HIV, one study found lifetime prevalence rates of 33.3% for physical assault and 30.3% for completed rape, with 35% of the sample estimated as currently meeting the criteria for PTSD (Kimerling et al., 1999). As 88% of the women in our sample were African American, we believe the findings of our present study are particularly generalizable to this subset of HIV-positive individuals with a significant need for interventions to address the resultant psychological difficulties of these traumatic experiences.

Furthermore, emotional expression writing interventions appear to be particularly effective in health populations and has been shown to positively impact reported health immunological and psychological functioning (Frattaroli, 2006), all of which are compromised in HIV. The findings of the present study highlight the possibility that this intervention may be best suited for HIV-positive women and may not be the intervention technique of choice for HIV-positive men.

Limitations

Although the parent study from which the present data was derived is a randomized controlled trial, the focus of this examination was solely within the treatment

(i.e., trauma-writing) group. The rationale for not including an examination of the control group was previously explained. In summary, a previous comparison showed significant differences between women in the treatment versus control groups on two of the HRQoL subscales (Overall Healthy Functioning and Without Health Worries; Leserman, et al., in preparation). Interpretations of findings for the Life Satisfaction subscale in particular should be made with caution, as this subscale was not found to differ for the treatment versus control group in the parent study. This subscale was also examined because it does represent a fairly general domain of HRQoL and also captures psychological functioning aspects of HRQoL not represented in the two other subscales examined. The intent of the present study was to better understand how levels of emotional expression and depth processing in the trauma essays might help explain these group differences observed. Therefore, the interpretations of the present study must be made with caution as the treatment group was not compared with the control group on the EE and DP factors being examined. Although amount of emotional expression and processing of trauma/stressors was not technically measured in the control group, it is relatively safe to assume that these factors were occurring at a much lower degree than in the treatment group, as the control group wrote about a neutral topic (i.e., daily activities).

The present sample was generally diverse in regards to gender, race/ethnicity, and SES factors. However, the sample was comprised of paid volunteers and a number of exclusion criteria were involved in recruitment, therefore the sample may not be fully representative of all individuals living with HIV. Furthermore, preliminary analyses indicated that men and women were significantly different on several demographic, medical, and psychological variables, including ethnicity, education, sexual orientation,

Baseline level of CD4 cell counts, and history of sexual abuse/assault during adulthood. Specifically, the men in our sample were more likely to be homosexual and of higher SES, and the women in our sample were predominantly African American while the men were more ethnically diverse. Additionally, women were more likelyto have a history of sexual abuse/assault during adulthood, and women had higher CD4 cell count at Baseline in comparison to men. The findings that the intervention may have impacted women differently from men may actually be due to demographic, health, and trauma history differences, as much or more than due to actual differences related to being female or male.

An additional limitation is that the emotional expression and depth processing variables were derived from the same essays and so there may be a particularly high degree of correlation between these variables. This may limit interpretations of the mediation finding where Experiential Involvement Depth Processing mediated the relationship between Negative Emotion Words and HRQoL-Life in men.

Another noted limitation was that a few participants were identified as having follow-up sessions at a significantly later date than originally designed (i.e., three months past the intended time). This was not discovered until after main study analyses were conducted. However, one of the strengths of HLM analyses is that this statistical method takes into account the variation in time between measurements. However, it is possible that the course of HRQoL over time differed for these few participants as a function of their extended time between study sessions.

Lastly, the non-significant overall change in slopes for the outcome variable (HRQoL subscales) may limit the interpretation of the present findings. The present

study only used HRQoL at three time points to measure slope (i.e., Baseline, F1, F6). Perhaps following the cohort over a longer period of time would provide more information about the slopes of change in HRQoL over time as a function of the intervention and specific processes involved in writing about traumatic/stressful life experiences.

Future Directions

A number of future research endeavors may help elucidate the findings of the present study, as well as bring new information and clinical implications into the picture in regards to the efficacy and effectiveness of emotional expression writing interventions for individuals living with HIV. The foremost area of further investigation would be to tease apart the factors explaining the notable differences between men and women in this study. As previously postulated, it may be that men and women differ in the types of negative emotion words they express during trauma-writing. In the present analyses all types of negative emotion words were combined together, however it is possible for the data to be recoded to represent separate categories for emotion words (i.e., anger, sadness, fear, etc). If men and women are in fact different in the type of negative emotion words used, this may shed light on why higher negative emotional expression appeared beneficial for women and detrimental for men. Francis and Pennebaker's (1993) LIWC computerized scoring system includes measures of different types of emotion words and would be a useful tool for accomplishing a further examination in this area.

It is also possible that the trauma/stressor topics discussed may help to explain the difference in outcomes for men and women. Preliminary analyses indicated that while the severity of trauma/stressor written about did not differ between men and women, men

were significantly more likely to write about HIV-related traumas/stressors (i.e., diagnosis, stigma) and women were more likely to write about childhood traumas (i.e., childhood physical or sexual abuse). Interestingly, men and women did not differ in their reported history of childhood sexual abuse, although women did report higher rates of sexual abuse/assault during adulthood. It appears that although both groups were similar in the likelihood that they experienced childhood sexual abuse, women were more likely to choose this topic for processing during the trauma-writing essays. Further inspection of the difference by gender in the history of traumatic experiences as well as topics selected for processing during the trauma-writing intervention may be a worthwhile enterprise. Additionally, the possibility that that aspects of HRQoL may change over the course of HIV illness could be further examined by future analyses looking at the impact of "time since HIV diagnosis" on slope of HRQoL. Lastly, salivary and urinary cortisol measures were collected as part of the larger parent study. Incorporating this data about the neuroendocrine functioning of participants in relation to changes in HRQoL over time could also wield interesting results.

The unexpected finding that higher levels of Self Esteem Depth Processing were related to less improvement in HRQoL-Life for women should be further examined. The larger study with this sample included a self-report measure of self-esteem. An examination of how this measure of self-esteem relates to HRQoL and EE/DP may better explain this surprising and somewhat counter-intuitive finding.

One previously noted limitation of the present study is the focus solely on the treatment group without examination of the study control group. While it is assumed that the control group did not include significant amounts of emotional expression or depth

processing of stressful/traumatic events in their essays about neutral topics, it would be possible to examine this assumption empirically. It may be a worthwhile endeavor to score the control group essays to substantiate this assumption, and the data from the scoring process would allow for statistical comparison of the two groups. It is noted that although the control group essays were not measured for EE/DP, a manipulation check was in fact performed to confirm that none of the control group participants wrote about traumatic experiences in their essays.

Another future direction with the data of the present study would be to examine the change in processing across the four writing sessions. Francis and Pennebaker (1993) found that individuals who benefited most from an emotional disclosure intervention had a significant increase across writing sessions in causation words (i.e., because, effect, reason), and insight words (i.e., know, understand). Change over time in processing and expression may better explain changes in HRQoL over time.

Summary and Conclusions

The results of this longitudinal study indicate that indices of emotional expression and processing of traumatic/stressful life events occurring during a trauma-writing intervention predicted rate of change in health-related quality of life for HIV-positive individuals. While EE and DP did not predict rate of change for the sample as a whole, there were significant effects for men and women when examined separately.

Men had a tendency to decrease in HRQoL over time while women had a tendency to increase over the course of the study (i.e., from baseline to 6-month follow-up). In sum, greater levels of negative emotional expression and greater involvement in processing during the trauma-writing appeared beneficial in improving satisfaction with

life and overall healthy physical functioning in women. For men however, greater levels of negative emotional expression and involvement in processing appeared detrimental, as these dimensions predicted greater rate of decrease over time in life satisfaction as well as in the ability to be free of health worries. Men and women were also different in the relationship between HRQoL and their level of self-esteem in relation to the trauma/stressor written about in essays. Specifically, greater levels of the self-esteem depth processing dimension were related to less increase over time in life satisfaction for women, while for men it acted as a buffer to decreases in life satisfaction. These findings are not due to the impact of several demographic (age, ethnicity/race, education), medical (CD4 and VL) factors or stressful life events, all of which were controlled for in the HLM analyses. However, the results of the present study should be interpreted with caution, as the overall slopes indicated that there was not a significant change in HRQoL for either men or women.

The reasons for observed gender differences are not known, although several areas of future research to further examine of this topic are suggested. Overall, it appears that this emotional expression trauma-writing intervention is more beneficial for HIV-positive women in regards to health-related quality of life, and may not be the best treatment for improving HRQoL in HIV-positive men. However, as previously noted, these gender differences may be at least somewhat due to differences in our samples of men and women on a number of demographic and medical variables. This is the first study to our knowledge to examine the impact of this intervention on HRQoL in HIV. Additionally, our findings add to the literature by examining gender differences for an emotional expression writing intervention.

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Figure 1. HRQoL-Overall at Baseline, F1 and F6 for Total Sample, Men, and Women

