

MODERATING EFFECTS OF COGNITIVE ADAPTABILITY ON EXPRESSIVE
WRITING OUTCOMES AMONG PERSONS INFECTED WITH HUMAN
IMMUNODEFICIENCY VIRUS

By

Lois Jean Wagner

Dissertation

Submitted to the Faculty of the
Graduate School of Vanderbilt University
in partial fulfillment of the requirements

for the degree of

DOCTOR OF PHILOSOPHY

in

Nursing Science

May, 2004

Nashville, Tennessee

Copyright© 2004 by Lois Jean Wagner
All Rights Reserved

To my parents, John Carl and Evelyn Dean Wagner, with my deepest love and gratitude

and

To my beloved partner, Barbara, unfailingly supportive

ACKNOWLEDGEMENTS

This work would not have been possible without the financial support of the National Institute of Mental Health and all those with whom I have had the pleasure and good fortune to work during this challenging and exciting project. I am especially grateful to Dr. Kenneth Wallston, the chairperson of my committee and my long-time teacher, mentor and friend. By his skill, knowledge, example and generosity he has taught me more about being a scientist, mentor and friend than I could ever credit here. I am also grateful to my committee members, Drs. Lancaster, Sinclair, Smith and Wells, each of whom shared their personal and profession support, expertise and guidance. I am especially grateful to Takesia Richardson, M.A. She was a pleasure with whom to work, and the study was simply undoable without her. Her commitment, reliability, organizational and interpersonal skills and support made her an essential and invaluable member of the research team.

A special thank you goes to Dr. Stephen Raffanti, M.D., for graciously allowing me access to the patients, facility and staff of the Comprehensive Care Center. What good fortune to have been entrusted with such an incredible opportunity! I am especially grateful and indebted to the staff at the Comprehensive Care Center for accepting and supporting me with warmth and kindness that made me feel a part of their outstanding health care team.

More important than anything is the love and support I have received from my family and friends throughout this project. I want to thank my partner, Barbara, my mom and dad, my sisters, Carol and Marian, and all of my friends and co-workers who supported me, and “picked up the slack” over the years. Finally, words cannot express my gratitude to the study participants who entrusted me with their well-being and their deepest thoughts and feelings. By this, I am truly humbled.

TABLE OF CONTENTS

	Page
DEDICATION.....	iii
ACKNOWLEDGEMENTS.....	iv
LIST OF TABLES.....	viii
LIST OF FIGURES	ix
 Chapter	
I. LITERATURE REVIEW.....	1
Historical context of written emotional disclosure	2
The effects of written disclosure.....	5
The experimental paradigm	7
Moderating variables	9
Expressive writing in chronic illness	11
Psychiatric illness and expressive writing	11
Rheumatoid arthritis and asthma	13
Cancer and expressive writing.....	15
HIV/AIDS and expressive writing.....	17
Why study persons with HIV infection	20
The current study	23
Purpose and rationale.....	25
II. THEORETICAL FRAMEWORK	28
Cognitive processing and emotional disclosure.....	29
Emotional self-regulation and expressive writing	32
Cognitive adaptability in health and illness	37
Cognitive adaptation theory.....	37
Assumptions of cognitive adaptation theory.....	41
Empirical support for cognitive adaptation theory	43
Optimism and cognitive adaptability.....	45
Optimism and expressive writing	49
Control, self-efficacy and cognitive adaptability.....	51
Perceived competence and cognitive adaptability	53
Cognitive adaptation theory and the search for meaning.....	57

Research Questions	59
II. METHODS	61
Study design	61
Research setting	61
Sample size	62
Participant recruitment	62
Study Participants	65
Procedures	67
The intervention	69
Research instruments	70
Control and moderator variables	71
Demographic and background questionnaire	71
Cognitive adaptability Index	71
Outcome measures of psychological well-being	73
Positive and negative affect	73
Perceived stress	75
HIV-specific cognitive adaptability	76
Sense of coherence and HIV-specific meaning	78
Outcome measure related to health status	80
HIV-related quality of life	80
HIV-related physical functioning	82
HIV-related signs and symptoms	83
Illness related clinic visits	85
Outcomes measures related to adherence	85
Appointment adherence	85
Medication adherence	85
Manipulation check	86
Symptom and emotional responses	87
Perception of writing	87
Statistical analyses	89
IV. RESULTS	91
Preliminary analyses	91
Group equivalency	92
Manipulation check	93
Symptom and emotional responses	93
Perception of writing	97
Baseline analyses	99
Moderating and group main effects	101
V. DISCUSSION	110
Moderating effects in cognitive adaptability in expressive writing	110

Strengths and limitations of the study.....	119
Theoretical and empirical implications.....	120
Clinical implications	124
Conclusions.....	125
Appendix	
A. INFORMED CONSENT DOCUMENT.....	127
B. QUESTIONNAIRES AND STUDY INSTRUMENTS	134
REFERENCES	158

LIST OF TABLES

Table	Page
1. Baseline Characteristics of the Total Sample by Intervention Group.....	66
2. Reliability Estimates and Intercorrelations Among Self-Report Measures at Baseline.....	88
3. Means and (Standard Deviations) of Baseline Psychological, Health Status and Adherence Variables by Group Assignment.....	100
4. Results of Hierarchical Regression Analyses for Significant Changes on Outcome Variables	103
5. Results of Non-Significant Hierarchical Multiple Regression Analyses for Changes on Outcomes.....	109

LIST OF FIGURES

Figure	Page
1. Profile of trial screening, randomization and completion ($N = 37$)	64
2. Effect of expressive writing on symptom reporting immediately prior to and after writing by group	95
3. Change in symptom/emotion checklist scores across writing days	96
4. Group differences on post-writing reports of level of personal, emotional and non-revealed essay content	98
5. Moderating effect of cognitive adaptability on change in positive affect scores by group assignment	104
6. Moderating effect of cognitive adaptability on change in sense of coherence by group assignment	105
7. Moderating effect of cognitive adaptability on change in HIV-related quality of life by group assignment	106
8. Moderating effect of cognitive adaptability on change in HIV-related cognitive adaptability by group assignment	107
9. Moderating effect of cognitive adaptability on HIV-specific physical functioning by group assignment	108

CHAPTER I

LITERATURE REVIEW

The interpersonal disclosure of highly emotional experiences is universal across history and cultures (Rime', 1995). The association between highly stressful or traumatic events and long-lasting, negative physical and psychological health effects has been documented in both retrospective and prospective studies (Pennebaker & Susman, 1988; Smyth & Greenberg, 2000). Studies indicate that people seek to disclose their personal experiences and emotions with others (Jourard, 1964; Smyth & Pennebaker, 2001). Furthermore, self-disclosure and emotional expression are integral to most psychotherapeutic modalities and considered essential to improved mental and physical health (Breuer & Freud, 1966; Esterling, L'Abate, Murray, & Pennebaker, 1999; Hinshaw, 1989; Pennebaker & Seagal, 1999; Rachman, 1980; Scheff, 1979; Smyth & Pennebaker, 2001). Indeed, persons who express their feelings and thoughts about traumatic life events appear to benefit from improved physical and psychological health (Greenberg & Lepore, 2001).

Verbal therapies, such as psychoanalysis provide settings in which individuals can safely disclose their emotions surrounding traumatic events if an individual is willing to openly discuss the problem with another (Mumford, Schlesinger, & Glass, 1983; Smyth & Pennebaker, 2001). Studies indicate that the act of disclosure itself has a therapeutic impact that accounts for a major portion of the variance in the therapeutic healing process (Smyth & Pennebaker, 2001), yet individuals do not always disclose their emotions

surrounding traumatic events, fearing negative social consequences or constraints (Lepore, Silver, Wortman, & Wayment, 1996; Pennebaker & Harber, 1993; Smyth & Pennebaker, 2001). Empirical findings over nearly two decades indicate that emotional disclosure through writing may offer a viable alternative by providing an opportunity for emotional expression without the fear of negative social consequences or stigmatization (Smyth & Pennebaker, 2001).

Historical Context of Written Emotional Disclosure

Before to the late 1990s, the preponderance of studies on written emotional disclosure reflected the experience of normal, healthy individuals. Therefore, little is known about the impact of written emotional disclosure among chronically ill individuals or about the investigational challenges of conducting such research. This dissertation is concerned with the concept of emotional disclosure among individuals infected with the Human Immunodeficiency Virus (HIV) using a written emotional disclosure intervention that first appeared in the social psychology literature in 1986 (Pennebaker & Beall, 1986). Specifically, this research explores the impact of emotional disclosure through writing on psychological well-being, self-reported health status, and adherence among persons with HIV infection and acquired immune deficiency syndrome (AIDS). It will further evaluate whether these effects are moderated by individual difference in levels of cognitive adaptive abilities that are described below.

Emotional disclosure involves the purposeful expression of emotions coupled with the cognitive components of self-reflection and language processing and, as will be elucidated below, is associated with several positive health outcomes (Smyth &

Pennebaker, 2001). Emotional expression is distinguishable from emotional disclosure and is defined as “the natural venting of feelings, often in nonverbal ways: crying, laughter, screams of rage” (Smyth & Pennebaker, 2001, p. 339). Negative emotional expression has been empirically linked with increased levels of depression (Nolen-Hoeksema, 1987), hopelessness (Keltner, Ellsworth, & Edwards, 1993), and stress and physical health problems (Watson & Pennebaker, 1989). In contrast, emotional disclosure involves self-reflection and cognitive processing and with positive health outcomes.

Over the last 15 or more years, there has been increasing evidence that one’s emotional and attitudinal states can affect physical health (Dienstfrey, 1991; Locke & Colligan, 1987; Smyth & Pennebaker, 2001). Studies of both the impact of daily hassles in life (Brantley & Jones, 1993; Stone, Reed, & Neale, 1987) and major life stressors (Antoni, 1985; Cohen, Tyrell, & Smith, 1991) have found an association with both symptom reporting and illness. Since then, investigators have explored empirically the value of talking or writing about emotional experiences and have found a link between emotional disclosure about traumatic events and health outcomes (Pennebaker, 1985; Pennebaker & O’Heeron, 1984). These studies support the notion that disclosure of emotions about deeply personal issues can have an impact on physical health, perceived well being, and certain adaptive behaviors (Smyth & Pennebaker, 2001).

In 1986, Pennebaker and Beal published the first report on the health benefits of written emotional disclosure. This seminal article has fostered intense interest in and empirical investigation of the phenomenon in healthy individuals and, more recently, those with chronic illnesses. The writing intervention has been variously referred to as

expressive writing (Greenberg & Lepore, 2001), written disclosure (Balderson, Mullins, & Hoff, 2001), emotional expression (Walker, Nail, & Croyle, 1999), emotional disclosure (Esterling, Antoni, Fletcher, Margulies, & Schneiderman, 1994; Esterling et al., 1999), programmed writing (Esterling et al., 1999), and scriptotherapy (Smyth & Greenberg, 2000), and focused expressive writing (Smyth & Helm, 2003). All of the above refer to an experimental writing intervention involving the written disclosure of emotionally-laden material in a controlled and proscribed manner over a defined period of time. The effects of the intervention have been measured by a variety of physical, psychological and behavioral health measures, including health and symptom reports, number of visits to health care professionals, well-being and emotional measures, adaptive behaviors, and immunological, endocrinological, and autonomic nervous system outcomes.

Results of these studies in healthy individuals indicate that written emotional disclosure significantly decreased the number of post-intervention health care visits (Greenberg & Stone, 1992; Greenberg, Wortman, & Stone, 1996; Pennebaker, 1991; Pennebaker & Beall, 1986; Pennebaker, Colder, & Sharp, 1990; Pennebaker & Frances, 1996; Pennebaker, Kiecolt-Glaser, & Glaser, 1988; Richards, Beal, Seagal, & Pennebaker, 2000; Richards, Pennebaker, & Beall, 1995), reduced self reports of physical symptoms (Greenberg & Stone, 1992; Lepore, Greenberg, Wortman, Bruno, & Smyth, 2002), improved immunological outcomes and decreased skin-conductance levels (Pennebaker, Hughes, & O'Heeron, 1987), improved liver function (Francis & Pennebaker, 1992), decreased psychological distress (Greenberg & Stone, 1992; Greenberg et al., 1996; Lepore, 1997; Murray & Segal, 1994; Paez, Velasco, & Gonzalez,

1999; Rime', 1995; Schoutrop, Lange, Brosschot, & Everaerd, 1996; Spera, Buhfeind, & Pennebaker, 1994), improved coping, adaptive behaviors, and working memory capacity (Lepore et al., 2002; Pennebaker et al., 1990), improved employment opportunities and academic functioning (Francis & Pennebaker, 1992; Pennebaker, 1991; Pennebaker et al., 1990; Spera et al., 1994).

The Effects of Written Disclosure

A meta-analysis of 13 randomized, experimental trials involving over 800 physically and psychologically healthy participants concluded that written emotional disclosure about traumatic or stressful events produced significant overall health benefits ($d = .47, p < .0001$) across all studies and outcomes (Smyth, 1998). Improved physical and mental health outcomes included decreases in the number of health care visits ($d = .42$), improved immune and hormonal functioning ($d = .68$), and improved reports of psychological well being ($d = .66$). No significant effects were found for health behaviors such as alcohol and drug use, exercise, or eating and sleeping patterns. In general, the greatest effect sizes were for outcomes related to psychological well being and physiological functioning. Lower effect sizes were reported for self-reported health and general functioning outcomes (Smyth, 1998).

Comparisons with other interventions can be made using the binomial effect size display (BESD), a method for showing the practical importance of an effect size. The BESD is presented as the difference in outcome between experimental and control groups (Lipsey, 1990; Rosenthal, 1982). According to this method, the overall effect size of the writing task is 23%, with experimental groups that engage in a written emotional

disclosure task demonstrating improved health outcomes over control groups that wrote about benign, non-emotional topics. This means that participants writing under the experimental conditions would be expected to demonstrate a 23% overall improvement in measured health outcomes when compared to participants in the control condition (Smyth & Pennebaker, 2001). This compares favorably with other therapies such as those cited in a meta-analysis of psychotherapy outcomes (Smith & Glass, 1977) that found an average BESD of 32 % improvement for individuals who received psychotherapy over those who did not.

A 1995 meta-analysis by (Wells-Parker, Bangert-Drowns, McMillen, & Williams, 1995) that reviewed the effect of remediation treatment among drunk drivers found an average reduction of 8% to 9% over control participants who did not receive remediation treatment. An earlier review of meta-analyses of behavioral and educational interventions found average improvements of 23% among individuals randomized to experimental treatment conditions (Lipsey & Wilson, 1993). A later synthesis of the effects of psychosocial interventions among adult cancer patients found improvements that ranged from 9% to 14% across outcomes measured (Meyer & Mark, 1995). In addition, the effect size for the writing intervention is of the same magnitude as that for azidothymidine (AZT) on the survival of persons with AIDS (Barnes, 1986). Although it may not be valid to compare biological outcomes from clinical trials with those used in behavioral and psychological intervention studies, the comparable magnitudes of effect are testaments to the potential power of the writing intervention.

The Experimental Paradigm

The typical design of most expressive writing studies involves the random assignment of study participants to an experimental group that is asked to disclose highly traumatic and emotion-laden material or to one or more control groups assigned to write objectively about trivial, non-emotional topics. Participants typically write for 15 to 30 minutes over three to five consecutive days in a setting devoid of social interaction and feedback. Participants write uninterrupted for the specified time without regard for spelling, grammar, or punctuation.

Study outcomes include a variety of psychological, physiological and behavioral measures that, for evaluation purposes, can be grouped across studies as conceptually similar clusters (Smyth, 1998). Frequently measured outcomes include self-reported health status (illness-related health care visits, self-reported symptoms, upper respiratory infections), psychological well-being (positive and negative affect, happiness, anxiety, sadness, intrusions, adjustment, general temperament), physiological functioning (lymphoproliferation, Epstein Barr Virus [EBV] and hepatitis B antibody production, quantitative and functional immunological assays, blood pressure, heart rate, lipid profiles), general functioning (reemployment, grade point average, absenteeism, thought generation, reaction time, school behavior), and health behaviors (alcohol and drug use, exercise, sleeping and eating habits).

Investigators have explored the empirical boundaries of the paradigm by modifying the modality of disclosure, the assigned disclosure topic, and the timing or dose of the intervention. Comparable effects have been found for participants who wrote alone, spoke to a therapist (Donnelly & Murray, 1991; Murray, Lamnin, & Carver, 1989),

or spoke into a tape recorder (Esterling et al., 1994). Although the standard or traditional writing instructions ask participants to disclose their deepest feelings about past or current traumas, positive findings have also been reported when participants wrote about imaginary traumas (Greenberg et al., 1996), positive aspects of past traumas (King & Miner, 2000), optimistic futures (Hughes, Uhlmann, & Pennebaker, 1994; Mann, 2001), or future selves (King, 2001; King & Miner, 2000). Instructions designed to facilitate cognitive processing and meaning-making (Ullrich & Lutgendorf, 2002) and to promote emotional self-regulation (Cameron & Nicholls, 1998) resulted in greater awareness of the positive benefits of a stressful event and reductions in the number of clinic visits respectively. Across all studies, talking or writing about emotional experiences produced superior results when compared with writing about superficial topics (Smyth & Pennebaker, 2001).

The question of optimal dosing of the intervention is an important one, particularly when balancing the desire for maximum effect with the concern for participant burden. Investigators have manipulated the timing of the intervention by varying the number, length, and time span between writing sessions and found that writing sessions spaced out over longer periods may be more effective than session that are compressed over a shorter time (Smyth, 1998). The implication that length of writing session is less important than the spacing of sessions bodes well for utilizing this intervention with chronically ill populations. Investigators might feel more confident that using shorter writing sessions spread out over time may favorably reduce participant burden while maintaining the efficacy of the intervention. Caution is advised, however, as the optimal dose and spacing of the intervention remains an unresolved issue (J. M.

Smyth, personal communication, May 20, 2003). Although the intervention appears to be tolerable among healthy participants in laboratory settings, little is known about its tolerability in chronically or acutely ill participants.

Moderating Variables

Prior to the late 1990s, only healthy, community-dwelling participants from 18 to 68 years of age were enrolled in studies using the writing paradigm. The majority of participants were college students, limiting Smyth's (1998) meta-analysis to student vs. non-student comparisons for effect sizes. Controlling for age, students had slightly higher overall and physiological effect sizes than non-students, and significantly higher psychological well-being outcomes. Otherwise, among healthy participants in the 13 studies analyzed, he found very few individual difference variables that moderate the effects of the writing task. For example, no moderating effects were found for age, level of education, or social class (Smyth, 1998); self-esteem or self-concealment (Pennebaker et al., 1990); neuroticism, depression proneness, extroversion (Pennebaker & Seagal, 1999) or adaptive coping strategies (Esterling et al., 1994).

Positive correlations have been found, however, between degree of disclosure and high negative affectivity (Pennebaker, 1989). Among healthy participants males appear to benefit more than females from written emotional disclosure (Smyth, 1998). The explanation for this remains an empirical question but perhaps can be explained by an increased use of problem-focused coping or lower prewriting levels of emotional disclosure among men. Thus, emotional writing may afford men the opportunity to engage in alternative coping mechanisms such as cognitive reframing (Ptacek, 1992).

Other findings suggest that individuals who are extremely high on hostility and suspicion (Christensen & Smith, 1994), and alexithymia (Paez et al., 1999) may benefit from expressive writing more than participants low on hostility and alexithymia. In contrast to the latter finding, Lumley (Lumley, in press) found that, among college students, alexithymia may interfere with the potential benefits of emotional disclosure by limiting the ability to identify, express, and process the emotions into creative cognitive change.

Dispositional optimism has been evaluated as an individual difference variable among college students and women with HIV infection. Optimistic college students assigned to express their thoughts and feelings or to formulate a coping plan while doing so had reduced illness-related clinic visits, while pessimistic students improved only on the self-regulation task (Cameron & Nicholls, 1998). Mann (2001) found improved medication adherence and decreased distress from medication side effects among pessimistic women with HIV infection who wrote about an optimistic future, but found the opposite effect for their optimistic counterparts (Mann, 2001). Although these findings warrant further investigation, the results should be interpreted with caution because of the small sample size and lack of a writing control condition in Mann's study.

It is important to note that the writing intervention may be ineffective or contraindicated in some clinical populations. For example, there was no benefit from writing for a large sample of recently bereaved older adults (Strobe & Strobe, 1988) and patients with post traumatic stress disorder (PTSD) reported increased avoidance symptoms and health-care visits 5 weeks after written and oral disclosure as compared to participants in the control condition (Gidron, Peri, Connolly, & Shalev, 1996). Another consistent finding is that participants who write about traumatic experiences report short-

term elevations in negative affect immediately after writing (Smyth, 1998). Thus, investigators must use caution when moving this intervention into groups with chronic or acute physical or psychiatric conditions. At the very least, until more is known about the effect of written disclosure in these groups, potential participants should be screened for past or current psychiatric illness.

Expressive Writing in Chronic Illness

Written emotional disclosure in chronically ill populations is a relatively new line of research. Although the body of literature is relatively small, the expressive writing paradigm has been studied in populations with psychiatric disorders, arthritis and asthma, cancer, and HIV/AIDS. Below is a review of the published data in this field.

Psychiatric Illness and Expressive Writing

Reasoning that emotional disclosure through writing may facilitate habituation to the emotional associations and fears experienced by persons diagnosed with PTSD, Gidron, Peri, Connelly, and Shalev (1996) studied 14 participants with combat related PTSD to determine if writing about traumatic events predicted improvement on indices of depression, negative affect, intrusive and avoidance thoughts, health visits, and symptom reporting five weeks after writing. Participants wrote for 20 minutes on three consecutive days followed by a period of oral elaboration on the topic. Contrary to previous findings, Gidron et al. (1996) found that traumatic writers had significant increases in the number of health care visits and avoidance symptoms as compared to trivial writers who had slight decreases in the number of visits. Further, the degree of emotional and somatic

disclosure was positively correlated with intrusive and avoidance thoughts and health care visits respectively. A possible explanation may be the negative effect of short-term arousal in the absence of coping skills training in this population and the lack of long-term follow-up data. Confidence in these findings is limited by the small sample size but do suggest the need for caution when testing this intervention in patients with PTSD, and perhaps other psychiatric disorders, until more is known about the effect in these populations.

In contrast to the above, Richards, Beal, Seagal, and Pennebaker (2000) reported positive outcomes for 98 maximum-security psychiatric prisoners randomized to either a traumatic writing group or trivial writing control group. Six weeks after three consecutive, 20-minute writing sessions, participants assigned to write about past traumas had a non-significant decrease in the number of visits to the infirmary as compared to controls. An interaction effect was found whereby sex offenders who wrote about traumatic topics had significantly fewer infirmary visits compared to non-sex offender trauma writers. The secrecy surrounding sexual offenses and the stigmatization experienced by incarcerated sexual offenders may partly explain these findings. In addition, chronic inhibition of stressful information may be linked to poor health outcomes. If this is true, expressive writing in a private, non-punitive setting may have provided an outlet for previously undisclosed stressors among this subgroup within the prison population.

Rheumatoid Arthritis and Asthma

In 1999, Smyth, Stone, Hurewitz, and Kaell published the seminal article on the expressive writing intervention in a clinical population. Theirs was the first study to assess the clinical relevance of the standard writing paradigm using disease-related objective measures of disease status. They examined the effect of expressive writing on forced expiratory volume in 1 second (FEV₁) in asthma patients, and physician-rated disease activity and severity in patients with rheumatoid arthritis (RA). At the 4-month follow-up visit, patients with asthma who wrote about stressful experiences had a significant increase in FEV₁ as compared to those who wrote about trivial topics. RA patients assigned to the experimental group had significant improvements in overall disease activity as compared with controls.

To assess the clinical relevance of the above findings, the investigators established a priori standards for categorizing observed findings as improvement, no significant change, and worsening. For patients with asthma, a 15% increase or decrease in FEV₁ over pre-intervention values was defined as improvement or worsening respectively. For RA patients, overall disease activity was categorized as asymptomatic, mild, moderate, severe, and very severe. A shift from one category to another was defined as worsening or improvement, depending on the direction of the shift. The expressive writing groups had greater rates of improvement and lesser rates of worsening than the control groups. To explain the finding that approximately 50% of participants in both groups experienced no change in outcomes, a secondary analysis of the data was undertaken to evaluate characteristic differences between responders and non-responders (Stone, Smyth, Kaell, & Hurewitz, 2000). They examined the relationship between

perceived stress, quality of sleep, affect, substance abuse, and medication use and found no association between these variables and the positive health effects found in the previous study. These findings, consistent with those of a previous meta-analysis of expressive writing studies in healthy participants (Smyth, 1998), found no consistent association between expressive writing outcomes and these control variables. They also suggest the need to further characterize the individual differences between intervention responders and non-responders.

An earlier study of the effects of verbal emotional disclosure about stressful events on RA related pain, and physical and affective dysfunction (Kelley, Lumley, & Leisen, 1997) had similar results. While emotional disclosure resulted in immediate increases in negative mood, at the 3-month follow-up patients in the emotional disclosure condition had less affective disturbance and better physical functioning. Emotional disclosers who experienced the greatest increase in negative mood immediately after disclosure experienced objective improvements in the condition of their joints.

Attempting to translate the traditional laboratory-based intervention into a more accessible, low-cost, community-based intervention, Broderick, Stone, Smyth, and Kaell (in press) conducted an effectiveness trial of a community sample of RA patients using videotaped instructions delivering at-home writing instructions. They failed to find differences between experimental and control groups on objective disease activity ratings. These findings suggest that additional data on the correlates of the effects of expressive writing may be needed before the intervention can be moved into less controlled settings. More information also may be needed about the tolerability and

acceptance of written disclosure among chronically ill samples before making the intervention more widely available in these groups.

Cancer and Expressive Writing

Walker, Nail, and Croyle (Walker et al., 1999) examined the feasibility of expressive writing and its effect on psychosocial adjustment in women completing radiation therapy (RT) for stage I and II breast cancer. Thirty-nine women were randomly assigned to a single 30-minute writing session immediately after completing RT, three 30-minute writing sessions over three to four days, or to an attention control condition. Participants were asked to write about their deepest thoughts and feelings about their cancer experience immediately after their final RT session and at home for those assigned to the write on three occasions. The writing sessions were followed by telephone interviews at 1, 4 to 6, 16 and 28 weeks after completion of RT. No significant main effects or interaction effects were found for condition when co varying for negative affect and severity of treatment side effects. The intervention was well received and tolerated by the participants but the small sample size and a possible ceiling effect for positive affect and adjustment preclude the drawing of definitive conclusions about this study.

Stanton and colleagues (Stanton et al., 2002) tested the effect of expressive writing among 60 breast cancer patients following primary medical treatment for stage I and II breast cancer. Women were randomly assigned to write for 20 minutes on four occasions over a 3-week period. Two experimental conditions assigned participants to write about their deepest thoughts and feelings or the benefits derived from their cancer

experience while control participants wrote about only the facts surrounding their cancer experience. The outcomes included quality of life, affect, medical appointments for cancer-related morbidity, and self-reported physical symptoms. Expressive writers reported significantly increased distress levels immediately after writing as compared with the benefit writing group, a finding consistent with the previous literature on trauma related writing topics. No significant main effects were found for writing condition at either the 1-month or 3-month post-intervention time points. There was, however, a significant interaction effect whereby the trauma writing group reported decreased distress for women with low avoidance scores as compared with women with higher levels of reported avoidance. Trauma writers also reported a significant decrease in physical symptoms and medical visits for cancer-related morbidity as compared with the control group. Women high on avoidance tended to benefit from the positive benefit writing condition, and to fall between the other groups on physical symptoms and cancer-related morbidity. Benefit writers also reported a slight advantage over expressive writers on perceived enhanced understanding of their cancer experience and the value of the writing experience.

Metastatic renal cell carcinoma patients enrolled in a phase II trial of an experimental vaccine therapy were randomly assigned to write about cancer related stressors or health behaviors (de Moor et al., 2002). Psychological and behavioral adjustment scores were computed before and after the intervention. Averaged across all follow-up sessions (4, 6, 8 and 10 weeks post intervention) there were no significant differences between the groups on symptoms of distress, perceived stress, or mood disturbance. However, participants in the expressive writing group reported significantly

decreased sleep disturbance, better sleep quality and sleep duration, and less daytime dysfunction compared to control participants. This is the first expressive writing study to find significant improvements in sleep quality. This is an important finding that warrants further evaluation among cancer patients and those with other chronic conditions.

HIV/AIDS and Expressive Writing

The first published account of the impact of the expressive writing intervention in participants with HIV infection evaluated the effect of writing about an optimistic future on dispositional optimism, treatment adherence, and side effects in HIV infected women (Mann, 2001). Forty-four women, categorized as either low or high on optimism, were randomized either to an experimental group that wrote about an optimistic future in which they required only one HIV pill daily or to a no-writing control group. Participants were asked to write at home for 10 minutes on 8 occasions over a 4-week period. Study outcomes included levels of optimism, self-reported adherence to treatment, and treatment-related side effects.

Results indicated that intervention group participants *low* on optimism at time 1 reported significantly higher optimism, marginally higher adherence, and significantly lower distress from side effects at time 2 than did control participants. Experimental participants *high* on optimism at time 1 reported significantly less optimism and adherence, and more distress from side effects at time 2. There were no changes on any outcome measure among the non-writing control participants.

Although confidence in Mann's (2000) findings is limited by the lack of a trivial writing comparison group, her findings do suggest that individual differences in

dispositional optimism may have an impact on expressive writing outcomes, and may interact with the writing topic. The changes in dispositional optimism are concerning however, since a dispositional measure would not be expected to change over time. Whether this represents a true change in disposition or a deficit in the measure or its application, the validity of the findings remain an empirical question to be answered in future studies. Although Mann's study did not conform to the traditional writing paradigm and lacked HIV-related clinical outcomes, it attests to the feasibility of conducting such a study in this population.

The second study is a cross-sectional analysis of the relationship between emotional disclosure through writing and depth processing to long-term survival with AIDS (O'Cleirigh et al., 2003). The study explored the mediational role of depth processing, an indicator of the extent to which participants are working through and resolving the traumatic experience, plays between emotional disclosure and long-term survival, and the relationship between emotional disclosure/depth processing and HIV viral load and CD4+ cell count. Participants were also evaluated on measures of anti-HIV medication adherence, perceived stress, and social support. Using a non-random sampling technique, long-term survivors of AIDS and HIV-seropositive participants with no history of an AIDS-defining illness wrote for 20 minutes on one occasion about the most stressful or traumatic situations or feelings they have had to deal with since finding out about their HIV infection.

Essays were coded by independent raters for the total number of emotion-related words, and the number of positive and negative emotion words. Essays were also coded for depth processing as indicated by positive cognitive appraisal change, experiential

involvement, self-esteem improvements, and adaptive coping strategies. While groups were equivalent on all control variables, including gender, the men were significantly older, better educated, had higher incomes, and lower viral loads, than the women did. Women and men also differed on sexual orientation and race with 90% of women and 27% of men self-reporting as heterosexual and 70% of women versus 27% of the men identified as African-American.

Controlling for time since diagnosis, long-term survivors were rated as writing significantly more total emotional words, and displaying more cognitive appraisal change, experiential involvement, self-esteem enhancement, and adaptive coping strategies than the HIV-seropositive comparison group. Indexing the depth processing variables into a single depth-processing factor, depth processing was identified as a mediator between emotional expression and long-term survival. Depth processing, but not emotional expression, was significantly and positively related to adherence and social support, and negatively related to perceived stress. An interaction effect emerged between gender and immunological markers in which there was a significant negative relationship between viral load and positive emotional expression for women but not for men. Similarly, there was a significant negative relationship between CD4 cell count and depth processing for women but not for men. These gender-related findings are inconsistent with those of Smyth's (1998) meta-analysis of expressive writing studies in healthy participants, which indicated that men derived significantly more overall benefit from expressive writing than did women.

The generalizability of this study is limited by its correlational design and lack of a trivial-writing control group. In addition, as was the case in the Mann (2001) study, this

study did not conform to the traditional expressive writing paradigm, leaving open the question as to the tolerability and effect of the intervention in HIV infected participants. It does provide, however, some insight into the role expressive writing may play in depth processing, a possible mediator of the intervention that is associated with positive immunological, psychosocial, and behavioral health outcomes.

In summary, the preponderance of published findings suggests that expressive writing can positively impact psychological and psychological health among persons with psychiatric disorders (Richards et al., 2000), asthma and rheumatoid arthritis (Smyth et al., 1999), breast cancer (Stanton et al., 2002; Walker et al., 1999), and HIV infection and AIDS (Mann, 2001; O'Cleirigh, 2002). The positive effects include decreased health care visits (Richards et al., 2000; Stanton et al., 2002), improvements in disease-related status (Smyth et al., 1999), decreases in reported disease-related symptoms (Mann, 2001; Stanton et al., 2002), decreased distress (Stanton et al., 2002), and increased optimism and adherence to treatment regimen (Mann, 2001). The above studies provide support for the applicability of this intervention in chronically ill populations. They also validate the need to explore individual difference variables as possible moderators of effect and the extent to which expressive writing can affect behavioral, psychological, and physiological health outcomes in these populations.

Why Study Persons with HIV Infection?

As of December, 2003, 886,575 cumulative cases of AIDS and 501,669 deaths from AIDS had been reported in the United States (CDC, 2000; CDC, 2002). In addition, it is estimated that 800,000 to 900,000 persons are living with HIV infection and over

40,000 new infections occur annually in the United States (CDC, 2002). The dramatic decline in AIDS-related deaths and slowed progression from HIV to AIDS following the introduction of new HIV treatments in the mid-to-late 1990s is now beginning to level due to slowing declines in the incidence of AIDS, limited access to care, and the limitations of current therapies (CDC, 2002). Thus, despite new treatments that favorably influence survival and quality of life, HIV and AIDS remain significant causes of morbidity and mortality, and continue to pose a major public health burden.

From a physiological perspective, HIV is characterized by progressive immunological impairment and a highly variable course of progression whereby some individuals remain immunologically healthy and asymptomatic for long periods of time while others progress rapidly to profound immunological impairment or AIDS (Schneiderman, 2001; Levy, 1993; Cole, 1996). The source of this variability is unknown but may be attributable to both biological differences in viral strains and individual host responses, and to psychosocial characteristics of the host (Cole et al., 1996; Schneiderman et al., 2001). Research on the correlates of disease progression in HIV has examined psychological factors that predict disease progression and immunological markers of disease (Schneiderman, 2001). They document the relationship of psychosocial factors such as depressive symptoms (Burack, 1993; Mayne, 1996; Page-Shafer, 1996; Patterson, 1996; Zorrilla, 1996), cumulative life stress, lack of social support, denial coping (Leserman, 1999), and bereavement (Coates, McKusick, Kuno, & Stites, 1989; Reed, Kemeny, Taylor, & Visscher, 1994) to HIV-related symptoms, immunological changes and disease progression.

Persons with HIV/AIDS confront an array of psychosocial and coping issues on a daily basis. Advances in treatment have established HIV infection as a serious and chronic, but manageable, disease. However, these advances profoundly influence the psychosocial landscape, driving the critical need for psychosocial interventions to help those who are infected cope with the ramifications of their disease. Some of the challenges individuals with HIV infection face include adjustment to different treatment outcomes and illness trajectories related to Highly Active Antiretroviral Therapy (HAART); adherence to treatment regimens; economic stressors; social stressors related to loss, relationships, and work life; and adjustment to common side effects associated with their drug regimen (Catz, Kelly, Bogart, Benotsch, & McAuliffe, 2000).

In addition, a number of interventions designed to enhance psychosocial adjustment in HIV-infected populations have been shown to reduce distress (Kelly et al., 1993; Mulder et al., 1994), decrease perceived helplessness (Antoni et al., 1991), reduce Herpes Simplex Virus Type 2 (HSV-2) titers (Cruess et al., 2000); reduce self-reported anxiety, anger, total mood disturbance, perceived stress, and norepinephrine output (Antoni, Cruess, Cruess, Lutgendorf, & Kumar, 2000); and improve coping strategies and markers of social support (Lutgendorf et al., 1998). Most of these studies involved a cognitive-behavioral stress management (CSBM) intervention that took place in a social setting requiring attendance at up to 10 weekly sessions. While these interventions resulted in significant improvements in health-related outcomes, they required highly committed and motivated participants who were comfortable in an interactive social setting. This type of intervention may have limited applicability to participants who are unable or unwilling to commit to the requirement of the intervention or who are

uncomfortable with the social milieu. The written disclosure writing intervention may provide an alternative to participants who are uncomfortable with the traditional CBSM intervention.

Very few expressive writing studies have evaluated chronically ill populations, and only two previous studies have attempted to study the impact of expressive writing among persons with HIV infection (Mann, 2001; O'Cleirigh, 2002). As described above, neither study replicated the standard expressive writing paradigm, nor did they include trivial writing comparison groups. Thus, the standard expressive writing intervention has yet to be studied in persons with HIV and AIDS. The study of expressive writing in this population is important and warranted for several reasons. First, the psychological and physiological benefits of expressive writing have been repeatedly demonstrated in randomized trials of both healthy and chronically ill participants. Second, from a psychological perspective, HIV is a potentially stigmatizing condition whereby individuals may be reluctant to disclose or discuss their HIV infection or related risk factors to others. Third, it poses a serious threat to health and is associated with significant morbidity and eventual mortality, factors that also challenge the individual's psychological reserves and coping repertoire. Therefore, it is likely that HIV infected individuals have highly stressful, or traumatic, past, or current, memories or concerns that require emotional or cognitive processing.

The Current Study

Since the introduction of the expressive writing intervention, numerous articles reporting results from randomized, controlled trials have appeared in prestigious

scientific journals that attest to the health benefits of written emotional disclosure among healthy individuals and, on a limited basis, those with chronic diseases. There are, however, several deficiencies in the literature that should be addressed. An important area, and one that will be addressed in this study, is the need for systematic evaluation of individual difference variables that may moderate the effect of the intervention. While the moderating effects on health outcomes of individual difference variables have received considerable attention in the psychosocial literature, it remains an area of debate in the written disclosure literature.

Studies in healthy participants have failed to find consistent personality markers that moderate the outcomes of written disclosure interventions. The findings are primarily correlational and have not been replicated in subsequent trials. In addition, very few rigorous, systematic evaluations of individual differences that may moderate the effects of the written disclosure intervention have been undertaken. Numerous authors (Paez et al., 1999; Richards et al., 2000; Smyth, 1998; Smyth et al., 1999) have suggested that moderating variables should be explored more extensively in future studies. This information is essential to help predict which individuals or participant groups may benefit most from this intervention, which may be poor candidates for the intervention, and to provide valuable information about fine-tuning the intervention to maximize its effect.

Another deficiency is the lack of variability in the populations that have been studied. The preliminary and cautiously optimistic findings among certain clinical populations serve as an endorsement for moving the intervention into other clinical populations. Finally, it cannot be assumed that the response to the intervention among

healthy participants is directly applicable to participants with chronic illness. Indeed, as has been noted, there is significant reason to be cautious when introducing the intervention in novel settings. Investigators should be careful to design trials that address important gaps in knowledge and are congruent with the state of the science in both expressive writing and the chronic condition being studied.

Purpose and Rationale

The empirical literature suggests that addressing the psychosocial needs of patients can produce both psychological and physical health benefits (Smyth et al., 1999). Rising rates of major depression and other anxiety-related disorders (Costello, 1993; Weissman, 1992), the pressure for more cost-effective and accessible health care (Esterling et al., 1999), and the growing awareness of the interrelatedness of biological, behavioral, and psychological factors on health outcomes (Zeller, McCain, & Swanson, 1996) have fostered increasing concern for the development of cost-effective psychosocial interventions that are readily accessible to large numbers of individuals (Esterling et al., 1999). The literature also suggests that simple, inexpensive, and relatively safe mind-body interventions targeted to specific populations may reduce the need for more expensive medical treatments (Sobel, 2000).

Over 15 years of data from well-designed and well-controlled studies suggest that the brief writing intervention described in this proposal can produce reliable and moderately effective psychological and physical health benefits in normal, healthy participants. Promising data are also beginning to emerge on the potential benefit of this intervention for persons suffering from a variety of chronic diseases. These findings

suggest that emotional disclosure through writing may hold promise as a viable, cost-effective, and accessible intervention that may expand the repertoire of patient care interventions available to health care practitioners, and be of significant value to patient health and well-being. Evaluating the relationship of written emotional disclosure to psychological, behavioral, and physiological health outcomes, particularly in chronically ill populations, is of great potential value to health care in general.

As indicated above, many of the CBSM interventions that appear in the empirical literature are multi-modal, complicated, require long-term commitments from participants, and take place in a social setting. As the expressive writing intervention moves into this population the need for well-controlled trials with well-defined psychological, biological and behavioral endpoints are essential to establish whether this intervention can improve the quality of life or impact disease progression in persons with HIV infection and AIDS.

The primary purpose of the proposed research is to evaluate the moderating effects of an individual difference variable termed cognitive adaptability on several psychological well-being, self-reported health status, and adherence among persons with HIV infection and AIDS. Cognitive adaptability, a psychological resource associated with dispositional optimism and perceived competence, will be described in detail in Chapter II. A secondary purpose is to evaluate the effect of expressive writing about traumatic events on these outcomes. Specifically addressed will be the impact of four weekly writing sessions on positive and negative affect, perceived stress, global sense of meaning, HIV-specific cognitive adaptability, HIV-related quality of life, HIV-related symptom reporting, physical functioning, and adherence to treatment regimen. It will

further be determined if cognitive adaptability moderates the effect of expressive writing on any of the outcome variables.

CHAPTER II

THEORETICAL FRAMEWORK

Although expressive writing is known to have a myriad of health benefits, it is not known why it works. Early explanatory notions emerged from the synthesis of Freudian theories of catharsis and insight, and from theories related to the health benefits of emotional expression (King, 2001). The initial hypothesis assumed that repressed or unexpressed emotions about previous stresses or traumas resulted in chronic autonomic nervous system arousal and eventual physical illness. Based on this, the originators of the intervention reasoned that the release of these emotions through expressive writing would lead to beneficial health effects. This thesis has found support in studies demonstrating a relationship between emotional expression and autonomic nervous system arousal as measured by reduced skin conductance levels (Pennebaker et al., 1987), and increased susceptibility to illness among individuals who conceal their gay identity (Cole, Kemeny, Taylor, & Visscher, 1996) or withhold emotional expression (Temoshok et al., 1985).

An alternative explanatory mechanism is that repeated emotional expression and the subsequent confrontation of past aversive traumas promotes habituation to and extinction of the physiological and psychological stressors that trigger aversive emotional responses (Foa & Kozak, 1986). This hypothesis suggests that expressive writing allows an individual to confront past traumas in a non-threatening environment, leading to the eventual reduction of associated fear responses, changes in cognitive structures whereby

the stressor is viewed as less threatening, the eventual extinction of the fearful response, and improved health outcomes (Foa & Kozak, 1986). Support for this premise is found in expressive writing studies where negative emotions triggered related and fearful intrusive thoughts. In these studies, the induction of intrusive thoughts was associated with the attenuation of depressive symptoms (Lepore, 1997) and respiratory illnesses (Greenberg & Lepore, 2001) in healthy college students.

Taken on their own, neither model is sufficient to explain findings that participants experienced health benefits when they wrote about imaginary traumas (Greenberg, Wortman, & Stone, 1996), current stressors (Spera et al., 1994), someone else's trauma (Greenberg et al., 1996), or even positive topics (King, 2001; King & Miner, 2000; Mann, 2001). Investigators now believe that simple disclosure is not sufficient to induce the health benefits derived from written emotional disclosure. Current explanatory models suggest that cognitive processing is an *essential* component of the written disclosure paradigm and that emotional self-regulatory mechanisms are engaged during the process.

Cognitive Processing and Emotional Disclosure

Research on catharsis and venting of emotions demonstrates that, in the absence of cognitive processing, simple catharsis or venting of emotions does not lead to improved health outcomes (Smyth & Pennebaker, 1999). A study by Krantz and Pennebaker (as cited in Pennebaker, 1997) evaluated the relative contributions of emotions and writing about emotions through trials that randomized students to one of three groups: those who expressed emotions through dance or bodily movements alone,

those who expressed the trauma experience through dance or bodily movements followed by writing, or those who performed routine, non-expressive exercise. Only the movement plus writing group had significantly improved physical health and grade point averages in the months following the exercise. This suggested that the mere expression of trauma was not sufficient to improve health outcomes and implied that a cognitive process involving the translation of the traumatic experience through language may be necessary.

Research in the human response to trauma and the psychobiology of PTSD indicates that traumatic memories are often experienced as fragmentary visual, olfactory, auditory, and kinesthetic sensations of the original traumatic experience (van der Kolk & van der Hart, 1991). These memories are often resistant to change and are emotional or perceptual rather than declarative as are ordinary daily events (Terr, 1994). Traumatic memories may be encoded differently than ordinary memories because of altered attention focus or hippocampal memory function due to the extreme arousal of the traumatic event (van der Kolk, 1994). Under stress, the endogenous stress hormones that are secreted can influence the consolidation of memory, storing it in a highly aroused state.

Having lost some discriminatory ability of memory recall, when traumatized individuals are emotionally aroused they may more readily access the traumatic memory, triggering inappropriate memories of the traumatic events as intrusive thoughts. These memories may occur even when the triggering event is not relevant to the traumatic memory (Pitman, 1990). Such memories may not become integrated into a personal narrative, resulting in storing of sensory perceptions, ruminations or behavioral reenactments as opposed to organized thoughts (van der Kolk & van der Hart, 1991). It is

believed that this hyperarousal and related intrusive and distressing symptoms may be the source of biological and psychological distress observed in PTSD (McFarlane, 1992).

Indeed, the goal of treatment for individuals with serious traumatic memories is to facilitate memory processing aimed at organizing memory and create a narrative memory that can more readily integrate it into existing memory.

Smyth and Pennebaker (Smyth & Pennebaker, 1999) suggest that the organization of traumatic memory into a more cognitive narrative structure may be a critical factor in producing the improved health outcomes following written disclosure about emotional events. Thus, emotional disclosure through writing may lead to the recoding of traumatic memory into narrative language, facilitating the integration of traumatic memory and reducing intrusive thoughts and re-experiencing of the event, leading to improvements in psychological and physiological symptomatology.

Computerized analyses of disclosure essays have found links between word usage and health outcomes indicating that improved health outcomes are directly proportional to the number of positive emotion words used and to an increase in the number of causal and insight words used over the course of the writing intervention (Pennebaker, 1997; Pennebaker & Frances, 1996; Pennebaker & Seagal, 1999; Smyth & Pennebaker, 1999). Pennebaker and colleagues also found a curvilinear relationship between the use of negative emotion words and health outcomes whereby very low or very high negative word usage was associated with more doctor visits than when a moderate number of negative emotion words were used.

Other studies have found that writing in an organized rather than fragmented manner results in better health outcomes (Smyth, 1998; Smyth, 2000; Williams-Avery,

1998). These findings suggest that an increase in the use of cognitive words over writing days predicts improved health outcomes (Klein & Boals, 2001; Pennebaker, 1997; Pennebaker & Frances, 1996), that participants with a more coherent narrative at the outset derived less benefit from the writing than did those with less coherent narratives (Gergen & Gergen, 1988) and that trauma writing resulted in increased working memory relative to superficial writing controls (Klein & Boals, 2001).

Emotional Self-Regulation and Expressive Writing

Self-regulation models of action and experience are concerned with one's goals or efforts to attain and maintain desired conditions in one's life, whether the goals are to maintain a steady state or to make something happen (Scheier & Carver, 1985). The process by which the goal is attained is a process of self-regulation (Scheier & Carver, 1985). The self-regulation process involves the self's control of its own thoughts, feelings, impulses, and actions, and the general effort to bring the self closer to what one should or would ideally like to be (Banaji, 1994). Emotional self-regulation is a part of the broader construct of self-regulation and refers to control over the quality, frequency, intensity, and duration of responses in emotional experience, physiology, and behavior (Greenberg & Lepore, 2001). Emotional self-regulation processes influence the types of emotions people have, how they express them, and how intensely they experience the emotions (Greenberg & Lepore, 2001).

Greenberg and Lepore (2001) suggest that two emotional self-regulation mechanisms, emotional habituation and cognitive reappraisal of emotion, may account for these findings. They argue that the habituation model described above may operate as

an emotional self-regulatory process in the context of the written emotional disclosure paradigm. They cite the literature on patient responses to exposure therapy for PTSD, as well as that on phobias (as presented above), as support for their premise. Exposure therapy involves repeated emotional engagement, confrontation and activation of fear structures, resulting in gradual reduction in anxiety and negative emotion over time (Foa, 1995; Jaycox, 1998). Similar to exposure therapy for PTSD, written emotional disclosure involves confrontation with negative stimuli and habituation (Greenberg & Lepore, 2001). Emotional disclosure through writing may facilitate habituation by “producing extinction of negative emotional associations through repetition and exposure” (Bootzin, 1997, p.167), thereby affecting cognitive structures underlying the negative emotions or fears (Foa & Kozak, 1986).

Empirical evidence suggests that participants who confront negative feelings about stressful situations through writing experience a reduction in the physiological intensity of feelings over time. For example, participants who revealed the most emotions, or used more emotion-focused words, had lower skin-conductance levels during disclosure (Pennebaker et al., 1987), less joint swelling by objective measure (Kelley et al., 1997), and improved immune function as evidenced by lower antibody levels to Epstein-Barr virus (EBV) immediately and four weeks after writing (Esterling, Antoni, Kumar, & Schneiderman, 1990; Lutgendorf, Antoni, Kumar, & Schneiderman, 1994). In addition, Petrie, Booth and Pennebaker (1998) found a decrease in self-reported tension over three writing sessions among students who wrote about emotional topics. Experimental groups also evidenced greater decreases in skin-conductance levels over four writing days than did control participants (Petrie, Booth, Pennebaker, Davison,

& Thomas, 1995), and demonstrated lower autonomic arousal upon viewing an emotional film for the second time (Mendolia, 1993). It is interesting to note that these results were not obtained among participants who verbally disclosed emotions, suggesting that the act of expressing emotion through writing may be an important and unique contributor to the observed outcomes (Segal & Murray, 1994).

Cognitive reappraisal of emotions is the second self-regulatory mechanism that Greenberg and Lepore (2001) suggest may account for the outcomes seen in emotional disclosure. They posit that disclosure may produce cognitive changes that enhance participants' perceptions of self-efficacy and control over emotions leading to understanding, validation, and acceptance of these emotional reactions. They suggest that attaining mastery over emotional reactions results in less intense negative affect and chronic subjective stress (Greenberg & Lepore, 2001). Several studies support this idea. A written disclosure study by Paez, Velasco, and Gonzalez (1999) found that students who wrote about undisclosed traumas had decreased negative affect and perceived their trauma memories as more controllable two months post-writing, indicating that disclosure changes cognitive appraisals of one's emotional reactions.

Previous studies also have observed that experimental participants in written disclosure studies evidenced emotional blunting to intrusive thoughts (Greenberg & Lepore, 2001; Lepore, 1997). Breast cancer patients who disclosed emotions during group therapy had enhanced perceived emotional self-efficacy to tolerate negative emotions, decreased emotional suppression, and self-efficacy maintenance over time as compared to controls (Giese-Davis, 2000). Further, the cancer literature suggests that supportive expressive therapy increases survival time in cancer (Spiegel, 1989).

Greenberg and Lepore suggest that enhanced perceived control over emotions may attenuate chronic stress and autonomic arousal, fostering improved immune responses and enhanced health effects.

Other studies have found that adult trauma victims have impaired affect tolerance, fear their emotions, dread the return of the traumatic state, and often experience emotions as traumatic scenes (Krystal, 1988). They have difficulty modulating emotion, often shifting from emotional numbing to intense and overwhelming affect (van der Kolk, 1989). The trauma literature explains this deficit of emotion-regulation as a disruption of trust and intimacy self-trust schemas, whereby people distrust their perceptions, reactions, and judgments (McCann, 1988). Having been unable to protect themselves from trauma, they lack self-trust and feel vulnerable to invalidation and self-doubt. They also feel disconnected from self, leaving them unable to self-nurture and modulate negative affective states (McCann, 1988). Greenberg and Lepore (2001) argue that the above supports their notion of the self-regulation effect of written emotional disclosure. Encouraging individuals to safely explore their deepest feelings implies validation of feelings, promoting greater connection to self, enhanced self-awareness and self-efficacy, and organization and acceptance of the experience (Greenberg, 1987).

Several written disclosure studies support the self-regulation model. Participants often write about doubting and suppressing their feelings about their traumatic situation (Greenberg et al., 1996). For example, a study by Swanbon (2000) found that gay men who wrote on their deepest feelings about being gay had improved clarity, less avoidance of feelings, and fewer psychosomatic symptoms than trivial writing controls. (Lepore, Ragan, & Jones (2000) found that students who watched a stressful film followed by

talking alone or to a validating confederate had less intrusive thoughts and perceived less stress on reexposure to the stressor than non-talking controls. Participants who talked to a non-validating confederate, however, did not report reduction in intrusive thoughts or stress. The above findings suggest that disclosure may enhance emotional experiencing, and that disclosure alone or in a supportive setting is emotionally validating.

Other studies support Greenberg and Lepore's (Greenberg & Lepore, 2001) notion of cognitive reappraisal. In a novel study by King (2001), participants were randomized to describe either their best possible future self in which all of their life goals are realized, past traumas, both future self and past traumas, or a non-emotional event. Five months post-writing, participants who wrote about their future selves, past traumas, or both had fewer health center visits than non-emotional (control) writers did. While writing about positive life goals lacks emotional confrontation as would be required under an emotional habituation framework alone, Greenberg and Lepore (2001) suggest that perhaps this type of disclosure allows participants to cognitively regulate their self-view and promote more positive self images and adaptive behaviors.

Greenberg and Lepore (2001) state that narrative construction that emerges in disclosive writing allows individuals to "make sense of their lives overall and to incorporate specific discrepant events into their self-views" (p. 15). They suggest that, consistent with life-story theory, expressive writing may promote self-regulation and stability of identity, adjustment to ongoing stressors, and give meaning and purpose to life (McAdams, 1990). Several studies support that premise. A qualitative study of drug addicts used narratives of recovery to reconstruct a new non-addict identity by differentiating between who they were "at heart" from their "future self" and their "self

on drugs,” maintaining hope and forgiving themselves for past mistakes (McIntosh, 2000). In another study, highly generative adults were distinguishable from less generative adults by their clear and temporally stable narratives that set goals and transformed negative experiences into good outcomes (McAdams, 1997). Finally, a study by Wong and Watt (1991) found that persons classified as unsuccessful agers with less cohesive narratives were less able to integrate, accept, and reconcile past negative experiences in their narratives than successful agers.

Cognitive Adaptability in Health and Illness

The traditional theory of mental health asserts that psychological health is dependent on accurate perceptions of reality, and acknowledgment and acceptance of discrepancies from the ideal self without consternation (Taylor & Lobel, 1989). In contrast, individuals prone to illusions about reality and self are viewed as vulnerable to mental illness. In her seminal article on cognitive adaptation theory, Taylor (1983) challenged this viewpoint by suggesting that certain illusions, such as moderately enhanced positive self-evaluations, may be highly adaptive and predictive of mental health and well-being. This section will describe the theory of cognitive adaptation, review the precepts upon which it is based, and discuss the evolution of the theory to the present. This will be followed by a review of relevant empirical findings.

Cognitive Adaptation Theory

Guided by theory and research in social cognition, Taylor and colleagues studied how people adjust to threatening events and return to psychological normalcy (Taylor &

Armor, 1996). They assumed that one's beliefs about the self, one's level of personal control, and perceptions about the future enable this adjustment and promote one's return to their pre-trauma functioning. An early study with breast cancer patients, however, revealed some findings that were contradictory to the original assumption (Taylor, 1984). Originally hoping to identify psychological resources that predict the return to functional levels prior to the cancer diagnosis, the investigators found that most women were changed by their cancer experience, often for the better (Taylor, 1984). Most surprising was the finding that some of the positive beliefs the women reported about their cancer experience were illusory and inconsistent with objective medical evidence. Furthermore, these positive perceptions and effects persisted even in the face of subsequent illness progression (Taylor, Kemeny, Reed, Bower, & Gruenewald, 2000). These and other findings, in conjunction with contemporary models of social cognition theory, led to the formulation of cognitive adaptation theory.

The traditional wisdom about mental illness suggests that illusory beliefs are inconsistent with criteria for mental health and that psychological health depends on accurate perceptions of reality (Taylor & Brown, 1988). Early theories of social cognition generally concurred with this, viewing the individual as a "naïve scientist" who logically evaluates unbiased data and reaches accurate causal attributions, predictions, and decisions from the data (Gilbert, Fiske, & Lindzey, 1998; Kelley, 1967; Taylor & Brown, 1988). This viewpoint fell into disfavor, however, as data emerged indicating that social perceptions are, in reality, based on biased, incomplete or inaccurate information, and heuristic shortcuts (Manstead & Hewstone, 1996; Taylor & Brown, 1994b). Indeed, the perceiver often makes decisions based on self-serving interpretations and illusory patterns

of error and bias (Taylor & Brown, 1994a). Social psychologists labeled this predilection as the self-serving bias (Manstead & Hewstone, 1996).

Contrary to traditional beliefs that the mentally healthy are aware of and accept both the positive and negative aspects of the self without consternation, the evidence indicates that most people have an overly positive view of self (Taylor & Brown, 1988). Indeed, a substantial body of research on the self-serving bias among normal, healthy participants indicates that, instead of having a well-balanced view of one's favorable and unfavorable personality traits and abilities, normal individuals appear to be far more cognizant of their assets than their faults. In addition, studies have shown that these positive self-portrayals are unrealistic in that most people perceive themselves as better than the average person and see themselves as better than others see them (Taylor & Brown, 1988), an assertion that is logically impossible for most people.

In contrast to the findings in healthy subjects, persons who are low in self-esteem, moderately depressed, or both, appear to have more balanced perceptions of self and more realistic self-appraisals than do their mentally healthy counterparts (Taylor & Brown, 1988). Thus, it appears that the conventional wisdom about what constitutes mental health is inconsistent with the empirical findings based on contemporary social cognition theory and the above findings on adjustment to threatening or traumatic events. The term positive illusions was coined to conceptualize the meaning of these phenomena (Taylor & Brown, 1988). As will be elucidated below, these positive illusions are fundamental precepts of cognitive adaptation theory.

The human psyche has an impressive ability to draw on an array of psychological resources to successfully buffer, withstand, and recuperate from personal threat and

tragedy (Taylor, 1983). Among these are various individual resources that help people adjust and recover despite significant personal setbacks. Taylor's theory of cognitive adaptation posits that these recuperative processes are centered on the themes of a search for meaning, the attempt to regain mastery, and an effort to enhance self-esteem (Taylor, 1983). The goals or adaptive beliefs toward which these themes are directed are the attainment of a sense of personal control, an ability to be optimistic about the future, and self-enhancement (Taylor & Armor, 1996). The fundamental precept of cognitive adaptation theory is that the ability to form and maintain these illusions is essential to the successful resolution of negative life events and maintenance of mental health (Taylor, 1983; Taylor & Brown, 1988; Taylor et al., 2000).

According to cognitive adaptation theory, people confronted by personal setbacks engage in cognitively adaptive efforts in order to regain or exceed their pre-trauma level of functioning. In the face of threatening events, people make attributions of cause in an attempt to understand, predict, and control their environment (Wong & Weiner, 1981). They also search for meaning to understand why a traumatic event occurred, the significance of the event, and what it symbolizes about one's life (Taylor, 1983). Threatening events also tend to undermine one's sense of control, causing people to attempt to regain a feeling of control or mastery to manage the event or prevent it from re-occurring. Finally, when confronted with personal setbacks, people often experience threats to self-esteem and engage in efforts to restore a positive sense of self (Taylor & Brown, 1988; Taylor et al., 2000).

Assumptions of Cognitive Adaptation Theory

Cognitive adaptation theory is based on four assumptions derived from research in social cognition. The first assumption states that humans perceive themselves with a modest degree of self-aggrandizement characterized by moderate illusions of control and unrealistic optimism. These positive perceptions are assumed the normal, steady state in the absence of threat. Large bodies of literature suggest that people judge positive traits more characteristic of themselves than negative traits. Further, they view these traits to be truer of themselves than of others (Taylor & Brown, 1988). They also believe themselves to have a high degree of control over traumatic health events, even when they are determined by chance and are objectively untrue (Taylor & Armor, 1996; Taylor & Brown, 1994b). Finally, a growing body of literature suggests that people are overly optimistic about their future, tending to see themselves as more likely to experience positive events and less vulnerable to threat in comparison to others (Taylor & Brown, 1988).

The second assumption suggests that when threatening events occur and these positive perceptions are challenged, there is an increased effort to restore or enhance these positive self-perceptions. Under normal circumstances, the enhanced self-perceptions are modest. When challenged with traumatic health events there is an increased effort to enhance or shore up these perceptions of personal control, optimism, and self-esteem (Taylor & Armor, 1996). Studies among cardiac patients (Helgeson & Taylor, 1993), cancer patients (Wood, Taylor, & Lichtman, 1985), and AIDS patients (Schneider, Taylor, Kemeny, & Hammen, 1991) demonstrate that patients tend to view themselves as healthier and more effective copers than other patients with the same

challenges, even in the face of objective, contradictory information. Some patients also commonly report positive life changes such as increased understanding of others, increased tolerance, and enhanced sense of meaning as a result of their illness (Taylor & Armor, 1996; Taylor, Kemeny, Aspinwall, Rodriguez, & Herbert, 1992).

A third assumption states that people use a variety of psychological processes to maintain and restore their exaggerated perception of self, sense of control, and optimism and that these processes are enhanced in times of threat. For example, people may bolster their self-esteem by making downward comparisons to others who are less fortunate (Suls, 2003), or may emphasize the importance of their assets and downplay the importance of their deficits (Taylor & Armor, 1996). If they cannot make downward comparisons to actual others, they make comparisons to hypothetical others (Taylor, 1983). They may also use dissonance resolution processes by selecting or emphasizing attributes on which they excel in order to assure more positive self-perceptions or by changing standards of judgment to highlight positive aspects of the situation (Taylor, 1983).

Finally, cognitive adaptation theory assumes that efforts used to restore a sense of positive self-regard during times of threat are associated with psychological adjustment and effective coping. These positive illusions are not just analogous to avoidance coping, denial, or wishful thinking, as critics of the theory have suggested (Taylor & Armor, 1996). Taylor argues that unlike repression or denial, which are associated with increasing anxiety, positive illusions enable people to deal with negative information and enable them to cope or adjust to it (Taylor & Lobel, 1989). Unlike wishful thinking, which involves a desire for things to be different, positive illusions are beliefs about

one's self-efficacy, personal control, or view of the future (Taylor & Armor, 1996). These conceptualizations are supported by data that suggest that people with positive self-beliefs use more active coping strategies (Aspinwall & Taylor, 1992), are more likely to confront negative information (Aspinwall & Taylor, 1992), engage in efforts to alleviate stressors (Bandura, 1986), and view their problem-solving skills as more effective (Taylor et al., 1992).

Empirical Support for Cognitive Adaptation Theory

The theory of cognitive adaptation proposes that the ability to sustain and enhance one's beliefs about optimism, control, and self-esteem predicts adjustment to and buffers against threats to health and possible future setbacks. The association between these moderately robust, enhanced self-beliefs and psychological adjustment are supported in the empirical literature among both healthy participants and those with chronic illnesses such as coronary artery disease, cancer, and HIV infection. Among healthy college freshmen, Aspinwall and Taylor (1992) found that optimism accounted for 52% of the variance in overall adjustment to college, and that enhanced self-esteem and desire for control predicted increased motivation that, in turn, mediated higher grades after two years in college.

Several studies have explored the applicability of cognitive adaptation theory to predicting psychological adjustment and disease progression among persons with coronary artery disease. Helgeson and Fritz (1999) applied cognitive adaptation theory to the study of patients who have undergone their first Percutaneous Transluminal Coronary Angioplasty (PTCA). The psychological components of the theory (perceived control

over the future, positive expectations, and positive view of self) predicted decreased risk of a new cardiac event in this sample and greater life satisfaction over time for patients who experienced a new cardiac event (Helgeson & Fritz, 1999). Four years later the Cognitive Adaptation Theory Index (CATI), a measure of the theoretical construct, predicted positive adjustment to disease and a reduced likelihood of sustaining a subsequent cardiac event (Helgeson, 2003). Among cancer patients, Stiegelis and colleagues (Stiegelis et al., 2003) found that lower levels of optimism and control together predicted increased feelings of anxiety and depression and that cancer patients had significantly higher levels of optimism and self-esteem than did a healthy reference group.

Recently, investigators have begun to evaluate this association with physical health outcomes among persons with HIV infection. HIV disease is a particularly useful model for examining cognitive adaptation processes and health outcomes. It is a progressive chronic disease with meaningful biological and clinical markers of disease progression, allowing individuals to be followed from early, asymptomatic disease through later symptomatic stages of disease (Taylor et al., 2000). Over the course of their disease, individuals with HIV confront a variety of behavioral challenges as well as psychosocial and physiological stressors that influence the course of disease. The cognitive adaptation framework predicts that under stressful conditions, such as threatening diagnoses or advancing disease, moderately enhanced perceptions of optimism, control, and self-esteem may be more adaptive than more realistic beliefs. The constructs of cognitive adaptation theory will be reviewed below and, using exemplars

from the empirical literature, the association between these variables and health outcomes in expressive writing studies and in HIV-infected populations will be explored.