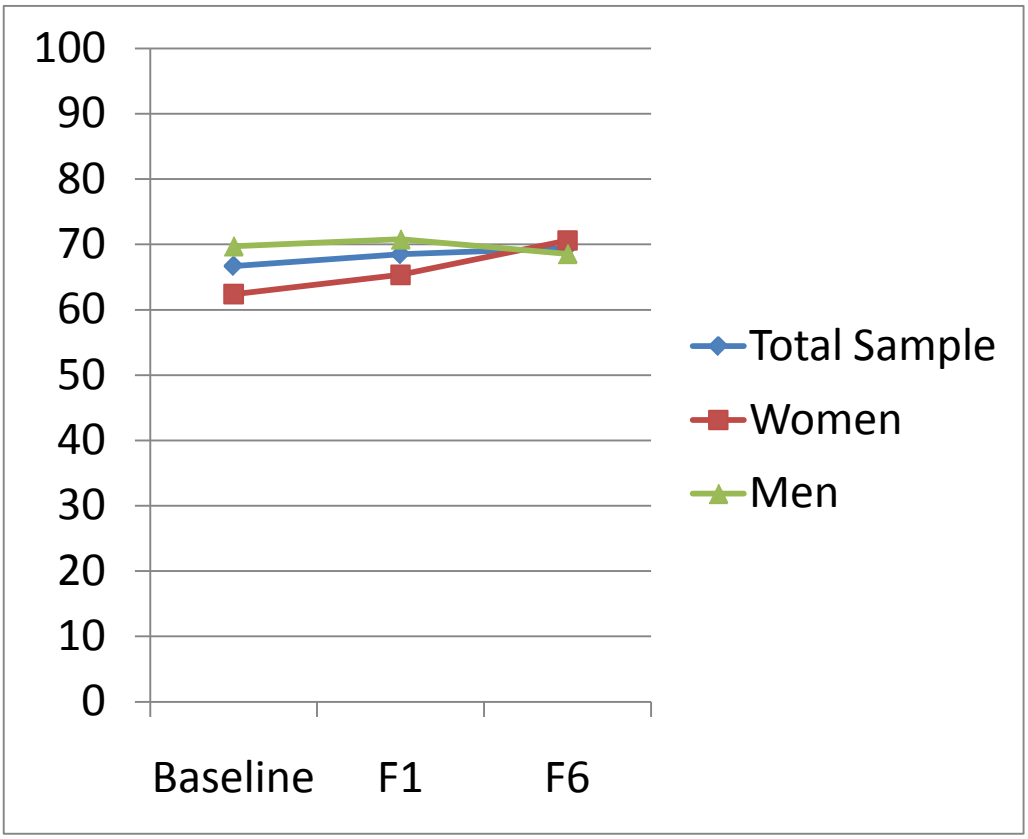


Figure 2. HRQoL-Health at Baseline, F1 and F6 for Total Sample, Men, and Women

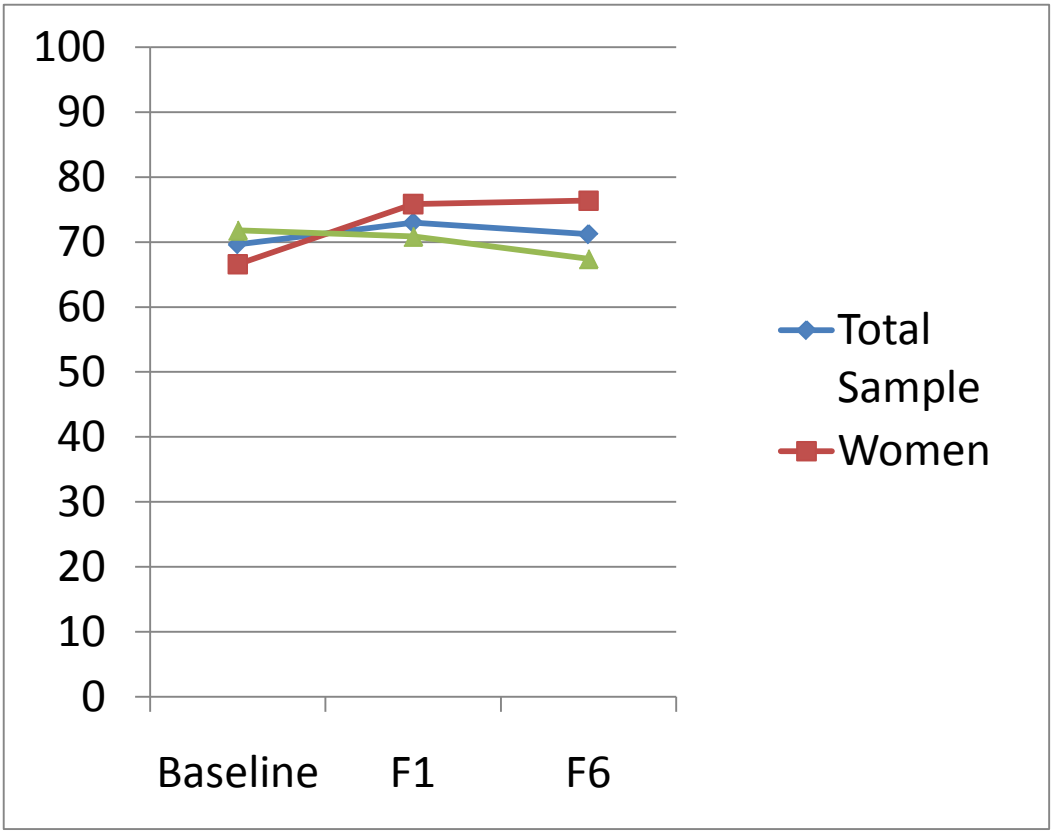


Figure 3. HRQoL-Life at Baseline, F1 and F6 for Total Sample, Men, and Women

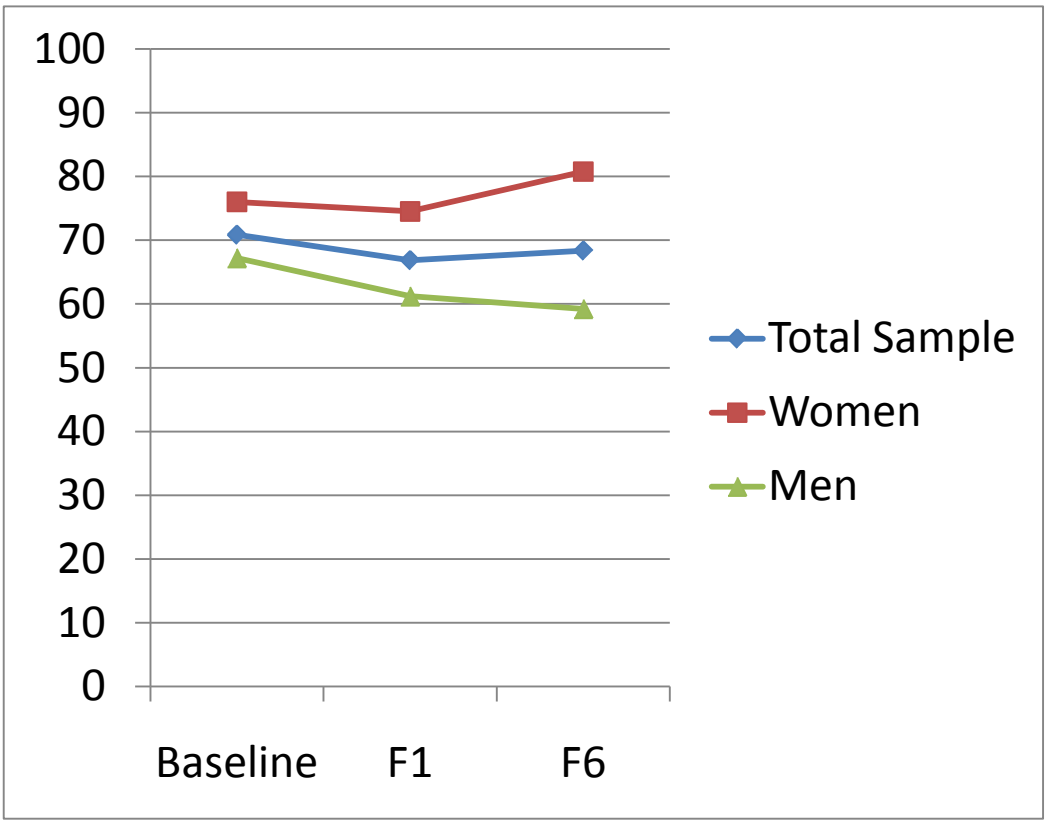
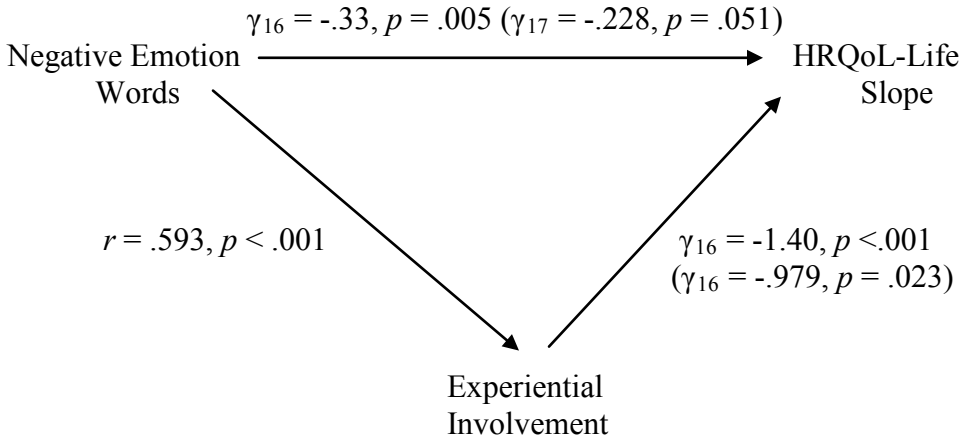


Figure 4. Experiential Involvement (DP variable) as a Mediator of the Relationship between Negative Emotion Words (EE variable) and HRQoL-Life Change Over Time for Men (n = 61)



Path diagram model for testing the direct and indirect effects of Negative Emotion Words (EE variable) on HRQoL-Life Slope for men over 6 months with exploration of Experiential Involvement (DP variable) as a potential mediator. The expressions outside parentheses describe the direct relationships between the variables, the parameters inside the parentheses describe the relationships with the mediator variable and all other covariates included in the HLM model. The full model is presented in Table X.

Table 1. The Basic Equations for Predicting Changes (Slope) in HRQoL with Explanation of Terms

Level 1	$Y_{ti} = \beta_{0i} + \beta_{1i}(\text{months since baseline})_{ti} + \beta_{2i}(CD4)_{ti} + \beta_{3i}(VL)_{ti} + e_{ti}$
Y_{ti}	HRQoL[a] for participant i at time point t
β_{0i}	HRQoL at Baseline for the i^{th} participant
β_{1i}	Slope representing linear change in HRQoL for participant i
β_{2i}, β_{3i}	Slopes for the covariates (CD4 and VL). These terms control for changes in HRQoL due to a particular CD4 count or Viral Load at a particular time point.
e_{ti}	Residual term for participant i at time t

To examine individual differences in level 1 change parameters, the level 2 equations are:

Level 2	β_{01} (intercept) $= \gamma_{00} + u_0$
	β_{1i} (slope) $= \gamma_{10} + \gamma_{11}(\text{baseline HRQoL})_i + \gamma_{12}(\text{gender})_i + \gamma_{13}(\text{age})_i + \gamma_{14}(\text{education})_i + \gamma_{15}(\text{ethnicity})_I + \gamma_{16}(\text{LES})_i + \gamma_{17}(\text{EE/DP variable})_i$[a] $+ u_1$
	$\beta_{2i}, \beta_{3i} = \gamma_{20}, \gamma_{30}$ (CD4, VL)
γ_{00}	Group average initial HRQoL
γ_{10}	Average linear change in HRQoL per month
γ_{20}, γ_{30}	Average effect on level of HRQoL across participants from CD4 or VL
$\gamma_{11} - \gamma_{15}$	Effect of the a priori (Level 2) covariates on change in HRQoL
γ_{16}	Effect of individual differences in HRQoL slope (γ_{10}) attributable to EE or DP variable[b]

The u term represents unexplained individual variance associated with estimation of γ coefficients.

EE = emotional expression; DP = depth processing; LES = Life Events Stress (average score)

[a] Each HLM analysis will examine one of three HRQoL subscales (HRQoL-Overall, HRQoL-Health, HRQoL-Life)

[b] The specific emotional expression or depth processing variable being examined will change for each HLM model depending on the hypothesis being tested. The rest of the model will be identical for each analysis.

Table 2. Emotional/Cognitive Processing Scale Inter-Rater Reliability

Construct Scored	*N*	*r*	*W*[a]
Severity of Trauma	46	.995**	.989**
Emotional Expression			
Positive Words	50	.968**	.923**
Negative Words	50	.988**	.951**
Total Words	50	.986**	.932**
Cognitive/Emotional Processing			
Adaptive/Realistic Cognitive Appraisal	39	.855**	.744**
Self-Esteem	36	.921**	.849**
Approach-Oriented Problem Solving	35	.893**	.837**
Experiential Involvement	50	.901**	.831**

*$p < .05$; **$p < .01$
[a] *W* = Kendall's tau

Table 3. Demographic Information for Full Sample (N = 106), Men (N = 62), women (n = 44), and Results of Analyses Comparing by Gender (t-test or Chi-square)

Variable	Full Sample	Men	Women	Significance
Gender				
Male (n = 62)	58.5%	---	---	---
Female (n = 44)	41.5%	---	---	---
Age				
M	44.42	44.58	44.20	t = -.234
(SD)	(8.12)	(7.30)	(9.25)	df = 104
				p = .816
Ethnicity				
African American	56.6%	38.7%	81.8%	χ^2 = 25.80
Caucasian, non-Hispanic	17.0%	24.2%	6.8%	df = 7
Hispanic/Latino	19.8%	29.0%	6.8%	p = .001**
Afro-Caribbean	2.8%	4.8%	0%	
Haitian	1.0%	0%	2.3%	
American Indian	1.0%	1.6%	0%	
Asian American	1.0%	1.6%	0%	
Bi-racial	1.0%	0%	2.3%	
Education				
Some High School or less	31.2%	19.3%	36.4%	χ^2 = 23.13
High School graduate	21.9%	14.5%	36.4%	df = 7
Some college/trade school	27.1%	30.6%	20.5%	p < .001**
College degree	14.6%	24.2%	2.3%	
Graduate degree	5.2%	11.3%	4.5%	
Sexual Orientation				
Exclusively Gay	31.3%	51.7%	3.8%	χ^2 = 77.52
Predominantly Gay	3.1%	4.6%	.9%	df = 5
Bisexual	6.1%	6.0%	5.7%	p < .001**
Predom. Heterosexual	5.0%	2.6%	7.5%	
Exclusively Heterosex.	54.2%	34.4%	82.1%	
Asexual	.4%	.7%	0%	

*p < .05; **p < .001

Table 4. Medical Information at Baseline for Full Sample (N = 106), Men (N = 62), and Women (N = 44) and Results of Analyses Comparing by Gender (t-test or Chi-square)

Variable	Full Sample	Men	Women	Significance
Time Since HIV Diagnosis (in years)				
M	10.81	11.18	10.28	$t = -.658$
(SD)	(6.84)	(7.17)	(6.39)	$df = 102$
				$p = .512$
CD4 count				
M	407.18	358.06	479.43	$t = 3.008$
(SD)	(209.62)	(185.18)	(224.43)	$df = 102$
				$p = .003$*
Viral Load $_{log}$				
M	2.77	2.85	2.65	$t = -.542$
(SD)	(1.81)	(1.89)	(1.70)	$df = 102$
				$p = .589$
Antiretroviral Medication Use				
None	28.5%	27.6%	30.3%	$\chi^2 = .592$
Combination Therapy	6.3%	5.8%	7.3%	$df = 2$
HAART Therapy	65.2%	66.7%	62.4%	$p = .744$
Alcohol Use in Past 1 Month				
Yes	44.9%	52.4%	36.1%	$\chi^2 = 2.074$
No	55.1%	47.6%	69.9%	$df = 1$
				$p = .150$
Cocaine (Intranasal) Use in Past 1 Month				
Yes	11.3%	11.3%	11.4%	$\chi^2 = .000$
No	88.7%	88.7%	88.6%	$df = 1$
				$p = .991$
Crack Cocaine Use in Past 1 Month				
Yes	6.7%	8.2%	4.5%	$\chi^2 = .548$
No	88.7%	91.8%	95.5%	df = 1
				$p = .459$
Heroin (Injected) Use in Past 1 Month				
Yes	0%	---	---	---
No	100%	---	---	---