Optimism and Cognitive Adaptation

From an anthropological perspective, optimism is viewed as an inherent part of human nature that was selected in the course of human evolution, developing along with human cognitive abilities (Peterson, 2000; Tiger, 1979). As a cognitive characteristic, contemporary psychologists view optimism as an expectation or a goal of positive future outcomes regarded as socially desirable, advantageous, or pleasurable (Kemeney & Gruenewald, 2000; Peterson, 2000; Tiger, 1979). The conceptual origin of optimism is rooted in the assumption that goal-directed behavior is driven by a hierarchical, negative-feedback system that becomes more fully engaged when attention is focused on the self for some salient reason (Scheier & Carver, 1985). It is further assumed that the goal of this inwardly directed focus is to reduce discrepancies between one's present behavior or circumstances and a desired goal or standard (Scheier & Carver, 1985). When there are obstacles to the reduction of this discrepancy, people engage in a reassessment of their outcome expectancies or goals. If the assessment is a favorable one, the assessment will result in continued or renewed behavior toward the goal or, if it is unfavorable, a reduction in or disengagement from the effort (Scheier & Carver, 1985).

Dispositional optimism is a personality variable defined as a global expectation about a future where good things are plentiful and bad things are scarce (Peterson, 2000; Scheier & Carver, 1985). In the health arena, dispositional optimism is empirically linked to such outcomes as better mood, increased numbers of CD4 T lymphocytes and

natural killer cell cytotoxicity (Segerstrom, Taylor, Kemeny, & Fahey, 1998), reduced skin conductance levels (Segerstrom, 2001), and faster recovery from bypass surgery (Scheier, Matthews, Owens, Magovern, & Lefebvre, 1989). In the HIV literature, dispositional optimism is associated with decreases in distress and avoidant coping, reduced symptom development (Reed, Kemeny, Taylor, & Visscher, 1999; Taylor et al., 1992), increased survival time (Reed et al., 1994), improved immune functioning (Brynes et al., 1998), and decreased depression and anxiety (Updegraff, Taylor, Kemeny, & Wyatt, 2002). In the expressive writing literature dispositional optimism has been found to moderate the effect of the expressive writing intervention among healthy college students (Cameron & Nicholls, 1998) and among women with HIV infection (Mann, 2001).

Taylor et al. (1992) examined the relationship of dispositional optimism and AIDS-related optimism to psychological distress, coping, and health behaviors among known HIV-seronegative and HIV-seropositive gay men who had not been diagnosed with AIDS. HIV-seropositive men reported significantly higher levels of AIDS-related optimism and positive attitudes as coping mechanisms than did seronegative men. Dispositional optimism, however, was the only significant predictor of psychological distress among *all* participants. Participants who were unrealistically optimistic about the future course of disease reported lower levels of psychological distress, a higher degree of control over AIDS, and more active coping than did their less optimistic counterparts. AIDS-specific optimism was associated with lower perceived risk of developing AIDS and avoidance coping strategies. Among seropositive men, AIDS-specific optimism also appeared to moderate AIDS-specific cognitions and coping, whereas it had no

moderating effects among seronegative men. These findings suggest that it may be important to assess both dispositional and situation-specific optimism when predicting outcomes in this population (Taylor et al., 1992).

Reed et al. (1994) studied the relationship between realistic acceptance of one's deteriorating health and mortality among men diagnosed with AIDS. Psychological measures included self-reported health status, an index of global adjustment, a realistic acceptance factor derived from the Responses to HIV Scale, and dispositional optimism. Results indicated that increased realistic acceptance of future debilitation and mortality was significantly and negatively associated with survival time. Participants high on realistic acceptance died an average of nine months earlier than those low on realistic acceptance. While, on the surface, it may appear that realistic acceptance and dispositional optimism are related constructs, in the Reed et al. (1994) study dispositional optimism did not significantly correlate with realistic acceptance or survival time. The authors suggest that these constructs may operate in different ways. For example, optimistic beliefs may serve a protective function while more realistic beliefs may be harmful (Reed, 1994). The small sample size and the homogeneity of the sample (i.e., well educated, white gay men with optimal access to care) may further explain these findings

Another group of investigators (Byrnes, 1998) examined whether pessimism (the opposite of optimism) was associated with lower natural killer cell cytotoxicity (NKCC) and T cytotoxic/suppressor cell (CD8+/CD3+) percentages among a culturally diverse sample of HIV-infected women. Zero-order correlations indicated that pessimism was significantly negatively correlated with lower NKCC and marginally negatively

associated with lower CD8+CD3+ percentages. When entered into a hierarchical regression model, dispositional pessimism accounted for a significant and unique portion of the variance in NKCC levels and marginally significant and unique variance in CD8+CD3+ percentages. Although Byrnes et al. found a relationship between pessimism and immunological markers of HIV infection, the small sample size limits the generalizability of their findings.

Reed, Kemeny, Taylor, and Visscher (1999) examined whether the interaction of negative HIV-specific related life expectancies and recent bereavement predicted the onset of HIV-related symptoms in asymptomatic HIV infected men. The Negative HIV Specific Expectancies Index consisted of items that were positively loaded on realistic acceptance and perceived risk of disease progression, and negatively loaded on perceived control over risk of disease progression, confidence about risk of disease progression, and AIDS-specific optimism. Negative expectancies were significantly associated with more avoidance and self-blame coping strategies and a greater likelihood for the onset of HIV-related symptoms among participants who were recently bereaved. This study also sheds some light on the relationship between realistic acceptance and AIDS-specific optimism in that both factors loaded highly (but in opposite directions) on the Negative HIV-specific Expectancies Factor. Thus, negative HIV-specific expectancies were positively associated with realistic acceptance and negatively associated with AIDS-specific optimism, suggesting that these latter two constructs may represent opposite ends of a related concept.

Using cognitive adaptation and Hobfoll's (1989) conservation of resources theories, Updegraff, Taylor, Kemeny, and Wyatt (2002) studied benefit-finding and

psychological adjustment among a diverse group of low socioeconomic status (SES) women with HIV infection. The study explored the relationship between SES, ongoing stressful events, positive and negative HIV-related changes, optimism, lifetime traumas and chronic stress, and adjustment. Data were obtained from intensive structured interviews and medical examination. Interview content was coded for positive and negative HIV-related changes and dispositional optimism scores were obtained using Scheier and Carver's (1985) Life Orientation Test (LOT). Consistent with cognitive adaptation theory, participants reported moderately optimistic expectations, and reported more positive changes than negative changes because of their disease. However, in the domains of relationships and body image, participants reported more negative than positive changes. Dispositional optimism was positively associated with higher education, more HIV-related positive changes, fewer HIV-related negative changes, less depression, and less anxiety. Optimism and health status significantly and negatively predicted HIV-related negative changes, depression, and anxiety. Because the analyses were based on cross-sectional data, a causal relationship between variables cannot be assumed.

Optimism and Expressive Writing

Mann's (2001) study of HIV infected women, reviewed above, examined the differential role of dispositional optimism and pessimism on adherence, HIV treatment-related side effects, and optimism about the future following an optimistic expressive writing task. As indicated above, participants low on dispositional optimism who wrote about an optimistic future had superior outcomes as compared to participants high on

dispositional optimism. [The results of the Mann study were reviewed above and will not be evaluated here].

Cameron and Nicholls (1998) studied the effectiveness of written emotional disclosure, a self-regulatory writing task, and a trivial writing condition on the number of illness-related clinic visits, adjustment to college, grade-point average, and negative mood in healthy college freshmen. Participants wrote for 20 minutes every week for three weeks about their deepest thoughts and feelings about coming to college in the disclosure condition; their deepest thoughts and feelings, challenges, and a coping plan in the self-regulatory condition; or a trivial, non-emotional, control topic. There was a significant decrease in the number of clinic visits for participants in the experimental groups and an increase among control participants five weeks after writing. Pessimists completing the self-regulatory task had significantly fewer clinic visits than did control group pessimists. Pessimists in the disclosure group did not differ from pessimists in either group and there were no differences between groups for participants high on dispositional optimism. No optimism by group interactions emerged for adjustment or negative mood.

Cameron and Nicholls (1998), however, did find decreases in adjustment scores in the control and disclosure groups, while the self-regulatory group remained stable. Negative mood scores did not change for self-regulatory participants, but there was a non-significant increase in negative mood among disclosure participants and a significant increase among control participants. The above studies clearly suggest that dispositional optimism does moderate the effect of outcomes on expressive writing tasks. These findings would suggest that low dispositional optimism or dispositional pessimism might

be associated with improved outcomes within the context of expressive writing. However, these findings should be interpreted cautiously. Participants in the Mann (2001) study wrote about a very circumscribed optimistic future (only one pill a day), possibly limiting or frustrating the more optimistic expectancies of the optimists. Despite this, these studies (Mann, 2001; Cameron & Nicholls, 1998) demonstrate that dispositional optimism is an important individual difference variable in the context of the expressive writing paradigm.

Control, Self-Efficacy, and Cognitive Adaptability

In the field of health psychology, control has emerged as an important and useful construct in the understanding of human health behavior (Manstead & Hewstone, 1996). The view that people are intrinsically motivated to achieve a sense of mastery over the environment has been a pervasive feature of psychology since the early 1900s (Walker, 2001). Control generally refers to both the process and attainment or achievement of a goal or outcome. Although there is no unifying theory of control, there are a number of theories or concepts associated with control such as locus of control, learned helplessness, perceived control, perceived competence, mastery, and self-efficacy (Walker, 2001; Wallston, 2001). This proposal is particularly concerned with the concepts of perceived control/competence and self-efficacy as they relate to the themes of mastery and self-enhancement within cognitive adaptation theory.

Perceived or personal control is not associated with any key theorist or any one appropriate measure of the construct (Walker, 2001). It is defined as “the belief that one can determine one’s own internal states and behavior, influence one’s environment,

and/or bring about desired outcomes” (Wallston, Wallston, Smith, & Dobbins, 1987). Self-perception of control can be based on reality, termed veridical control, or on illusion, termed illusory control. Either type of control can have an impact on the individual’s health status (Wallston et al., 1987). Control can be directed toward enhanced rewards by either exerting an influence on reality, termed primary control, or by accommodating to reality to enhance outcomes, termed secondary control (Wallston, 2001; Weisz, Rothbaum, & Blackburn, 1984).

In the empirical literature, perceived control is most commonly treated as an individual difference construct, but also has been treated as an intervening or dependent variable in health-related research (Wallston, 2001). The construct can be assessed at the general level (i.e., cross-behavioral and cross-situational without regard to domain), midlevel (i.e., cross-behavioral and cross-situational within a specific domain), or at the specific level (concerned with a particular behavior or situation (Wallston, 2001). Personal control is frequently operationalized as locus of control or beliefs about responsibility for outcomes (Walker, 2001; Wallston 2001). However, as data have accumulated, locus of control has been shown to be a weak predictor of health-related behavior because, as an outcome expectancy, it sheds no light on behavioral expectancies or perceptions of one’s capacity to attain the desired outcome (Wallston, 2001). Self-efficacy is closely associated with perceived control and distinguishes between outcome and behavioral expectancies. Thus, self-efficacy has been shown to be a better predictor of health behavior (Walker, 2001; Wallston, 2001; Weisz et al., 1984).

Self-efficacy has its origins in Bandura’s (1986) social cognitive theory. According to Bandura (1977), self-efficacy beliefs are amenable to self-regulation, and

are shaped by experiences, interactions with the environment and society, and psychological feedback. Perceived self-efficacy relates to control of behavior and is defined as a belief that one is capable of organizing and executing a course of action to attain what is desired (Walker, 2001; Wallston, 2001). Bandura originally conceived of self-efficacy as a behavior- or situation-specific construct, but later identified three levels of perceived self-efficacy that range from situation-specific to global beliefs (Walker, 2001). Self-efficacy beliefs can regulate human functioning through cognitive, motivational, emotional, and selection processes (Manstead & Hewstone, 1996). The sources that shape one's self-efficacy beliefs include mastery experiences that provide evidence of the capacity to succeed, vicarious success by seeing similar others succeed, persuasion by others that one has the capacity to succeed, and the interpretation of one's somatic and emotional responses as signs of the capacity to perform (Manstead & Hewstone, 1996).

Perceived Competence and Cognitive Adaptability

Both perceived control and self-efficacy have been shown to be valuable predictors of psychological and physiological health status, and health behavior (Manstead & Hewstone, 1996; Wallston, 2001). Perceived competence is a construct that combines both outcome and behavioral expectancies and is closely related to the constructs of mastery and self-efficacy (Manstead & Hewstone, 1996; Smith, Dobbins, & Wallston, 1991; Walker, 2001; Wallston, 2001). It is defined as one's beliefs about one's ability, sense of behavioral effectiveness, and capability of interacting with the environment to accomplish outcomes that are important to or undertaken by oneself

(Smith et al., 1991). People who perceive themselves to be highly competent in a wide variety of domains generally have very favorable self-perceptions (K. A. Wallston, personal communication, November, 2003). Thus, perceived competence is closely tied to self-esteem.

A search of the HIV-related literature revealed no studies that specifically addressed perceived self-competence among persons with HIV infection. Several studies, however, address issues of perceived control and self-related beliefs. Taylor et al. (1992) studied perceived control over the development of AIDS among HIV negative gay men and HIV positive gay men without a diagnosis of AIDS. They found that HIV-positive men perceived themselves as having less control over AIDS than their HIV-negative counterparts have. Perceived control interacted with measures of optimism and fatalistic-vulnerability whereby participants high on AIDS specific optimism and low on fatalistic vulnerability reported greater levels of perceived control over AIDS. Participants scoring high on dispositional optimism also reported more perceived control over AIDS than did their counterparts who scored low on dispositional optimism. Control beliefs were not directly related to measures of psychological distress or health-related behaviors in Taylor et al. study (1992).

Thompson, Nanni, and Levine (1994) studied two dimension of perceived control (primary and secondary vs. central and consequence-related control) among HIV infected men. Both primary control (control by belief in one's influence) and secondary control (control gained by accepting reality) were associated with less depression. However, high beliefs in secondary control were associated with lower depression only in participants low on perceived primary control. All participants reported higher beliefs in

consequence-related control (control of the consequences of a threat) than central control (escape from or avoidance of a threat). Beliefs in central control were significantly and negatively related to depression, while beliefs in consequence-related control were negatively correlated with depressive symptoms and the number of HIV-related physical symptoms.

In another study of the effect of perceived control among gay men living with AIDS (Reed, 1994), personal control was associated with better adjustment and vicarious control was associated with poorer adjustment. As health status declined these relationships strengthened. Thus, perceived control beliefs alone or in interaction with other variables are associated with measures of psychological distress, adjustment, and symptom reporting among persons with HIV infection and AIDS. No studies were found that correlate control beliefs with biological markers of disease progression such as CD4+ cell counts or viral load.

Self-efficacy has been correlated with weight management, substance use, contraceptive use, symptom reduction, and intention to use condoms (Basen-Enquist & Parcel, 1992; Brafford & Beck, 1991; Ozer & Bandura, 1990), and is an important predictor of health behavior change in studies of smoking cessation, exercise, and alcohol abuse (Walker, 2001). Surprisingly, very few trials have examined the effects of self-efficacy in participants with HIV infection and AIDS. Of the few studies that have been conducted, most used correlational designs relating behavior-specific self-efficacy to risk behavior or psychological adjustment. Self-efficacy has also been evaluated as a mediator in risk-reduction intervention trials. Scharts-Hopko, Regan-Kubinski, Lincoln, and Heverly (1996) explored the relationship among HIV specific self-efficacy and

uncertainty, social support, problem-solving coping, and psychological distress among HIV-infected mothers. Perceived self-efficacy was inversely associated with psychological distress and duration of an HIV-infected child's illness. It was positively associated with mothers' use of problem-solving coping strategies.

In a study of psychosocial factors that contribute to HIV-related attitudes and behaviors, Brown, Kessel, Louris, Ford, and Lipsett (1997) studied the association among condom use self-efficacy, HIV-related anxiety and behaviors, and peer relationships among adolescent, psychiatric inpatients. Self-efficacy for condom use was significantly and positive associated with HIV-related knowledge, tolerance for people with AIDS, and general risk tendencies. Patients, especially female patients, with a history of sexual abuse indicated less condom use self-efficacy than did participants who had not been abused. Faryna and Morales (2000) studied condom use self-efficacy in relation to HIV-related risk behaviors and substance use among ethnically diverse adolescents. The only consistent finding in this study was a negative relationship between self-efficacy for condom use and number of sexual partners. The self-efficacy-related correlates of behavior identified in these HIV studies are consistent with those found in other health related fields (Brown et al., 1997).

A group of investigators studied social-cognitive theory (SCT) mediators of behavior change in a large trial of an intervention to reduce HIV risk behaviors among low-income adults (Updegraff et al., 2002). They hypothesized that self-efficacy, along with other SCT variables, would mediate the effect of the intervention. Participants were randomized to a small group intervention involving risk information, sensitization, and skill building or an information only group. Five behavior-specific self-efficacy indices

for conversation, overcoming partner and hedonistic resistance, leaving the situation, and an overall efficacy index were derived. Self-efficacy added a small amount to the variance for behavior change, but the effect of the intervention on self-efficacy was quite small compared to other variables.

The authors (Updegraff et al., 2002) suggested that the group format weakened the skill building component resulting in the small effect for self-efficacy, and that social desirability may have influenced some of the unaccounted for variance. This raises an interesting question as to the comparative effect of multimodal group interventions, which predominate in the HIV literature, and more parsimonious interventions, such as expressive writing, that can be conducted in a non-social setting. The proposed study is the first known to introduce this type of intervention into this population. While not solely directed at behavioral outcomes as in the above study, knowledge attained from the writing intervention may add to the armamentarium of intervention options in HIV infected or other chronically ill populations.

Cognitive Adaptation Theory and the Search for Meaning

As noted above, the central themes or adjustment processes of cognitive adaptation theory involve attempts to regain mastery, efforts to restore self-esteem, and a search for meaning when faced with threatening information. The theory suggests that beliefs around these themes act as psychological resources that can preserve mental health under threat and can protect and promote physical well-being (Taylor et al., 2000). The search for meaning reflects a need to understand why a threatening event has

occurred and to make causal attributions as to why the event occurred (Heider, 1958; Kelley, 1967; Taylor, 1983).

Finding meaning is associated with the perception that one's life makes sense and that life is worthy of commitment and engagement (McSherry & Holm, 1994). The value of finding meaning is well-supported in the literature on recovery from traumatic or stressful events (Tedeschi, Park, & Calhoun, 1998; Thompson, 1991). Horowitz (1986) theorized that cognitive processing of traumatic events often provides information that may upset existing schemas forcing the development of new schemas that incorporate and match the reality of the events (Horowitz, 1986). Such events may change one's basic assumptions about the self, the world and one's place in it, leading to extensive cognitive processing in order to make sense of the event (Janoff-Bulman, 1992).

Little is known about the relationship between finding meaning and health or illness related factors (Taylor et al., 2000). In a study of heart attack patients, Affleck, Tennen, Croog, and Levine (1987) found that finding meaning, such as obtaining benefit or changing life views or values, was associated with less cardiac morbidity. Using the Sense of Coherence (SOC) construct as a marker for meaning, Zhang, Vitaliano, Lutgendorf, Scanlon, and Savage (2001) examined the buffering effect of SOC in the relationship between chronic stress, fasting glucose, and insulin levels among Alzheimer patient caregivers and non-caregiving controls. Among male caregivers, SOC scores were negatively related to glucose levels at study entrance and 15 to 18 months later.

In the HIV literature, Bower, Kemeny, Taylor, and Fahey (1998) explored whether finding meaning in a bereavement experience would prevent negative expectations from developing, resulting in a protective effect against deteriorating health

among HIV positive gay men. Meaning was defined as a shift in values, priorities, or perspectives because of the loss. Transcribed interview sessions were coded for evidence of cognitive processing and meaning. Men who found meaning in their bereavement experience showed a significantly less rapid decline in CD4 positive T lymphocytes over a two to three year follow-up period and significantly lower rates of AIDS-related mortality over a four to nine year follow up period. Engaging in cognitive processing alone was not sufficient to produce this effect. Furthermore, these findings were unrelated to affective measures of optimism or negative affectivity, suggesting that the relationship between finding meaning and CD4 positive T lymphocyte maintenance is not mediated by emotion. For the purposes of this study, the search for meaning is operationalized as an outcome variable.

Research Questions

Based on the knowledge derived from the relevant empirical literature and the theoretical foundation presented above, this study will explore how individual differences in levels of cognitive adaptation might modify the effects of the expressive writing intervention on the study outcomes related to psychological well-being, health status, and adherence to HIV treatment. Differential effects of the intervention on these outcomes will also be explored. The specific research questions are as follows:

1. Do individual differences in cognitive adaptability moderate the effects of expressive writing on outcomes related to psychological well-being, health status, and treatment adherence among persons with HIV infection?

2. At one-month post-intervention, are there differences between the experimental and control groups on the following outcomes related to psychological well being: positive and negative affect, HIV-specific cognitive adaptability, HIV-related sense of meaning, global sense of meaning, and perceived stress?
3. At one-month post-intervention, are there differences between groups on the following outcomes related to self-reported and objective health status: the total number and intensity of self-reported HIV-related symptoms, HIV-related physical functioning, HIV-related quality of life, and the number of illness-related clinic visits?
4. At one-month post-intervention, are there differences between groups on the following outcomes related to adherence to treatment regimen: Number of missed clinic visits and medication adherence?

CHAPTER III

METHODS

Study Design

This study is an exploratory, repeated measure, randomized intervention study of the effects of emotional expression on psychological well-being, self-reported health status, and adherence among persons with HIV infection and AIDS. Upon enrollment, participants were randomized to an experimental condition where they wrote about past or current stressful life events or a control condition where they wrote about non-emotional topics. At baseline, participants completed a series of questionnaires to obtain demographic information, individual levels of cognitive adaptability, and several measures of psychological well-being, self-reported health, and treatment adherence status which were reassessed at a one-month follow-up visit.

Research Setting

The data were gathered in a private setting in a large clinic that serves as a major provider of comprehensive HIV-related care and services in the Middle Tennessee Area. The Comprehensive Care Center draws patients from Middle Tennessee, Southern Kentucky, and Northern Alabama. Data were also obtained at the General Clinical Research Center at the Vanderbilt University Medical Center.

Sample Size

A meta-analysis of earlier studies among healthy participants suggests that the overall effect size of the intervention is $d = .47$ (Smyth, 1998). To date, the effect size of the intervention in various chronic illnesses, including HIV infection, is unknown. Using a more conservative estimate of $d = .30$, power computations for a balanced design indicate that a minimum of 102 participants (51 per experimental group) would be required to achieve 80% power with alpha set at .05 (Shuster, 1990). Allowing a 15% loss to follow up, a minimum of 118 participants (59 per group) would be required for this study. The final sample size on whom complete data were obtained in the current study is 37 participants. As such, this study is an exploratory intervention study designed to inform future work in this field.

Participant Recruitment

Study participants were recruited via advertisements in local newspapers, flyers placed in clinical settings and community-based organizations that provide care and services for those infected and affected by the HIV epidemic, and by referral from HIV health care providers. To be eligible for enrollment, participants met the following inclusion criteria: (a) able to read and write in English; (b) able and willing to give informed consent; (c) HIV-seropositive by self report and confirmatory chart review; d) at least 18 years of age; and (e) ambulatory and able to sit and write for 20 minutes. Participants were excluded from participation if they had a history of any of the following: (a) previous suicide attempts or ideation; (b) a previous diagnosis of

posttraumatic stress disorder (PTSD); or (c) current or past diagnosis of a psychotic disorder requiring hospitalization.

Eighty-nine potential participants responded by telephone expressing interest in the study. Forty-five (50.6%) of these were ineligible based on the inclusion or exclusion criteria ($n = 11$), declined enrollment ($n = 10$), or were lost to follow up ($n = 23$). Of the remaining 44 (49.4%) participants, 20 (45.6%) were randomized to the experimental group and 24 (54.4%) to the control group. For unknown reasons, four participants (1 experimental and 3 control) dropped out after completing their first writing session and were subsequently lost to follow up. Two additional participants in the control writing condition withdrew after completing two writing sessions and another withdrew after completing all four writing session. Reasons for withdrawal of these control participants included drug relapse ($n = 2$) and illness requiring hospitalization ($n = 1$). This resulted in a final sample size of 37 participants on whom complete data were obtained, 19 in the experimental group and 18 in the control group. Recruitment and enrollment were completed in 10 months, and three additional months were required to obtain the complete data set. This information is summarized in a profile of trial screening, randomization and completion (Figure 1).

Screened: 89

Randomized: 44 (49.4%)

Not randomized: 45 (50.6%)

Experimental: 20 (45.6%)	Control: 24 (54.4%)	Ineligible: 11 (24.5%)	Lost/declined: 34 (75.5%)
LTFU: 1 Completed v2	Drug relapse: 2 Completed v3, v 5 Illness/hosp: 1 Completed v3 Withdrew/LTFU: 3 Completed v2, v2, v1 v1	Suicide/ideation: 9 PTSD: 1 HIV-: 1	LTFU: 23 No interest: 7 Money: 2 Moving: 1 Timing: 1
Completed trial: 19	Completed trial: 18		

Figure 1. Profile of trial screening, randomization, and completion ($N = 37$)

Study Participants

The sample included 27 HIV seropositive men and 10 HIV seropositive women. The mean age of the sample was 44.2 years ($SD= 9.6$). One-half of the participants classified themselves as White, while the remaining half self-identified as either Black (47.2%) or Native American (2.8%). A small percentage of participants (2.7%) identified themselves as Hispanic. The majority of participants answering the question reported their sexual orientation as heterosexual (47.1%), followed by homosexual (44.1%), and bisexual (8.8%). The time since HIV diagnosis for all participants averaged 7.8 years ($SD = 5.0$). For those with a diagnosis of AIDS (32.4%), an average of 1.7 years ($SD = 5.0$) had elapsed since diagnosis. Eighty two percent of participants were on medication regimens that included the use of antiretroviral agents.

The majority of participants (86.5%) reported acquiring their HIV infection through sexual contact only. In contrast, only a small percentage of participants reported acquiring infection through exposure to blood products only (8.1%) or sexual contact and blood exposure (2.7%). Surprisingly, no participants identified injection drug use as their primary mode of HIV infection, although 2.7% reported having acquired the infection via both sexual contact and IDU. Over half of the participants (51.4%) reported exercising an average of 2.5 days per week. The preponderance of participants (59.5%) reported smoking an average of 7.4 cigarettes a day, while 44.4% reported drinking alcohol on a daily basis. About 15% of participants reported taking antiretroviral medication and approximately one quarter (23.5%) of study participants reported experiencing significant, repeated past traumas in their lives. Baseline characteristics of the total sample by intervention group are shown in Table 1.

Table 1. Baseline Characteristics of the Total Sample By Intervention Group

Characteristics	Experimental (<i>n</i> =19)	Control (<i>n</i> =18)	Total (<i>n</i> =37)
Age, mean (<i>SD</i>)	43.9 (10.5)	44.3 (6.5)	44.2 (8.6)
Male %	68.4	77.8	73
Hispanic %	5.3	0	2.7
Black	47.3	44.4	45.9
White	47.4	55.6	51.4
Native American	5.3	0	2.7
Homosexual	44.1	56.3	39.5
Heterosexual	47.1	41.2	42.1
Bisexual	5.9	11.8	7.9
Smokers %	68.4	50	59.5
Cigarettes per day, <i>M</i> (<i>SD</i>)	8.3 (7.1)	6.5 (8.9)	7.4 (7.9)
Drinkers %	55.6	33.3	44.4 ¹
Drinks per day, <i>M</i> (<i>SD</i>)	.42 (1.0)	.45 (1.0)	.43 (1.0)
Regular exercise %	42.1	61.1	51.4
Exercise days/week, <i>M</i> (<i>SD</i>)	1.6 (2.1)	3.5 (3.1)	2.5 (2.8) ²
Hours sleep/night, <i>M</i> (<i>SD</i>)	7.0 (1.2)	7.5 (1.5)	7.3 (1.4)
Years HIV Positive, <i>M</i> (<i>SD</i>)	7.9 (5.4)	7.9 (4.4)	7.9 (5.0)
Diagnosed with AIDS %	15.8	50	32.4 ²
Years with AIDS, <i>M</i> (<i>SD</i>)	1.2 (3.3)	2.4 (3.2)	1.7 (3.2)
Sexual contact only	94.7	77.4	86.5 ¹
Blood products only	0	16.7	8.1
Mixed exposure routes	5.3	0	2.7
Antiretroviral drug use %	47.4	52.6	51.4
Experienced traumas %			
Yes or unsure	35.3	11.8	23.5 ¹

¹(*p* < .2), ² (*p* < .05)

Procedures

Permission to conduct the study was obtained from the Vanderbilt Institutional Review Board as part of a larger project that explores the impact of expressive writing among persons with HIV infection and AIDS¹. Potential participants interested in learning more about the study contacted the investigator or a research assistant by phone and received a brief description of the study and had all of their questions answered. A brief screening questionnaire assessing inclusion and exclusion criteria was administered by phone prior to scheduling the initial appointment.

After obtaining informed consent (see Appendix A for consent document), participants were randomized to an experimental intervention group that wrote about the most traumatic or stressful experiences of their life, or control writing group that wrote about trivial, non-emotional topics. Participants received a group assignment and an identification number via sequentially numbered study packets that were previously prepared and coded according to their group assignment. A computerized random numbers table was used to determine group assignment. Other members of the research team generated and maintained the randomization code and prepared the study packets used in the study. The primary investigator and research assistant were blind to the randomization code until follow-up data had been obtained on all study participants. At the first study visit, consenting participants completed a series of self-report questionnaires to obtain baseline demographic information and measures of cognitive adaptability, psychological well-being, self-reported health status, and treatment adherence.

¹ NIMH grant # 1R21 MH65872-01, Effects of Expressive Writing in Persons with HIV/AIDS, PI: Kenneth A. Wallston, Ph.D.

Participants were then asked to write for 20 minutes, one day a week, for the following four weeks. Writing took place in a private room where they were supplied with a writing tablet, an envelope containing their writing instructions, and another envelope in which to seal their writings upon completion. They were instructed to silently read their assignment and inform the investigator when they were ready to begin writing. The participants were instructed to refrain from discussing their writing assignment or content with the investigator or her research assistant. Precautions were taken to assure that participants were never in contact with other study participants during the course of the study.

A medical records review was conducted for the period three months prior to the first writing session and three months following the fourth writing session. The reviews were conducted in a blinded manner by the principal investigator to obtain confirmatory data on the dates of HIV and AIDS diagnoses, HIV medication history, CD4 counts, HIV viral loads, and the number and types of clinic visits or missed appointments during these timeframes. Medical records were obtained on 32 of the 37 study participants. Records could not be obtained on three participants who did not receive their medical care at the Comprehensive Care Center and on whom provider-specific approval for release of information was unavailable. Two additional participants received their care at an institution requiring an institutional sponsor and additional study approval by their Institutional Review Board before record release. For the purposes of this study, approval was not sought from this institution.

The Intervention

All participants received the following general writing instructions:

Please do not start the timer and begin writing until you have read the instructions. Do not worry about grammar, proper punctuation, or your writing style. Only your study identification number will be associated with what you write. After 20 minutes, you may stop writing. After writing please place what you have written in the envelope and seal it before you give it to the investigator. Thank you.

Participants in the experimental writing condition received the following instructions:

For the next 20 minutes, please write about some extremely upsetting or traumatic event that you have experienced in your life. This can be something that happened long ago, in the recent past, or that is currently ongoing. Write about the experience in as much detail as you can. Really get into it and freely express any and all of the deepest emotions or thoughts that you have about the experience. As you write, do not worry about punctuation or grammar. Just really, let go and write as much as you can about the experience. You can write on different topics each day or on the same topic for all 4 days.

Participants assigned to the control writing condition received one of the following assignments at each of the writing sessions:

Day 1:

For the next 20 minutes, please describe in writing, your plans for the remainder of the day. Try to describe specific events or objects in detail as objectively as you can, without expressing your thoughts, emotions, opinions or beliefs about them.

Day 2:

For the next 20 minutes please describe in writing, the clothes you are wearing today. Try to describe specific objects in detail as objectively as you can, without expressing your thoughts, emotions, or beliefs about them.

Day 3:

For the next 20 minutes please describe in writing, any particular object or event of your choosing. Try to describe specific events or objects in detail as objectively as you can, without expressing your thoughts, emotions, opinions or beliefs about them.

Day 4:

For the next 20 minutes, please describe the contents of your closet. Try to describe the contents of your closet in detail and as objectively as you can, without expressing your thoughts, emotions, opinions or beliefs about them

After 20 minutes, participants stopped writing, sealed their essays in an envelope and returned them to the investigator or her assistant. At the final writing session participants were given the option to have their essays returned to them unopened or to leave them with the investigator for future analysis (only one participant declined the latter option). Immediately prior to and after each writing session, participants completed a symptom and emotion checklist to assess their current mood and physical symptoms. Following each writing session, participants completed a manipulation check assessing their degree of previous disclosure about their writings, the level of emotional disclosure in their writing, and how personal they considered the writings to be.

Study outcomes were obtained one month after the last writing session when the participants again completed all baseline questionnaires, exclusive of the cognitive adaptability measures. They were debriefed about the study and any remaining questions were answered. Participants were paid \$10 per study visit, and their parking or transportation fees were paid. They were encouraged to contact any of the investigative team at any time during or after their formal participation in the study with any comments about the study and to report any adverse effects from study participation.

Research Instruments

The instruments used in this study are presented below along with their psychometric characteristics as gleaned from the literature. The global and condition-specific cognitive adaptability indexes, the HIV-Specific Optimism Scale (HSOS), the

HIV-Specific Meaning Scale (HSMS), and the Perceived Medical Condition Self Management scale were developed and used for the first time in the current study. Pre-intervention internal consistency reliabilities (Cronbach's coefficient α) and correlations among all of the scales are displayed in Table 2. All study instruments are contained in Appendix B.

Control and Moderator Variables

Demographic and Background Questionnaire

A form to collect this information was designed specifically for this study to attain information on study eligibility and baseline demographic information.

Cognitive Adaptability Index

Cognitive adaptability is an individual difference variable that reflects an ability to engage in the process of cognitive adaptation which is defined as a tendency toward enhanced optimism about the future and enhanced beliefs about one's ability to deal with the stressors of life. In this study, the construct was evaluated as a moderator variable measured by the Cognitive Adaptability Index (CAI) developed by Wallston (personal communication, April 14, 2002). An index is a set of individual measures or scales that, when combined, are presumed to be indicative of some more general characteristic (Vogt, 1993).

Indexed measures enhance validity by taking advantage of the inconsistency of the error component of each measure resulting in a true score relative to the error

component (Lipsey, 1990). The CAI used in this study is an index of dispositional optimism as operationalized by the Life Orientation Test (LOT; Scheier & Carver, 1985) and generalized perceived control as operationalized by the Perceived Competence Scale (PCS; Wallston, 1990). The scores on these individual scales were standardized and summed to yield a continuous Cognitive Adaptability Index score. The CAI is a more parsimonious measure of cognitive adaptability than the Cognitive Adaptation Theory Index (CATI; Helgeson, 2003) which consists of several scales that measure dispositional optimism, self-esteem, perceived control, and mastery.

Dispositional optimism is generalized outcome expectancy. The LOT is a widely used eight-item measure of dispositional optimism that asks respondents to rate their agreement with a series of phrases along a six-point Likert scale ranging from *Strongly disagree* (1) to *Strongly agree* (6). Four of the items are positively phrased (e.g., “I always look on the bright side of things”) and four items are negatively phrased (e.g., “I hardly ever expect things to go my way”). The latter four items are reverse scored before summing to obtain a total optimism score. Item scale correlations are all in the moderate range (.37 to .56) suggesting that each item partially measures the underlying construct without being overly redundant (Scheier & Carver, 1985). Cronbach’s alpha for the entire scale is .76, indicating an acceptable level of internal consistency. The test-retest correlation of the LOT is .79, demonstrating adequate stability over time. Convergent and discriminant validity is acceptable with respect to related concepts such as internal locus of control (.34), self-esteem (.48), and helplessness (-.47) (Scheier & Carver, 1985).

Mastery and self-esteem, the other two components of the CATI, were measured using the Perceived Competence Scale (PCS) first developed by Wallston in the late

1980s. The PCS is similar to broader, generalized measures of self-esteem and mastery or perceived control. It is an eight-item measure that is compatible with the concept of “generalized self-efficacy” (Wallston, 1990). Perceived competence is the self-perceived ability to accomplish what one undertakes in order to obtain what is important to oneself. The PCS consists of eight items with six-point Likert response options that range from *strongly disagree* (1) to *strongly agree* (6). As with the LOT, the PCS has four positively worded and four negatively worded items with the latter reverse-scored before summing. The average internal consistency of the PCS in a sample of persons with rheumatoid arthritis was .72, with a test-retest reliability of .73 over a six-month interval (C. A. Smith et al., 1991). Construct validity is adequate, correlating positively with such measures as self-esteem (.64 to .67), dispositional optimism (.61), and trait anxiety (-.57). (K. A. Wallston, communication to potential scale users, March 1, 1990).

Outcome Measures of Psychological Well Being

Positive and Negative Affect

Positive and negative affect were measured using the Positive and Negative Affect Schedule (PANAS; Watson, Clark, and Tellegen, 1988). Positive affect (PA) and negative affect (NA) are two dominant and orthogonal dimensions of affective states that consistently emerge in the literature on this construct (Watson, 1988). Positive affect reflects the extent to which one feels enthusiastic, active, and alert. Persons with high PA scores are characteristically in a state of high energy, with full concentration and pleasurable engagement (Watson, 1988). Negative affect is a general subjective sense of

distress and unpleasant engagement associated with aversive mood states such as anger, disgust, fear, and guilt. Persons with low NA are characteristically in a state of serenity and calmness (Watson, 1988). The PANAS was developed as a brief measure of mood state along the dimensions of PA and NA.

The PANAS is a 20-item scale with 5-point response options ranging from “very slightly or not at all” (1) to “extremely” (5). Words that describe feelings and emotions, such as *interested*, *distressed*, and *proud* constitute the 20 items. The PANAS contains 10 items that load on the PA factor and 10 items that load on the NA factor. Scores are obtained by independently summing the 10 items on each factor. The PANAS may be administered along several different temporal dimensions that ask participants to rate how they feel at the present moment (“right now”), “today,” “during the past few days,” “during the past week,” “during the past year,” and “in general, that is, on the average.” In this study, participants were asked to rate their feelings during “the past week, including today.”

The internal consistency reliabilities of the PANAS are consistently and acceptably high, ranging from .86 to .90 for PA and from .84 to .87 for NA, and are unaffected by the temporal instructions (Watson, 1988). The PA and NA scales are quasi-independent of each other as indicated by their intercorrelations ranging between -.12 to -.23. The scale exhibits moderate levels of stability in every timeframe with test-retest reliabilities ranging from .47 to .68 for PA and .39 to .71 for NA over an eight-week retest interval. Convergent validity is supported by correlations with other affect measures appropriate for the PA or NA factor and range from .76 to .92. The PANAS demonstrates adequate external validity when compared to related measures such as the

Beck Depression Inventory (PA = -.35 and -.36; NA = .56 and .58), the Hopkins Symptom Checklist (PA = -.19 and -.29; NA = .74 and .64), and the State Trait Anxiety Index (PA = -.35; NA = .51) (Watson, 1988).

Perceived Stress

Perceived stress was measured using the Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983). It is generally assumed among health researchers and practitioners that the impact of a stressful event is determined by one's perception of its stressfulness. Responses to threatening events are presumed to be cognitively mediated emotional responses to objective situations. Stressor effects are assumed to occur only when a situation is appraised as threatening and coping resources are deemed insufficient to meet the demand (Cohen et al., 1983). The PSS is a global measure of the degree to which situations are appraised as stressful, and was designed for use in community samples with at least a junior high school education (Cohen et al., 1983).

The PSS is a 14-item scale with 5-point response options ranging from *never* (0) to *very often* (4). Participants are asked to indicate how often during the last month they felt or thought a certain way. For example, participants are asked how often they have been "upset because of something that happened unexpectedly," or how often they have been "able to control irritations in your life." A total PSS score is obtained by reversing the scores of the "positive" items and then summing across all 14 items.

The PSS has adequate internal and test-retest reliability, and demonstrates appropriate concurrent validity (Cohen et al., 1983). Coefficient alpha reliability scores for the PSS range from .84 to .86. Test-retest reliability after two weeks is .85 and .55

after six weeks. As predicted, PSS is significantly and moderately correlated with objective stress levels such as number of life events (.20 to .39) and the impact of life events (.24 to .49). Scores on the PSS also demonstrate convergent validity when compared to measures of depressive symptomatology (.65 to .76), and physical symptomatology (Cohen et al., 1983).

HIV-Specific Cognitive Adaptability Index

The HIV-Specific Cognitive Adaptability Index (HIV-CAI) is a condition specific measure of the cognitive adaptability construct for administration to persons with HIV infection and AIDS. The index, designed for use in this study, consists of two condition-specific scales that are comparable to the more global measures of dispositional optimism and perceived competence described above. The index is composed of the AIDS-Specific Optimism Scale (AIDS-SOS) and the Perceived Self-Management Scale-HIV (PSMS-HIV) which are described in detail below. The AIDS-Specific Optimism Scale (AIDS-SOS) is modeled after the Life Orientation Test (the LOT and its psychometric properties were described above). The AIDS-SOS is a 7-item Likert scale anchored by the phrases *Strongly Disagree* (1) and *Strongly Agree* (6). Sample phrases include “I am not counting on things going my way in the course of my HIV infection” and “Although the future course of my HIV infection is uncertain, I expect the best.”

HIV-specific perceived competence was measured using the Perceived Self-Management Scale-HIV (PSMS-HIV). The PSMS-HIV was derived from the Perceived Medical Condition Self-Management Scale (PMCSMS) (K. A. Wallston, personal communication, July 14, 2002) which is a disease or condition specific version of the

more general Perceived Health Competence Scale (PHCS; Smith, Wallston, & Smith, 1995). The PMCSMS was designed to measure a patient's perceived ability to manage his or her own specific medical condition.

The PHCS is a valid and reliable measure of perceived self-efficacy relevant to one's health in general (Smith et al., 1995). Across all samples, the internal consistency of the scale is high with α coefficients ranging from .82 to .90. Stability estimates vary from very high (.82) over a one-week interval for healthy undergraduates, to moderately high (.60) over approximately 2.5 years among persons with arthritis (Smith et al., 1995). Within samples, the PHCS is consistently correlated within the range of 0.4 to 0.5 with indicators of health status such as global health functioning and physical functioning. Convergent validity is demonstrated by theoretically predicted associations with conceptually related measures of locus of control beliefs such as chance locus of control (-.20 and -.38), passive coping strategies (-.11), hardiness (.72), dispositional optimism (.55), and active coping with pain (.31) (Smith et al., 1995).

Content and face validity of the AIDS-SOS and PSMS-HIV were established by review by three expert judges knowledgeable about the relevant, underlying theoretical constructs. It is anticipated that these scales will have psychometric properties similar to those of the more global measures of dispositional optimism and perceived competence (K. A. Wallston, personal communication, August 21, 2002). The negatively worded items of both scales are reverse scored prior to summing. The index is created by summing the standardized scores of both the AIDS-SOS and the PSMS-HIV.

Sense of Coherence and HIV-Specific Meaning Scales

The search for meaning is an important theme of cognitive adaptation theory. In this context, the search for meaning is defined as the need to understand why a traumatic event occurred, the significance of the event, and what it symbolizes about one's life. The search for meaning is often operationalized using qualitative analyses that look for shifts in values and priorities (Bower, Kemeny, Taylor, & Fahey, 1998). Very few quantitative measures of either global or disease-specific meaning can be found in the literature. The Sense of Coherence (SOC) Scale (Antonovsky, 1987) is a self-report questionnaire often cited in the empirical literature as a quantitative measure of meaning. It is defined as a "global measure of the extent of one's confidence that the environment is structured and predictable, that the necessary resources are available to meet the demands of the environment, and that these demands or challenges are worthy of investment and engagement" (Antonovsky, 1987, pg 19). The HIV-Specific Meaning Scale (HSMS) used in this study was adapted from the SOC and used for the first time in this study. The psychometric properties of the SOC and a description of the development of the HSMS are presented below.

The development of the SOC represented a departure from the pathogenic model of response to stress, traditionally concerned with identifying factors that predict the onset of disease, to a salutogenic model that is concerned with factors promoting movement toward the healthy end of the health/disease continuum (Antonovsky, 1987). The SOC is composed of three elements: (a) comprehensibility, or the degree to which one feels that perceived internal and external stimuli make sense, are ordered, and are relatively consistent rather than chaotic, unpredictable, or inexplicable; (b) manageability,

or one's perception of access to adequate resources to deal with the challenges posed by these stimuli; and (c) meaningfulness, or the subjective feeling that life makes sense and that some parts of one's life are worthy and warrant engagement and commitment (McSherry & Holm, 1994).

The short form of the SOCS is a 13-item questionnaire that is scored along a 7-point Likert scale with two anchoring phrases such as, "Until now life has had: (1) 'no clear goals or purpose at all' [to] (7) 'very clear goals and purpose.'" After reverse scoring five of the 13 items, the scores are summed to attain a total SOC score. A high score represents a strong SOC. The psychometric properties of the SOC support its reliability and validity. Its internal consistency is high, with Cronbach's alphas ranging from .82 to .93 (Antonovsky, 1993). Test-retest reliability ranges from .80 at six months to .52 at one year of follow-up (Antonovsky, 1993). The scale has been used in many studies, among various populations (Antonovsky, 1993).

The SOC significantly correlates with measures of generalized perceptions of self and the environment (e.g., self-esteem [.49 to .63], anxiety [-.31 to -.75], perception of perceived stressors [-.22 to -.67], health and well-being [.32 to .46], physical and psychological symptoms [-.26 to -.59], and attitudes and behavior [emotion-focused coping -.53; social skills .27]). Factor analysis indicates that the three elements of the SOC scale load on only one factor suggesting that there is no basis for distinguishing between subscores on the individual elements of the scale (Antonovsky, 1993).

As noted above, the HSMS was adapted from the SOC for use in this study. The HSMS is an eight-item questionnaire that is responded to along a 7-point Likert response scale with the anchoring phrases "Strongly Agree" and "Strongly Disagree." The eight

items were derived from the meaningfulness subscale of the SOC and were designed to solicit responses to statements about one's life as a person living with HIV infection. Following the general introductory statement, "As a person living with HIV infection...", sample phrases include "Until now my life has had no clear goals or purpose at all" and "I anticipate that my personal life in the future will be full of meaning and purpose." Face validity was established by review of experts familiar with issues relevant to persons with HIV infection, meaningfulness, and related constructs. During the development stage, the questionnaire was administered to persons with HIV infection, other chronic illnesses, and among healthy participants unfamiliar with the study. The positively worded items are reversed prior to scoring and summing with the negatively worded items, to attain a total score with a possible range of eight for low AIDS-specific meaning to 56 for high AIDS-specific meaning.

Outcome Measures Related to Health Status

HIV-Related Quality of Life

Quality of life is described as the discrepancy between a person's expectancies and their present experiences (Calman, 1985). HIV-related quality of life was determined using the Medical Outcomes Study-HIV Health Survey (MOS-HIV) (Wu et al., 1991; Wu, Revicki, & Malitz, 1997). The MOS-HIV is a brief, multidimensional, and comprehensive measure of health-related quality of life (HRQoL) used extensively in HIV/AIDS research. It is a 35-item, self-report questionnaire that includes 11 subscales and takes about five to ten minutes to complete. The ten dimension of the MOS-HIV

include general health perceptions, pain, physical functioning, role functioning, social functioning, cognitive functioning, mental health, energy, health distress, health transition, and general quality of life. As noted above, the physical functioning subscale of the MOS-HIV is a key outcome variable in and of itself, and was removed from the more general HIV-related quality of life measure for use in this study.

The MOS-HIV (Wu et al., 1991) is a self-report measure of HIV-related health status developed for the Medical Outcomes Study (Stewart, Hays, & Ware, 1988; Ware & Sherbourne, 1992). The items ask participants to respond to questions requiring either a “yes” or “no” response that varies according to the question being asked. The subscales of the MOS-HIV are treated as summated rated score and converted to a 0 - 100 scale with higher scores indicating better health or quality of life (Riviki, Sorensen, and Wu, 1998; Wu, et al., 1997). The reliability, validity and usefulness of the MOS-HIV are well documented and have been used extensively in studies of HIV and AIDS (Wachtel et al., 1992; Riviki, Sorenson, and Wu, 1998; Badia et, al., 2000; Sousa, Holzemer, Henry, & Slaughter, 1999; Wu, Hays, Malitz, & Bozette, 1997; Weinfurt, Willke, Henry, Freimuth, & Schulman, 2000). A number of studies support the internal consistency reliability of the MOS-HIV scales. In the majority of studies, Cronbach’s α coefficients suggest adequate reliability across group comparison, often exceeding 0.70 (Wu et al., 1991; Burgess, Dayer, Catalan, Hawkins, & Gazzard, 1993; Wu, Lichter, Richardson, et al., 1992; Scott-Lennox, McLaughlin, & Mauskopf, 1996; Wu, Reviki, Jacobson & Malitz, 1997; Riviki, Wu, & Brown, 1995; Reviki, & Swarts, 1997). Multitrait analyses suggest that the scales measure distinct health related constructs over time (Wu et al., 1997; Wu, Rubin, Matthews, et al., 1988), and support the convergent and discriminant

construct validity of the scales. Concurrent validity is indicated by numerous studies that demonstrate moderate and significant correlation with other established indicators of health (O’Leary, Ganz, Wu, Coscarelli, & Peterson; Wu, Rubin, & Brown, 1998; Givitz & Reviki, 1995).

HIV-Related Physical Functioning

Physical functioning refers to one’s ability to provide for the necessities of life, including activities that people do in their normal course to meet their daily needs. HIV-related physical functioning was measured using the six-item physical functioning scale of the MOS-HIV (Wu, et al., 1991). The physical functioning scale of the MOS-HIV is a self report measure of how long one’s health has been limited in six activity areas: vigorous activities such as lifting; moderate activities such as carrying groceries, climbing stairs, bending or lifting, walking one block; and activities of daily living. Responses range along a three-point scale consisting of the following responses: “Limited for more than three months” (1); “limited for the last 3 months” (2); and “Not at all limited” (3).

The scale is scored by summing the score on individual items and converting them to a 0-to-100 point scale with 100 representing the best physical functioning. Single dimension subscales of the MOS, such as physical functioning, have been used in health survey and nutritional studies (Bergner, 1981; Read et al., 1987; Stewart and Ware, 1992) including studies that assessed patients with HIV infection (Sousa et al., 1999; Wachtel et al., 1992; Wu et al., 1991, Wu et al., 1997). In HIV infected samples

the internal consistency reliability coefficients (Chronbach's alpha) range from $\alpha = 0.83$ to 0.89).

Construct and discriminant validity are indicated by moderate and significant correlations consistently found between scores on the physical functioning subscale, subjective measures of disease severity such as the Sickness Impact Profile and the Rabeneck Severity Score (Reviki, et al., 1995), and objective measures of disease status such as the Karnofsky Performance Status (Wu et al., 1991; Zander et al., 1993), and the six minute walk performance test (Givertz & Reviki, 1995). The scale is also able to significantly ($p = .001$) discriminate between patients with asymptomatic (mean = 95.6) versus early symptomatic HIV infection (mean = 85.6). The six items of the physical functioning subscale are contained under question four of the MOS-HIV.

HIV-Related Signs and Symptom Reporting

Self-reported HIV related symptoms were measured using the revised Sign and Symptom Check-List for Persons with HIV Disease (SSC-HIVrev; Holzemer et.al, 2002). Symptom reporting and management in HIV clusters around interacting symptoms that result from HIV infection itself, associated opportunistic infections, and the side effects of various therapeutic and prophylactic interventions and medications (Holzemer et al., 1999). Symptoms are defined as "subjective experiences reflecting changes in a person's biopsychosocial function, sensation or cognition" (Holzemer et al., 1999, pg 1043). The model from which the scale is derived includes interrelated dimensions of symptom experience, symptom management, and symptom outcomes.

The SSC-HIVrev scale focuses on the dimension of symptom experience including symptom perception, evaluation, and response (Holzemer, 1999).

The SSC-HIVrev is a 74-item checklist that asks participants to identify their symptoms and rate the degree of symptom intensity (mild, moderate, or severe) that best describes the extent of their problem (Holzemer et al., 1999). The factor structure of the scale represents six symptom clusters: fatigue, fear, fever, gastrointestinal upset, shortness of breath, sore throat, numbness, headache, rectal itch, bruising/bleeding, body changes, gynecological-related problem, and 19 items without factor loadings.

Cronbach's alpha reliability estimates of internal consistency for factor scores range from .72 to .82. Content validity was established by a review of the HIV/AIDS literature and concurrence of six expert HIV/AIDS clinicians. Sensitivity to change was established by a significant decrease in symptoms from the time of symptom onset to two weeks post treatment. Modest support for concurrent validity was reported after comparison to the Medical Outcomes Study-Health Status Questionnaire (MOS-HSQ), and a measure of self-care ability (Wu et al., 1991).

If symptoms are present, participants place a checkmark along a three-point scale: one = mild, two = moderate and three = severe intensity. If the symptom is not present, the item is left blank and assigned a score of zero. To obtain a total score, the items of each factor are summed and divided by the number of items for that factor. The factor scores are then summed to a total score for the entire scale. Total symptoms are a count of the number of symptoms checked on a particular day (min. = zero, max. = 74). The total symptom intensity score is a weighting of the symptoms as checked along the three-point scale (min. = zero, max. = 222).

Illness Related Clinic Visits

The number of illness related visits was determined by review of participants' medical records and summary reports of patient visits for the three months prior to the first writing session and for three months after the fourth writing session. Illness visits were defined as patient-initiated, non-scheduled clinic visits with a chief complaint of a new or exacerbated illness or symptom. Visits involving the same complaint that occurred within a 24-hour period were counted as a single visit.

Outcome Measures Related to Adherence

Appointment Keeping

Data on the number of missed appointments for the three months prior to the first writing session and the three months after the last writing session were obtained by chart review. These data were verified, when possible, by clinic visit summary reports obtained from the clinic database accessible only by the clinic administrator.

Medication Adherence

Data on medication adherence were obtained via a four-item self-report scale based on the notion that medication non-adherence may occur by several means: carelessness, forgetting, stopping the drug when feeling well, or inappropriately starting a drug based on self-perceptions of health status (Morisky, Green, & Levine, 1986). Questions were phrased in a manner designed to elicit a "yes" (1) response if reporting nonadherence behaviors, and a "no" (0) response if reporting adherence. This reversed

phraseology is designed to overcome the “yea-saying” bias inherent in the way health care practitioners phrase, and patients respond to, questions of medication adherence (Morisky et al., 1986). Total scores range from zero (very adherent) to four (very nonadherent).

The reliability of the scale is reflected in its internal consistency ranging from 0.61 to 0.71 (Holzemer et al., 1999; Morisky et al., 1986). Patient recall of missed doses for the preceding day, week, and month were elicited by a single item questionnaire with scores ranging from one (every day) to six (never during the last month). The scores on the four items from Morisky et al. (1986) and the recall of missing doses item were standardized and summed to create a single medication-taking index. Two participants who were not on HIV antiretroviral agents at baseline were excluded from the analysis on this measure.

Manipulation Checks

The following measures were used as a manipulation check of the study conditions. They were designed to elicit information about the relative level of emotional arousal following writing and the personal nature of essay content between groups. Participants randomized to the Trauma Writing condition were expected to report more symptoms that indicate emotional arousal and reveal more personal and emotional content in their writings than participants randomized to the Control condition.

The Symptom/Emotion Checklist (SEC)

The SEC is a brief measure of one's physical and emotional symptom state at the present moment (Pennebaker, 1982). It is a 17-item scale with 7-point response options anchored by statements indicting the absence or presence of a symptom or emotional state. Sample statements include "No headache" (1) – "Headache" (7) or "Not happy" (1) – "Happy" (7). Intersymptom correlations average 0.21, indicating that a person reporting one symptom is likely to report others (Pennebaker, 1982). Across samples, the mean Cronbach's alpha coefficient is .75. Together, these estimates suggest that this scale is internally consistent and taps a general proclivity to report symptoms (Pennebaker, 1982). As the SEC was designed to be a state measure intended to tap a person's awareness of symptoms only at the present moment, test-retest reliability is low, ranging from .21 at one month to .07 at four months. This scale was administered immediately prior to and after each writing session.

Perception of Writing Questionnaire

Immediately after each writing session, the participants completed a three-item questionnaire designed for this study to determine participants' perception of how personal their essay was, their degree of emotional expression, and their previous level of disclosure about the essay topic. Participants responded to the items on a seven-point Likert scale anchored by the following statements: "Not at all" (1), and "A great deal" (7).

Table 2. Reliability Estimates and Intercorrelations Among Self-Report Measures at Baseline

Measure	PA	NA	PSS	SOC	MOS-HIV	MOS-PF	LOT	PCS	HIV-SOS	HSMS-HIV	PSMS-HIV
PA	(.92)										
NA	-.39*	(.93)									
PSS	.64*	-.75*	(.83)								
SOC	.59*	-.58*	.75*	(.83)							
MOS-HIV	.49*	-.59*	.65*	.62*	(.96)						
MOS-PF	.23	-.29	.23	.27	.71*	(.82)					
LOT	.72*	-.51*	.67*	.53*	.66*	.39	(.82)				
PCS	.65*	-.63*	.71*	.64*	.73*	.43*	.77*	(.83)			
AIDS-SOS	.40*	-.36*	.54*	.48*	.60*	.28	.59*	.51*	(.76)		
HSMS-HIV	.58*	-.39*	.43*	.42*	.31	.14	.60*	.50*	.30	(.64)	
PSMS-HIV	.41*	-.40*	.55*	.46*	.65*	.31	.60*	.61*	.61*	.36*	(.85)

* $p < .05$. PA (Positive Affect), NA (Negative Affect), PSS (Perceived Stress Scale), SOC (Sense of Coherence Scale), MOS-HIV (Medical Outcomes Study-HIV), MOS-PF (MOS-HIV Physical Functioning scale), LOT (Life Orientation Test), PSCS (Perceived Self Competence Scale), HIV-SOS (HIV-Specific Optimism Scale), HIVMS (HIV Specific Meaning Scale), PSMS-HIV (Perceived Self Management Scale-HIV). Internal consistency (coefficient α) reliabilities are on the diagonal (in parentheses).

Statistical Analyses

Group equivalency was determined by cross tabulation for categorical data and analysis of variance for continuous variables. Manipulation predictions were tested using repeated measures analyses of variance with mean symptom reporting scores and post-writing essay items as the repeated measure variables. Symptom/emotion checklist and post-writing essay scores were tested using 2 x 2 x 4 (group x pre/post scores x day) and 4 x 2 (day x group) ANOVAs respectively. The Pearson product moment correlation coefficient (r) was used to examine intercorrelations among baseline measures. Cronbach's alpha was used to estimate the internal consistency reliability of scales consisting of two or more items.

To answer the major research questions, a series of hierarchical multiple regression analyses were used to examine differences between groups and to examine moderator effects on changes in outcome variables. Baseline scores of the dependent variables were entered in the first step to create a residual score representing the *change* in the outcome variable from baseline to follow-up. Group assignment (effect-coded—1 for Trauma Writing group and -1 for Control writing group) and CAI scores were entered on the second step, followed by the interaction term (group X CAI) which was entered on the third and final step. A significant interaction term is an indicator that baseline cognitive adaptability moderates the relationship between group assignment and change in the outcome variables. This being the case, the interaction is plotted by separately regressing the residual score from step one on CAI scores for each of the two groups and examining the slopes of the two regression lines. If the interaction term is significant, the main effect for Group is not examined. If the interaction term is not significant, the main

effect for group is examined to see how those in the Trauma Writing condition differ from those in the Control Writing condition.

CHAPTER IV

RESULTS

This pilot study was designed to explore how individual differences in cognitive adaptability modify the effects of the expressive writing intervention on the study outcomes. The secondary purpose was to explore the differential effects of the expressive writing intervention on outcomes related to psychological well being, self-reported health status, and adherence to HIV related treatment and medication regimens. Following the preliminary and manipulation check analyses, the key findings on moderator effects and group differences are presented.

Preliminary Analyses

Only participants who completed the study were included in the analysis ($N = 37$). All variables were inspected for outliers defined as two standard deviations above or below the mean. Distributions were visually inspected for normality and Fisher's measures of skewness and kurtosis were calculated to determine if distributions deviated significantly from a symmetrical distribution (Munro, 1997). No outliers were found and there were no significant deviations from normality.

Data were also inspected for missing values. If 75% or more of the items on a particular scale were present, the mean scale item value was retained for that participant. Variables on which 25% or more of the values were missing were inspected for non-random patterns of missing data by comparing groups containing missing values and

groups without missing values on that variable (Hertel, 1976). If significant differences emerged suggesting a non-random pattern of missing data, those variables on which 15% or more of the participants were missing data were eliminated from analysis (Hertel, 1976). All scales and variables were retained in the analyses. Random missing values were replaced by the group mean prior to analysis. One participant who failed to complete the PANAS and MOS-HIV at the one-month follow-up was removed from analysis on those measures.

Group Equivalency

To enhance the sensitivity of equivalency determinations, alpha was set at $p \leq .2$. The experimental and control groups were equivalent on all demographic variables except for drinking status, days of exercise per week, self-reported AIDS diagnosis, route of HIV infection, and number of significant, repeated traumas (see Table 1). The experimental group had a greater proportion of drinkers than did the control group and were more likely than the control group to have acquired HIV infection through sexual contact only or mixed routes of exposure. The control group reported more days of exercise per week than the experimental group and were more likely to have acquired HIV infection through exposure to blood products only than the experimental group. In addition, the trauma-writing group was more likely to report being certain or unsure about experiencing significant, repeated traumas.

The participants on whom complete data were obtained differed from those on whom the data were incomplete on only three variables: the number of study dropouts ($p = .05$); the number of suicide attempts in the last three years ($p = .05$), and race ($p < .20$).

The control group accounted for 86% of the participants (6/7) who began the study and dropped out prior to study completion. As was noted in Chapter III, the control group experienced a disproportionate number of drug relapses, hospitalizations, or were lost to follow up for unknown reasons. One participant in the trauma-writing condition withdrew without explanation after completing all writing sessions. This person simply did not return after completing the first writing session but subsequently made contact five months later requesting study completion. Although the individual was permitted to complete the final visit, the data on this individual were excluded from the final analysis. Non-completing participants were more likely to be black or African American, accounting for 85.7% of those who withdrew from the study. One participant entered the study after denying a previous history of previous suicide attempts at baseline questioning, but later admitted to a previous suicide attempt. This person completed the study without incident and his or her data are included in the analysis.

Manipulation Checks

Symptoms and Emotions

It was predicted that the manipulation, if effective, would result in increased physical and emotional symptom reporting immediately after writing among the Trauma Writing participants with no increase in symptoms for the Control Writing participants. This prediction was supported by a significant group by pre-post-writing interaction ($p = .035$). Trauma writing participants reported a significant increase in the intensity of symptoms from the pre-writing ($M = 1.98$) to post-writing ($M = 2.15$) time points, while

the control group reported a decrease in symptom intensity from before ($M = 1.93$) to after writing ($M = 1.77$). Other findings include a significant main effect for day of intervention ($p = .04$) indicating an overall decline in symptom scores across the days of the intervention, and a significant day by pre- and post-writing effect ($p = .029$) indicating an overall decline of differences between pre-post-writing scores over time. Figure 2 depicts the effect of the experimental manipulation on post-writing symptom reporting by group, and Figure 3 illustrates the decline of pre- to post- writing scores over time.