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

Table 5. Means and Standard Deviations of Emotional Expression and Depth Processing Variables as Measured at W1 and Average (W1-W4) and the Pearson Correlations between the W1 and Average Measure for Total Sample ($N = 106$)

Variable	W1[a,b] M(SD)	Average[c,d] M(SD)	Correlation *r*	*p*
DP1-Cognitive Appraisal	4.14(1.27)	3.98(1.01)	.787	.000**
DP2-Self Esteem	3.59(1.37)	3.79(1.04)	.561	.000**
DP3-Problem Solving	4.00(1.74)	4.16(1.00)	.615	.000**
DP4-Experiential Involvement	4.32(1.15)	4.34(0.90)	.687	.000**
DP-Composite	4.01(0.99)	4.07(0.68)	.714	.000**
EE-Positive Words	2.34(2.90)	2.24(1.81)	.746	.000**
EE-Negative Words	4.81(3.93)	5.38(3.76)	.741	.000**

**$p < .001$

[a] EE Positive and Negative for W1 consists of number of emotional expression words in 1st writing session

[b] DP for W1 consists of depth processing score for 1st writing session on 1-7 scale

[c] EE for Average consists of average number of emotional expression words across all 4 writing sessions (W1-W4)

[d] DP for Average consists of average depth processing score across all 4 writing sessions (W1-W4) on 1-7 scale

Table 6. Means and Standard Deviations for Health Related Quality of Life (HRQoL) Subscales at Baseline (B), 1-month Follow-up (F1), and 6-month Follow-up (F6) for Total Sample, Women, and Men

	Total		Women		Men	
Variable	Mean(SD)	*n*	Mean(SD)	*n*	Mean(SD)	*n*
HRQoL-Overall (B)	66.71(23.57)	104	62.40(26.01)	43	69.74(21.38)	61
HRQoL-Overall (F1)	68.50(21.40)	102	65.35(22.59)	43	70.79(20.37)	59
HRQoL-Overall (F6)	69.44(20.52)	92	70.62(19.75)	39	68.57(21.22)	53
HRQoL- Health (B)	69.65(29.50)	104	66.57(31.45)	43	71.82(28.10)	61
HRQoL- Health (F1)	72.98(28.27)	102	75.87(28.46)	43	70.87(28.18)	59
HRQoL- Health (F6)	71.22(27.60)	92	76.39(26.12)	39	67.41(28.27)	53
HRQoL-Life (B)	70.85(26.22)	104	76.02(29.04)	43	67.21(23.60)	61
HRQoL-Life (F1)	66.87(23.85)	101	74.52(21.91)	43	61.21(23.81)	59
HRQoL-Life (F6)	68.37(24.24)	92	80.77(20.35)	39	59.24(22.93)	53

Note: HRQoL scores range from 0-100

Table 7. Means and Standard Deviations of Psychological Variables for Full Sample ($N = 106$), Men ($N = 62$) and Women ($N = 44$) and Results of Analyses Comparing by Gender (Chi-square or *t*-test)

Variable	Full Sample	Men	Women	Significance
Life Events Stress[a]				
M	11.01	11.05	10.94	$t = -.064$
(SD)	(8.64)	(7.71)	(9.90)	$df = 104$
				$p = .949$
Trauma Severity[b]				
M	4.39	4.40	4.36	$t = -.175$
(SD)	(1.06)	(1.11)	(.99)	$df = 104$
				$p = .861$
BDI (Baseline)				
M	9.53	10.32	8.41	$t = -1.214$
(SD)	(8.01)	(7.87)	(8.17)	$df = 104$
				$p = .227$
BDI (F1)				
M	9.00	10.04	7.58	$t = -1.448$
(SD)	(8.51)	(8.38)	(8.58)	$df = 100$
				$p = .151$
Davidson Trauma Scale (Baseline)				
M	26.86	27.67	25.73	$t = -.411$
(SD)	(23.84)	(21.67)	(26.77)	$df = 103$
				$p = .682$
Davidson Trauma Scale (F1)				
M	21.46	24.22	17.60	$t = -1.332$
(SD)	(24.94)	(27.99)	(19.61)	$df = 101$
				$p = .186$
History of Childhood Sexual Abuse				
Yes	36.5%	31.1%	44.2%	$\chi^2 = 1.849$
No	63.5%	68.9%	55.8%	$df = 1$
				$p = .174$
History of Adult Sexual Abuse (Rape)				
Yes	34.6%	21.1%	48.8%	$\chi^2 = 6.551$
No	65.4%	39.9%	51.2%	$df = 1$
				$p = .010$*

[a] Average score of B and F6 measures

[b] Measured in the 4 trauma-writing essays

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

Table 8. Frequencies of Trauma/Stressor Written about in Study Essays for Full Sample (N = 106), Men (n = 62), and Women (n = 44), and Results of Chi-square Analyses Comparing by Gender

Trauma Topic	Total	Men	Women	p
HIV-Related Trauma	22.2%	29.9%	12.0%	.021*
Childhood Trauma	18.8%	6.0%	24.0%	.005*
Death of a Loved One	13.7%	19.4%	18.0%	.849
Adult Physical/Sexual	11.1%	10.4%	12.0%	.794
Other Trauma/Stressor	34.2%	34.3%	34.0%	.971

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

Table 9. The Interrelationship (Pearson Correlation) between Emotional Expression and Depth Processing Variables and HRQoL Subscales at Baseline for Total Sample (n = 106)

	HRQoL-Overall		HRQoL-Health		HRQoL-Life	
	r	*p*	*r*	*p*	*r*	*p*
DP Variables[a]						
Cog. App.	.091	.361	.093	.346	.115	.243
Self Esteem	.008	.932	.020	.838	.176	.075
Prob. Solve	.006	.952	-.063	.524	.031	.751
Exp. Involv.	.114	.250	.189	.054*	-.194	.049*
Composite	.077	.437	.082	.406	.057	.562
EE Variables[b]						
Positive	-.062	.532	.127	.200	-.015	.883
Negative	.041	.683	.119	.228	-.231	.018*

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

[a,b] DP and EE variables used in these analyses are average scores (W1-W4)

Table 10. The Interrelationship (Pearson Correlation) between Emotional Expression and Depth Processing Variables and HRQoL Subscales at F1 for Total Sample

	HRQoL-Overall		HRQoL-Health		HRQoL-Life	
	r	*p*	*r*	*p*	*r*	*p*
DP Variables[a]						
Cog. App.	.144	.147	.202	.042*	.234	.018*
Self Esteem	.068	.499	.139	.164	.419	.000**
Prob. Solve	-.051	.614	-.039	.696	.125	.212
Exp. Involv.	.138	.167	.054	.587	-.348	.000**
Composite	.109	.275	.136	.174	.186	.063
EE Variables[b]						
Positive	.015	.844	.049	.622	-.032	.754
Negative	-.128	.200	-.074	.458	-.426	.000**

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

[a,b] DP and EE variables used in these analyses are average scores (W1-W4)

Table 11. The Interrelationship (Pearson Correlation) between Emotional Expression and Depth Processing Variables and HRQoL Subscales at F6 for Total Sample

	HRQoL-Overall		HRQoL-Health		HRQoL-Life	
	r	*p*	*r*	*p*	*r*	*p*
DP Variables[a]						
Cog. App.	.281	.037*	.230	.028*	.191	.068
Self Esteem	.085	.420	.183	.081	.186	.075
Prob. Solve	.153	.146	.011	.921	.004	.971
Exp. Involv.	.234	.025*	.189	.054*	-.224	.032*
Composite	.245	.019*	.200	.056	.095	.367
EE Variables[b]						
Positive	.098	.352	.109	.303	-.015	.883
Negative	.016	.876	-.061	.566	-.254	.015*

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

[a,b] DP and EE variables used in these analyses are average scores (W1-W4)

Table 12. The Interrelationship (Pearson Correlation) between Emotional Expression and Depth Processing Variables and HRQoL Subscales at Baseline for Men ($n = 61$)

	HRQoL-Overall		HRQoL-Health		HRQoL-Life	
	r	*p*	*r*	*p*	*r*	*p*
DP Variables[a]						
Cog. App.	.046	.725	.060	.644	.224	.083+
Self Esteem	-.047	.721	-.008	.953	.260	.043*
Prob. Solve	.026	.848	-.080	.540	.024	.854
Exp. Involv.	-.099	.448	.025	.850	-.429	.001**
Composite	-.024	.854	-.001	.992	.066	.614
EE Variables[b]						
Positive	-.147	.257	.041	.754	-.105	.421
Negative	-.045	.683	.099	.449	-.388	.002*

* $p \leq .05$; * $p \leq .001$

[a,b] DP and EE variables used in these analyses are average scores (W1-W4)

Table 13. The Interrelationship (Pearson Correlation) between Emotional Expression and Depth Processing Variables and HRQoL Subscales at F1 for Men (n = 59)

	HRQoL-Overall		HRQoL-Health		HRQoL-Life	
	r	*p*	*r*	*p*	*r*	*p*
DP Variables[a]						
Cog. App.	.166	.210	.192	.145	.277	.035*
Self Esteem	.067	.616	-.038	.777	.464	<.001**
Prob. Solve	-.182	.168	-.035	.790	.145	.277
Exp. Involv.	-.079	.550	-.037	.780	-.408	.001**
Composite	.001	.994	.066	.619	.226	.089
EE Variables[b]						
Positive	-.038	.775	-.132	.320	-.106	.429
Negative	-.248	.058+	-.154	.246	-.406	.002**

* $p \leq .05$; * $p \leq .001$

[a,b] DP and EE variables used in these analyses are average scores (W1-W4)

Table 14. The Interrelationship (Pearson Correlation) between Emotional Expression and Depth Processing Variables and HRQoL Subscales at F6 for Men (n = 53)

	HRQoL-Overall		HRQoL-Health		HRQoL-Life	
	r	*p*	*r*	*p*	*r*	*p*
DP Variables[a]						
Cog. App.	.088	.531	.195	.162	.197	.158
Self Esteem	.090	.520	.174	.213	.314	<.001**
Prob. Solve	.054	.700	-.008	.955	-.077	.585
Exp. Involv.	.071	.661	.003	.984	-.364	.007*
Composite	.111	.428	.141	.314	.056	.693
EE Variables[b]						
Positive	.010	.946	.076	.587	-.014	.919
Negative	.009	.947	-.078	.576	-.319	.020*

* $p \leq .05$; * $p \leq .001$

[a,b] DP and EE variables used in these analyses are average scores (W1-W4)

Table 15. The Interrelationship (Pearson Correlation) between Emotional Expression and Depth Processing Variables and HRQoL Subscales at Baseline for Women ($n = 43$)

	HRQoL-Overall		HRQoL-Health		HRQoL-Life	
	r	*p*	*r*	*p*	*r*	*p*
DP Variables[a]						
Cog. App.	.166	.286	.149	.342	-.026	.869
Self Esteem	.187	.230	.125	.425	-.021	.892
Prob. Solve	-.012	.938	-.044	.778	.039	.805
Exp. Involv.	.262	.090	- 340	.025*	.118	.451
Composite	.201	.196	.189	.226	.038	.808
EE Variables[b]						
Positive	.033	.833	.225	.147	.045	.773
Negative	.046	.768	.098	.532	-.058	.711

* $p \leq .05$; * $p \leq .001$

[a,b] DP and EE variables used in these analyses are average scores (W1-W4)

Table 16. The Interrelationship (Pearson Correlation) between Emotional Expression and Depth Processing Variables and HRQoL Subscales at F1 for Women (n = 43)

	HRQoL-Overall		HRQoL-Health		HRQoL-Life	
	r	*p*	*r*	*p*	*r*	*p*
DP Variables[a]						
Cog. App.	.140	.370	.204	.190	.155	.322
Self Esteem	.163	.296	.257	.096+	.215	.167
Prob. Solve	.110	.482	-.052	.739	.084	.593
Exp. Involv.	.324	.034*	.222	.152	-.156	.316
Composite	.258	.095+	.217	.162	.109	.486
EE Variables[b]						
Positive	.083	.596	.226	.144	.007	.964
Negative	-.073	.640	.110	.484	-.322	.035*

* $p \leq .05$; * $p \leq .001$; + $p < 1.00$ (trend)
[a,b] DP and EE variables used in these analyses are average scores (W1-W4)

Table 17. The Interrelationship (Pearson Correlation) between Emotional Expression and Depth Processing Variables and HRQoL Subscales at F6 for Women (n = 59)