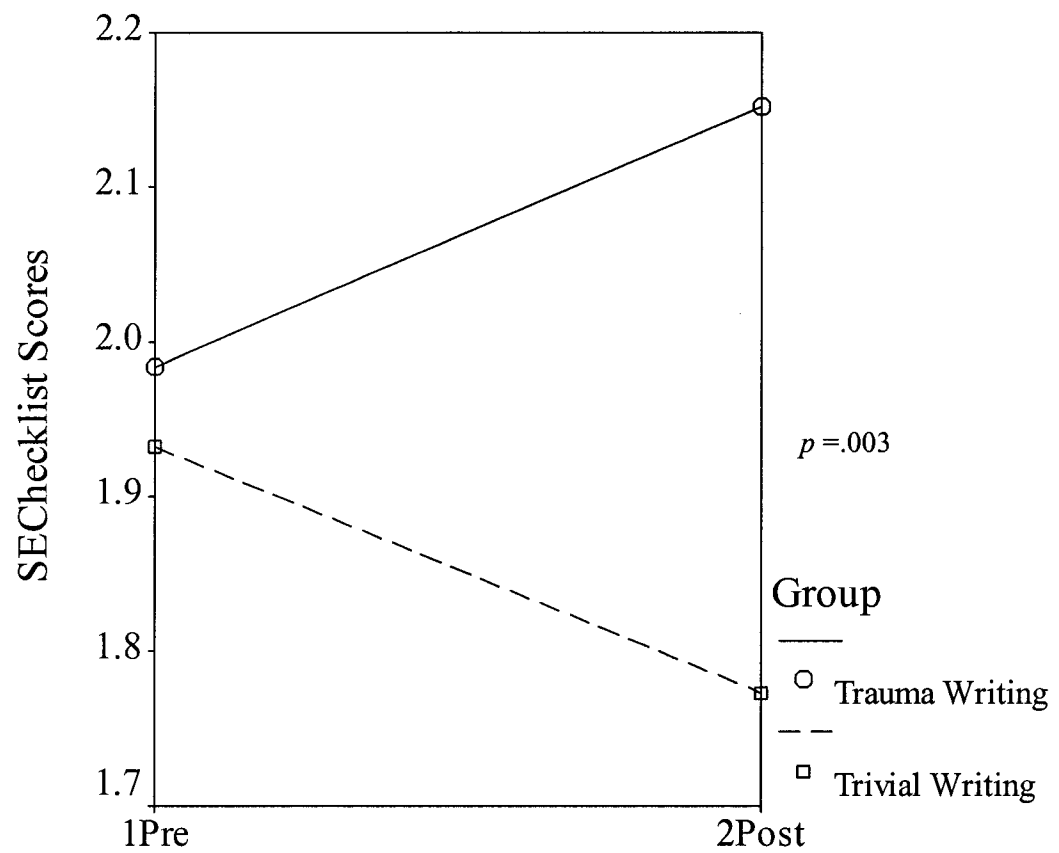


Figure 2. Effect of expressive writing on symptom reporting immediately prior to and after writing by group

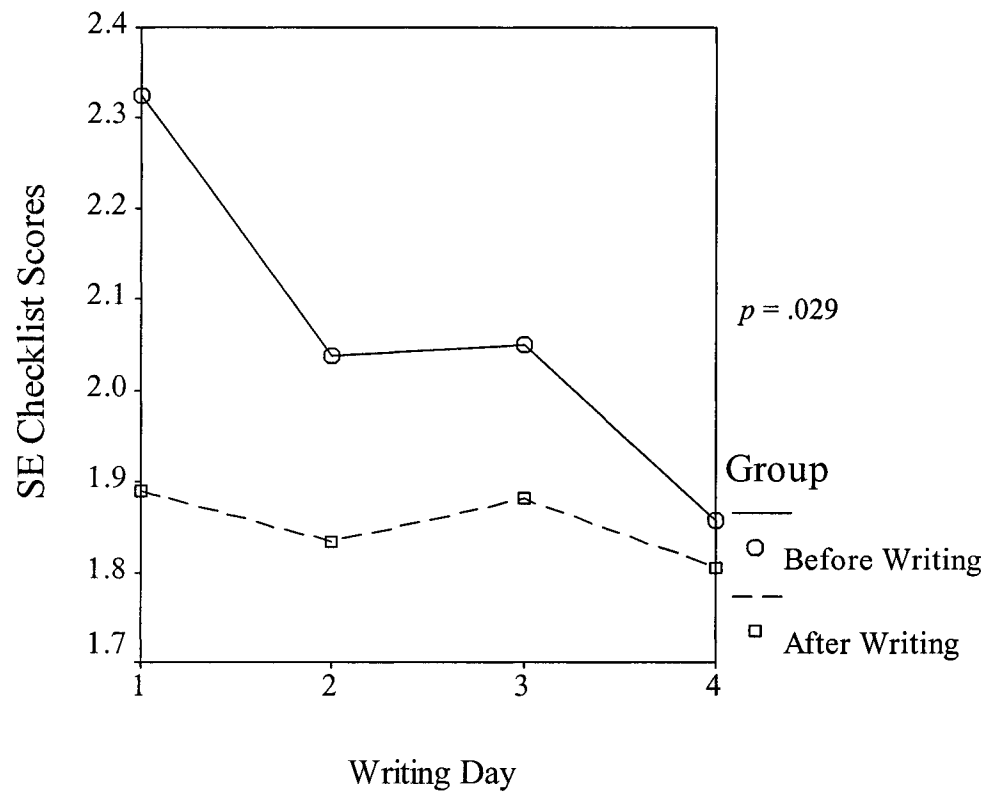


Figure 3. Change in symptom/emotion checklist scores across writing days

Perception of Writing

It was expected that the Trauma Writing group would rate their essays as revealing significantly more personal and emotional content than the Control Writing group. It was also expected that the Trauma Writing group would have, to a greater degree than the Control group, held back from revealing the essay content to others. These predictions were tested using a four x 2 (Day x Group) repeated measures ANOVA with the scores on each question as the repeated measure. These analyses supported the expectation of significant differences between the trauma and trivial writing groups on the personal and emotional nature of the essays and on previous inhibition to revealing their content ($p < .05$). Within groups, there were no significant changes over time in the amount of emotions revealed or the extent of previous disclosure. Figure 4 illustrates the difference between groups on post-writing reports of essay content.

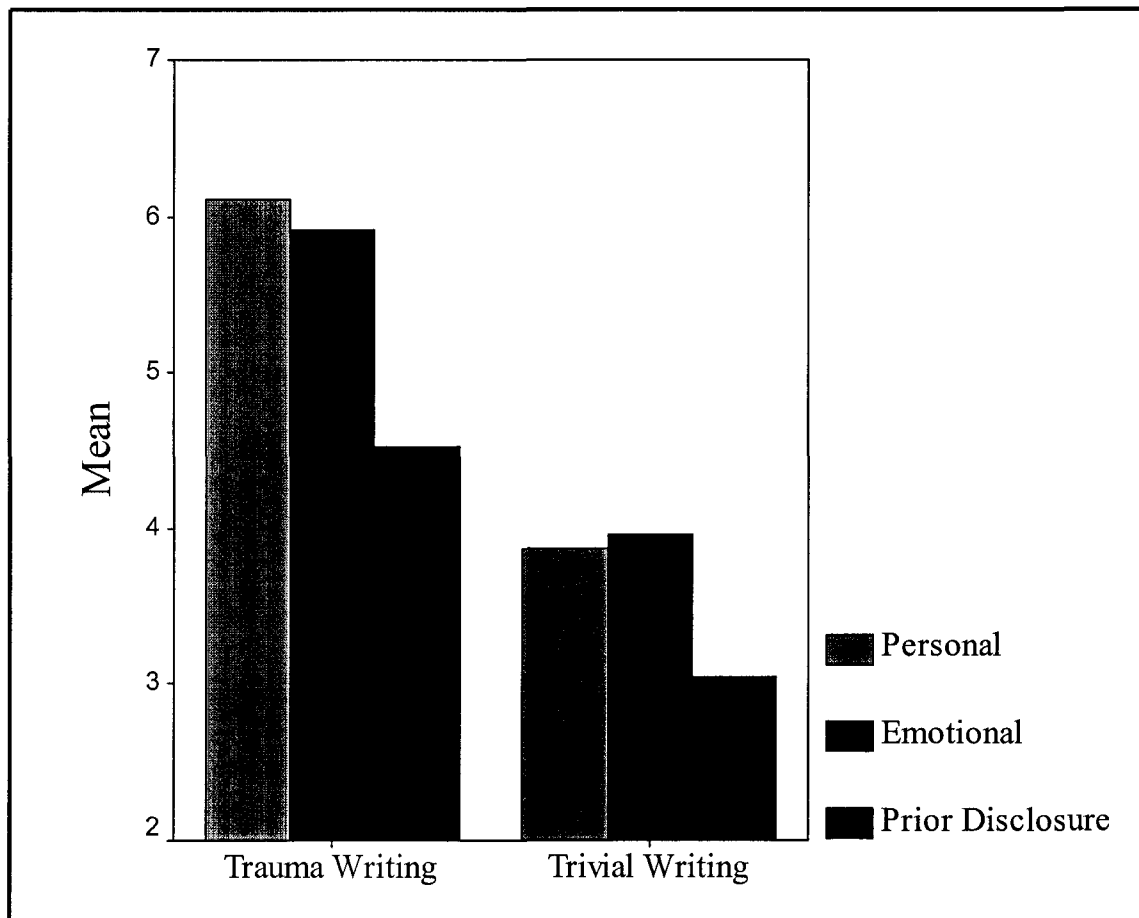


Figure 4. Group differences on post-writing reports of level of personal, emotional, and previously revealed essay content

Baseline Analyses

The constructs examined in this analysis include positive and negative affect, perceived stress, HIV-specific cognitive adaptability, global sense of coherence, HIV-specific meaning, the total number of HIV-related symptoms, symptom intensity, physical functioning, HIV-related quality of life, medication adherence, and the number of illness-related clinic visits and missed appointments three months before the writing intervention. Analyses on baseline measures indicate that the experimental and control groups did not differ significantly on any of these variables. Means and standard deviations of baseline factors by group are presented in Table 3.

Table 3. Means and (Standard Deviations) of Baseline Psychological, Health Status, and Adherence Variables by Group Assignment

Psychological Factors	Experimental (<i>n</i> = 19)	Control (<i>n</i> = 18)	Sample (<i>n</i> = 37)
Positive affect	3.14 (.99)	3.1 (.71)	3.1 (.85)
Negative affect	2.47 (1.02)	2.19 (.98)	2.33 (1.0)
Perceived stress	2.97 (.63)	3.29 (.52)	3.12 (.59)
Sense of coherence	4.25 (1.07)	4.62 (1.01)	4.23 (1.04)
HIV-specific CAI	.18 (2.01)	-.19 (1.56)	0 (1.79)
HIV meaning	4.50 (1.04)	4.51 (.82)	4.50 (.93)
Health Status Factors			
Total symptoms	22.79 (18.12)	20.11 (17.39)	21.49 (17.57)
Symptom intensity	15.54 (12.91)	13.25 (13.76)	14.43 (13.20)
Physical functioning	12.38 (3.58)	11.93 (2.54)	12.16 (8.08)
HIV quality of life	46.77 (10.95)	45.14 (10.61)	45.97 (10.79)
Illness visits	.11 (.32)	.67 (1.37)	.33 (.92)
Adherence Factors			
Total missed visits	.17 (.38)	.83 (2.03)	.43 (1.33)
Medication-taking	1.34 (.48)	1.16 (.21)	1.26 (.38)

Moderating and Group Main Effects

The first question was concerned with the moderating effects of cognitive adaptability on the thirteen outcomes related to psychological well-being, health status, and treatment adherence among persons with HIV infection. Questions two, three, and four asked if there are main effects at the one-month follow-up time point between the experimental and control groups on these outcomes. Moderator (i.e., interaction) effects and group differences (i.e., main effects) were addressed in the same hierarchical regression analyses as noted in Chapter III.

As shown in Table 4, baseline cognitive adaptability significantly interacts with group (Trauma Writing or Control Writing) in predicting changes in positive affect, sense of coherence, HIV-specific quality of life, HIV-specific cognitive adaptability, and HIV-specific physical functioning at the one-month follow-up. Among disclosure participants, higher levels of baseline cognitive adaptability strongly predicted increases in positive affect [$F(1, 32) = 4.12, p = .051$], sense of coherence [$F(1/32) = 3.55, p = .069$], and HIV-related quality of life [$F(1,32) = 4.64, p = .039$]. In contrast, baseline cognitive adaptability weakly predicted declines in these same measures among control group participants. See Figures 5, 6, and 7 for graphic displays of these interaction effects.

A somewhat different pattern emerged for HIV-specific cognitive adaptability and HIV-specific physical functioning outcomes. On these measures, higher levels of baseline cognitive adaptability weakly predictive of increases in HIV-specific cognitive adaptability [$F(1,32) = 4.82, p = .035$] and HIV-specific physical functioning [$F(1,32) = 6.19, p = .018$] in the Trauma Writing condition, but, among trivial writers, baseline CAI was strongly predictive of declines in these outcomes (see Figures 8 and 9). There were

no moderating effects of CAI by group assignment (trauma versus trivial writing) for negative affect, perceived stress, HIV-specific meaning, the total number of symptoms, symptom intensity, the number of illness-related clinic visits, medication adherence, or appointment adherence (see Table 5). There were no interpretable group main effects for any of the outcome measures.

Table 4. Results of Hierarchical Multiple Regression Analyses for Significant Changes on Outcome Variables

Outcome Variable	R Square Change			R Square	Beta Weights			Semipartial Correlation ²		
	$\Delta R^2_{\text{step 1}}$	$\Delta R^2_{\text{step 2}}$	$\Delta R^2_{\text{step 3}}$		B_{Group}	B_{CAI}	B_{GxCAI}	sr^2_{Group}	sr^2_{CAI}	sr^2_{GxCAI}
Positive Affect	.306***	.162**	.061**	.528	-.222*	.426**	.252**	.049	.083	.061
Sense of Coherence	.559***	.092**	.035*	.686	-.143	.276**	.198*	.019	.041	.035
HIV Quality of Life	.508***	.146**	.044**	.698	-.199**	.393**	.251**	-.039	.066	.045
HIV CAI	.568***	.035	.052**	.655	-.150	.105	.235**	.022	.006	.052
Physical functioning	.439***	.002	.091**	.532	.028	-.099	.308**	.002	.008	.091

Note. Analyses performed using hierarchical regression entering baseline value of the dependent variable at step 1, group assignment and moderator variable (CAI) at step 2, and the interaction term (group x CAI) at step 3.

^a*** $p < .001$. ^b** $p \leq .05$. ^c* $p < .10$. ^d ΔR^2 = change in R^2 . ^e R^2 = total R^2 . ^f B = beta weight. ^gG = group assignment. ^hCAI = cognitive adaptability index. ⁱGxCAI = interaction of group and cognitive adaptability index. ^j sr^2 = square of the semi-partial correlation.

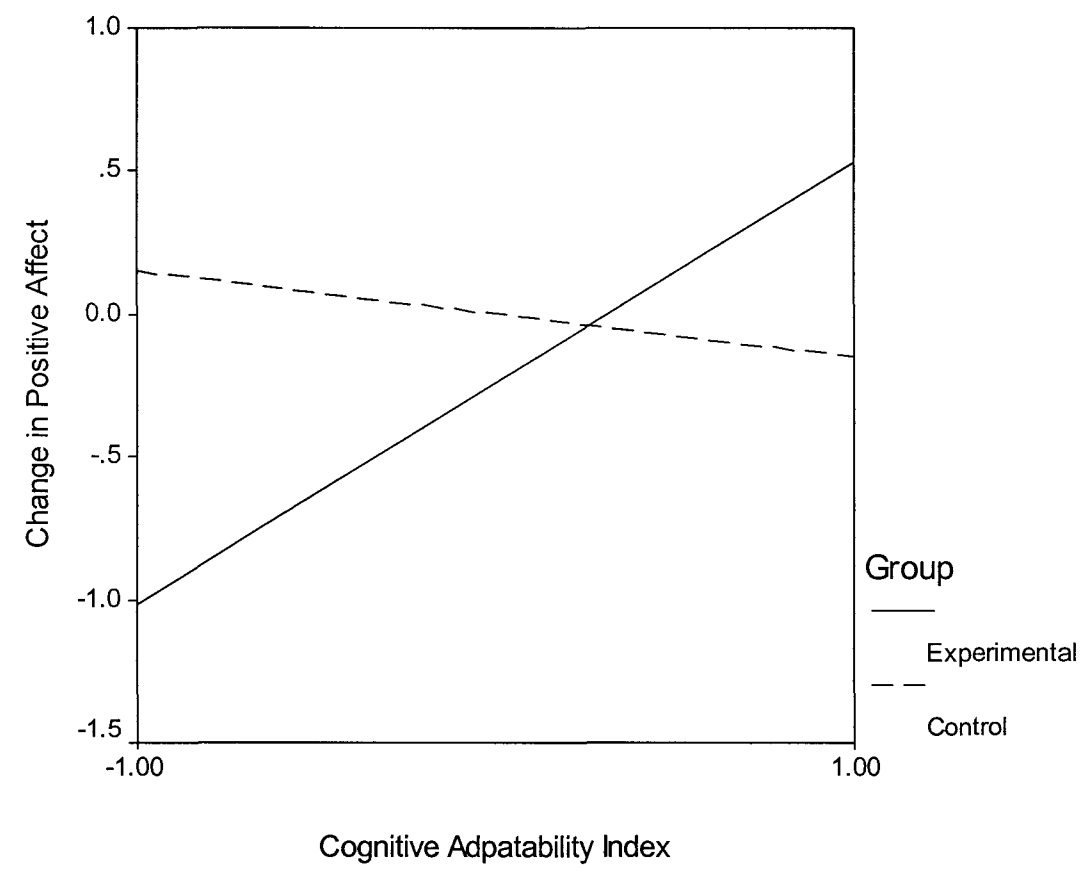


Figure 5. Moderating effect of cognitive adaptability on positive affect scores by group assignment

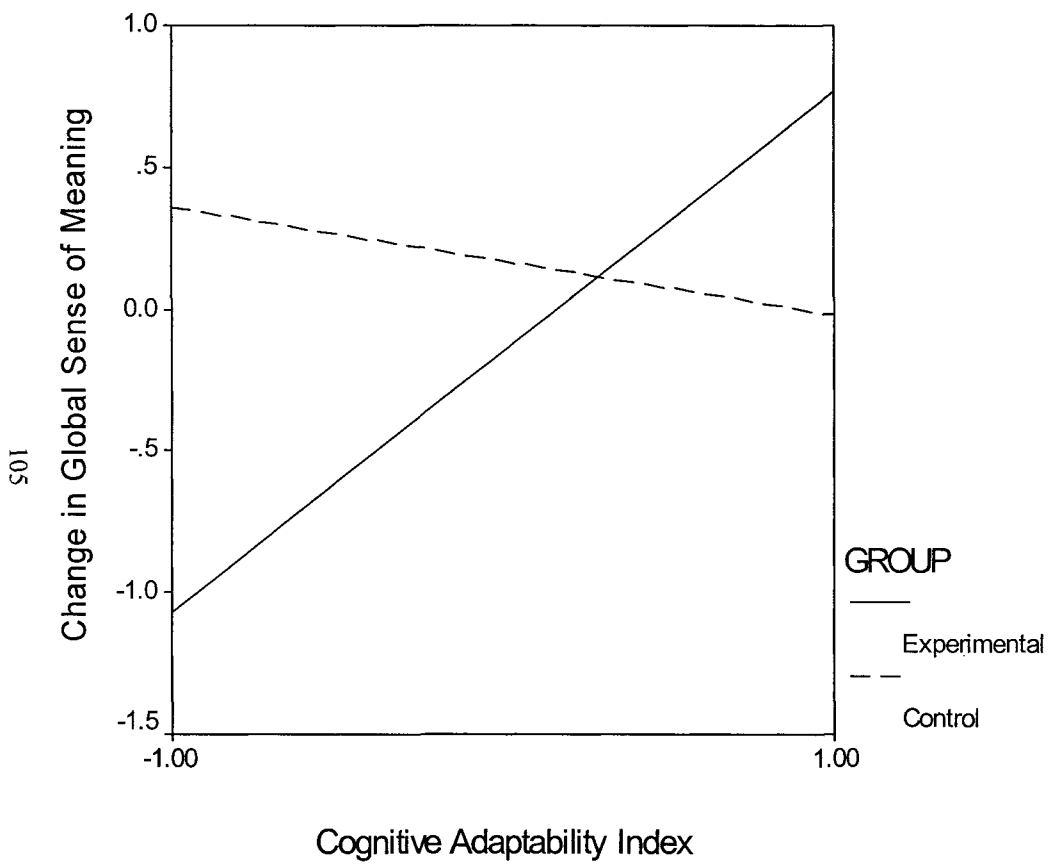


Figure 6. Moderating effects of cognitive adaptability on change in global sense of meaning by group assignment

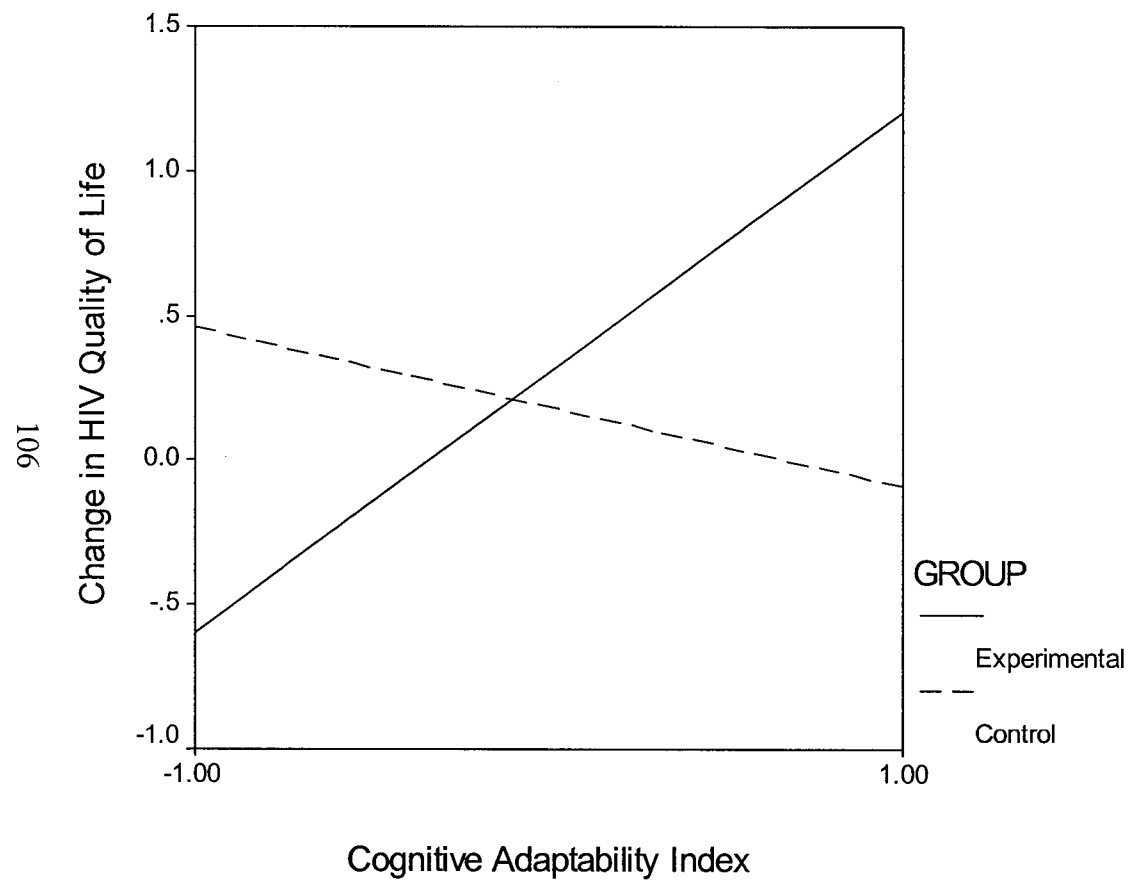


Figure 7. Moderating effects of cognitive adaptability in HIV quality of life by group assignment

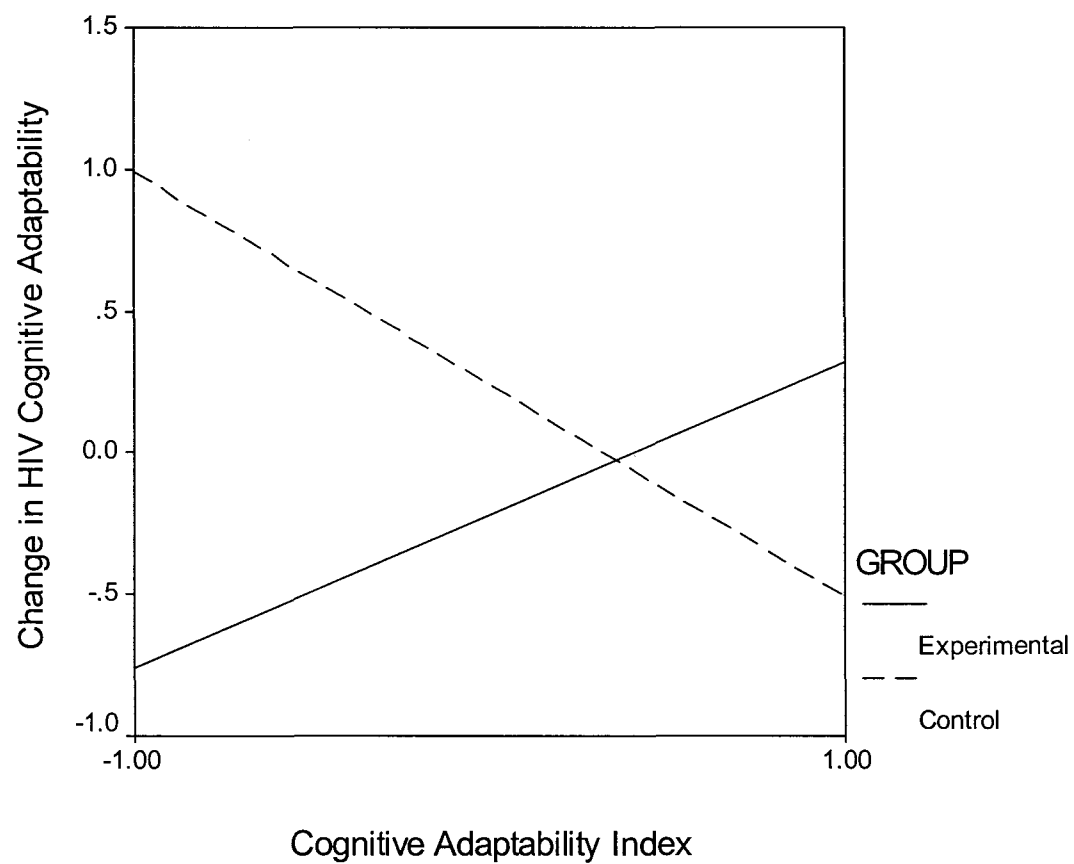


Figure 8. Moderating effects of cognitive adaptability on HIV-specific cognitive adaptability by group assignment

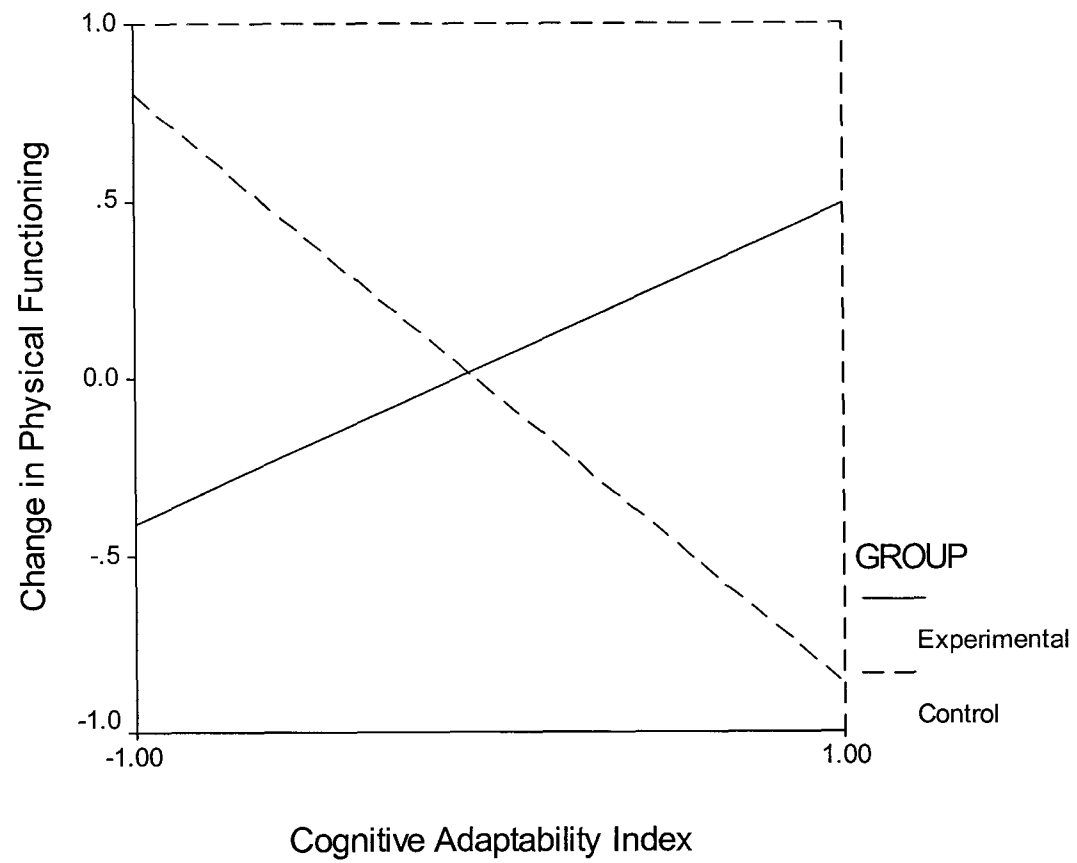


Figure 9. Moderating effects of cognitive adaptability on change in HIV-specific physical functioning by group assignment

Table 5. Results of Non-Significant Hierarchical Multiple Regression Analyses for Changes on Outcomes

Outcome	R Square Change			R Square	Beta Weights			Semipartial Correlation ²		
	ΔR^2_{step}	ΔR^2_{step}	ΔR^2_{step}		B_{Group}	B_{CAI}	B_{GxCAI}	sr^2_{Group}	sr^2_{CAI}	sr^2_{GxCAI}
Negative Affect	.476***	.029	.000	.505	.053	-.208	-.005	.003	.026	.000
Perceived Stress	.481***	.039	.004	.524	-.087	.302	.063	.006	.038	.004
HIV-Specific Meaning	.472***	.007	.025	.460	-.031	.070	.163	.001	.003	.025
Total Symptoms	.370***	.025	.001	.396	.029	.117	.035	.001	.005	.001
Symptom Intensity	.530***	.008	.000	.538	.055	.088	-.019	.003	.005	.000
Illness visits	.313***	.042	.022	.376	-.232	-.154	.201	.037	.014	.022
Missed Appointments	.645***	.012	.000	.811	.114	.013	.012	.034	.000	.000
Medication Taking	.402***	.066	.011	.479	-.027	-.234	-.108	.001	.052	.011

Note. Analyses performed using hierarchical regression entering baseline value of the dependent variable at step 1, group assignment and moderator variable (CAI) at step 2, and the interaction term (group X CAI) at step 3.

^a*** $p < .001$. ^b** $p \leq .05$. ^c* $p < .10$. ^d ΔR^2 = change in R^2 . ^e R^2 = total R^2 . ^f B = beta weight. ^gG = group assignment. ^hCAI = cognitive adaptability index. ⁱGxCAI = interaction of group and cognitive adaptability index. ^j sr^2 = square of the semi-partial correlation.

CHAPTER V

DISCUSSION

This study is the first to explore whether individual differences in cognitive adaptability moderate the effects of expressive writing on outcomes related to psychological well-being, health status, and treatment adherence among persons with HIV infection. It is also the first randomized, clinical trial among persons with HIV infection that replicates the foundational expressive writing intervention (i.e., trauma writing versus control writing). The most important finding of this study is that individual differences in baseline levels of cognitive adaptability moderated group effects on changes in positive affect, HIV-specific cognitive adaptability, sense of coherence or meaning, HIV-specific physical functioning, and HIV-related quality of life one month after completion of the writing task. Specifically, participants who reported higher levels of cognitive adaptability prior to writing about the most stressful or traumatic events of their lives showed the most improvement in these outcomes when compared to participants who wrote about trivial, non-emotional topics. Expressive writing alone was not associated with changes on any study outcome.

Moderating Effects of Cognitive Adaptability in Expressive Writing

This study found that individual differences in the level of cognitive adaptability differentially target the benefits of writing about stressful or trivial topics among persons with HIV infection and AIDS. This means that participants who wrote about stressful

life or traumatic events and who reported enhanced beliefs about their sense of personal competence and optimism about the future derived greater benefit from the writing task than did those with lower levels of cognitive adaptability. In contrast, cognitive adaptability did not modify outcomes related to negative affect, perceived stress, HIV-specific meaning, the total number of symptoms or symptom intensity, the number of illness-related clinic visits, or medication and appointment adherence. As this is the first study to examine the cognitive adaptability construct as a moderator variable in the context of a randomized clinical trial and the first to examine the influence of individual differences in cognitive adaptability in the context of the expressive writing paradigm, comparisons with similar research are not currently feasible. However, the findings of this study are consistent with both cross-sectional and longitudinal data suggesting that positive beliefs about one's sense of control and future expectancies are powerful predictors of health outcomes among persons with HIV infection or other chronic conditions. For example, cross-sectional and longitudinal analyses of data from two studies of persons with rheumatoid arthritis found that cognitive adaptability, as operationalized by the same CAI that was used in this study, explained significant portions of the variance and change scores over 4 years in depressive symptomatology, life satisfaction, pain scores, and patients' global pain ratings of function (Wallston, 2003).

Using a different measure derived from cognitive adaptation theory, Helgeson and colleagues found that higher levels of cognitive adaptability predicted reductions in the number of new cardiac events and positive long-term psychological adjustment following their first angioplasty procedure, and improved life satisfaction among persons who

sustained a subsequent cardiac event (Helgeson & Fritz, 1999; Helgeson, 1999; Helgeson, 2002; Helgeson, 2003). Among persons with HIV infection, unrealistically optimistic beliefs about the course of their HIV disease were associated with greater longevity when compared to persons with a more “realistic acceptance” of their future trajectory (Reed et al, 1994). In a subsequent study, Reed et al. (1999) found that negative HIV-specific expectancies were significant predictors of symptom onset among previously asymptomatic persons with HIV infection (Reed, et al., 1999). One caveat of the Reed et al. studies, however, is their use of only one dimension of the cognitive adaptability construct, optimistic expectancies, thus accounting for only a portion of the variance in outcome effects.

The current study expands existing knowledge about the correlates of cognitive adaptability with health outcomes, and adds new knowledge about how individual differences in this psychological resource may operate in the context of the written emotional disclosure paradigm. A pattern emerged from these findings that suggests that cognitive adaptability may be an important factor for enhancing psychological well-being, quality of life, and physical functioning among persons with HIV disease and other chronic health conditions. These findings are important as they suggest that cognitively adaptive resources may favorably modify outcomes related to chronic illness, and promote movement toward the positive end of the illness-health continuum associated with optimal health, enhanced well-being, and personal growth. In contrast, cognitive adaptability did not exert a moderating effect on eight of the 13 outcome variables evaluated in this study. No moderating effects were found for outcomes related to negative affect, perceived stress, HIV-specific meaning, symptom reporting, the

number of illness-related clinic visits, or adherence to medication and appointment keeping. As will be discussed below, this may be partially explained by the nature of the variables themselves and/or the properties of the instruments used to measure them.