	HRQoL-Overall		HRQoL-Health		HRQoL-Life	
	r	*p*	*r*	*p*	*r*	*p*
DP Variables[a]						
Cog. App.	.408	.010*	.285	.079+	.225	.169
Self Esteem	.049	.767	.103	.531	-.326	.043*
Prob. Solve	.285	.079+	.049	.769	.155	.345
Exp. Involv.	.517	.001**	.438	.005*	.237	.146
Composite	.429	.006*	.289	.075+	.108	.514
EE Variables[b]						
Positive	.190	.247	.125	.449	.164	.318
Negative	.073	.657	.101	.542	.176	.283

* $p \leq .05$; * $p \leq .001$; + $p < 1.00$ (trend)
[a,b] DP and EE variables used in these analyses are average scores (W1-W4)

Table 18. The Interrelationship (Pearson Correlations) Between Emotional Expression (EE)[a] and Depth Processing (DP)[b] Variables for the Total Sample (n = 104)

	1	2	3	4	5	6	7
1. EE Pos.	---	.175	.406**	.314**	.299**	.366*	.505**
2. EE Neg.		---	-.201*	-.541**	.152	.621**	-.020
3. Cog. App.			---	.458**	.577**	.266**	.851**
4. Self Est.				---	.266**	-.270**	.565**
5. Prob. Solv.					---	.411**	.825**
6. Exp. Involv.						---	.480**
7. DP Comp.							---

[a,b] EE and DP variables are Average scores (W1-W4)
* $p < .05$; ** $p < .01$

Table 19. The Interrelationship (Pearson Correlations) Between Emotional Expression (EE)[a] and Depth Processing (DP)[b] Variables for Women (n = 44)

	1	2	3	4	5	6	7
1. EE Pos.	---	.135	.340*	.241	.303*	.353*	.430**
2. EE Neg.		---	-.096	-.618**	.103	.601**	.003
3. Cog. App.			---	.376*	.733**	.364 *	.879**
4. Self Est.				---	.205	-.153	.484**
5. Prob. Solv.					---	.496**	.873**
6. Exp. Involv.						---	.598**
7. DP Comp.							---

[a,b] EE and DP variables are Average scores (W1-W4)
* $p < .05$; ** $p < .01$

Table 20. The Interrelationship (Pearson Correlations) Between Emotional Expression (EE)[a] and Depth Processing (DP)[b] Variables for Men (n = 62)

	1	2	3	4	5	6	7
1. EE Pos.	---	.261*	.470**	.373**	.298*	.441**	.582**
2. EE Neg.		---	-.261*	-.450**	.202	.593**	-.025
3. Cog. App.			---	.517**	.450**	.224*	.830**
4. Self Est.				---	.326*	-.273*	.643**
5. Prob. Solv.					---	.361**	.783**
6. Exp. Involv.						---	.421**
7. DP Comp.							---

[a,b] EE and DP variables are Average scores (W1-W4)
* $p < .05$; ** $p < .01$

Table 21. Means, Standard Deviations, and T-tests Comparing Men (n = 62) and Women (n = 44) on Emotional Expression and Depth Processing Variables

Variable	Men $M(SD)$	Women $M(SD)$	t	p
EE-Positive Words	2.15(1.61)	2.37(2.07)	6.24	.534
EE-Negative Words	6.29(3.82)	4.10(3.31)	-3.07	.003*
DP-Cog. Appraisal	3.94(1.00)	4.03(1.03)	.45	.651
DP-Self Esteem	3.58(1.08)	4.08(.91)	2.51	.013*
DP-Problem Solving	4.16(.94)	4.16(1.08)	.02	.983
DP-Exper. Involv.	4.53(.83)	4.07(.93)	-2.68	.009*
DP-Composite	4.05(.65)	4.09(.71)	.26	.799

*p < .05; ** p < .001

Table 22. Interrelationships Between Gender and HRQoL Subscales at F1 and F6 controlling for Baseline HRQoL ($N = 106$)

Variable	*r*	*p*
F1 Controlling for Baseline		
HRQoL-Overall	.145	.183
HRQoL-Health	-.143	.191
HRQoL-Life	-.239	.028*
F6 Controlling for baseline		
HRQoL-Overall	-.116	.288
HRQoL-Health	-.238	.028*
HRQoL-Life	-.412	<.001**

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

Table 23. Interrelationships (Pearson Correlations) between Potential Covariates, Predictor Variables (EE and DP) and Outcome Variables (HRQoL Subscales) ($N = 106$)

	Time Since Dx		Trauma Severity [c]	
	r	*p*	*r*	*p*
DP Variables[a]				
Cog. App.	-.046	.640	.268	.006*
Self Esteem	.019	.848	.039	.692
Prob. Solve	-.036	.719	.192	.048*
Exp. Involv.	.061	.536	.178	.069
Composite	-.003	.977	.245	.011*
EE Variables[b]				
Positive	.104	.293	-.025	.798
Negative	.060	.542	.126	.199
HRQoL Subscales[d]				
Overall	-.061	.545	.014	.891
Health	-.022	.826	.059	.551
Life	-.056	.574	-.072	.465

* $p < .05$

[a,b,c] EE, DP, and Trauma Severity variables are Average scores (W1-W4)

[d] HRQoL subscales are Baseline measure

Table 24. Basic Model Including Coefficients and Significance Tests for Level 1 and Level 2 Covariates Prediction of HRQoL-Overall Slope Over 6-Months for Total Sample ($N = 104$)

	Coefficient	Stand. Error	*t* Ratio	*df*	*p*
Fixed effects					
HRQoL intercept, β_0					
Avg. initial HRQoL, γ_{00}	68.243	2.274	30.009	103	<.001
HRQoL slope[a], β_1					
Avg. slope, γ_{10}	-.102	.657	-.155	97	.878
Gender, γ_{11}	-1.327	.607	-2.187	97	.031*
Age, γ_{12}	-.020	.034	-.587	97	.558
Education, γ_{13}	.452	.234	1.933	97	.056+
Ethnicity, γ_{14}	.613	.566	1.082	97	.282
Life Event Stress, γ_{15}	-.028	.030	-.927	97	.356
Baseline HRQoL, γ_{16}	-.007	.013	-.572	97	.568
CD4 increment, β_2					
Average increment, γ_{20}	.001	.001	.069	278	.945
VL increment, β_3					
Average increment, γ_{30}	-1.681	2.474	-.679	278	.497
Random effects	**SD**	**Variance**	***df***	χ^2	***p***
Intercept, U_0	17.986	323.514	102	353.839	<.001
Slope, U_1	1.112	1.236	96	107.738	.194
Error, R	13.663	186.668			

[a] HRQoL-Overall slope per month

* $p < .05$; ** $p \leq .001$; + $p < 1.00$

Table 25. Prediction from Emotional Expression and Depth Processing Variables to HRQoL-Overall Subscale Slope for Total Sample ($N = 104$)

Predictor	γ_{17} Coefficient	*t* Ratio	*p*
Depth Processing			
Cog. App.	.436	1.702	.092+
Self Esteem	.140	.583	.561
Prob. Solv.	.339	1.129	.262
Exp. Involv.	.647	1.862	.065+
Composite	.692	1.734	.086+
Emotional Expression			
Positive Words	.149	.911	.365
Negative Words	-.047	-.668	.505
Negative^2 (Quadratic)[a]	-.012	-.871	.385

* $p < .05$; + $p < 1.00$

Models are controlling for CD4 count and VL at level 1 and gender, age, education, ethnicity, Life Event Stress, and Baseline HRQoL at level 2.

[a] the coefficient for the Negative Emotion Words quadratic term is γ_{18} as it was entered into the model along with the linear term for Negative Emotion Words to test for a potential curvilinear relationship

Table 26. Basic Model Including Coefficients and Significance Tests for Level 1 and Level 2 Covariates Prediction of HRQoL-Health Slope Over 6-Months for Total Sample ($N = 104$)

Predictor	Coefficient	Stand. Error	*t* Ratio	*df*	*p*
Fixed effects					
HRQoL intercept, β_0					
Avg. initial HRQoL, γ_{00}	77.291	2.742	28.187	103	<.001
HRQoL slope[a], β_1					
Avg. slope, γ_{10}	.173	.898	.193	97	.848
Gender, γ_{11}	-1.609	.854	-1.884	97	.062+
Age, γ_{12}	.065	.062	1.046	97	.298
Education, γ_{13}	.347	.369	.940	97	.350
Ethnicity, γ_{14}	1.011	.866	1.167	97	.246
Life Event Stress, γ_{15}	-.026	.039	-.673	97	.502
Baseline HRQoL, γ_{16}	-.056	.017	-3.363	97	<.001**
CD4 increment, β_2					
Average increment, γ_{20}	.002	.009	.248	278	.804
VL increment, β_3					
Average increment, γ_{30}	-11.835	3.951	-2.996	278	.003*
Random effects	SD	Variance	*df*	χ^2	*p*
Intercept, U_0	21.740	472.611	102	311.512	<.001
Slope, U_1	.783	.613	96	92.733	>.500
Error, *R*	17.935	321.652			

[a] HRQoL-Health slope per month

* $p < .05$; ** $p \leq .001$; + $p < 1.00$

Table 27. Prediction from Emotional Expression and Depth Processing Variables to HRQoL-Health Subscale Slope for Total Sample ($N = 104$)

Predictor	γ_{17} Coefficient	*t* Ratio	*p*
Depth Processing			
Cog. App.	.626	1.581	.117
Self Esteem	.521	1.592	.114
Prob. Solv.	.094	.238	.812
Exp. Involv.	.559	1.090	.279
Composite	.812	1.527	.130
Emotional Expression			
Positive Words	-.063	-.328	.743
Negative Words	-.173	-1.645	.103
Negative^2 (Quadratic)[a]	-.010	-.574	.567

* $p < .05$

Models are controlling for CD4 count and VL at level 1 and gender, age, education, ethnicity, Life Event Stress, and Baseline HRQoL at level 2.

[a] the coefficient for the Negative Emotion Words quadratic term is γ_{18} as it was entered into the model along with the linear term for Negative Emotion Words to test for a potential curvilinear relationship

Table 28. Basic Model Including Coefficients and Significance Tests for Level 1 and Level 2 Covariates Prediction of HRQoL-Life Slope Over 6-Months for Total Sample ($N = 104$)

Predictor	Coefficient	Stand. Error	*t* Ratio	*df*	*p*
Fixed effects					
HRQoL intercept, β_0					
Avg. initial HRQoL, γ_{00}	70.380	2.957	23.804	103	<.001
HRQoL slope[a], β_1					
Avg. slope, γ_{10}	1.687	.720	2.345	97	.021*
Gender, γ_{11}	-2.983	.646	-4.619	97	<.001**
Age, γ_{12}	-.034	.038	-.897	97	.372
Education, γ_{13}	-.125	.247	-.506	97	.614
Ethnicity, γ_{14}	.382	.707	.540	97	.590
Life Event Stress, γ_{15}	-.109	.042	-2.603	97	.011*
Baseline HRQoL, γ_{16}	-.046	.013	-3.624	97	.001**
CD4 increment, β_2					
Average increment, γ_{20}	.004	.008	.445	277	.656
VL increment, β_3					
Average increment, γ_{30}	-1.972	3.162	-.624	277	.533

Random effects	SD	Variance	*df*	χ^2	*p*
Intercept, U_0	19.272	371.406	102	289.446	<.001
Slope, U_1	.335	.112	96	90.547	>.500
Error, *R*	16.185	261.970			

[a] HRQoL-Life slope per month

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

Table 29. Prediction from Emotional Expression and Depth Processing Variables to HRQoL-Life Subscale Slope for Total Sample (n = 104)

Predictor	γ_{17} Coefficient	t Ratio	p
Depth Processing			
Cog. App.	.230	.838	.404
Self Esteem	.068	.209	.835
Prob. Solv.	-.136	-.488	.626
Exp. Involv.	-.276	-.843	.402
Composite	-.011	-.030	.977
Emotional Expression			
Positive Words	.047	.343	.732
Negative Words	-.082	-.726	.469
Negative^2 (Quadratic)[a]	-.013	-.365	.722

* $p < .05$

Models are controlling for CD4 count and VL at level 1 and gender, age, education, ethnicity, Life Event Stress, and Baseline HRQoL at level 2.

[a] the coefficient for the Negative Emotion Words quadratic term is γ_{18} as it was entered into the model along with the linear term for Negative Emotion Words to test for a potential curvilinear relationship

Table 30. Moderation Analyses Indicating Prediction to HRQoL-Overall Slope from Interaction Terms (Gender x EE/DP Variables) for Total Sample ($N = 104$; $df = 94$)

Predictor	γ_{18} Coefficient	*t* Ratio	*p*
Depth Processing			
Cog. App. x Gender	-.343	-.663	.509
Self Esteem x Gender	.883	1.527	.130
Prob. Solv. x Gender	-.509	- .869	.387
Exp. Involv. x Gender	-.612	-.964	.338
Composite x Gender	-.204	-.374	.709
Emotional Expression			
Positive Words x Gender	-.223	-.394	.694
Negative Words x Gender	-.872	-1.475	.143

* $p < .05$; ** $p \leq .001$
Models are controlling for CD4 count and VL at level 1 and age, education, ethnicity, Life Event Stress, and Baseline HRQoL at level 2.