It has been speculated that written emotional expression may differentially influence conceptually similar or dissimilar outcome types (Smyth, 1998). For example, positive affect, global sense of meaning, HIV-specific cognitive adaptability, and HIV-specific quality of life (including HIV-related physical functioning) all reflect positive psychological factors, whereas negative affect and perceived stress reflect general levels of psychological distress or negative psychological factors. The literature on affect supports this premise (Watson, Clark, & Tellegan, 1988). One exemplar of this is the typically low correlations between positive and negative affect (-.12 to -.23), two constructs that operate as highly distinctive dimensions of affect, not as polar opposites. This distinction among constellations of affective constructs is also reflected in the data from this study, e.g., positive correlations among conceptually similar variables and low or negative correlations of these variables with their dissimilar counterparts (see Table 3).

Why did cognitive adaptability fail to moderate outcomes related to the HIV-specific meaning, the number of illness-related clinic visits, the number of symptoms reported, the intensity of those symptoms, or the measures of medication taking and appointment adherence? The finding related to HIV-specific meaning is, perhaps, the most inconsistent finding in that cognitive adaptability failed to moderate HIV-specific meaning but had a significant moderating effect on the more global measure of meaning, the SOC Scale. One explanation for this is that the HIV-specific meaning subscale was

derived from only one subscale of the more global SOC scale, the eight item meaning subscale.

The reported psychometric properties of the SOC are based on the entire scale that consists of 13 items and two additional subscales, manageability and comprehensibility. Although factor analysis of the SOC indicates that the three subscales load on the same dimension, it would appear that the additional subscales add to the reliability and, perhaps, validity of the measure (Antonofsky, 1987) and may be a necessary piece of the more domain specific measure of HIV meaning. Another concern about the HIV-specific meaning scale is its first-time use in this study. Following initial item analysis of the instrument, one of the eight items (item 3) was deleted from the scale to enhance its internal consistency. The subsequent seven item scale attained a coefficient α of $r = .64$, falling short of the lower acceptable bound for alpha, i.e., $.70$ (Nunnally, 1978). Several modifications and additional analyses in larger samples are necessary to clarify the factor structure, reliability, and validity of the HIV-specific meaning measure before its use in future studies is recommended.

Cognitive adaptability also did not exert a moderating effect on outcomes related to symptom number and intensity, illness-related clinic visits, and medication and appointment adherence. One explanation for this is that symptom reporting is known to be confounded by negative affect e.g., negative affect is positively correlated with symptom reporting, even in the absence of objective, identifiable illness (Watson & Pennebaker, 1989). In this study, negative affect was strongly and positively correlated with the total number of symptoms reported ($.45$) and with symptom intensity ($.60$). Baseline cognitive adaptability, which was not associated with a change in negative

affect scores, was significantly and negatively correlated with baseline negative affect (-.61), the total number of symptoms reported (-.58), and symptom intensity (-.59), indicating an association in the expected direction and a possible explanation for why no effect was found. It is possible that persons initially high in cognitive adaptability were already about as low in distress as they could reasonably be. Because the dependent variables in this study were residualized gain (i.e., change) scores, there was not much room for persons high in cognitive adaptability to further reduce their levels of distress and symptom reporting. This is known as a floor effect.

Although not statistically significant, cognitive adaptability was also negatively correlated or uncorrelated with the number of illness visits for the three months prior to and after the writing intervention (-.40 and .05 respectively). Confidence in the illness visit data is compromised by several other factors. Although most participants had illness-related clinic visits before (65%) and after (55%) the writing intervention, they averaged less than one illness-related visit per three-month timeframe. Thus, the three-month time periods may have been too short to detect a pattern of illness-related health care seeking behavior. In addition, illness visit data were obtained by review of the participants' medical records for the three-month periods before and after the writing intervention. Not all records were available for review, and those that were available were often difficult to interpret as to the purpose of visits as these data often overlapped with the type of visit for which it was coded in the record. This led to confusion about the appropriate coding for the purposes of data analysis. In addition, the records were often incomplete or lacked documentation of the variables sought.

Reports on the challenges associated with measuring adherence are legend and are compounded by the fact that behaviors associated with adherence are complex and confounded by factors related to such things as patient characteristics, provider relationships, and medical regimen to name a few (Chesney, 1999). Data on *missed* appointments were also problematic because missed visits were often not documented in the medical record. Even when these data were cross-referenced with scheduling records, the information was often discrepant with the actual record. The appointment adherence data that were available indicate that 34% of participants missed scheduled appointments in the three months before writing and 40% missed appointments in the three months after writing. As with the illness-related visits, participants averaged less than one missed visit per time period, again suggesting that the three-month timeframe allotted for chart review may be too short to obtain a reliable pattern of clinic utilization.

Information on medication adherence was obtained by self-report and was not verifiable by a more objective standard. Self-reports of adherence to medication regimens are known to be unreliable and subject to reporting bias (Morisky, Green, & Levine, 1986). In addition, medication adherence is influenced by demographic and individual difference factors that cannot be accounted for by the use of a single measure of adherence. It is, however, interesting to note that self-efficacy, an important cognitively adaptive construct, frequently correlates with adherence in general, indicating that patients who believe that they are capable of adhering to difficult treatment regimens are, in fact, more likely to do so (Chesney, 1999). Thus, despite the negative findings in this area, cognitive adaptability may be an important variable to consider in future studies about adherence to HAART or other difficult treatment regimens.

The findings from this dissertation add another individual difference variable, cognitive adaptability, to the mix of moderator variables under analysis in the expressive writing field. Looking for moderators is an important area of research in the expressive writing field because of the differential effects of expressive writing in chronically ill samples. The failure to find main effects for expressive writing in this study four weeks following completion of the writing intervention adds to the growing number of controlled trials of the standard writing paradigm in chronic illness that have found limited main effects that are differentially influenced by individual difference variables that moderate these effects (Meyer, 2003; de Moor, 2002; Rosenberg, 2002; Stanton, 2002; Richards, 2000; Smyth, 1999; Gidron, 1996; Broderick, in press; Lumley, in press; Norman, in press).

The absence of main effects one month following the intervention is consistent with the literature in expressive writing and chronic illness, as significant main effects favoring the expressive writing intervention generally do not begin to emerge until six weeks to three months into the follow-up period. For example, a study of persons with fibromyalgia found that emotional disclosure was associated with *increased* negative mood and prescription drug use one month after writing, but with improvements in overall disease impact, less over the counter medication use, and less health care utilization at a three month follow-up (Gillis, Lumley, Koch, Mosley-Williams, Leisen, & Roehrs, 2003). Thus, future studies should include extended follow-up periods beyond one month, and might include interim data gathering points to assess for variations in effects over time.

It is important to note that while expressive writers with high cognitive adaptability improved on certain outcomes, this was not the case for those with low cognitive adaptability in the expressive condition or those with high cognitive adaptability who wrote about trivial topics. Thus it appears that expressive writing does not work equally well for all participants. While expressive writing may be effective or offer no benefit for some, it may even worsen outcomes for others, such those with low levels of cognitive adaptability.

Of particular interest is the pattern of findings shown in Figures 7 and 8 in which persons high in cognitive adaptability who were assigned to the control condition appeared to decrease their levels of HIV-specific cognitive adaptability and quality of life. A partial explanation for this pattern may be that a control condition that asks participants to write about trivial topics may not be ideal for comparison with emotional disclosure. In fact, this may negatively affect health outcomes for persons who might benefit from emotional disclosure. Such meaningless control conditions among persons with HIV infection or other serious health conditions may have a reactive effect that negatively influences health outcomes, at least in certain individuals. This concern has been raised by other investigators (Lumley & Prevezano, 2003; Lepore, Lutgendorf, and Pennebaker, personal communication, May 20, 2003) who suggest trivial writing may be perceived as too meaningless to be a credible control for the stress management effects intended by emotional disclosure. The findings in this study support recent suggestions that control participants be given, for example, a time management assignment that asks them to write about their plans for the next day, week, month, or year (Lumley & Prevezano, 2003) instead of such topics as the content of their closets.

Strengths and Limitations of the Study

The strengths of this study include its experimental design with random assignment to groups, the effective manipulation, and the favorable attrition rate. In addition, the measure of general cognitive adaptability, a key independent variable, is composed of well-validated and reliable scales, the Life Orientation Test and the Perceived Competence Scale. Its more domain-specific counterpart, the HIV-Specific Cognitive Adaptability Index, is composed of two new scales, the AIDS-Specific Optimism Scale and the HIV-Specific Perceived Competence Scale, that, as expected, have comparable internal consistency and validity to the more generalized instruments. Several of the other measures used in this study, e.g., the PANAS and the PSS, also have strong psychometric support and add to the strength of the study.

Several limitations of the study, however, deserve mention. Foremost among the limitations is the sample size. An a priori power analysis indicated that the sample size would not be adequate to detect small to moderate or, perhaps, even larger effects. It is surprising, in fact, that with so few subjects any statistically significant findings were found at all. One must always be cautious in interpreting interaction effects with a small size. In addition, although the sample generally reflects the racial and ethnic demographics of HIV/AIDS in Tennessee, this study enrolled a greater percentage of women and a disproportionately high number of participants who reported blood contact as their route of infection and a disproportionately low number of who reported becoming infected via injection drug use. This, combined with the small sample size, limits the generalizability of the findings. In addition, the study is limited by its heavy reliance on

self-report data, the lack of objective corroborative data, and the previously discussed short follow-up period. Finally, the study is limited by the use of several new instruments that were developed for this study: the HIV-specific optimism scale, the HIV-specific meaning scale, and the HIV perceived competence measure. Although based on existing instruments that are known to be reliable and valid, more work is needed to more clearly define the psychometric properties of these instruments.

Theoretical and Empirical Implications of the Findings

Despite the limitations, the findings from this study have implications for cognitive adaptation theory and the use of expressive writing and suggest avenues for additional research and knowledge advancement in both areas. Although the findings cannot be interpreted to support *all* of the assumptions of cognitive adaptation theory, they do partially support the underlying assumptions of the theory. Not addressed by this study is the first assumption of cognitive adaptation theory, which concerns the modest degree of self-aggrandizement and perceived control that characterizes human self-perceptions under normal conditions. Although highly cognitively adaptive individuals reported improvements in several outcome measures, it is not known whether these participants' self-perceptions of competence or optimism are illusory or based in reality. Also not addressed, the third theoretical assumption concerning the variety of psychological processes that mediate the restoration of enhanced perceptions of competence and optimism.

However, finding that cognitively adaptive participants reported increased levels of HIV-specific cognitive adaptation a month after expressive writing supports the second

assumption of cognitive adaptation theory which states that, under threatening circumstances, one's positive self-perceptions and future expectancies are challenged and this challenge is associated with increased efforts to restore or enhance the challenged self-perceptions. It also supports the fourth theoretical assumption that states that efforts used to restore one's sense of positive self-regard are manifestations of cognitive adaptation and are associated with psychological adjustment and improved outcomes.

What is the nature of the challenge or threat that is associated with these findings?

All the study participants presented with a serious health condition that poses a pervasive and ongoing challenge to their psychological, physical, and emotional health. In addition, while writing about their deepest feelings and thoughts about the most stressful and traumatic experiences of their lives, those in the experimental condition must activate traumatic memories and schemata and confront the memories, feelings and thoughts associated with them. Although the mechanism is unclear, such engagement through writing among cognitively adaptive participants may have bolstered their psychological resources and enhanced efforts to self-regulate these thoughts and feelings to restore or enhance their challenged perceptions. Thus, those in the expressive writing condition who were initially high in cognitive adaptability reported enhanced levels of HIV-specific cognitive adaptation resources, perceived better physical functioning, and higher overall quality of life compared to their counterparts in the control condition.

While this study supports the predictive value of cognitive adaptability for promoting psychological adjustment in the context of confronting powerful feelings about past or present traumas, the findings raise a number of empirical questions about cognitive adaptability as an individual difference variable and its predictive value with regard to

expressive writing and health outcomes. For example, the differential findings associated with varying levels of dispositional cognitive adaptability suggest that individual difference variables are important in the study of expressive writing as they may help explain the variability seen in outcomes and define who will benefit from written emotional disclosure. Future investigations of expressive writing would benefit from additional testing of known moderators such as cognitive adaptability and alexithymia (Lumley, in press), and the inclusion of other potential moderators such as emotional intelligence or defensive coping style.

While this study adds to the literature on the correlates of cognitive adaptability, several other questions remain. What are the antecedents of cognitive adaptability and can interventions be developed to enhance patients' cognitively adaptive resources? What are the linkages between cognitive adaptability and various demographic variables or constructs such as social support and coping? Does cognitive adaptability buffer the onset of new disease or dysfunction? What is the predictive value of cognitive adaptability with regard to immunological (CD4 counts, HIV viral loads, EBV or HSV2 antibody reactivation), endocrinological (cortisol), and other physiological outcomes or objective measures of health status?

The findings from this dissertation may also add insight into the mechanisms by which expressive writing may operate. The current thinking suggests that self-regulatory processes involving emotional habituation and cognitive reappraisal may partially explain how expressive writing operates to affect health outcomes (Greenberg and Lepore, 2001). As evidenced by the significant differences between the experimental and control groups on their reported levels of emotional disclosure and post writing symptomatology,

expressive writing apparently did engender some level of emotional engagement and, possibly, activation of fear structures that may promote emotional habituation to the aversive stimuli (Foa, et al., 1995; Jaycox et al., 1998). Additional linguistic analyses are necessary to understand more fully what impact, if any, cognitive reappraisal processes have on study outcomes.

The findings also raise issues about the importance of individual differences in the context of expressive writing. Despite the small sample size, significant interactions with cognitive adaptability resulted from emotional expression about non-specific traumas in the context of a pervasive health condition such as HIV infection. Would the outcomes be different if participants wrote exclusively about HIV-related topics or in a manner that promotes finding meaning, enhanced coping, or self-regulatory advancement as has been suggested in other investigations (Norman, in press; de Moor, 2002; Stanton, 2002; Cameron & Nicholls, 1998; Broderick, in press). Would the outcomes be different if a different moderator--e.g., alexithymia, emotional intelligence, or defensive coping style--were to be substituted for cognitive adaptability?

In addition, both cognitive adaptation indices in current use in research (the CAI and the CATI) address only some of the major themes that underlie cognitive adaptation theory, future expectancies and efforts to regain mastery and enhance self-esteem. The search for meaning is another important thematic foundation of the theory that has been absent from either index. This deficit should be addressed in future research to assure that the full intent and meaning of the cognitive adaptation construct is being covered.

Clinical Implications

This is the first test of the traditional expressive writing intervention among persons with HIV infection and one of only a small number of studies to evaluate the intervention among persons with chronic health conditions. Any clinical implications are, at this point, premature and highly speculative, and should be promulgated with caution. This study demonstrated that the writing task is feasible, safe, and well tolerated among persons with HIV infection. Anecdotal evidence gathered post intervention suggests that participants generally enjoyed the writing task and felt that others with HIV may enjoy it as well. However, there is no evidence to support the notion that expressive writing in and of itself can offer direct benefit to study participants. This absence of a main effect for the intervention and the small sample size mitigates generalizing results beyond this study.

There is no evidence to support prescribing expressive writing for all people with HIV infection, but there is some evidence to suggest that it could be harmful to do so if the patient is not high on cognitive adaptability. As was found with individuals with cardiac disease (Helgeson, 1999a; 1999b; 2001; 2003), evidence did emerge that suggests that cognitive adaptation resources may be powerful predictors of outcomes related to psychological well-being, quality of life, and physical functioning among persons with HIV infection. It might very well be helpful, therefore, to assess cognitive adaptation resources on a routine basis among people with HIV infection and to pay particular attention to patients low in perceived competence and dispositional optimism. Nursing has long advocated “individualized patient care”, and one way of individualizing

care is to assess and take account of important individual differences when deciding which interventions to use with which patients.

This study offers several avenues for future clinical investigations. Questions about the viability of the expressive writing intervention with HIV infection cohorts can only be answered by rigorously designed controlled clinical trials. It is too early to assume this intervention can be feasibly implemented on a more ad hoc basis remote from the clinical setting. However, the results of this study would endorse further research on expressive writing among persons with HIV infection. Clinical investigations might also be designed to more clearly define the antecedents of cognitively adaptive resources and to assess the predictive value of cognitive adaptation among individuals with other chronic health conditions. Such information is an important precursor to the design of interventions to enhance patients' cognitive adaptation resources.

Finally, until more is known about the effects of this intervention among persons with HIV or any other chronic illness, the field would be well-served by rigorously designed clinical trials that advance the science while optimizing participant safety. While this may limit the generalizability of findings, it may provide the evidence needed to implement future interventions that are safe, feasible, acceptable and reliable for use in clinical practice.

Conclusions

When Engle (1977) introduced his biopsychosocial model as an alternative to the traditional medical model of care that focuses on disease and pathology, he legitimized a path of scientific inquiry that has led to the unmistakable conclusion that the human

mind, body, and social milieu are dynamically interrelated and function synergistically along the illness-health continuum. Health care practitioners have come to appreciate the role that biopsychosocial factors play in the treatment of illness, the restoration and maintenance of health, and the optimization of function. Indeed, it has been suggested that biopsychosocial correlates of health, illness and resistance to disease is the emerging challenge for healthcare in the new century (Riff and Singer, 2000).

When Pennebaker and Beale (1986) introduced their simple writing intervention, they advanced Engle's vision and promulgated a line of research that has contributed to the advancement of knowledge about the interplay between the mind, the body, and health. This study adds to that growing body of knowledge. This research found that persons with HIV infection who report higher levels of cognitively adaptive resources derived several benefits from written emotional disclosure. Those participants reported improvements in positive affect, sense of coherence, HIV-specific cognitive adaptation, HIV specific quality of life and physical functioning following a simple writing task involving emotional expression about significant past or current life trauma or stressors. The study also found that the positive effects are limited by individual differences in various writing assignment (control versus experimental) and levels of cognitive adaptability (high versus low). Although the limitations of the study and the current state of the science limit the clinical applicability of this intervention, the findings are provocative and warrant further investigation.

APPENDIX A

INFORMED CONSENT DOCUMENT

Name of subject _____ Age _____

The following information is provided to inform you about the research project and your participation in the study. Please read this form carefully. Please feel free to ask any questions you may have about this study and the information given below. You will be given an opportunity to ask questions, and your questions will be answered. You will be given a copy of this consent form.

1. Purpose of the study.

We are trying to understand how people living with HIV and AIDS deal with their disease and other stresses in their lives. This is an investigational study of the relationship between life stress and health. The study involves writing about certain events in your life, some of which may be upsetting or hopeful, for 20 minutes on either 4 consecutive days or 1 day a week over 4 weeks. The entire study will last for 5 to 8 weeks depending on your group assignment, which will be explained below. Over the past 15 years this type of study has been done mostly with people who are healthy and do not have any chronic illness of any kind. Over the past several years, investigators have begun to do this type of study with people who have chronic illnesses such as asthma and rheumatoid arthritis. To date, however, this has not been adequately tested in people who have HIV infection or AIDS. The purpose of this study is to begin to understand how acceptable this procedure is and the best method for doing this type of study among persons with HIV infection. We are also interested in the impact of this procedure on your health. The results of this study will be used to design a larger study of this type among persons with HIV/AIDS.

Prior to signing this consent form, it is important for you to clearly understand why this study is being done and what will be expected of you if you choose to participate. Please make sure that all of your questions have been answered prior to signing this consent form.

2. Description of the procedures to be followed and approximate duration of the study. (Included is a statement of the procedures that will be done solely for research purposes and those that are considered routine treatment. Also included is information about the costs, if any, of the procedures.)

This study is being done for research purposes only. The study will enroll 80 participants who will be asked to complete 7 study visits over a period of 5 to 8 weeks. At the first visit, the study procedures will be explained to you in detail. If you choose to participate, you will be asked to read the consent form and have all of your questions answered about study participation before signing the form. After giving informed

consent we will measure your heart rate and blood pressure. We will then obtain a sample of saliva by placing an absorptive wick between your cheek and gum for 5 minutes, and 1 teaspoon of blood will be drawn from a vein in your arm. The saliva will be used to test your immune system and endocrine system (the system in the body that secretes hormones into the blood) and the blood will be used to test your immune system. You will then be asked to complete several paper-and-pencil questionnaires that will ask you a variety of questions about your thoughts and beliefs, mood, emotions, and feelings and your physical health. You will then be offered some refreshments such as juice or water. This first visit will require approximately 1 hour of your time.

If you so choose, you may complete visit 2 following the refreshment break or you may complete visit 2 any time within the next 7 days. At this visit you will be randomly assigned to one of 4 groups. Random assignment means that the group you go into is determined by chance, like the flip of a coin. The group you are assigned to will determine what you are asked to write about and the length of the time interval between writing sessions. Regardless of which group you are assigned to, at visit 2 you will be asked to complete a brief questionnaire and your heart rate and blood pressure will be measured. You will then be asked to write for 20 minutes on the topic corresponding to your group assignment. When you write you do not need to be concerned about your grammar, spelling or sentence structure. We just ask that you write as openly and honestly as you can for the full 20 minutes about the topic you are assigned to write on. After you write your heart rate and blood pressure will be measured again and you will repeat the brief questionnaire you completed immediately prior to writing plus another brief questionnaire.

Depending on your group assignment you will be asked to write on your assigned topic for 4 consecutive days or once a week for 4 consecutive weeks. All of the writing sessions will take place here in the CCC or GCRC and the procedure will be the same as for the first writing session. After the 4th writing session (visit 5) we will again obtain saliva and blood samples as described above. After this writing session, you will be asked to complete 2 brief questionnaires and have your heart rate and blood pressure measured a second time. If you need to miss one writing day, you will be asked, if possible, to make up that day during that same week. The second and third writing session visits will take 30 minutes of your time. You will be paid \$10.00 per study visit (\$60 potential maximum payment). You will be given a timer to time your writing session. The final writing session visit will take approximately 45 minutes of your time to complete.

One month after your last writing session, you will be asked to return to the research center for visit #6. We will once again measure your heart rate and blood pressure, and take saliva and blood samples as described above for visit 1. You will then be asked to complete some of the same questionnaires you completed on the first day of the study and you will be thoroughly debriefed about the study. This visit will take about 40 minutes of your time. You will also be asked if you are willing to participate in a “focus group,” a small group meeting with other volunteers who were assigned to be in your same experimental condition. This focus group will most likely take place within 1 week

following visit 6. Your ideas and thoughts about the study are important to us; however, you do not have to participate in the focus group if you do not wish to do so. If you choose not to be in the focus group, we would still like to ask you some questions about your experience in this study. This could be done over the telephone within the next week. With your permission, the group meeting or individual telephone call will be audio-recorded so that the other members of the research team can hear what you have to say. The focus group visit will require about 90 minutes of your time.

When you enter the study you will be assigned a unique identification number that will be used instead of your name on all of your research-related documents, including your written essays. Your name will appear only on your signed consent form and on an intake form containing your contact information and assignment code. All documents that contain your name will be kept under separate lock and key from your research-related documents for the protection of your confidentiality. The researchers will not be looking at your writings until after you have completed your involvement with the study. At the end of visit 5 you will be given the option to have your writings destroyed, returned to you, or, with your permission, returned to the study team for further analysis. No copies of your writings will be made or kept on file without your permission. If you permit, your writings will be transcribed so that we can analyze their content, but only your subject ID number will be used. The audio-recordings of the focus group will not identify you by name, and after they have been transcribed, the tapes will be kept under lock and key. In addition to the above, we are asking your permission to review your medical record at the Comprehensive Care Center to record the number of office visits you made to the clinic in the 3 months prior to and after your writing sessions, and to obtain a list of your medications, a recent CD4 count, and viral load. The chart review will be performed in a confidential manner using only your identification number to record the information. You will be paid \$10.00 per study visit, including the focus group visit, and your parking fees will be paid while at Vanderbilt.

You are encouraged to contact any of the research team at any time during or after your participation in the study if you have suggestions on how we might improve the study and to report any problems you are experiencing as a result of your participation in the study. If you experience any problems, please report these at any time to Lois Wagner, the Project Director, at (██████████). If necessary, we will refer you to your medical doctor or your psychotherapist, if you have one, who can help you with your concerns. A psychotherapist who is familiar with the concerns of people with HIV infection will review all serious concerns and make recommendations to the principal investigator.

Below is a calendar of the study visits and procedures.

Study Procedure and Visit Schedule

Daily Writing Groups								Weekly Writing Groups					
Week	Pre	0				5	6	0	1	2	3	7	8
Day	-7 to 0	0	1	2	3	31	38	0	7	14	21	49	56
Study Visit	01 #	02	03	04	05	06	07	02	03	04	05	06	07
Informed Consent	X												
Writing		X	X	X	X			X	X	X	X		
Heart Rate	X	X	X	X	X	X		X	X	X	X	X	
Blood Pressure	X	X	X	X	X	X		X	X	X	X	X	
Saliva	X				X	X					X	X	
Blood test	X				X	X					X	X	
Study Visit	01	02	03	04	05	06	07	02	03	04	05	06	07
Screening Qs*	X												
Other Questionnaires	X					X						X	
Pre & Post writing Qs.		X	X	X	X			X	X	X	X		
Post-Writing Qs.		X	X	X	X			X	X	X	X		
Debriefing Q.						X						X	
Focus Group							X						X

#Visit 01 is the same for all groups * Qs = questionnaires

3. Description of the discomforts, inconveniences, and/or risks that can be reasonably expected as a result of participation in this study.

It is known that persons who write about stressful or traumatic events may feel temporarily upset, or have increased heart rate and blood pressure readings. These responses are not expected to last long or to be serious in nature. No uncommon or rare (serious or minor) risks have been reported. However, rare or unknown and unforeseen risks may occur. The inconveniences include the time required by the study visits and completing questionnaires. Blood drawing is associated with pain at the site where the needle punctures the skin. It may also be associated with bruising and swelling, and a feeling of light-headedness. Placement of an absorptive wick in the between the gum and the cheek may feel mildly uncomfortable. This study will enroll women of child bearing potential but there are no issues of sexual activity or contraception. Also, although we will change participants' names and personally identifiable information, there is a possibility that someone close to you may be able to identify you through your personal stories.

Immediate necessary care for adverse events will be provided at Vanderbilt University without charge if you are injured because of participation in this research project. Vanderbilt will neither provide for the costs of further treatment beyond immediate necessary care nor provide monetary compensation for such injury.

4. Anticipated benefits resulting from this study:

a) The potential benefits to science and mankind that may result from this study are:

The results obtained from this study may benefit science and humankind by leading to greater understanding of the effect and potential value of this intervention for persons with HIV infection.

b) The potential benefits to you from this study are:

While previous studies of this type have found some improvement in decreased feelings of distress and reductions in the number of health care visits among healthy people, we do not know if this study will offer any benefit for persons with HIV infection.

Therefore, you should expect no personal benefit from your participation in this study.

5. Alternative procedures

The following are alternative procedures or treatments that may be available to you if you choose not to participate in this study:

Alternative procedures include other non-experimental psychosocial interventions. You may refuse participation in the study and may withdraw at any time.

6. Contact information: If you should have any questions about this research study, please feel free to contact Dr. Kenneth Wallston, PhD. at [REDACTED] or Lois Wagner, MSN, RN, at [REDACTED]. For additional information about giving consent or your rights as a participant in this study, please feel free to contact the Vanderbilt University Institutional Review Board Office at [REDACTED] or toll free at [REDACTED].

Your rights as a volunteer:

Your participation in this study is voluntary. You may choose not to participate and receive alternative treatment without affecting your health care/services or other rights. You are also free to withdraw from this study at any time. Withdrawal or refusal to participate will not prejudice your health care.

In the event new information becomes available that may affect the risks or benefits associated with this study or your willingness to participate in it, you will be notified so that you can make an informed decision whether or not to continue your participation in this study.

Efforts will be made to keep the personal information in your research record private and confidential but absolute confidentiality cannot be guaranteed. Your personal information may be disclosed if required by law. Organizations that may inspect and/or copy your research records for quality assurance and data analysis include groups such as the National Institutes of Health, the Office of Human Research Protections, the National Cancer Institute, Food and Drug Administration, study sponsor, etc.

STATEMENT BY PERSON AGREEING TO PARTICIPATE IN THIS STUDY

- ☐ I have read this consent form. All my questions have been answered, and I freely and voluntarily choose to participate. I understand that I may withdraw at any time.
- ☐ The material contained in this consent form has been explained to me verbally. All my questions have been answered, and I freely and voluntarily choose to participate. I understand that I may withdraw at any time.
- ☐ If I am interviewed about my reactions to participating in this study either in a focus group or over the telephone, I agree to being audio taped.
- ☐ I give my permission to have my medical case record reviewed.

Date

Signature of patient/volunteer

Time: _____

Consent obtained by:

Signature

Printed Name and Title

Authorization to Use/Disclose Protected Health Information

Protected health information (PHI) is individually identifiable health information that has been entered into a medical record. Once this has occurred, use or disclosure of such information from the medical record must follow federal privacy guidelines. A decision to participate in this research means that you agree to let the research team use and share your PHI as described below.

As part of the study, Dr. Kenneth Wallston and his study team may report the results of your study and/or non-study related laboratory tests to those groups named below. If your research record is reviewed by any of these groups, they may also need to review your entire medical record. Your records may also be reviewed in order to meet federal or state regulations. Reviewers may include representatives from the Vanderbilt University Institutional Review Board, and the sponsor of the study, the National Institute of Mental Health. Once your health information is released to the persons or groups described above, there is no guarantee that those persons or groups will not in turn release your health information to others who may not be legally required to follow the procedures and limitations in this Informed Consent and Authorization Form.

The study results will be retained in your research record for at least six years after the study is completed. At that time the research information not already in your medical record will be retained indefinitely in your research record. Any research information in your medical record will be kept indefinitely.

If you decide to withdraw your authorization to use or disclose your PHI, we ask that you contact Dr. Kenneth Wallston in writing and let him know that you are withdrawing your authorization. His mailing address is School of Nursing, Vanderbilt University, [REDACTED] [REDACTED] At that time we will discontinue further collection of any information about you.

Signature: _____ Date: _____

APPENDIX B

QUESTIONNAIRES

Demographic/Background Information

1. What is your date of birth? _____
2. What is your sex? Male _____ Female _____
3. Are you Latino/and or of Hispanic origin? Yes ____ No _____
4. What is your race? (Mark only one)
 - a. White _____
 - b. Black or African American? _____
 - c. Asian or Pacific Islander _____
 - d. Native American/Alaskan Native? _____
 - e. Other, specify: _____ (Latino is not a race)
5. Which of the following terms best describes your current sexual orientation?
 - a. Homosexual (gay) _____
 - b. Heterosexual (straight) _____
 - c. Bisexual (bi) _____

Medical History

1. Are you able to read English? Yes ____ No _____
2. Are you able to write English? Yes ____ No _____
3. Do you think you are able to sit and write for 20 minutes? Yes _____ No _____
4. Do you smoke cigarettes? Yes ____ No ____ (if "no", go to #6)
5. If "yes" to #4, how many per day? _____ cigarettes/day
6. Do you drink alcohol? Yes _____ No _____ (if "no", go to #8)
7. If "yes" to #6, how many per day? _____ drinks/day
8. How many hours of sleep do you get on an average night? _____ hours

9. Do you get regular exercise? Yes _____ No _____ (if "no", go to #11)
10. If "yes" to #9, how many days per week do you exercise? _____
days/week
11. When were you diagnosed with HIV infection? _____
12. What HIV medications do you take?

13. How do you think you became HIV infected? (Check all that apply)
- a. Sexual contact _____
 - b. Injection drug use? _____
 - c. Blood products? _____
14. Have you been diagnosed with AIDS? Yes _____ No _____
- a. If so, When? _____
15. Do you have a history of suicide attempts within the last 3 years?
- a. Yes _____ No _____
16. Have you had thoughts about suicide lately? Yes _____ No _____
17. Have you ever been diagnosed with Post Traumatic Stress Disorder (PTSD)?
- Yes _____ No _____ Not Sure _____
18. Have you ever experienced significant, repeated traumas? Yes ____ No ____ Not
Sure _____
19. Have you, or do you currently take, antipsychotic medication (e.g. Clozaril, Haldol, Loxitane, Moban, Navane, Risperdal, Orap, Seroquel, Zyprexa, Thiothixene, Compazine, Etraphon, Serentil, Stelazine, Thioridazine, Thorazine, Trilaphon)?
- Yes (in the past) _____ Yes (now) _____ No _____
- If "yes" which antipsychotic medication is/was it?

Cognitive Adaptability Index

Life Orientation Test

INSTRUCTIONS: This test deals with your PERSONAL BELIEFS. There are no right or wrong answers. Use the responses below to indicate how much YOU agree or disagree with each of the following statements. Please circle one response for each item.

SD = STRONGLY Disagree
MD = Moderately Disagree
D = Slightly Disagree

SA = STRONGLY Agree
MA = Moderately Agree
A = Slightly Agree

1. In uncertain times, I usually expect the best. SD MD D A MA SA
2. If something can go wrong for me, it will. SD MD D A MA SA
3. I always look on the bright side of things. SD MD D A MA SA
4. I'm always optimistic about my future. SD MD D A MA SA
5. I hardly ever expect things to go my way. SD MD D A MA SA
6. Things never work out the way I want them to. SD MD D A MA SA
7. I'm a believer in the idea that "every cloud has a silver lining." SD MD D A MA SA
8. I rarely count on good things happening to me. SD MD D A MA SA

Perceived Self-Competence Scale

Please answer the following questions as thoughtfully and accurately as you can, keeping in mind that there are no right or wrong answers. **CIRCLE ONLY ONE RESPONSE.**

Leave no questions unanswered.

	STRONGLY DISAGREE	MODERATELY DISAGREE	SLIGHTLY DISAGREE	SLIGHTLY AGREE	MODERATELY AGREE	STRONGLY AGREE
1. I handle myself well in whatever situation I'm in.	1	2	3	4	5	6
2. I find my efforts to change situations I don't like are ineffective.	1	2	3	4	5	6
3. I succeed in projects I undertake.	1	2	3	4	5	6
4. No matter how hard I try; things just don't turn out the way I would like.	1	2	3	4	5	6
5. I'm generally able to accomplish goals.	1	2	3	4	5	6
6. Typically my plans don't work out well.	1	2	3	4	5	6
7. It is difficult for me to find effective solutions to the problems that come my way.	1	2	3	4	5	6
8. I am able to do things as well as most other people.	1	2	3	4	5	6

Below is a list of words that describe different feelings and emotions. Please check the ONE circle that best describes how you have been feeling during the PAST WEEK, INCLUDING TODAY.

The numbers refer to these phrases:

1 = very slightly or not at all 4 = quite a bit

2 = a little

5 = extremely

3 = moderately

	1	2	3	4	5
1. Interested	0	0	0	0	0
2. Distressed.....	0	0	0	0	0
3. Excited.....	0	0	0	0	0
4. Upset.....	0	0	0	0	0
5. Strong.....	0	0	0	0	0
6. Guilty.....	0	0	0	0	0
7. Scared.....	0	0	0	0	0
8. Hostile.....	0	0	0	0	0
9. Enthusiastic.....	0	0	0	0	0
10. Proud.....	0	0	0	0	0
11. Irritable.....	0	0	0	0	0
12. Alert.....	0	0	0	0	0
13. Ashamed.....	0	0	0	0	0
14. Inspired.....	0	0	0	0	0
15. Nervous.....	0	0	0	0	0
16. Determined.....	0	0	0	0	0
17. Attentive.....	0	0	0	0	0
8. Jittery.....	0	0	0	0	0
19. Active.....	0	0	0	0	0
20. Afraid.....	0	0	0	0	0

The following questions ask about your feelings and thoughts during the last month. In each case, you will be asked to indicate how often you felt or thought a certain way (*Never, Almost never, Sometimes, Fairly often, Very often*). **Don't try to count up the number of times you felt a particular way, but rather indicate the alternative that seems like a reasonable estimate.** The best approach is to answer each question fairly quickly. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question.

For each question, choose the following alternatives:	Never	Almost never	Sometimes	Fairly often	Very often
In the last month, how often have you been upset because of something that happened unexpectedly?					
In the last month, how often have you felt that you were unable to control the important things in your life?					
In that last month, how often have you felt nervous and "stressed"?					
In the last month, how often have you dealt successfully with irritating life hassles?					
In the last month, how often have you felt that you were effectively coping with important changes that were occurring in your life?					
In the last month how often have you felt confident about your ability to handle your personal problems?					
In the last month, how often have you felt things were going your way?					
In that last month, how often have you found that you could not cope with all the things that you had to do?					
In the last month, how often have you been able to control irritations in your life?					
In the last month, how often have you felt that you were on top of things?					
In the last month, how often have you been angered because of things that happened that were outside of your control?					
In the last month, how often have you found yourself thinking about things that you have to accomplish?					
In the last month, how often have you been able to control the way you spend your time?					
In the last month, how often have you felt difficulties piling up so high that you could not overcome them?					

HIV Outlook Measure (HIV Specific Optimism Scale)

INSTRUCTIONS: This test deals with your PERSONAL BELIEFS about your HIV infection. There are no right or wrong answers. Put a check in the box next to each question that best indicates how much YOU agree or disagree with each of the following statements.

	STRONGLY DISAGREE	MODERATELY DISAGREE	SLIGHTLY DISAGREE	SLIGHTLY AGREE	MODERATELY AGREE	STRONGLY AGREE
It is difficult for me to find effective solutions for problems with managing my HIV infection.	1	2	3	4	5	6
I have a positive attitude about my HIV infection.	1	2	3	4	5	6
I find efforts to change things I don't like about my HIV infection are ineffective.	1	2	3	4	5	6
I am optimistic about the future course of my HIV infection.	1	2	3	4	5	6
I handle myself well with respect to my HIV infection.	1	2	3	4	5	6
I do not count on things going smoothly with my HIV infection.	1	2	3	4	5	6
I am able to manage things related to my HIV infection as well as most other people.	1	2	3	4	5	6
Although the future course of my HIV infection is uncertain, I expect the best.	1	2	3	4	5	6
I succeed in the projects I undertake to manage my HIV infection.	1	2	3	4	5	6
I expect something to go wrong with the future course of my HIV infection.	1	2	3	4	5	6
Typically, my plans for managing my HIV condition don't work out well.	1	2	3	4	5	6
When it comes to my HIV infection, I always look on the bright side of things.	1	2	3	4	5	6
No matter how hard I try, managing my HIV infection doesn't turn out the way I would like	1	2	3	4	5	6
I am not counting on things going my way in the course of my HIV infection	1	2	3	4	5	6
I'm generally able to accomplish my goals with respect to my HIV infection.	1	2	3	4	5	6

HIV-Specific Meaning Scale (HIV-MS)

Below are some statements about your life as a person living with HIV infection. Please circle one number that best describes YOUR level of agreement or disagreement with each statement. If you strongly agree with the statement circle 1, if you strongly disagree with the statement circle 7. If you feel differently from either 1 or 7, circle the one number between 1 and 7 that best describes where YOUR feelings lie.

As a person living with HIV infection:

- | | | | | | | | |
|--|----------------|---|---|---|---|---|-------------------|
| 1. I very often have the feeling that I don't really care about what goes on around me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | strongly agree | | | | | | strongly disagree |
| 2. Life is full of interest. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | strongly agree | | | | | | strongly disagree |
| 3. Until now my life has had no clear goals or purpose at all. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | strongly agree | | | | | | strongly disagree |
| 4. Most of the things I do in the future will probably be completely boring. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | strongly agree | | | | | | strongly disagree |
| 5. When I think about my life I very often feel how good it is to be alive. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | strongly agree | | | | | | strongly disagree |
| 6. Doing the things I do every day is a source of deep pleasure and satisfaction. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | strongly agree | | | | | | strongly disagree |
| 7. I anticipate that my personal life in the future will be full of meaning and purpose. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | strongly agree | | | | | | strongly disagree |
| 8. I have the feeling that there is little meaning in the things I do in my daily life. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | strongly agree | | | | | | strongly disagree |

Medical Outcomes Study-HIV Health Survey (MOS-HIV)

We would like you to answer some questions about how you are feeling and the kinds of things you are able to do. Your answers will help us understand how things are going for you.

Instructions: Please answer the following questions by circling the correct number. The questions refer to the PAST 4 WEEKS.

1. In general, would you say your health is: *(Circle only 1 number)*

Excellent.....1
Very Good.....2
Good.....3
Fair.....4
Poor.....5

2. How much bodily pain have you generally had during the past 4 weeks?
(Circle only one number)

None.....1
Very Mild.....2
Mild.....3
Moderate.....4
Severe.....5
Very Severe.....6

3. During the past 4 weeks, how much did pain interfere with your normal work (or your normal activities, including work outside the home and housework)? *(Circle only one number)*

Not at all.....1
A little bit.....2
Moderately.....3
Quite a bit.....4
Extremely.....5

4. The following questions are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much? *(Circle one number on each line).*

	Yes, limited a lot 1	Yes, limited a little 2	No, not limited at all 3
a. The kinds or amounts of vigorous activities you can do, like lifting heavy objects, running, or participating in strenuous sports.			
b. The kinds or amounts of moderate activities you can do, like moving a table, carrying groceries or bowling.	1	2	3
c. Walking uphill or climbing (a few flights of stairs). <u>Continue on next page</u>	1	2	3

Question # 4 continued from above:

	Yes, limited a lot 1	Yes, limited a little 2	No, not limited at all 3
d. Bending, lifting or stooping.			
e. Walking one block.	1	2	3
f. Eating, dressing, bathing or using the toilet.	1	2	3
5. Does your health keep you from working at a job, doing work around the house, or going to school? <i>(Circle only one number)</i>		Yes 1	No 2
6. Have you been unable to do certain kinds or amounts of work, housework, or schoolwork because of your health? <i>(Circle only one number)</i>		Yes 1	No 2

For each of the following questions, please circle the number for the one answer that comes closest to the way you have been feeling during the past 4 weeks.

- | | All of
the
time | Most
of the
time | A good
bit of the
time | Some
of the
time | A little
of the
time | None
of the
time |
|---|-----------------------|------------------------|------------------------------|------------------------|----------------------------|------------------------|
| 7. How much of the time, during the past 4 weeks, has your health limited your social activities (like visiting with friends or close relatives)? <i>(Circle only one number)</i> | 1 | 2 | 3 | 4 | 5 | 6 |

- | | All of
the
time | Most
of the
time | A good
bit of the
time | Some
of the
time | A little
of the
time | None
of the
time |
|----|-----------------------|------------------------|------------------------------|------------------------|----------------------------|------------------------|
| 8. | | | | | | |

How much of the time, during the past 4 weeks:

- | | | | | | | |
|---|---|---|---|---|---|---|
| a. Have you been a very nervous person? | 1 | 2 | 3 | 4 | 5 | 6 |
| b. Have you felt calm and peaceful? | 1 | 2 | 3 | 4 | 5 | 6 |
| c. Have you felt downhearted and blue? | 1 | 2 | 3 | 4 | 5 | 6 |

- | | | | | | | |
|---|---|---|---|---|---|---|
| d. Have you been a happy person? | 1 | 2 | 3 | 4 | 5 | 6 |
| e. Have you felt so down in the dumps
that nothing could cheer you up? | 1 | 2 | 3 | 4 | 5 | 6 |

Continue on next page

For each of the following questions, please circle the number for the one answer that comes closest to the way you have been feeling during the past 4 weeks. (Circle only one number on each line)

- | | | All of
the
time | Most
of the
time | A good
bit of the
time | Some
of the
time | A little
of the
time | None
of the
time |
|------------------------------------|------------------------------|-----------------------|------------------------|------------------------------|------------------------|----------------------------|------------------------|
| How often during the past 4 weeks: | | | | | | | |
| 9. | a. Did you feel full of pep? | 1 | 2 | 3 | 4 | 5 | 6 |
| | b. Did you feel worn out? | 1 | 2 | 3 | 4 | 5 | 6 |
| | c. Did you feel tired? | 1 | 2 | 3 | 4 | 5 | 6 |

d. Did you have enough energy to do the things you wanted to do?		1	2	3	4	5	6
e. Did you feel weighed down by your health problems?		1	2	3	4	5	6
f. Were you discourage by your health problems?		1	2	3	4	5	6
g. Did you feel despair over your health?		1	2	3	4	5	6
h. Were you afraid because of your health?		1	2	3	4	5	6
10.	How much of the time during the past 4 weeks:	All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time
	a. Did you have difficulty reasoning and solving problems, for example, making plans, making decisions, learning new things?	1	2	3	4	5	6
	b. Did you forget things that happened recently, for example,	1	2	3	4	5	6

where you put things and when you
had appointments?

c. Did you have trouble keeping your
attention on any activity for long?

1	2	3	4	5	6
---	---	---	---	---	---

d. Did you have difficulty doing
activities involving concentration and
thinking?

1	2	3	4	5	6
---	---	---	---	---	---

11. Please circle the answer that best describes whether each of the following
statements is true for you. (Circle one number on each line)

	Definitely true 1	Mostly true 2	Don't know 3	Mostly false 4	Definitely false 5
a. I am somewhat ill.	1	2	3	4	5
b. I am as healthy as anybody I know.	1	2	3	4	5
c. My health is excellent.	1	2	3	4	5
d. Did you have difficulty doing	1	2	3	4	5

activities involving concentration

and thinking?

12. How has the quality of your life been during the past 4 weeks? That is, how have things been going for you? (Circle only one number)

Very well; could hardly be better.....1
Pretty good.....2
Good and bad parts about equal.....3
Pretty bad.....4
Very bad; could hardly be worse.....5

13. How would you rate your physical health and emotional condition now compared to 4 weeks ago? (Circle only one number)

Much better.....1
A little better.....2
About the same.....3
A little worse.....4
Much worse.....5

HIV Sign and Symptom Checklist

Sign & Symptom Check List

Below is a list of potential problems that **you may be experiencing today**. If you have the problem, check the circle to rate the degree of **INTENSITY** which best describes the extent of the problem.

If you do not have the problem, do not check the circle.

INTENSITY

Mild	Moderate	Severe	Problem
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Muscle aches (1)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Weakness (2)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Painful joints (3)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Fatigue (4)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Dry mouth (5)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Thirsty (6)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Difficulty concentrating (7)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Depression (8)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Memory loss (9)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Fear/Worries (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Fever (11)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Chills (12)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Day sweats (13)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Night sweats (14)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Loose stools (15)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Diarrhea (16)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Gas/bloating (17)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Abdominal pain (18)
CONTINUES →			

If you do not have the problem, do not check a box

INTENSITY

Mild	Moderate	Severe	Problem
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Shortness of breath at rest (19)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Wheezing (20)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Shortness of breath with activity (21)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Nausea (22)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Vomiting (23)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Lack of appetite (24)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Coughing (25)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Blood in spit/sputum (26)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Sore throat (27)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Painful swallowing (28)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Mouth ulcers (29)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	White spots in mouth/Thrush (30)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Constipation (31)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Concern over weight loss (32)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Concern over weight gain (33)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Insomnia/can't sleep (34)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Anxious (35)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Heart racing (36)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Chest pain (37)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Dizziness (38)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Headaches (39)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Blurred vision (40)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Seizures/tremors (41)

CONTINUES →

If you do not have the problem, do not check a box

INTENSITY

Mild	Moderate	Severe	Problem
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Numbness/tingling of arms (42)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Numbness/tingling of hands/fingers (43)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Numbness/tingling of legs (44)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Numbness/tingling of feet/toes (45)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Sore/bleeding gums (46)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Nose bleeds (47)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Easy bruising (48)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Flushing (49)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Swollen glands (50)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Swollen feet (51)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Rash (52)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Itchy skin (53)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Weight gain in stomach area (54)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Hump on back of neck/shoulders (55)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Skinny arms and legs (56)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Prominent leg veins (57)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Rectal itching (58)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Rectal bleeding (59)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Rectal discharge (60)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Nipple discharge (61)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Breast pain/changes (62)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Sores or lumps on genitals (63)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Burning with urination (64)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Other-list: _____ (65)

CONTINUES →

If you do not have the problem, do not check a box

INTENSITY

Mild	Moderate	Severe	Problem
			For women only
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Vaginal discharge (66)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Irregular period (67)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Heavy period (68)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Bad cramps (69)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Vaginal itching (70)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Vaginal odor (71)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Bleeding between period (72)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Pelvic pain (73)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Other-list: _____ (74)

Thank You!

© Holzemer & Bakken, 1999

Thank You!

Chart Review Form

Expressive Writing Chart Review Form

Date of writing session: # 1 _____ # 4 _____

Period of Review:

3 months prior to 1st writing session: From _____ to _____

3 months after 4th writing session: From _____ to _____

Scheduled and Illness Related Visits

# of visit	Pre-writing	Post Writing	Reason
Scheduled Appts.			
Missed Scheduled Appts.			
Unscheduled Illness Visits			
Other visit			

CD4 Counts:

Pre Writing CD4 Ct.	Date	Post Writing CD4 Ct.	Date

Viral Loads:

Pre-Writing V. Load	Date	Post Writing V. Load	Date

HIV History:

Date of HIV diagnosis _____ **Date of AIDS diagnosis** _____

Transmission route:**MSM****MSM and inject Drugs****Hemophilia****Heterosexual****Blood/Tissue Contact****Other/Not Reported**

3-Month Pre-Writing Medication History:

Medication	Drug Class	Date reported/ordered	Date Discontinued	Comment

3-Month Post-Writing Medication History

Medication	Drug Class	Date reported/ordered	Date Discontinued	Comments

Notes

Medication Adherence

Self-Reported Medication-Taking Scale

1. Do you ever forget to take your medicine?
Yes _____ No _____
2. Are you careless at times about taking your medicine?
Yes _____ No _____
3. When you feel better do you sometimes stop taking your medicine?
Yes _____ No _____
4. Sometimes if you feel worse when you take the medicine, do you stop taking it?
Yes _____ No _____
5. How often did you miss a dose of your HIV medication in the last month?
Every day _____
More than once a week _____
About once a week _____
About once every 2 weeks _____
Less than once a month _____
Never during the last month _____

The Symptom/Emotion Checklist (SEC)

Please rate yourself along the scale below by placing a $\sqrt{}$ on the line closest to what you are experiencing or feeling right now, at this moment.

No	_____	_____	_____	_____	_____	Headache
No	_____	_____	_____	_____	_____	Watering eyes
No	_____	_____	_____	_____	_____	Racing heart
No	_____	_____	_____	_____	_____	Congested nose
No	_____	_____	_____	_____	_____	Tense muscles
No	_____	_____	_____	_____	_____	Upset stomach
No	_____	_____	_____	_____	_____	Flushed face
No	_____	_____	_____	_____	_____	Sweaty hands
No	_____	_____	_____	_____	_____	Shortness of breath
No	_____	_____	_____	_____	_____	Cold hands
No	_____	_____	_____	_____	_____	Dizziness
No	_____	_____	_____	_____	_____	Ring in ears
Not	_____	_____	_____	_____	_____	Happy
Not	_____	_____	_____	_____	_____	Anxious
Not	_____	_____	_____	_____	_____	Guilty
Not	_____	_____	_____	_____	_____	Angry
Not	_____	_____	_____	_____	_____	Sad

Perception of Writing Questionnaire

Please read the following questions and rate your responses by drawing a circle around the number on the scale that best corresponds to your answer. Your answers will range from **1** (*Not at all*) to **7** (*A great deal*) along the scale depending on where your response falls on the continuum.

For example: If you feel that your essay is somewhat personal you would choose a number between 1 and 7 that best describes how YOU feel.

1. How personal did you consider your essay to be?

1 2 3 4 5 6 7

Not at all A great deal

2. To what degree did you reveal emotions in your essay?

1 2 3 4 5 6 7
Not at all A great deal

3. To what degree have you previously held back telling others about the subject you covered in your essay?

1 2 3 4 5 6 7
Not at all A great deal

REFERENCES

- Affleck, G., Tennen H. Croog S. Levine S. (1987). Causal attribution, perceived benefits, and morbidity after a heart attack: an 8-year study. *Journal of Consulting & Clinical Psychology*, 55(1), 29-35.
- Antoni, M. H. (1985). Temporal relationship between life events and two illness measures: A cross-lagged panel analysis. *Journal of Human Stress*, 11(1), 21-26.
- Antoni, M. H., Bagget, L., Ironson, G. H., August, S., LaPerriere, A., Klismas, G., et al. (1991). Cognitive behavioral stress management intervention buffers distress responses and immunological changes following notification of HIV-1 seropositivity. *Journal of Clinical and Consulting Psychology*, 58, 906-915.
- Antoni, M. H., Cruess, D. G., Cruess, S., Lutgendorf, S. K., & Kumar, M. (2000). Cognitive behavioral stress management intervention effects on anxiety, 24-hour urinary catecholamine output, and T-cytotoxic/suppressor cells over time among symptomatic HIV-infected gay men. *Journal of Clinical and Consulting Psychology*, 68, 31-46.
- Antonovsky, A. (1987). *Unraveling the mystery of health: How people manage stress and stay well*. San Francisco: Jossey-Bass Publishers.
- Antonovsky, A. (1993). The structure and properties of the sense of coherence scale. *Social Science and Medicine*, 36(6), 725-733.
- Aspinwall, L. G., & Taylor, S. E. (1992). Modeling cognitive adaptation: a longitudinal investigation of the impact of individual differences and coping on college adjustment and performance. *Journal of Personality and Social Psychology*, 63(6), 989-1003.
- Badia, X., Podzamczar, D., Casado, A., Lopez-Lavid, C. C., Garcia, M., & the Spanish MOS-HIV and MQOL-HIV Validation Group. (2000). Evaluating changes in health status in HIV-infected patients: Medical outcomes study-HIV and multidimensional quality of life-HIV quality of life questionnaires. *AIDS*, 14(10), 1439-1447.
- Balderson, B., Mullins, L. L., & Hoff, A. (2001). *The effects of written disclosure on physical and mental health in individuals with asthma*. Paper presented at the Society of Behavioral Medicine Annual Convention, Seattle, WA.
- Banaji, M. R., & Prentice, D. A. (1994). The self in social contexts. In L. Porter & M. Rosenzweig (Eds.), *Annual Review of Psychology* (vol. 45, pp. 279-332). Palo Alto, CA: Annual Reviews, Inc.

- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. (1977). *Social learning theory*. Oxford: Prentice Hall.
- Barnes, D. (1986). Promising results halt trial of anti-AIDS drug. *Science*, 234, 15-16.
- Basen-Enquist, K., & Parcel, G. (1992). Attitudes, norms, and self efficacy: A model of adolescent HIV-related sexual risk behavior. *Health Education Quarterly*, 19, 263-274.
- Bergner, M., Bobbit, R. A., Carter, W. B., Gilson, B. S. (1981). The sickness impact profile: Development and final revision of a health status measure. *Medical Care*, 19, 787-805.
- Bootzin, R. R. (1997). Examining the theory and clinical utility of writing about emotional experiences. *Psychological Science*, 8, 167-169.
- Bower, J. E., Kemeny, M. E., Taylor, S. E., & Fahey, J. L. (1998). Cognitive processing, discovery of meaning, CD4 decline, and AIDS-related mortality among bereaved HIV-seropositive men. *Journal of Consulting and Clinical Psychology*, 66(6), 979-986.
- Brafford, L. J., & Beck, K. H. (1991). Development and validation of a condom self-efficacy scale for college students. *Journal of American College Health*, 39(5), 219-225.
- Brantley, P., & Jones, G. (1993). Nonverbal and verbal emotional expression and health. *Annals of Behavioral Medicine*, 15, 17-25.
- Breuer, J., & Freud, S. (1966). *Studies on hysteria*. New York: Avon.
- Broderick, J. E., Stone, A. A., Smyth, J. M., & Kaell, A., T. (in press). *The feasibility and effectiveness of an expressive writing intervention for rheumatoid arthritis via home-based videotaped instructions*. *Annals of Behavioral Medicine*.
- Brown, L. K., Kessel, S. M., Lourie, K. J., Ford, H. H., & Lipsett, L. P. (1997). Influence of sexual abuse on HIV-related attitudes and behaviors in adolescent psychiatric inpatients. *Child and Adolescent Psychology*, 36(3), 316-322.
- Brynes, D., Antoni, M. H., Goodken, K., Efantis-Potter, J., Asthana, D., Simon, T., et al. (1998). Stressful events, pessimism, natural killer cell cytotoxicity, and cytotoxic/suppressor T cells in HIV + black women at risk for cervical cancer. *Psychosomatic Medicine*, 60(6), 714-722.

- Burack, J. H., Barrett, D. C., Stall, R. D., Chesney, M. A., Ekstrand, M. L., & Coates, T. J. (1993). Depressive symptoms and CD4 lymphocyte decline among HIV-infected men. *Journal of the American Medical Association*, 270, 2567-2573.
- Burgess, A., Dayer, M., Catalan, J., Hawkins, K., Gazzard, B. (1993). The reliability and validity of two HIV-specific health related quality of life measures: Preliminary analysis. *AIDS*, 7, 1001-1008.
- Calman, K. C. (1984). Quality of life in cancer patients - an hypothesis. *Journal of Medical Ethics*, 10, 124-127.
- Cameron, L. D., & Nicholls, G. (1998). Expression of stressful experiences through writing: Effects of a self-regulation manipulation for pessimists and optimists. *Health Psychology*, 17, 84-92.
- Campbell, D. T., & Stanley, J. C. (1963). *Experimental and quasi-experimental designs for research*. Chicago: Rand McNally & Company.
- Catz, S. L., Kelly, J. A., Bogart, L. M., Benotsch, E. G., & McAuliffe, T. L. (2000). Patterns, correlates, and barriers to medication adherence among persons prescribed new treatments for HIV disease. *Health Psychology*, 19(2), 124-133.
- Centers for Disease Control and Prevention. (2000). US HIV and AIDS cases reported through December, 2000. *HIV/AIDS Surveillance Report*; 12(2).
- Centers for Disease Control, P. (2002). *Basic statistics -cumulative AIDS cases*, from <http://www.cdc.gov/hiv/stats/cumulati.htm>.
- Chesney, M. A., Ickovics, J., Hecht F. M., Sikipa, G., Rabkin J. (1999). Adherence: A necessity for successful HIV combination therapy. *AIDS*. 13(Suppl A), S271-278.
- Christensen, A. J., & Smith, T. W. (1994). Cynical hostility and cardiovascular reactivity during self-disclosure. *Psychosomatic Medicine*, 55, 193-202.
- Coates, T. J., MucKusick, L., Kuno, R., & Stites, D. P. (1989). Stress management training reduced number of sexual partners but did not improve immune function in men infected with HIV. *American Journal of Public Health*, 79, 885-887.
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24, 384-396.
- Cohen, S., Tyrell, D., & Smith, A. (1991). Psychological stress and susceptibility to the common cold. *New England Journal of Medicine*, 325(9), 606-1.

- Cole, S. W., Kemeny, M. W., Taylor, S. E., & Visscher, B. R. (1996). Elevated health risk among men who conceal their homosexuality. *Health Psychology, 15*, 243-251S.
- Costello, C. G. (1993). *Symptoms of depression*. New York: Wiley.
- Cruess, S., Antoni, M., Cruess, D. G., Fletcher, M. A., Ironson, G., Kumar, M., et al. (2000). Reductions in herpes simplex virus type 2 antibody titers after cognitive behavioral stress management and relationships with neuroendocrine function, relaxation skills, and social support in HIV-positive men. *Psychosomatic Medicine, 62*(6), 828-837.
- de Moor, C., Sterner, J., Hall, M., Warneke, C., Gilani, Z., Amato, r., et al. (2002). A pilot study of the effects of expressive writing on psychological and behavioral adjustment in patients enrolled in a phase II trial of vaccine therapy for metastatic renal cell carcinoma. *health Psychology, 21*(6), 615-619.
- Dienstfrey, H. (1991). *Where the mind meets the body*. New York: Harper Collins.
- Donnelly, D. A., & Murray, E. J. (1991). Cognitive and emotional changes in written essays and therapy interviews. *Journal of Social and Clinical Psychology, 10*, 334-350.
- Engle, G. L. (1977). The need for a new medical model: A challenge for biomedicine. *Science, 8*(4286), 129-196.
- Esterling, B., Antoni, M., Kumar, M., & Schneiderman, N. (1990). Emotional repression, stress disclosure responses, and Epstein-Barr capsid antigen titers. *Psychosomatic Medicine, 52*, 397-410.
- Esterling, B. A., Antoni, M. H., Fletcher, M. A., Margulies, S., & Schneiderman, N. (1994). Emotional disclosure through writing or speaking modulates latent Epstein Barr virus antibody titers. *Journal of Consulting and Clinical Psychology, 62*(1), 130-140.
- Esterling, B. A., L'Abate, L., Murray, E. J., & Pennebaker, J. W. (1999). Empirical foundations for writing in prevention and psychotherapy: Mental and physical health outcomes. *Clinical Psychology Review, 19*(1), 79-96.
- Faryna, E. L., & Morales, E. (2000). Self-efficacy and HIV-related risk behaviors among multiethnic adolescents. *Cultural Diversity and Ethnic Minority Psychology, 6*(1), 42-56.
- Foa, E. B., & Kozak, M. J. (1986). Emotional processing of fear: Exposure to corrective information. *Psychological Bulletin, 99*, 20-35.

- Foa, E. B., Riggs, D. S., Massie, E. D., & Yarczower, M. (1995). The impact of fear activation and anger on the efficacy of exposure treatment for PTSD. *Behavior Therapy*, 26, 487-499.
- Francis, M. E., & Pennebaker, J. W. (1992). Putting stress into words; Writing about personal upheavals and health. *American Journal of Health Promotion*, 6, 280-287.
- Gergen, K. J., & Gergen, M. M. (1988). Narrative and the self as relationship. In L. Berkowitz (Ed.), *Advances in experimental social psychology*, Vol. 21: *Social psychological studies of the self: Perspectives and programs* (Vol. 21, pp. 17-56). San Diego: Academic Press, Inc.
- Gidron, Y., Peri, T., Connolly, J. F., & Shalev, A. Y. (1996). Written disclosure in posttraumatic stress disorder: Is it beneficial for the patient? *Journal of Nervous and Mental Health*, 184, 505-507.
- Giese-Davis, J., Koopman, C., & Butler, D. (April, 2000). *Change over time in emotional control in supportive-expressive group therapy for metastatic breast cancer patients*. Paper presented at the Society of Behavioral Medicine, Nashville, TN.
- Gilbert, D. T., Fiske, S. T., & Lindzey, G. (Eds.). (1998). *The Handbook of Social Psychology*. New York: McGraw-Hill.
- Gillis, M., Lumley, M., Koch, H., Mosley-Williams, A., Leisen, J., & Roehrs, T. (2003). Written emotional disclosure in fibromyalgia syndrome. Abstract published in *Psychosomatic Medicine*, 65, A-12.
- Givertz, F., Revicki, D.A. (1995). Discriminant validity of the medical outcomes study cognitive function scale in HIV disease patients. In: International Society of Quality of Life Research, Montreal, Quebec, 14-17, October, 1995.
- Greenberg, M. A., & Lepore, S. J. (2001). Theoretical mechanisms involved in disclosure: From inhibition to self-regulation. In I. Nyklicek, A. J. J. M. Vingerhoets & L. R. Temoshok (Eds.), *The Expression and nonexpression of emotions in health and disease*. Amsterdam: Harwood Academic Publishers.
- Greenberg, L. S., & Safran, J. D. (1987). *Emotion in psychotherapy*. New York: Guilford Press.
- Greenberg, M. A., & Stone, A. A. (1992). Emotional disclosure about traumas and its relation to health: Effects of previous disclosure and trauma severity. *Journal of Personality and Social Psychology*, 63(1), 75-84.

- Greenberg, M. A., Wortman, C. B., & Stone, A. A. (1996). Emotional expression and physical health: revising traumatic memories or fostering self-regulation? *Journal of Personality and Social Psychology*, 71(3), 588-602.
- Heider, F. (1958). *The psychology of interpersonal relations*. Oxford: Wiley.
- Helgeson, V. S. (2003). Cognitive adaptation, psychological adjustment, and disease progression among angioplasty patients: 4 years later. *Health Psychology*, 22(1), 30-38.
- Helgeson, V. S., & Fritz, H. L. (1999). Cognitive adaptation as a predictor of new coronary events after percutaneous transluminal coronary angioplasty. *Psychosomatic Medicine*, 61(4), 488-495.
- Helgeson, V. S., & Taylor, S. E. (1993). Social comparisons and adjustment among cardiac patients. *Journal of Applied Social Psychology*, 23(15), 1171-1195.
- Hertel, B. r. (1976). Minimizing error variance introduced by missing data routines in survey analysis. *Sociological Methods and Research*, 4, 459-574.
- Hinshaw, A. S. (1989). Nursing science: The challenge to develop knowledge. *Nursing Science quarterly Review*, 2(4), 162-171.
- Hobfoll, S. E. (1989). Conservation of resources. A new attempt at conceptualizing stress. *American Psychologist*, 44(3), 513-524.
- Holzemer, W. L. (2002). HIV and AIDS: the symptom experience. *Journal of Nursing*. 102(4), 48-52.
- Holzemer, W. L., Corless, I. B., Nokes, K. M., Turner, J. G., Brown, M. A., Powell-Cope, G. M., et al. (1999). Predictors of self-reported adherence in persons living with HIV disease. *AIDS Patient Care and STDs*, 13(3), 185-197.
- Holzemer, L. W., Hudson, A., Kirksey, K. M., Hamilton, M. J., Ballen, S., (2001). The revised sign and symptom checklist for HIV (SSC-HIVrev). *Journal of the Association of Nurses in AIDS Care*, 12(5), 60-70.
- Horowitz, M. J. (1986). Stress-response syndromes: A review of posttraumatic and adjustment disorders. *Hospital and Community Psychiatry*, 37(3), 241-249.
- Hughes, C. F., Uhlmann, C., & Pennebaker, J. W. (1994). The body's response to psychological defense. *Journal of Personality*, 62, 565-585
- Janoff-Bulman, R. (1992). Shattered perceptions: Towards a new psychology of trauma. New York: Free Press.