Table 31. Moderation Analyses Indicating Prediction to HRQoL-Health Slope from Interaction Terms (Gender x EE/DP Variables) for Total Sample ($N = 104$; $df = 94$)

Predictor	γ_{18} Coefficient	*t* Ratio	*p*
Depth Processing			
Cog. App. x Gender	.109	.154	.878
Self Esteem x Gender	.559	.723	.472
Prob. Solv. x Gender	-.207	- .275	.784
Exp. Involv. x Gender	-1.628	-2.056	.042*
Composite x Gender	-.139	-.204	.839
Emotional Expression			
Positive Words x Gender	.027	.037	.971
Negative Words x Gender	-1.840	-2.493	.015*

* $p < .05$; ** $p \leq .001$
Models are controlling for CD4 count and VL at level 1 and age, education, ethnicity, Life Event Stress, and Baseline HRQoL at level 2.

Table 32. Moderation Analyses Indicating Prediction to HRQoL-Life Slope from Interaction Terms (Gender x EE/DP Variables) for Total Sample ($N = 104$; $df = 94$)

Predictor	γ_{18} Coefficient	*t* Ratio	*p*
Depth Processing			
Cog. App. x Gender	.124	.249	.804
Self Esteem x Gender	2.142	3.493	.001**
Prob. Solv. x Gender	-.317	- .579	.563
Exp. Involv. x Gender	-1.693	-3.024	.004*
Composite x Gender	.125	.265	.792
Emotional Expression			
Positive Words x Gender	-.161	-.301	.764
Negative Words x Gender	-1.989	-2.721	.008*

* $p < .05$; ** $p \leq .001$
Models are controlling for CD4 count and VL at level 1 and age, education, ethnicity, Life Event Stress, and Baseline HRQoL at level 2.

Table 33. Basic Model Including Coefficients and Significance Tests for Level 1 and Level 2 Covariates Prediction of HRQoL-Overall Slope Over 6-Months for Women (n = 43)

Predictor	Coefficient	Stand. Error	t Ratio	df	p
Fixed effects					
HRQoL intercept, β_0					
Avg. initial HRQoL, γ_{00}	62.911	3.853	16.326	42	<.001
HRQoL slope[a], β_1					
Avg. slope, γ_{10}	.961	.935	1.029	37	.311
Age, γ_{11}	-.015	.046	-.337	37	.738
Education, γ_{12}	.223	.384	.581	37	.564
Ethnicity, γ_{13}	-1.018	.701	-1.453	37	.155
Life Event Stress, γ_{14}	.035	.040	.872	37	.389
Baseline HRQoL, γ_{15}	-.019	.019	-1.020	37	.315
CD4 increment, β_2					
Average increment, γ_{20}	.010	.008	1.279	111	.204
VL increment, β_3					
Average increment, γ_{30}	-1.621	3.986	-.407	111	.685
Random effects	**SD**	**Variance**	***df***	**χ^2**	***p***
Intercept, U_0	22.114	489.045	42	225.196	<.001
Slope, U_1	2.135	4.562	37	58.119	.015*
Error, R	12.748	162.518			

[a] HRQoL-Overall slope per month
* $p < .05$

Table 34. Prediction from Emotional Expression and Depth Processing Variables to HRQoL-Overall Subscale Slope for Women (n = 43)

Predictor	γ_{16} Coefficient	t Ratio	p
Depth Processing			
Cog. App.	.882	1.672	.103
Self Esteem	-.266	-.556	.581
Prob. Solv.	.733	1.721	.093+
Exp. Involv.	1.405	2.590	.014*
Composite	1.212	1.727	.092+
Emotional Expression			
Positive Words	.272	1.138	.263
Negative Words	.134	1.140	.262
Negative^2 (Quadratic)[a]	.013	.663	.515

* $p < .05$; + $p < 1.00$

Models are controlling for CD4 count and VL at level 1 and age, education, ethnicity, Life Event Stress, and Baseline HRQoL at level 2.

[a] the coefficient for the Negative Emotion Words quadratic term is γ_{18} as it was entered into the model along with the linear term for Negative Emotion Words to test for a potential curvilinear relationship

Table 35. Basic Model Including Coefficients and Significance Tests for Level 1 and Level 2 Covariates Prediction of HRQoL-Health Slope Over 6-Months for Women (n = 43)

Predictor	Coefficient	Stand. Error	t Ratio	df	p
Fixed effects					
HRQoL intercept, β_0					
Avg. initial HRQoL, γ_{00}	78.122	4.602	16.977	42	<.001
HRQoL slope[a], β_1					
Avg. slope, γ_{10}	1.723	1.196	1.440	37	.158
Age, γ_{11}	-.118	.071	-1.665	37	.104
Education, γ_{12}	-.277	.446	-.622	37	.537
Ethnicity, γ_{13}	-.752	1.497	-.502	37	.618
Life Event Stress, γ_{14}	-.023	.059	-.393	37	.697
Baseline HRQoL, γ_{15}	.001	.018	.034	37	.973
CD4 increment, β_2					
Average increment, γ_{20}	-.003	.013	-.227	111	.656
VL increment, β_3					
Average increment, γ_{30}	-16.144	6.632	-2.434	111	.017*

Random effects	SD	Variance	df	χ^2	p
Intercept, U_0	22.899	524.409	42	141.229	<.001
Slope, U_1	.246	.060	37	29.354	>.500
Error, R	17.793	316.617			

[a] HRQoL-Health slope per month

* $p < .05$

Table 36. Prediction from Emotional Expression and Depth Processing Variables to HRQoL-Health Subscale Slope for Women (n = 43)

Predictor	γ_{16} Coefficient	t Ratio	p
Depth Processing			
Cog. App.	.349	.780	.441
Self Esteem	.369	.679	.501
Prob. Solv.	.240	.616	.542
Exp. Involv.	.888	1.634	.111
Composite	.692	1.252	.219
Emotional Expression			
Positive Words	-.145	-.762	.451
Negative Words	.044	.353	.726
Negative^2 (Quadratic)[a]	.011	.186	.856

* $p < .05$

Models are controlling for CD4 count and VL at level 1 and age, education, ethnicity, Life Event Stress, and Baseline HRQoL at level 2.

[a] the coefficient for the Negative Emotion Words quadratic term is γ_{18} as it was entered into the model along with the linear term for Negative Emotion Words to test for a potential curvilinear relationship

Table 37. Basic Model Including Coefficients and Significance Tests for Level 1 and Level 2 Covariates Prediction of HRQoL-Life Slope Over 6-Months for Women (n = 43)

Predictor	Coefficient	Stand. Error	t Ratio	df	p
Fixed effects					
HRQoL intercept, β_0					
Avg. initial HRQoL, γ_{00}	78.139	4.847	16.123	42	<.001
HRQoL slope[a], β_1					
Avg. slope, γ_{10}	1.901	1.133	1.678	37	.101
Age, γ_{11}	-.004	.044	-.080	37	.937
Education, γ_{12}	-.370	.475	-.778	37	.442
Ethnicity, γ_{13}	-1.688	1.011	-1.670	37	.103
Life Event Stress, γ_{14}	-.019	.039	-.488	37	.628
Baseline HRQoL, γ_{15}	-.025	.016	-1.539	37	.132
CD4 increment, β_2					
Average increment, γ_{20}	.006	.011	.531	111	.596
VL increment, β_3					
Average increment, γ_{30}	-7.915	4.550	-1.740	111	.084+

Random effects	SD	Variance	df	χ^2	p
Intercept, U_0	21.230	450.731	42	135.845	<.001
Slope, U_1	1.113	1.239	37	39.626	.353
Error, R	16.714	279.349			

[a] HRQoL-Life slope per month

* $p < .05$; ** $p \leq .001$; + $p < 1.00$

Table 38. Prediction from Emotional Expression and Depth Processing Variables to HRQoL-Life Subscale Slope for Women (n = 43)

Predictor	γ_{16} Coefficient	t Ratio	p
Depth Processing			
Cog. App.	.248	.689	.495
Self Esteem	-1.142	-2.732	.010*
Prob. Solv.	.150	.417	.679
Exp. Involv.	1.030	2.194	.035*
Composite	.116	.224	.824
Emotional Expression			
Positive Words	.212	1.206	.365
Negative Words	.265	2.144	.039*
Negative^2 (Quadratic)[a]	.018	1.114	.275

* $p < .05$

Models are controlling for CD4 count and VL at level 1 and age, education, ethnicity, Life Event Stress, and Baseline HRQoL at level 2.

[a] the coefficient for the Negative Emotion Words quadratic term is γ_{18} as it was entered into the model along with the linear term for Negative Emotion Words to test for a potential curvilinear relationship

Table 39. Basic Model Including Coefficients and Significance Tests for Level 1 and Level 2 Covariates Prediction of HRQoL-Overall Slope Over 6-Months for Men (n = 61)

Predictor	Coefficient	Stand. Error	t Ratio	df	p
Fixed effects					
HRQoL intercept, β_0					
Avg. initial HRQoL, γ_{00}	70.355	2.705	26.013	60	<.001
HRQoL slope[a], β_1					
Avg. slope, γ_{10}	-2.039	.853	-2.391	55	.020*
Age, γ_{11}	.001	.045	.006	55	.995
Education, γ_{12}	.550	.275	2.000	55	.050*
Ethnicity, γ_{13}	.670	.672	.997	55	.324
Life Event Stress, γ_{14}	-.055	.046	-1.185	55	.242
Baseline HRQoL, γ_{15}	-.027	.017	1.620	55	.111
CD4 increment, β_2					
Average increment, γ_{20}	-.002	.010	-.235	159	.815
VL increment, β_3					
Average increment, γ_{30}	1.252	2.714	.461	159	.645

Random effects	SD	Variance	df	χ^2	p
Intercept, U_0	13.625	185.628	59	128.849	<.001
Slope, U_1	.546	.298	54	53.828	<.500
Error, R	14.195	201.495			

[a] HRQoL-Overall slope per month
* $p < .05$; ** $p \leq .001$

Table 40. Prediction from Emotional Expression and Depth Processing Variables to HRQoL-Overall Subscale Slope for Men (n = 61)

Predictor	γ_{16} Coefficient	t Ratio	p
Depth Processing			
Cog. App.	.195	.798	.428
Self Esteem	.491	1.881	.065+
Prob. Solv.	-.048	-0.125	.902
Exp. Involv.	.313	.694	.490
Composite	.504	1.148	.256
Emotional Expression			
Positive Words	.174	.749	.457
Negative Words	-.141	-1.456	.151
Negative^2 (Quadratic)[a]	-.016	-1.256	.218

* $p < .05$; + $p < 1.00$

Models are controlling for CD4 count and VL at level 1 and age, education, ethnicity, Life Event Stress, and Baseline HRQoL at level 2.

[a] the coefficient for the Negative Emotion Words quadratic term is γ_{18} as it was entered into the model along with the linear term for Negative Emotion Words to test for a potential curvilinear relationship

Table 41. Basic Model Including Coefficients and Significance Tests for Level 1 and Level 2 Covariates Prediction of HRQoL-Health Slope Over 6-Months for Men (n = 61)

Predictor	Coefficient	Stand. Error	t Ratio	df	p
Fixed effects					
HRQoL intercept, β_0					
Avg. initial HRQoL, γ_{00}	77.051	3.506	21.974	60	<.001
HRQoL slope[a], β_1					
Avg. slope, γ_{10}	-2.129	1.246	-1.709	55	.093+
Age, γ_{11}	.232	.071	3.276	55	.002*
Education, γ_{12}	.568	.427	1.330	55	.189
Ethnicity, γ_{13}	1.570	1.139	1.379	55	.174
Life Event Stress, γ_{14}	-.047	.064	-.729	55	.469
Baseline HRQoL, γ_{15}	-.088	.022	-3.936	55	<.001**
CD4 increment, β_2					
Average increment, γ_{20}	.010	.012	.857	159	.393
VL increment, β_3					
Average increment, γ_{30}	-9.791	4.982	-1.965	159	.051*

Random effects	SD	Variance	df	χ^2	p
Intercept, U_0	21.749	473.033	59	180.547	<.001
Slope, U_1	.804	.647	54	54.550	.454
Error, R	17.463	304.955			

[a] HRQoL-Life slope per month

* $p < .05$; ** $p \leq .001$; + $p < 1.00$

Table 42. Prediction from Emotional Expression and Depth Processing Variables to HRQoL-Health Subscale Slope for Men (n = 61)

Predictor	γ_{16} Coefficient	t Ratio	p
Depth Processing			
Cognitive Appraisal	.553	1.171	.247
Self Esteem	.790	2.261	.028*
Problem Solving	-.228	-.448	.655
Experiential Involvement	-.782	-1.198	.236
Composite	.470	.750	.456
Emotional Expression			
Positive Words	-.162	-.506	.615
Negative Words	-.446	-3.682	.001*
Negative^2 (Quadratic)[a]	-.015	-.277	.789

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

Models are controlling for CD4 count and VL at level 1 and age, education, ethnicity, Life Event Stress, and Baseline HRQoL at level 2.