- Jaycox, L. H., Foa, E. B., & Morral, A. R. (1998). Influence of emotional engagement and habituation on exposure therapy for PTSD. *Journal of Consulting and Clinical Psychology, 66*, 185-192.
- Jourard, S. M. (1964). *The transparent self*. New York: Van Nostrand.
- Kelley, H. H. (1967). *Attribution theory in social psychology*. Lincoln: University of Nebraska.
- Kelley, J. E., Lumley, M. A., & Leisen, J. C. C. (1997). Health effects of emotional disclosure in rheumatoid patients. *Health Psychology, 16*, 331-340.
- Kelly, J. A., Murphy, D. A., Bahr, G. R., Kalichman, S. C., Morgan, M. G., Stevenson, L. Y., et al. (1993). Outcome of cognitive-behavioral and support group brief therapies for depressed HIV-infected persons. *American Journal of Psychiatry, 150*(11), 1679-1686.
- Keltner, D., Ellsworth, P., & Edwards, K. (1993). Beyond simple pessimism: Effects of sadness and anger on social perception. *Journal of Personality and Social Psychology, 64*, 740-752.
- Kemeney, M. E., & Gruenewald, T., L. (2000). *Affect, cognition, the immune system, and health*. Amsterdam: Elsevier Science B. V.
- Kemeny, M. E., Weiner, H., Taylor, S. E., Schneider, S., Visscher, B., & Fahey, J. L. (1994). Repeated bereavement, depressed mood, and immune parameters in HIV seropositive and seronegative gay men. *Health Psychology, 13*, 14-24.
- King, L. A. (2001). The health benefits of writing about life goals. *Journal of Personality and Social Psychology, 27*(7), 798-807.
- King, L. A., & Miner, K., N. (2000). Writing about the perceived benefits of traumatic events: Implications for physical health. *Personality and Social Psychology, 26*(2), 220-230.
- Klein, K., & Boals, A. (2001). Expressive writing can increase working memory capacity. *Journal of Experimental Psychology, 130*(3), 520-533.
- Krantz, D. S., Hedges, S. M., Gabbay, F. H., Klein, J., Falconer, J. J., Merz., Gottdiener, J. S., Rozanski, A. (1994). Triggers of angina and ST-segment depression in ambulatory patients with coronary artery disease: Evidence for a uncoupling of angina and ischemia, *American Heart Journal, 128*, 703-712.
- Krystal, H. (1988). *Integration and self-healing: Affect, trauma, alexithymia*. Hillsdale, NJ: The Analytic Press.

- Lepore, S. J. (1997). Expressive writing moderates the relation between intrusive thoughts and depressive symptoms. *Journal of Personality and Social Psychology*, 73, 1030-1037.
- Lepore, S. J., Greenberg, M. A., Wortman, C. B., Bruno, M., & Smyth, J. M. (2002). Expressive writing and health: Self-regulation of emotion-related experience, physiology, and behavior. In S. J. Lepore & J. M. Smyth. (Eds), *The writing cure: How expressive writing promotes health and emotional well-being*. Washington, D. C.: American Psychological Association.
- Lepore, S. J., Ragan, J. D., & Jones, S. (2000). Talking facilitates cognitive-emotional processes of adaptation to an acute stressor. *Journal of Personality and Social Psychology*, 78(3), 499-508.
- Lepore, S. J., Silver, R. C., Wortman, C. B., & Wayment, H. A. (1996). Social constraints, intrusive thoughts, and depressive symptoms among bereaved mothers. *Journal of Personality and Social Psychology*, 70, 271-282.
- Lipsey, M., & Wilson, D. (1993). The efficacy of psychological, educational, and bereaved treatment. Confirmation from meta-analysis. *American Psychologist*, 48, 1181-1209.
- Lipsey, M. W. (1990). *Design sensitivity: Statistical power for experimental research*. Newbury Park: Sage Publications.
- Leserman, J., Jackson, E. D., Petitto, J. M., Golden, R. N., Silva, S. G., & Perkins, D. O. (1999). Progression to AIDS: The effects of stress, depressive symptoms, and social support. *Psychosomatic Medicine*, 61, 397-406.
- Levy, J. A. (1993). Pathogenesis of human immunodeficiency virus infection. *Microbial Review*, 57, 183-289.
- Locke, S. E., & Colligan, D. (1987). *The healer within: The new medicine of mind and body*. New York: NAL-Dutton.
- Lumley, M. A. (in press). *Alexithymia, emotional disclosure, and health: A program of research*. *Journal of Personality*.
- Lumley, M. A., & Provenzano, K. M. (in press). Stress management through written emotional disclosure improves academic performance among college students with physical symptoms. *Journal of Educational Psychology*.
- Lutgendorf, S. K., Antoni, M., Ironson, G., Starr, K., Costello, N., Zuckerman, M., et al. (1998). Changes in cognitive coping skills and social support during cognitive behavioral stress management intervention and distress outcomes in symptomatic

- human immunodeficiency virus (HIV)-seropositive gay men. *Psychosomatic Medicine*, 60(2), 204-214.
- Lutgendorf, S. K., Antoni, M. H., Kumar, M., & Schneiderman, N. (1994). Changes in cognitive coping strategies predict EBV-antibody titer change following a stressor disclosure induction. *Journal of Psychosomatic Research*, 38, 63-78.
- Mann, T. (2001). Effects of future writing and optimism on health behaviors in HIV-infected women. *Annals of Behavioral Medicine*, 23(1), 26-33.
- Manstead, A. S. R., & Hewstone, M. (1996). *The Blackwell encyclopedia of social psychology*. Oxford: Blackwell Publishers, Ltd.
- Mayne, T. J., Vittinghoff, E., Chesney, M. A., Barrett, D. C., & Coates, T. J. (1996). Depressive affect and survival among gay and bisexual men infected with HIV. *Archives of Internal Medicine*, 156, 2233-2238.
- McAdams, D. P. (1990). Unity and purpose in human lives: The emergence of identity as a life story. In A. I. Rabin, R. A. Zucker, R. A. Emmons & S. Frank (Eds.), *Studying persons and lives*. New York: Springer.
- McAdams, D. P., Diamond, A., Aubin, E. d. S., & Mansfield, E. (1997). Stories of commitment: The psychosocial construction of general lives. *Journal of Personality and Social Psychology*, 72, 678-694.
- McCann, I. L., Sakheim, D. K., & Abrahamson, D. J. (1988). Trauma and victimization: A model of psychological adaptation. *The Counseling Psychologist*, 16, 531-594.
- McFarlane, A. (1992). Avoidance and intrusion in posttraumatic stress disorder. *Journal of Nervous and Mental Disease*, 180, 439-445.
- McIntosh, J., & McKeganey, N. (2000). Addict's narratives of recovery from drug use: Constructing a non-addict identity. *Social Science and Medicine*, 50, 1501-1510.
- McSherry, W. C., & Holm, J. E. (1994). Sense of coherence: Its effects on psychological and physiological processes prior to, during, and after a stressful situation. *Journal of Clinical Psychology*, 50(4), 476-487.
- Mendolia, M., & Kleck, R. E. (1993). Effects of talking about stressful events on arousal: Does what we talk about make a difference? *Journal of Personality and Social Psychology*, 64, 283-292.
- Meyer, T., Lumley, M., Markowitz, A., Leisen, J., Lubetsky, M., Lasichak, L., Mosley, A., Granda, J. (2003). Written or verbal disclosure about stress in rheumatoid arthritis. *Psychosomatic Medicine*, 65, A-13.

- Meyer, T., & Mark, M. (1995). Effects of psychosocial interventions with adult cancer patients: A meta-analysis of randomized experiments. *Health Psychology, 14*, 101-108.
- Morisky, D. E., Green, L. W., & Levine, D. M. (1986). Concurrent and predictive validity of a self-report measure of medication adherence. *Medical Care, 24*(1), 67-74.
- Mulder, C. L., Emmelkamp, M. G., Antoni, M., Mulder, J. W., Sandfort, T. G., & de Vries, M. J. (1994). Cognitive-behavioral and experiential group psychotherapy for HIV-infected homosexual men: A comparative study. *Psychosomatic Medicine, 56*, 423-431.
- Mumford, E., Schlesinger, H. J., & Glass, G. V. (1983). Reducing medical costs through mental health treatment: Research problems and recommendations. In A. Brokowski, E. Marks & S. K. Budman (Eds.), *Linking health and mental health* (pp. 257-273). Beverly Hills: Sage.
- Munro, B. H. (1997). Statistical methods for health care research, 3rd Ed. Philadelphia: Lippincott.
- Murray, E. J., Lamnin, A. D., & Carver, C. S. (1989). Emotional expression in written essays and psychotherapy. *Journal of Social and Clinical Psychology, 8*, 414-429.
- Murray, E. J., & Segal, D. L. (1994). Emotional processing in vocal and written expression of feelings about traumatic experiences. *Journal of Trauma Stress, 7*(3), 391-405.
- Nolen-Hoeksema, S. (1987). Sex differences in unipolar depression: Evidence and theory. *Psychological Bulletin, 101*, 259-282.
- Norman, S. A., Lumley, M. A., Dooley, J. A., Diamond, M. P. (in press). For whom does it work? Moderators of the effects of written emotional disclosure in women with chronic pelvic pain. *Psychosomatic Medicine*.
- Nunnally, J. C. (1978). Psychosomatic theory, 2nd Ed. New York, McGraw-Hill, 1978.
- O'Cleirigh, C., Ironson, G., Antoni, M. H., Fletcher, M. A., McGuffey, L., Balbin, E., et al. (2003). Emotional expression and depth processing of trauma and their relation to long-term survival in patients with HIV/AIDS. *Journal of Psychosomatic Research, 54*(3), 225-235.
- O'Leary, J. F., Ganz, P. A., Wu, A. W., Coscarelli, A., & Petersen, L. (1998). Toward a better understanding of health-related quality of life: A comparison of the Medical Outcomes Study HIV Health Survey (MOS-HIV) and the HIV Overview

- of Problems-Evaluation System (HOPES). *Journal of Acquired Immune Deficiency Syndromes and Retrovirology*, 17(5), 433-441.
- Ozer, E. M., & Bandura, A. (1990). Mechanisms governing empowerment effects: A self-efficacy analysis. *Journal of Personality and Social Psychology*, 58(3), 472-486.
- Paez, D., Velasco, C., & Gonzalez, J. L. (1999). Expressive writing and the role of alexithymia as a dispositional deficit in self-disclosure and psychological health. *Journal of Personality and Social Psychology*, 64, 630-641.
- Page-Shafer, K., Delorenze, G. N., Satariano, W., & Winkelstein, W. J. (1996). Comorbidity and survival in HIV-infected men in the San Francisco men's health survey. *Annals of Epidemiology*, 6, 420-430.
- Patterson, T., Shaw, W., Semple, S., Cherner, M., McCutchan, J., & Atkinson, J. (1996). Relationship of psychosocial factors to HIV disease progression. *Annals of Behavioral Medicine*, 18, 30-39.
- Pennebaker, J. W. (1982). *The psychology of physical symptoms*. New York: Springer-Verlag.
- Pennebaker, J. W. (1985). Traumatic experience and psychosomatic disease: Exploring the roles of behavioral inhibition, obsession, and confiding. *Canadian Psychology*, 26, 82-95.
- Pennebaker, J. W. (1989). Confession, inhibition, and disease. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 22). New York: Academic Press.
- Pennebaker, J. W. (1991). Writing your wrongs. *American Health*, 10, 64-67.
- Pennebaker, J. W. (1997). Writing about emotional experiences as a therapeutic process. *Psychological Science*, 8(3), 162-166.
- Pennebaker, J. W., & Beall, S. K. (1986). Confronting a traumatic event: toward an understanding of inhibition and disease. *Journal of Abnormal Psychology*, 95(3), 274-281.
- Pennebaker, J. W., Colder, M., & Sharp, L. K. (1990). Accelerating the coping process. *Journal of Personality and Social Psychology*, 58(3), 528-537.
- Pennebaker, J. W., & Frances, M. E. (1996). Cognitive, emotional, and language processes in disclosure. *Cognition and Emotion*, 10(6), 601-626.

- Pennebaker, J. W., & Harber, K. (1993). A social stage model of collective coping: The Loma Pietra earthquake and the Persian Gulf war. *Journal of Social Issues*, 49(4), 125-146.
- Pennebaker, J. W., Hughes, C. F., & O'Heeron, R. C. (1987). The psychophysiology of confession; Linking inhibitory and psychosomatic processes. *Journal of Personality and Social Psychology*, 52, 781-793.
- Pennebaker, J. W., Kiecolt-Glaser, J. K., & Glaser, R. (1988). Disclosure of traumas and immune function: health implications for psychotherapy. *Journal of Consulting and Clinical Psychology*, 56(2), 239-245.
- Pennebaker, J. W., & O'Heeron, R. (1984). Confiding in others and illness rate among spouses of suicide and accidental death victims. *Journal of Abnormal Psychology*, 93, 473-476.
- Pennebaker, J. W., & Seagal, J. D. (1999). Forming a story: the health benefits of narrative. *Journal of Clinical Psychology*, 55(10), 1243-1254.
- Pennebaker, J. W., & Susman, J. R. (1988). Disclosure of traumas and psychosomatic processes. *Social Science and Medicine*, 26(3), 327-332.
- Pennebaker, J. W., & Watson, D. (1988). Self-reports and physiological measures in the workplace. In J. J. H. Jr., L. R. Murphy, S. L. Sauter & C. L. Cooper (Eds.), *Occupational stress: Issues and development in research* (pp. 184-199). New York: Taylor & Francis.
- Peterson, C. (2000). The future of optimism. *American Psychologist*, 55(1), 44-55.
- Petrie, K. J., Booth, R. J., & Pennebaker, J. W. (1998). The immunological effects of thought suppression. *Journal of Personality and Social Psychology*, 75(5), 1264-1272.
- Petrie, K. J., Booth, R. J., Pennebaker, J. W., Davison, K. P., & Thomas, M. G. (1995). Disclosure of trauma and immune response to a hepatitis B vaccination program. *Journal of Counseling and Clinical Psychology*, 63(5), 787-792.
- Pitman, R. K., & Orr, S. P. (1990). The black hole of trauma. *Biological Psychiatry*, 27, 469-471.
- Ptacek, J., Smith, R., & Zanas, J. (1992). Gender, appraisal, and coping: A longitudinal analysis. *Journal of Personality*, 60, 747-770.
- Rachman, S. J. (1980). Emotional processing. *Behavior research and therapy*, 18, 51-60.

- Read, L. J., Quinn, R. J., Hoefer, M. A. (1987). Measuring overall health: an evaluation of three important approaches. *Journal of Chronic Diseases*, 40(suppl), 7S.
- Reed, G. M., Kemeny, M. E., Taylor, S. E., & Visscher, B. R. (1994). "Realistic acceptance" as a predictor of decreased survival time in gay men with AIDS. *Health Psychology*, 13, 299-307.
- Reed, G. M., Kemeny, M. E., Taylor, S. E., & Visscher, R. R. (1999). Negative HIV-specific expectancies and AIDS-related bereavement as predictors of symptom onset in asymptomatic HIV-positive gay men. *Health Psychology*, 18(4), 354-363.
- Rivicki, D. A., Sorensen, S., Wu, A. W. (1998). Reliability and validity of physical and mental health summary scores from the medical outcomes study HIV Health survey. *Medical Care*, 36(2), 126-137.
- Richards, J. M., Beal, W. E., Seagal, J. D., & Pennebaker, J. W. (2000). Effects of disclosure of traumatic events on illness behavior among psychiatric prison inmates. *Journal of Abnormal Psychology*, 109(1), 156-160.
- Richards, J. M., Pennebaker, J. W., & Beall, W. E. (1995). *The effects of criminal offense and disclosure of trauma on anxiety and illness in prison inmates*. Paper presented at the Midwest Psychological Association, Chicago.
- Rime', B. (1995). Mental rumination, social sharing, and the recovery from emotional disclosure. In J. W. Pennebaker (Ed.), *Emotion, disclosure, and health* (pp. 271-292). Washington, D. C.: American Psychological Association.
- Rosenberg, H. J., Rosenberg, S. D., Ernstoff, M. S., Wolford, G. L., Amdur, R. J., Elshamy, M. R., Bauer-Wu, S. M., Ahles, T. A., Pennebaker, J. W. (2002). Expressive disclosure and health outcomes in a prostate cancer population, *International Journal of Psychiatric Medicine*, 32, 37-53.
- Rosenthal, R., & Rubin, D. (1982). A simple, general purpose display of magnitude of experimental effect. *Journal of Educational Psychology*, 74, 166-199.
- Ryff, C. D., & Singer, B. H. (2000). Biopsychosocial challenges of the new millennium. *Psychotherapy and Psychosomatics*, 69, 170-177.
- Scheff, T. J. (1979). *Catharsis in healing, ritual, and drama*. Berkeley: University of California Press.
- Scheier, M. F., & Carver, C. S. (1985). Optimism, coping, and health: Assessment and implications of generalized outcome expectancies. *Health Psychology*, 4, 219-247.

- Scheier, M. F., Matthews, K. A., Owens, J. F., Magovern, G. J., & Lefebvre, R. C. (1989). Optimism and rehospitalization following coronary artery bypass graft surgery. *Archives of Internal Medicine*, 159, 829-835.
- Schneider, S. G., Taylor, S. E., Kemeny, M. E., & Hammen, C. (1991). AIDS-related factors predictive of suicidal ideation of low and high intent among gay and bisexual men. *Suicide and Life Threatening Behavior*, 21(4), 313-328.
- Schneiderman, N., Antoni, M. H., Saab, P. G., & Ironson, G. (2001). Health psychology: Psychosocial and biobehavioral aspects of chronic disease management. *Annual Review of Psychology*, 52, 555-580.
- Schoutrop, M. J. A., Lange, A., Brosschot, J., & Everaerd, W. (1996). *the effects of writing assignments on reprocessing traumatic events: Three experimental studies*. Paper presented at the (Non) Expression of Emotions and Health and Disease Conference, Tilburg, The Netherlands.
- Scott-Lennox, J., McLaughlin, Miley, C. J., Mauskopf, J. A. (1996). Impact of lamivudine and zidovudine therapy on quality of life (QOL). In: XI International Conference on AIDS, Vancouver, 7-12 July, 1996.
- Segal, D. L., & Murray, E. J. (1994). Emotional processing in cognitive therapy and vocal expression of feeling. *Journal of Social and Clinical Psychology*, 13(2), 189-206.
- Seegerstrom, M. J. A. (2001). Optimism and attentional bias for negative and positive stimuli. *Personality and Social Psychology Bulletin*, 27(10), 1334-1343.
- Seegerstrom, M. J. A., Taylor, S. E., Kemeny, M. E., & Fahey, J. L. (1998). Optimism is associated with mood, coping, and immune change in response to stress. *Journal of Personality and Social Psychology*, 74, 1646-1655.
- Silver, R. L., Boon, C., & Stones, M. H. (1983). Searching for meaning in misfortune: Making sense of incense. *Journal of Social Issues*, 39, 81-102.
- Smith, C. A., Dobbins, C. J., & Wallston, K. A. (1991). The mediational role of perceived competence in psychological adjustment to rheumatoid arthritis. *Journal of Applied Social Psychology*, 21(15), 1218-1247.
- Smith, M. L., & Glass, G. (1977). Meta-analysis of psychotherapy outcome studies. *American Psychologist*, 32, 752-760.
- Smith, M. S., Wallston, K. A., & Smith, C. A. (1995). The development of the perceived health competence scale. *Health Education Research Theory and Practice*, 10, 51-64.

- Smyth, J. M. (1998). Written emotional expression: effect sizes, outcome types, and moderating variables. *Journal of Consulting and Clinical Psychology*, 66(1), 174-184.
- Smyth, J. M., & Greenberg, M. A. (2000). *Scriptotherapy: The effects of writing about traumatic events*. Washington, D. C.: American Psychological Association.
- Smyth, J. M., & Helm, R. (2003). Focused expressive writing as self-help for stress and trauma. *Journal of Clinical Psychology*, 59(2), 227-235.
- Smyth, J. M., & Pennebaker, J. W. (1999). Sharing one's story. In G. R. Snyder (Ed.), *Coping: The Psychology of What Works* (pp. 70-89). New York: Oxford University Press.
- Smyth, J. M., & Pennebaker, J. W. (2001). What are the health effects of disclosure? In A. Baum, T. A. Revenson & J. E. Singer (Eds.), *Handbook of health psychology* (pp. 339-348). London: Lawrence Erlbaum Associates.
- Smyth, J. M., Stone, A. A., Hurewitz, A., & Kaell, A. (1999). Effects of writing about stressful experiences on symptom reduction in patients with asthma and rheumatoid arthritis: A randomized trial. *Journal of the American Medical Association*, 281(14), 1304-1309.
- Sobel, D. S. (2000). The cost-effectiveness of mind-body medicine intervention. In F. A. Mayer & C. B. Saper (Eds.), *Progress in brain research* (Vol. 122): Elsevier Science B V.
- Sousa, K. A., Holzemer, W. L., Henry, S. B., Slaughter, R. (1999). Dimensions of health-related quality of life in persons living with HIV disease. *Journal of Advanced Nursing*, 29(1), 178-187.
- Spiegel, D., Bloom, J. R., Kraemer, H. C., & Gottheil, E. (1989). Effect of psychosocial treatment on survival of patients with metastatic breast cancer. *Lancet*, 2(8668), 888-891.
- Spera, S. P., Buhfeind, E. D., & Pennebaker, J. W. (1994). Expressive writing and coping with job loss. *Academy of Management Journal*, 37(3), 722-733.
- Stanton, A. L., Danoff-Burg, S., Sworowski, L. A., Collins, C. A., Branstetter, A. D., Rodriguez-Hanley, A., et al. (2002). Randomized, controlled trial of written emotional expression and benefit finding in breast cancer patients. *Journal of Clinical Oncology*, 20(20), 4160-4168.
- Stewart, A. L., Hays, R. D., Ware, J. E. (1988). The MOS short-form general health survey: Reliability and validity in a patient population. *Medical Care*, 1988, 724-735.

- Stewart, A. L., Ware, J. E., Eds. (1992). *Measuring function and well-being: The Medical Outcomes Study approach*. Durham, NC: Duke University Press.
- Stiegelis, H. E., Hagedoorn, M., Sanderman, R., van der Zee, K. I., Buunk, b. P., & van den Bergh, a. C. (2003). Cognitive adaptation: a comparison of cancer patients and healthy references. *British Journal of Health Psychology*, 8(Pt 3), 303-318.
- Stone, A., Reed, B., & Neale, J. (1987). Changes in daily event frequency precede episodes of physical symptoms. *Journal of Human Stress*, 13, 70-74.
- Stone, A. A., Smyth, J. M., Kaell, A., & Hurewitz, A. (2000). Structured writing about stressful events: Exploring potential psychological mediators of positive health effects. *Health Psychology*, 19(6), 619-624.
- Strobe, W., & Strobe, M. S. (1988). *Bereavement and health: The psychological and physical consequences of partner loss*. New York: Cambridge University Press.
- Suls, J. (2003). Contributions of social comparison to physical illness and well-being. In J. W. Sulz, Kenneth (Ed.), *Social psychological foundations of health and illness. Blackwell series in health psychology and behavioral medicine*. Malden, MA: Blackwell Publishers.
- Swanbon, T. W. (2000). The physical and psychological health effects of self-disclosure in homosexual males. Dissertation-Abstract. Vol. 60(11-B): 5794.
- Taylor, S. E. (1983). Adjustment to threatening events. *American Psychologist*, 38(11), 1161-1172.
- Taylor, S. E. (1991). The asymmetrical impact of positive and negative events: The mobilization-minimization hypothesis. *Psychological Bulletin*, 110, 67-85.
- Taylor, S. E., & Armor, D. A. (1996). Positive illusions and coping with adversity. *Journal of Personality*, 64(4), 873-898.
- Taylor, S. E., & Brown, J. D. (1988). Illusion and well-being: A social psychological perspective on mental health. *Psychological Bulletin*, 103(2), 193-210.
- Taylor, S. E., & Brown, J. D. (1994a). "Illusion" of mental health does not explain positive illusions. *American Psychologist*, 49(11), 972-973.
- Taylor, S. E., & Brown, J. D. (1994b). Positive illusions and well-being revisited: Separating fact from fiction. *Psychological Bulletin*, 116(1), 21-27.

- Taylor, S. E., Helgeson, V. S., Reed, G. M., & Skokan, L. A. (1991). Self-generated feelings of control and adjustment to physical illness. *Journal of Social Issues*, 47(4), 91-109.
- Taylor, S. E., Kemeny, M. E., Reed, G. M., & Aspinwall, L. G. (1991). Assault on the self: Positive illusions and adjustment to threatening events. In J. Strauss & G. R. Goethals (Eds.), *The Self: Interdisciplinary approaches*. New York: Springer-Verlag.
- Taylor, S. E., Kemeny, M. E., Aspinwall, L. G., Rodriguez, R., & Herbert, M. (1992). Optimism, coping, psychological distress, and high-risk sexual behavior among men at risk for acquired immunodeficiency syndrome (AIDS). *Journal of Personality and Social Psychology*, 63(3), 460-473.
- Taylor, S. E., Kemeny, M. E., Reed, G. M., Bower, J., E., & Gruenewald, T., L. (2000). Psychological resources, positive illusions, and health. *American Psychologist*, 55(1), 99-109.
- Taylor, S. S., Lichtman, R. R., & Wood, J. V. (1984). Attributions, beliefs about control, and adjustment to breast cancer. *Journal of Personality and Social Psychology*, 46, 489-502.
- Taylor, S. E., & Lobel, M. (1989). Social comparison activity under threat: downward evaluation and upward contacts. *Psychological Review*, 96(4), 569-575.
- Tedeschi, R. G., Park, C. L., & Calhoun, L. G. (1998). *Posttraumatic growth: Positive changes in the aftermath of crisis*. Mahwah: Erlbaum.
- Temoshok, L. R., Heller, B., Sagebiel, R., Blois, M., Sweet, D., DiClemente, R., et al. (1985). The relationship of psychosocial factors to prognostic indicators in cutaneous malignant melanoma. *Journal of Psychosomatic Research*, 29, 139-154.
- Terr, L. (1994). *Unchained memories*. New York: Basic Books.
- Thompson, S. C. (1991). The search for meaning following a stroke. *Basic and Applied Social Psychology*, 12, 81-96.
- Thompson, S. C., Nanni, C., & Levine, A. (1994). Primary versus secondary and central versus consequence-related control in HIV-positive men. *Journal of Personality and Social Psychology*, 67(3), 540-547.
- Tiger, L. (1979). *Optimism: The biology of hope*. New York: Simon & Schuster.

- Ullrich, P. M., Lutgendorf, S. K., & Stapleton, J. T. (2003). Concealment of homosexual identity, social support and CD4 cell count among HIV-seropositive gay men. *Journal of Psychosomatic Research*, 54, 205-212.
- Updegraff, J. A., Taylor, S. E., Kemeny, M. E., & Wyatt, G. E. (2002). Positive and negative effects of HIV infection in women with low socioeconomic resources. *Personality and Social Psychology Bulletin*, 28(3), 382-394.
- van der Kolk, B. A. (1994). The body keeps the score: Memory and the evolving psychobiology of posttraumatic stress. *Harvard Review of Psychiatry*, 1, 253-471.
- van der Kolk, B. A., & Ducey, C. R. (1989). The psychological processing of traumatic experience: Rorschach patterns in PTSD. *Journal of Traumatic Stress*, 2, 259-274.
- van der Kolk, B. A., & van der Hart, O. (1991). The intrusive past: The flexibility of memory and the engraving of trauma. *American Imago*, 48, 425-454.
- Vogt, W. P. (1993). *Dictionary of statistics and methodology: A nontechnical guide for the social sciences*. Newbury Park: Sage Publications.
- Wachtel, T., Piette, J., Mor, V., Stein, M., Fleishman, J., & Carpenter, C. (1992). Quality of life in persons with human immunodeficiency virus infection: Measurement by the medical outcomes study instrument. *Annals of Internal Medicine*, 116, 129-137.
- Walker, B. L., Nail, L. M., & Croyle, R. T. (1999). Does emotional expression make a difference in reactions to breast cancer? *Oncology Nurse Forum*, 26(6), 1025-1032.
- Walker, J. (2001). *Control and the psychology of health*. Buckingham: Open University Press.
- Wallston, K. A. (2003). Conceptualization and operationalization of control. In . handbook of health psychology. Baum, A., Revenson, T. A., Singer, J. E. (Eds.). Mahwah, New Jersey: Lawrence Erlbaum Associates, Publishers.
- Wallston, K. A. (2001). Conceptualization and operationalization of perceived control. In A. Baum, T. A. Revenson & J. L. Singer (Eds.), *Handbook of Health Psychology*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Wallston, K. A., Wallston, B. S., Smith, S., & Dobbins, C. J. (1987). Perceived control and health. *Current Psychology - Research and Reviews*, 6(1), 5-25.
- Ware, J. E., Sherbourne, C. D. (1992). The MOS 36-item short-form health survey (SF-36) 1. Conceptual framework and item selection. *Medical Care*, 30(6), 473-483.

- Watson, D. (1988). Intraindividual and interindividual analyses of positive and negative affect: Their relation to health complaints, perceived stress, and daily activities. *Journal of Personality and Social Psychology*, 54(6), 1020-1030.
- Watson, D., & Pennebaker, J. E. (1989). Health complaints, stress, and distress: Exploring the central role of negative affectivity. *Psychological Review*, 96(2), 234-254.
- Weinfurt, K. P., Willke, Richard, J., Glick, H. A., Friemuth, W. W., Schulman, K. A. (2000). Relationship between CD4 count, viral burden, and quality of life over time in HIV-1 infected patients. *Medical Care*, 38(4), 404-410.
- Weissman, M. (1992). The changing rate of major depression: Cross-national comparison. *Journal of the American Medical Association*, 268, 3089-3105.
- Weisz, J. R., Rothbaum, F. M., & Blackburn, T. C. (1984). Standing out and standing in: The psychology of control in America and Japan. *American Psychologist*, 39(9), 955-969.
- Wells-Parker, E., Bangert-Drowns, R., McMillen, R., & Williams, M. (1995). Final results from a meta-analysis of remedial interventions with drunk-driving offenders. *Addiction*, 90, 907-926.
- Williams-Avery, R. (1998). *Cognitive processing: Linking disclosure, inhibition and health*. Paper presented at the Society of Behavioral Medicine, New Orleans.
- Wong, P. T., & Watt, L. M. (1991). What types of reminiscence are associated with successful aging? *Psychology of Aging*, 6(2), 272-279.
- Wong, P. T., & Weiner, B. (1981). When people ask "why" questions, and the heuristics of attributional search. *Journal of Personality and Social Psychology*, 40(4), 650-663.
- Wood, J. V., Taylor, S. E., & Lichtman, R. R. (1985). Social comparison in adjustment to breast cancer. *Journal of Personality and Social Psychology*, 49(5), 1169-1183.
- Wu, A. W., Lichter, S. L., Richardson, W., et al. (1991). Quality of life in patients receiving clarithromycin for Mycobacterium avium complex infection and AIDS. In: Eighth International Conference on AIDS/III STD World Congress, Amsterdam, 19-24, July, 1996.
- Wu, A. W., Hays, R. D., Kelly, S., Malitz, F., & Bozzette, S. A. (1997). Applications of the medical outcomes study health-related quality of life measures in HIV/AIDS. *Quality of Life Research*, 6, 531-554.

- Wu, A. W., Revicki, D. A., Jacobson, D., & Malitz, F. E. (1997). Evidence for reliability, validity, and usefulness of the medical outcomes study HIV health survey (MOS-HIV). *Quality of Life Research*, 6, 481-493.
- Wu, A. W., Rubin, H. R., Matthews, W. C., Ware, J. E., Brysk, L. T., Hardy, W. D., et al. (1991). A health status questionnaire using 30 items from the medical outcomes study: Preliminary validation in persons with HIV infection. *Medical Care*, 29(8), 786-798.
- Zander, K., Jager, H., Palitsch, M., Poppinger, J. V., Steinbuchel, N., Bullinger, M. (1993). Health related quality of life (HRQL) in HIV disease: Influence of symptom load, functioning, mood, and coping styles. In: Ninth International Conference on AIDS, Berlin, June 1993.
- Zeller, J. M., McCain, N. L., & Swanson, B. (1996). Psychoneuroimmunology: an emerging framework for nursing research. *Journal of Advanced Nursing*, 23(4), 657-664.
- Zhang, J., Vitaliano, P. P., Lutgenforf, S. K., Scanlon, J. M., Savage, M. V. (2001). Sense of coherence buffers relationship of chronic stress with fasting glucose levels. *Journal of Behavioral Medicine*, 24(1), 33-55.
- Zorrilla, E. P., McKay, J. R., Luborsky, L., & Schmidt, K. (1996). Relation of stressors and depressive symptoms to clinical progression of viral illness. *American Journal of Psychiatry*, 153, 626-635.