[a] the coefficient for the Negative Emotion Words quadratic term is γ_{18} as it was entered into the model along with the linear term for Negative Emotion Words to test for a potential curvilinear relationship

Table 43. Basic Model Including Coefficients and Significance Tests for Level 1 and Level 2 Covariates Prediction of HRQoL-Life Slope Over 6-Months for Men (n = 61)

Predictor	Coefficient	Stand. Error	t Ratio	df	p
Fixed effects					
HRQoL intercept, β_0					
Avg. initial HRQoL, γ_{00}	63.773	3.475	18.351	60	<.001
HRQoL slope[a], β_1					
Avg. slope, γ_{10}	-1.507	.839	-1.797	55	.077+
Age, γ_{11}	-.058	.050	-1.168	55	.248
Education, γ_{12}	.026	.285	.092	55	.928
Ethnicity, γ_{13}	.459	.700	.655	55	.515
Life Event Stress, γ_{14}	-.190	.016	-3.12	55	.003*
Baseline HRQoL, γ_{15}	-.07	.02	-4.260	55	<.001**
CD4 increment, β_2					
Average increment, γ_{20}	-.001	.013	-.137	158	.891
VL increment, β_3					
Average increment, γ_{30}	4.095	3.886	1.054	158	.294

Random effects	SD	Variance	df	χ^2	p
Intercept, U_0	18.221	331.996	59	160.292	<.001
Slope, U_1	.623	.388	54	47.532	>.500
Error, R	14.958	223.727			

[a] HRQoL-Health slope per month
* $p < .05$; ** $p \leq .001 + p < 1.00$

Table 44. Prediction from Emotional Expression and Depth Processing Variables to HRQoL-Life Subscale Slope for Men (n = 61)

Predictor	γ_{16} Coefficient	t Ratio	p
Depth Processing			
Cog. Appraisal	.106	.333	.741
Self Esteem	.783	2.499	.016*
Problem Solving	-.473	-1.164	.250
Experiential Involvement	-1.413	-3.505	.001*
Composite	-.092	-.199	.843
Emotional Expression			
Positive Words	.074	.349	.728
Negative Words	-.334	-2.976	.005*
Negative^2 (Quadratic)[a]	.020	.851	.401

* $p < .05$

Models are controlling for CD4 count and VL at level 1 and age, education, ethnicity, Life Event Stress, and Baseline HRQoL at level 2.

[a] the coefficient for the Negative Emotion Words quadratic term is γ_{18} as it was entered into the model along with the linear term for Negative Emotion Words to test for a potential curvilinear relationship

Table 45. Mediator Analyses for Potential Mediators (DP Variables) that Predict HRQoL Slope in Men (n = 61)

Mediator	Mediator Alone t	Mediator Controlling for EE Neg.[c] t	EE Neg.[c] Controlling for Mediator t	Sobel Test z[d]
Predicting to HRQoL-Health				
Self Esteem [a]	2.261*	.709	-2.772*	-1.365
Predicting to HRQoL-Life				
Self Esteem [a]	2.499*	1.518	-2.166*	-.693
Exper. Involve.[b]	**-3.505****	**-2.342***	**-1.992***	**2.045***

* $p \leq .05$; ** $p < .01$
[a, b] both Self Esteem and Experiential Involvement are DP scales
[c] EE Neg. (Negative Emotion Words) is the predictor variable in these hypothesized mediation models
[d] a significant result ($p < .05$) on Sobel test indicates a significant mediation effect
Note: the term in bold indicates a significant mediation finding

Table 46. Mediator Analyses for Potential Mediators (DP Variables) that Predict HRQoL Slope in Women (n = 43)

Mediator	Mediator Alone t	Mediator Controlling for EE Neg.[c] t	EE Neg.[c] Controlling for Mediator t	Sobel Test z
Predicting to HRQoL-Life Slope				
Self Esteem[a]	-2.732*	-1.689	.446	---
Exper. Involve.[b]	2.194*	1.587	1.089	---

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

[a, b] both Self Esteem and Experiential Involvement are DP scales

[c] EE Neg (Negative Emotion Words) is the predictor variable in these hypothesized mediation models

Table 47. Mediator Analyses for Potential Mediators that Predict HRQoL Slope in Women (n = 43)

Mediator	Mediator Alone t	Mediator Controlling for DP[c] t	DP[c] Controlling for Mediator t	Sobel Test z
Predicting to HRQoL-Overall				
Depression[a]	3.364*	1.291	2.315*	---

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

[a,] depression was calculated as a change score (BDI at Baseline – BDI at F1)

[c] Experiential Involvement (DP variable) is the predictor variable in this hypothesized mediation model

Table 48. Moderation Analyses Indicating Prediction to HRQoL-Overall Slope from Interaction Terms (Baseline PTSD x EE/DP Variables) for Total Sample ($N = 104$; $df = 93$)

Predictor	γ_{19} Coefficient	*t* Ratio	*p*
Depth Processing			
Cog. App. x PTSD	-.092	-.330	.742
Self Esteem x PTSD	-.343	-1.172	.245
Prob. Solv. x PTSD	-.447	-1.577	.118
Exp. Involv. x PTSD	-.216	-.609	.544
Composite x PTSD	-.298	-1.150	.254
Emotional Expression			
Positive Words x PTSD	-.738	-2.957	.004*
Negative Words x PTSD	-.215	-.639	.524

* $p < .05$

Models are controlling for CD4 count and VL at level 1 and age, education, ethnicity, Life Event Stress, and Baseline HRQoL at level 2.

Table 49. Moderation Analyses Indicating Prediction to HRQoL-Health Slope from Interaction Terms (Baseline PTSD x EE/DP Variables) for Total Sample ($N = 104$; $df = 93$)

Predictor	γ_{19} Coefficient	*t* Ratio	*p*
Depth Processing			
Cog. App. x PTSD	-.419	-1.249	.213
Self Esteem x PTSD	-.236	-.678	.499
Prob. Solv. x PTSD	-.420	-1.268	.208
Exp. Involv. x PTSD	-.502	-1.330	.187
Composite x PTSD	-.419	-1.314	.192
Emotional Expression			
Positive Words x PTSD	-.363	-1.077	.285
Negative Words x PTSD	-.477	-1.211	.229

* $p < .05$

Models are controlling for CD4 count and VL at level 1 and age, education, ethnicity, Life Event Stress, and Baseline HRQoL at level 2.

Table 50. Moderation Analyses Indicating Prediction to HRQoL-Life Slope from Interaction Terms (Baseline PTSD x EE/DP Variables) for Total Sample ($N = 104$; $df = 93$)

Predictor	γ_{19} Coefficient	*t* Ratio	*p*
Depth Processing			
Cog. App. x PTSD	-.195	-.863	.319
Self Esteem x PTSD	-.286	-.973	.333
Prob. Solv. x PTSD	-.318	-1.101	.274
Exp. Involv. x PTSD	.079	.226	.822
Composite x PTSD	-.216	-.905	.368
Emotional Expression			
Positive Words x PTSD	-.084	-.288	.774
Negative Words x PTSD	.253	.658	.512

* $p < .05$

Models are controlling for CD4 count and VL at level 1 and age, education, ethnicity, Life Event Stress, and Baseline HRQoL at level 2.

Table 51. Basic Model Including Coefficients and Significance Tests for Level 1 and Level 2 Covariates Prediction of HRQoL-Overall Slope Over 6-Months for Participants with "High" Baseline PTSD (n = 52)

Predictor	Coefficient	Stand. Error	t Ratio	df	p
Fixed effects					
HRQoL intercept, β_0					
Avg. initial HRQoL, γ_{00}	66.295	3.367	19.687	51	<.001
HRQoL slope[a], β_1					
Avg. slope, γ_{10}	.322	.922	.350	45	.728
Gender, γ_{11}	-1.853	.766	-2.419	45	.020*
Age, γ_{12}	-.049	.043	-1.149	45	.257
Education, γ_{13}	.498	.254	1.961	45	.056
Ethnicity, γ_{14}	.839	.688	1.220	45	.229
Life Event Stress, γ_{15}	-.034	.034	-.989	45	.328
Baseline HRQoL, γ_{16}	.001	.019	.032	45	.975
CD4 increment, β_2					
Average increment, γ_{20}	.034	.010	1.292	134	.199
VL increment, β_3					
Average increment, γ_{30}	-4.732	3.365	-1.407	134	.162

Random effects	SD	Variance	df	χ^2	p
Intercept, U_0	18.692	349.398	50	202.996	<.001**
Slope, U_1	1.166	1.359	44	53.461	.155
Error, R	12.677	160.717			

[a] HRQoL-Overall slope per month
* $p < .05$; ** $p \leq .001$

Table 52. Basic Model Including Coefficients and Significance Tests for Level 1 and Level 2 Covariates Prediction of HRQoL-Overall Slope Over 6-Months for Participants with "Low" Baseline PTSD (n = 50)

Predictor	Coefficient	Stand. Error	t Ratio	df	p
Fixed effects					
HRQoL intercept, β_0					
Avg. initial HRQoL, γ_{00}	69.215	3.025	22.881	50	<.001
HRQoL slope[a], β_1					
Avg. slope, γ_{10}	-.831	.957	-.869	44	.390
Gender, γ_{11}	-.232	1.011	-.229	44	.820
Age, γ_{12}	.047	.058	.805	44	.425
Education, γ_{13}	.371	.463	.799	44	.429
Ethnicity, γ_{14}	-.081	1.097	-.074	44	.942
Life Event Stress, γ_{15}	-.027	.071	-.264	44	.793
Baseline HRQoL, γ_{16}	-.067	.019	-.858	44	.396
CD4 increment, β_2					
Average increment, γ_{20}	-.007	.010	-.697	131	.487
VL increment, β_3					
Average increment, γ_{30}	3.609	3.441	1.049	131	.297

Random effects	SD	Variance	df	χ^2	p
Intercept, U_0	16.472	271.314	50	141.156	<.001**
Slope, U_1	1.514	2.292	44	52.105	.188
Error, R	14.316	204.946			

[a] HRQoL-Overall slope per month
* $p < .05$; ** $p \leq .001$

Appendix A

Trauma Group Writing Instructions

Writing Sessions 1-4
20-minute emotional disclosure instructions:

During the four writing days, **please write about your most traumatic or upsetting experiences of your entire life.** In your writing I want you to really let go and **explore your very deepest emotions and thoughts.**

- Although **I prefer that you write about a major trauma in your life**, instead you may choose to write about major conflicts of problems that you have experienced or are experiencing right now.

- It is best if **you write about the same experience on all four days**. But if you decide to write about a different experience that's okay too.

- I prefer that you write about significant trauma or conflicts **that you have not discussed in great detail with others.**

Try to make your memories of the event as real as possible, remembering what you were thinking and feeling at the time and what you were experiencing physically.

In your writing you may relate your personal experience to other parts of your life. For example, how is it related to your childhood, your parents, people who love you, who you are or who you want to be? Be sure to examine your deepest emotions and thoughts.

Whatever you decide to write about, please write continuously for 20 minutes. It is very important that you write for the whole 20 minutes. If you run out of things to write about you can repeat what you have already written.

Remember I want you to really let go and explore your very deepest emotions and thoughts.
Please begin writing now. I will tell you when the time is up.

(O'Cleirigh & Ironson, 2004)

Writing Sessions 1 and 4
10-minute Probe Instructions (Cognitive Appraisal dimension):

Write for 10 minutes on the topic below:
Please write for 10 minutes about how you've tried to understand the experience(s) that you have just written about and **how you make sense of it**. If the experience you've written about does not make sense to you please write about how you are trying to understand or make sense of it.
I will tell you when the time is up.

Writing Session 2
10-minute Probe Instructions (Self-Esteem dimension):

Write for 10 minutes on the topic below:
Please write for 10 minutes about how the traumatic experience(s) that you have just written about affect **your feelings about yourself, your self-worth and your self-esteem?** Does the experience change the way you feel about yourself?
I will tell you when the time is up.

Writing Session 3
10-minute Probe Instructions (Problem Solving dimension):

Write for 10 minutes on the topic below:
Please write for 10 minutes about how the traumatic experience(s) that you have just written about affect **your ability to solve problems, to meet future challenges or to deal with day-to-day stress?**
I will tell you when the time is up.

(O'Cleirigh & Ironson, 2004)

Appendix B

Control Group Writing Instructions

Writing Session 1
20-minute writing instructions:

In today's writing, I want you to describe what you did <u>yesterday</u> from the time you got up until the time you went to bed. Avoid writing about your emotions or opinions. Rather try to be as objective as possible. For example, you might start when your alarm went off and you got out of bed. You could include the things you ate, where you went, which buildings or objects you passed by as you walked from place to place. The most important thing in your writing, however, is for you to describe your day as accurately and as objectively as possible. I would like you to begin writing when I leave the room. **Please write for 20 minutes on what you did yesterday.**

Writing Session 1
10-minute writing instructions:

Write for 10 minutes on the topic below:
I want you to describe what you did <u>today</u> from the time you woke this morning. The most important thing in your writing is for you to describe what you did as accurately and with as much detail as possible. I will tell you when the time is up.

Writing Session 2
20-minute writing instructions:

In today's writing, I want you to describe what you did <u>today</u> from the time you woke up. Avoid writing about your emotions or opinions. Rather try to be as objective as possible. For example, you might start when your alarm went off and you got out of bed. You could include the things you ate, where you went, which buildings or objects you passed by as you walked from place to place. The most important thing in your writing, however, is for you to describe your day as accurately and as objectively as possible. I would like you to begin writing when I leave the room. **Please write for 20 minutes on what you did today.** I will tell you when the time is up.

Writing Session 2
10-minute writing instructions:

Write for 10 minutes on the topic below:
I want you to describe what you plan to do <u>tomorrow</u> from the time you wake up. The most important thing in your writing is for you to describe what plan to do as accurately and with as much detail as possible. I will tell you when the time is up.

(O'Cleirigh & Ironson, 2004)

Writing Session 3

20-minute instructions:

In today's writing, I want you to describe in detail what you plan to do as soon as you are finished with the study today. For example you might start by noting that you will walk out of the door, and describe where you go next. In your writing I want you to be as objective as possible. Avoid writing about your emotions or opinions. The most important thing in your writing, however, is for you to describe your day as accurately and as objectively as possible. I would like you to begin writing when I leave the room. **Please write for 20 minutes on what you will do today after the study visit.** I will tell you when the time is up

Writing Session 3
10-minute instructions:

Write for 10 minutes on the topic below:
I want you to describe what you plan to do tomorrow from the time you wake up. The most important thing in your writing is for you to describe what plan to do as accurately and with as much detail as possible. I will tell you when the time is up.

Writing Session 4
20-minute instructions:

In today's writing, I want you to describe what you plan to do during the next week. In your writing I want you to be as objective as possible. Avoid writing about your emotions or opinions. Rather try to be as objective and as detailed as possible. The most important thing in your writing, however, is for you to describe what you plan to do next week as accurately and as objectively as you can and that you write for the whole time. I would like you to begin writing when I leave the room. **Please write for 20 minutes on what you plan to do next week.**

Writing Session 4
10-minute writing instructions:

Write for 10 minutes on the topic below:
I want you to describe what you did last week. The most important thing in your writing is for you to describe what you did as accurately and with as much detail as possible. Please write for the whole time. I will tell you when the time is up.

(O'Cleirigh & Ironson, 2004)

Appendix C

Emotional/Cognitive Processing
(Measurement/Scoring Definitions)
(O'Cleirigh & Ironson, 2004)

ESSAY RATING FORM

A. Instructions

Essay Rating Procedures

Step 1: Record subject number, your initials and the date at the top of the scoring sheet.
Step 2: Read the essay through completely
Step 3: Read the essay through one more time to get a feel for the content.
Step 4: Answer questions 1-4 thoughtfully on the scoring sheet (Remember you must identify specific evidence in the text of the essay (or supportable clinical inference) to support each of the ratings that you assign.

B. Scoring

1. To what extent did the material show realistic cognitive appraisals of the event, a reflection on the problem, a deeper understanding of the problem, reviewing the problem in a more adaptive way, or identifying causal relationships?

1	2	3	4	5	6	7
Negative/ Distorted Appraisal						**Positive/ Realistic Appraisal**

2. To what extent did the material show a change in the person's view of him/her self? To what extent did the material show movement toward positive feelings about self such as a restoration of self-esteem?

1	2	3	4	5	6	7
Negative View of Self			**Neutral View of Self**			**Positive View of Self**
(explicit statements in 2+ areas or suicidal ideation)	**(explicit statement in 1 area)**	**(inferred, no explicit statement)**	**(no evid. of pos/ neg *or* equal pos & neg statements)**	**(inferred, no explicit statement)**	**(explicit statement in 1 area)**	**(unequivocal; explicit statements in 2+ areas)**

3. To what extent did the material indicate problem solving or adaptive sort of behavior? To what extent was there evidence that the subject has adopted an approach oriented response to the stressor?

1	2	3	4	5	6	7
no evidence	**aware of/ specifies stressor**	**thinking of solutions/ intentions to change behavior**	**planning/ preparation**	**implements 1 solution strategy**	**implements > 1 solution strategy**	**evidence of efficacy/ stressor less toxic**

4. To what extent was the person involved in discussing the various aspects of the traumatic or stressful event?

1	2	3	4	5	6	7
Only Minimally Involved			Moderately Involved			Fully Involved

5. Did the participant follow the directions? Yes No

If No, what did they write about? _____

6. How serious was the event discussed? How do you think the patient saw it?

1	2	3	4	5	6	7
Not at all Serious			Moderately Serious			Very Serious

7. What was the most severe stressor/trauma written about?

_____

8. Was the most severe stressor/trauma written about:

Past (>6 mos) Present (<6 mos) Unknown

9. Did the most severe stressor/trauma written about occur during:

Childhood(<18) Adulthood (>18) Unknown

Emotion Word Count

Positive Emotion Words		Negative Emotion Words	
_____	____	_____	____
_____	____	_____	____
_____	____	_____	____
_____	____	_____	____
_____	____	_____	____
_____	____	_____	____
_____	____	_____	____
_____	____	_____	____
_____	____	_____	____
Total Pos. Words	____	**Total Neg. Words**	____
		Total Emotion Words	____

(O'Cleirigh & Ironson, 2004)

Emotional/Cognitive Processing
(Measurement/Scoring Definitions)

Adaptive/Realistic Cognitive Appraisal

To what extent did the material show realistic cognitive appraisals of the event, a reflection on the problem, a deeper understanding of the problem, reviewing the problem in a more adaptive way, or identifying causal relationships?

1	2	3	4	5	6	7
Negative/ Distorted Appraisal						**Positive/ Realistic Appraisal**

Operational Definition

Realistic Cognitive Appraisal is measured by the individual's **current** reactions to the stressor.

In addition to the individual's direct account of their appraisals of the stressor and current appraisals of the stressor may also be inferred from:

a) the description in the essay of the individual's responses to the stressor,
   Examples:
   i) "I just couldn't deal with it. I went out and smoked crack for 2 days."
   ii) "I've been coping with diabetes for 10 years so I'm used to doctors appointments and medications. I found myself a HIV doctor and started learning about HIV."
   iii) "I knew I was going to need help so I told my mother and my boyfriend"
b) the reported effects of the stressor,
   Examples:
   i) "When I told my boyfriend I had HIV kicked me out of our apartment and changed the locks"
   ii) "After my lover passed away I became very ill and had to quit my job"
   iii) Finding out I was HIV positive was a shock but it was also the wake up call I needed to go into rehab and quit doing drugs"
c) or reported emotional states.
   Examples:
   i) "I felt like my life was over"
   ii) "I locked myself in my bedroom and I cried for 3 days"
   iii) "I felt that God was punishing me"

Distorted/Negative Appraisals
Generally, extremely negative appraisals are characterized by a view of the stressor as highly toxic (i.e., dangerous), uncontrollable, catastrophic (i.e., worst thing in the world ever vs. manageable & not end of the world), and may reflect evidence of distorted thinking and would indicate a starting point of 1 (the lowest point on the scale).

(O'Cleirigh & Ironson, 2004)

Realistic/Positive Appraisals

In contrast, positive appraisals are those that are first and foremost realistic (see list below), positive, and indicate a level of control over the stressor, and may reflect benefit finding. Appraisals that are both positive and realistic would score a 7 (the highest point on the scale). However, raters should be sensitive to appraisals that are so overly optimistic or positive that they are not realistic and may reflect denial or avoidance of the realities of the stressor and should be scored accordingly (e.g., "My doctor says I have HIV but I know that they'll find a cure before I get sick", "I think people worry too much about HIV, it's not that big a deal", "I'm not going to change my life just because I have HIV. I'm not stressing out about it. People just need to stop talking about it.")

Characteristics of positive and negative appraisals are listed below.

Characteristics of Negative/Distorted Appraisals	Characteristics of Positive/Realistic Appraisals
Toxic	Benign
Uncontrollable	Controllable
Unpredictable	Predictable
Non-Acceptance	Something to be accepted
Catastrophizing	Realistic Appraisal
Distorted Thinking	Realistic Thinking
Meaningless	Meaningful
Negative Reframing	Positive Appraisal
Random (Unlucky)	Caused
Denying Responsibility	Accepting Responsibility
Not Understandable	Understandable
Causing distress	A problem to be solved
Something to be avoided	Something to be approached

(O'Cleirigh & Ironson, 2004)

Emotional/Cognitive Processing
(Measurement/Scoring Definitions)

Self-Esteem

To what extent did the material show a change in the person's view of him/her self? To what extent did the material show movement toward positive feelings about self such as a restoration of self-esteem?

1	2	3	4	5	6	7
Negative View of Self			**Neutral View of Self**			**Positive View of Self**
(explicit statements in 2+ areas or suicidal ideation)	**(explicit statement in 1 area)**	**(inferred, no explicit statement)**	**(no evid. of pos/ neg *or* equal pos & neg statements)**	**(inferred, no explicit statement)**	**(explicit statement in 1 area)**	**(unequivocal; explicit statements in 2+ areas)**

Operational Definition

Self-Esteem Enhancement is assessed from information that directly or indirectly concerns the person's current view of self that is supportable with explicit information from the text of the essay or by supportable clinical inference. This should be the individual's terminal view of self; where they are at now.

Below are listed characteristics of negative and positive self-esteem appraisals which should guide raters in estimating the level of self esteem in relation to the stressor.

Negative Self-Esteem	Positive Self-Esteem
Sick	Healthy
Not Capable	Able
Source of Infection	Educated/Informed
Alone	Connected
Defective	Okay as I am
Feeling shunned/rejected	Feeling accepted/loved
Perverted/Addict	Responsible Adult
Self Blame	Takes responsibility
Toxic to others	Nurturing/loving and caring of others
Suicidal	Life/Self affirming
Helpless	Self sufficient
Burden to others	Support to others
Useless	Useful
Self hate	Self love/self-respect

(O'Cleirigh & Ironson, 2004)

Emotional/Cognitive Processing
(Measurement/Scoring Definitions)

Approach-Oriented Problem Solving

To what extend did the material indicate problem solving or adaptive sort of behavior? To what extent was there evidence that the subject has adopted an approach oriented response to the stressor?

1	2	3	4	5	6	7
no evidence	aware of/ specifies stressor	thinking of solutions/ intentions to change behavior	planning/ preparation	implements 1 solution strategy	implements > 1 solution strategy	evidence of efficacy/ stressor less toxic

Operational Definition

Approach-Oriented Problem Solving is measured by the extent to which the person has moved through the problem solving steps identified above beginning with an awareness of the problem/stressor through thinking of solutions, planning to implement a solution, and implementing solution(s) in such a way that the toxicity of the stressor may be reduced.

Individuals who score at the lowest end of this scale (i.e., '1') provide no evidence that they are aware that any problem exists: the writing may reflect denial or avoidant thinking and any identification of specific stressor or problem is absent. Persons who score in the mid range of this scale (i.e., '4') have shown through their writing an awareness of the stressor/problem, contemplation of solutions, and are preparing, or have a plan to implement a solution. Persons scoring at this level have not yet mounted/enacted a solution-based response to the problem. Those scoring at the highest end of the scale (i.e., '7') have presented evidence that they have implemented **multiple** problem solving strategies and that at least one of these strategies has impacted positively on the stressor. This may be inferred from evidence that the stressor is perceived as less toxic. The problem-solving strategies do not have to be self-referent (e.g. writing a letter to a state representative about concerns for all HIV+ individuals; helping friend, family, or society, not just oneself).

The individual must meet the criteria of all lower scores in order to receive a higher score. For example, a score of '4' must show evidence of planning/preparation, but also must show evidence of thinking of solutions/intention of behavior change (i.e., score '3') and awareness of/specifics of stressor (i.e., score '2'). However, the evidence of lower levels may not be explicit in the essay, and can often be reasonably inferred.

(O'Cleirigh & Ironson, 2004)

Emotional/Cognitive Processing
(Measurement/Scoring Definitions)

Experiential Involvement

To what extent was the person involved in discussing the various aspects of the traumatic or stressful event?

1	2	3	4	5	6	7
Only Minimally Involved			**Moderately Involved**			**Fully Involved**

Experiential Involvement refers to the extent to which the patient is involved in discussing or presenting (in the essay) seven central aspects of the traumatic event, its precursors, or its consequences. The essay should be scored for the presence (1) or absence (0) of each of these aspects. The first three aspects of involvement reflect 'lower level involvement' relating to involvement in discussing events, behaviors, emotions, and cognitions. The final 3 aspects tap into higher levels of involvement in processing and assessing the **impact** of the trauma (intentions/motivations, interpretations/insights, and interpersonal dynamics). Lower scores tend to be just reporting or telling a story about the stressor, while higher scores show evidence the individual is really getting into the task of emotional expression and processing.

On this scale, the individual does not need to meet the criteria of lower scores to obtain a higher score. For example, if the essay shows definite evidence of disclosure of emotions it will be scored '4' even if the essay does not include evidence of disclosure of cognitions/beliefs (i.e., score '3') or score '2' criteria. The highest level at which the essay fully meets criteria is the score that will be assigned.

Operational Definition

1. Nothing
   (no description of events or behaviors related to the trauma or stressful event)

2. Description of events
   (full or detailed description of events)
   -AND/OR-
   Disclosure of behaviors
   (e.g., what I did, what others did, what happened)
   -AND/OR-
   Disclosure of physical reactions/responses
   (e.g., injuries sustained, behavioral responses such as crying, nightmares, symptoms of shock, sleeping difficulties, flashbacks)

(O'Cleirigh & Ironson, 2004)

3. Disclosure of cognitions/beliefs
   (e.g., autonomy, control, self-worth, self-blame)

4. Disclosure of emotions
   (e.g., anxiety, fear, self-esteem, guilt)
   -AND/OR-
   Distinguishing emotions
   (e.g., legitimate fear from neurotic anxiety, humiliation from embarrassment,)

5. Questioning
   (e. g., why did this happen to me? Why am I in this situation?)
   -AND/OR-
   Intentions
   (e.g., what I want to happen, what I wanted to happen)
   -AND/OR-
   Motivations
   (e.g., why I did what I did (check for insight and/or causal relationships)
   (e.g., self-blame, accepting responsibility, denying responsibility)

6. Interpretations/Insights
   -AND/OR-
   Thoughts/beliefs about self in relation to the traumatic event
   -AND/OR-
   Thoughts/beliefs about others in relation to the traumatic event
   (e.g., blaming others, anger toward others)
   -AND/OR-
   Thoughts/beliefs about the world in relation to the traumatic event

7. Disclosure of interpersonal relationship dynamics/Description of Interpersonal Interactions
   (e.g., what impact the trauma had on my ability to interact with others, what effect it had on other people's perceptions of me)

Example (to distinguish between a score of 6 vs. 7)

Score 6: "I lost my friends because of my past drug use. It makes me angry and I don't understand why this happened and why they won't talk to me anymore."

Score 7: "Now that I have gone through rehab for my past drug use, I have lost many old friends. I realize this was because of my behaviors while on drugs. Now maybe I need to make amends and apologize or just try to move on and make new friends. I can understand why my old friends needed to distance themselves from me and why they see me differently now."

(O'Cleirigh & Ironson, 2004)

Trauma/Stressor Severity Rating Scale

How serious was the event discussed? How do you think the patient saw it?

1	2	3	4	5	6	7
Not at all Serious			**Moderately Serious**			**Very Serious**

Score = 7

- Death of child
- Death of spouse/partner

Score = 6

- Death of sibling
- Death of parent
- Divorce
- Childhood sexual abuse
- Childhood physical abuse
- Kidnapping/hostage situation
- Homicide of family member or close friend

Score = 5

- Loss of job-fired from work
- Adult physical abuse (e.g. domestic violence, physical assault)
- Adult sexual abuse (e.g. rape, sexual assault)
- Military/combat trauma
- Attempted suicide of family member or close friend
- Abandonment by parent/adoption/foster care (minor child)
- Diagnosis or ongoing status of life-threatening/chronic terminal illness (e.g., HIV, cancer)

Score = 4

- Separation from spouse due to marital problems
- Being held in jail
- Injury or illness (kept you in bed for 1 week or more or sent you to the hospital)
- Death of close friend
- Loss of job-laid off from work
- Pregnancy
- Birth or adoption of a child
- Miscarriage/stillbirth/abortion
- Act of violence on close family member or friend
- Child custody issues (e.g. regaining or losing custody)
- Victim of crime with threat to life (e.g. robbed at gunpoint w/out physical harm sustained)
- Prostitution

Score = 3

- Decreased income
- Major business adjustment
- A relative moving in with you
- Divorce of your parents
- Foreclosure on mortgage or loan
- Investment and/or credit difficulties
- Major change in health or behavior of a family member (including family member drug addiction)
- Separation from spouse due to work
- Retirement
- Change to a new type of work
- Major decision regarding your immediate future
- Change in arguments with spouse
- Parents remarriage
- Your own marriage
- An accident
- Drug abuse/dependence treatment or rehab
- Natural disaster (e.g. hurricane)
- Witnessing act of violence on a stranger
- Sexual identity crisis/disclosure
- Disclosure of potentially stigmatizing disease (e.g. HIV)
- Incarceration of family member or close friend
- Victim of non-violent crime (e.g. robbery or mugging without weapon, vandalism)

Score = 2

- Move to a different town, city, or state
- "Falling out" of a close personal relationship
- Spouse beginning or ending work
- Engagement to marry
- Child leaving home for other reasons
- Sexual difficulties
- An injury or illness which was less serious than "74"
- Birth of grandchild
- Loss or damage of personal property
- Major change in living conditions (including homelessness)
- Demotion at work
- Child leaving home to attend college
- Child leaving home due to marriage
- Girlfriend or boyfriend problems (including break-up of relationship)
- Increased income
- In-law problems
- Beginning or ending school or college
- New, close, personal relationship (including new romantic relationship)

- Major purchase
- Major personal achievement
- Troubles at work with co-workers
- Troubles at work with persons under your supervision
- Change of school or college
- Change in your work hours or conditions
- Arrest of family member or close friend
- Being bullied as a child
- Loss of pet
- Discrimination (e.g. racial, sexual orientation, HIV status, gender, etc.)

Score = 1

- Work transfer
- Promotion at work
- Change in religious beliefs
- More responsibilities at work
- Troubles with your boss
- Major change in your usual type/amount recreation
- Other work troubles
- Major change in eating habits
- Change in social activities
- Change in personal habits
- Major dental work
- Major change in sleeping habits
- Move within the same city or town
- Change in family get-togethers
- Change in political beliefs
- Vacation
- Fewer responsibilities at work
- Moderate purchase
- Minor violation of the law
- Correspondence course to help you in your work

Appendix D

HIV/AIDS-Targeted Quality of Life

Important Instructions:

The questions in this questionnaire ask how things are going in different areas of your life. Please answer all questions, even if you do not think they are relevant to you. Before starting to answer the question, however, there are two types of questions you need to know more about.

A. You will find some questions that ask about your job/routine daily activities. If you have a job, answer these questions thinking about your job. If you do not have a job, answer these questions thinking about the activities you usually do during most days of the week. Examples include housework, other sorts of chores, going to school or volunteering in an organization.

B. You will find some questions that ask about your doctor. If you usually see a nurse, a nurse practitioner or a physician's assistant, answer these questions thinking of this person rather than your doctor.

	All of the time	**A lot of the time**	**Some of the time**	**A little of the time**	**None of the time**
1. The following questions ask about your overall function in the past four weeks.					
a. In the past 4 weeks, I have been satisfied with my physical activity	**1**	**2**	**3**	**4**	**5**
b. In the past 4 weeks, I have been physically limited in my ability to do routine household chores	**1**	**2**	**3**	**4**	**5**
c. In the past 4 weeks, pain has limited my ability to be physically active	**1**	**2**	**3**	**4**	**5**
d. In the past 4 weeks, I have been worried about not being able to do my job/routine daily activities as I have in the past.	**1**	**2**	**3**	**4**	**5**
e. In the past 4 weeks, I have felt that having HIV has limited the amount of work I can do at my job/routine daily activities	**1**	**2**	**3**	**4**	**5**
f. In the past 4 weeks, I have been too tired to be socially active	**1**	**2**	**3**	**4**	**5**
2. The following questions ask about your life satisfaction in the past 4 weeks.					
a. In the past 4 weeks, I have enjoyed living	**1**	**2**	**3**	**4**	**5**
b. In the past 4 weeks, I have felt in control of my life	**1**	**2**	**3**	**4**	**5**

	All of the time	A lot of the time	Some of the time	A little of the time	None of the time
c. In the past 4 weeks, I have been satisfied with how socially active I am	**1**	**2**	**3**	**4**	**5**
d. In the past 4 weeks, I have been pleased with how healthy I have been	**1**	**2**	**3**	**4**	**5**
3. The following questions ask about your health worries in the past 4 weeks.					
a. In the past 4 weeks, I haven't been able to live the way I'd like to because I'm so worried about my health	**1**	**2**	**3**	**4**	**5**
b. In the past 4 weeks, I've been worried about my CD4 count	**1**	**2**	**3**	**4**	**5**
c. In the past 4 weeks, I've been worried about my viral load	**1**	**2**	**3**	**4**	**5**
d. In the past 4 weeks, I've been worried about when I'm going to die	**1**	**2**	**3**	**4**	**5**
4. The following questions ask about your financial worries in the past 4 weeks.					
a. In the past 4 weeks, I have been worried about having to live on a fixed income	**1**	**2**	**3**	**4**	**5**
b. In the past 4 weeks, I have been worried about how to pay my bills	**1**	**2**	**3**	**4**	**5**
c. In the past 4 weeks, money has been too tight for me to care for myself the way I think I should	**1**	**2**	**3**	**4**	**5**

5. The following questions ask how you have felt about your HIV medications in the past 4 weeks.

Have you taken HIV medications in the past 4 weeks?	NO	If not, go to section 6
	YES	If so, continue with 5a

	All of the time	A lot of the time	Some of the time	A little of the time	None of the time
a. In the past 4 weeks, taking my medicine has been a burden	**1**	**2**	**3**	**4**	**5**
b. In the past 4 weeks, taking my medicine has made it hard to live a normal life	**1**	**2**	**3**	**4**	**5**
c. In the past 4 weeks, taking my medicine has caused unpleasant side effects	**1**	**2**	**3**	**4**	**5**
d. In the past 4 weeks, I've been worried about the effects my medicine may have on my body	**1**	**2**	**3**	**4**	**5**
e. In the past 4 weeks, I've been unsure about why I'm taking medicine	**1**	**2**	**3**	**4**	**5**
6. The following questions ask how you have felt about being HIV positive in the past 4 weeks.					
a. In the past 4 weeks, I have had regrets about the way I lived my life before knowing I had HIV	**1**	**2**	**3**	**4**	**5**
b. In the past 4 weeks, I have been angry about my past HIV risk behavior	**1**	**2**	**3**	**4**	**5**
7. The following questions ask about your disclosure worries in the past 4 weeks.					
a. In the past 4 weeks, I've limited what I tell others about myself	**1**	**2**	**3**	**4**	**5**
b. In the past 4 weeks, I've been afraid to tell other people that I have HIV	**1**	**2**	**3**	**4**	**5**
c. In the past 4 weeks, I've been worried about my family members finding out that I have HIV	**1**	**2**	**3**	**4**	**5**
d. In the past 4 weeks, I've been worried about people at my job/routine daily activities finding out that I have HIV	**1**	**2**	**3**	**4**	**5**
e. In the past 4 weeks, I've been worried that I'll lose my source of income if other people find out that I have HIV	**1**	**2**	**3**	**4**	**5**

	All of the time	A lot of the time	Some of the time	A little of the time	None of the time
8. The following questions ask how you've felt about your doctor in the past 4 weeks.					
a. In the past 4 weeks, I've felt that I could see my doctor whenever I needed to	**1**	**2**	**3**	**4**	**5**
b. In the past 4 weeks, I've felt that my doctor involves me in decision-making	**1**	**2**	**3**	**4**	**5**
c. In the past 4 weeks, I've felt that my doctor cares about me	**1**	**2**	**3**	**4**	**5**
9. The following questions ask about your sexual function in the past 4 weeks.					
a. In the past 4 weeks, it's been difficult to get sexually aroused	**1**	**2**	**3**	**4**	**5**
b. In the past 4 weeks, I've had difficulty with orgasm	**1**	**2**	**3**	**4**	**5**