STRESS, COPING, AND APPRAISAL IN AN HIV-SEROPOSITIVE RURAL SAMPLE: A TEST OF THE GOODNESS-OF-FIT HYPOTHESIS

A thesis presented to

the faculty of

the College of Arts and Sciences of Ohio University

In partial fulfillment

of the requirements for the degree

Master of Science

Dana Mitchell

August 2004

This thesis entitled

STRESS, COPING, AND APPRAISAL IN AN HIV-SEROPOSITIVE RURAL SAMPLE: A TEST OF THE GOODNESS-OF-FIT HYPOTHESIS

BY

DANA MITCHELL

has been approved

for the Department of Psychology

and the College of Arts and Sciences by

Timothy G. Heckman

Associate Professor of Psychology

Leslie A. Flemming

Dean, College of Arts and Sciences

MITCHELL, DANA. M.S. AUGUST 2004. Psychology

Stress, Coping, and Appraisal in an HIV-seropositive Rural Sample:

A Test of the Goodness-of-Fit Hypothesis (120pp.)

Director of Thesis: Timothy G. Heckman

This present study tested two theories from Lazarus and Folkman's (1984) Transaction Model of Stress and Coping. Utilizing a sample of adults living with HIV/AIDS in rural communities of the United States, this secondary data analysis examined the interaction between cognitive appraisals of stressful life events, methods of coping, and depressive symptomology. This study was designed to investigate the proposals that coping strategies tend to match the appraised controllability of a stressor (matching hypothesis) and that the effectiveness of varying coping strategies is dependent on the appraised controllability of a stressful event (goodness-of-fit hypothesis). Self-reported data obtained from 304 HIV-seropositive adults living in non-metropolitan areas indicated that high levels of appraised control significantly predicted use of problem-focused coping. However, no support was found for the goodness-of-fit hypothesis. Study limitations and future directions are proposed.

Approved:

Timothy G. Heckman

Associate Professor of Psychology

Acknowledgements

This thesis is dedicated to my family and loved ones for their support through my academic and professional endeavors. I would also like to thank Dr. Timothy G. Heckman for his guidance and mentoring, as well as my committee members, Dr. John Garske and Dr. Kenneth Holroyd.

Table of Contents

Abstract 3

Acknowledgements 4

List of Tables 7

List of Figures 8

Overview of Current Study 9

Review of the Literature 12

HIV/AIDS in Rural America 12

Transactional Model of Stress, Appraisal, and Coping 17

Empirical Findings on the Goodness-of-Fit Hypothesis 20

Critiques of Prior Goodness-of-Fit Research 26

The Development of Alternative Coping Measures 28

Considerations when Testing the Transactional Model 31

Association of Coping to Physical & Psychological Health Outcomes 35

Psychological Distress Associated with HIV Infection 38

Living with HIV in Urban vs. Rural Communities 39

Associations of Coping & Health in HIV-seropositive Samples 41

Testing the Goodness-of-Fit in HIV-seropositive Samples 44

The Present Study 44

Objectives, Hypotheses, and Rationales 46

Method 47

Project Connect 47

Assessment Instruments....51
Statistical Analyses....59
Results....60
Data Screening and Preparation....60
Descriptive Statistics and Frequencies....64
Depressive Symptomology in Rural Persons Living with HIV/AIDS....65
Differential Stressors among the Sample....68
Scoring of the Ways of Coping Questionnaire....70
Hierarchical Regression Modeling....71
The Matching Hypothesis....72
Goodness-of-Fit Hypothesis....73
Analyses using Mean Item Scores....74
Analyses using Relative Percentage Scores....77
Analyses using Ratio Scores....81
Analyses using Standardized Factor Scores....85
Analysis with Selected Sample....89
Analyses using Varying Outcome Measures....93
Altering the Order of the Hierarchical Regression Model....94
Discussion....96
Summary of Findings....97
Limitations of the Study....101
Future Directions....107
References....111

Tables

Table 1. Association of Coping to Health Outcomes: Penley et al. (2002) 37

Table 2. Sociodemographic Characteristics of Sample 50

Table 3. Final Factor Loadings for Ways of Coping Questionnaire 55

Table 4. Reliability Coefficients for all Scales and Subscales 61

Table 5. Intercorrelations among Selected Variables 63

Table 6. Descriptive Statistics for Continuous Variables 65

Table 7. Psychological indices among HIV+ rural adults 66

Table 8. Summary of most Frequently Reported Stressors 69

Table 9. Predictors in Hierarchical Regression Analyses 72

Table 10. Hierarchical Multiple Regression Analysis (mean item) 75

Table 11. Hierarchical Multiple Regression Analysis (relative scores) 79

Table 12. Hierarchical Multiple Regression Analysis (ratio scores) 83

Table 13. Hierarchical Multiple Regression Analysis (standardized scores) 87

Table 14. Hierarchical Multiple Regression Analysis (gay/bisexual males) 91

Table 15. Predictors in Altered Hierarchical Regression Analysis 94

Table 16. Hierarchical Multiple Regression Analysis (altered order) 96

Figures

Figure 1. Expected Goodness-of-Fit Interactions 46

Figure 2. Ways of Coping Principal Components Screeplot 54

Figure 3. Emotion-focused Coping x Appraisal Interaction (mean item) 76

Figure 4. Problem-focused Coping x Appraisal Interaction (mean item) 77

Figure 5. Emotion-focused Coping x Appraisal Interaction (relative scores) 80

Figure 6. Problem-focused Coping x Appraisal Interaction (relative scores) 81

Figure 7. Emotion-focused Coping x Appraisal Interaction (ratio scores) 84

Figure 8. Problem-focused Coping x Appraisal Interaction (ratio scores) 85

Figure 9. Emotion-focused Coping x Appraisal Interaction (standardized scores).....88

Figure 10. Problem-focused Coping x Appraisal Interaction (standardized scores).....89

Figure 11. Emotion-focused Coping x Appraisal Interaction (gay/bisexual males).....92

Figure 12. Problem-focused Coping x Appraisal Interaction (gay/bisexual males) 93

Stress, Coping, and Appraisal in an HIV-seropositive Rural Sample: A Test of the Goodness-of-Fit Hypothesis

Overview of Current Study

Lazarus and Folkman proposed one of the most comprehensive theories of stress and coping in the psychological literature; however, their model has received little empirical attention in chronically ill populations, and some existing research has yielded conflicting findings. This secondary data analysis sought to address the basic hypotheses of Lazarus and Folkman's Transactional Model of Stress and Coping with a sample of HIV-seropositive persons living in rural communities of the United States. Individuals diagnosed with HIV infection may be overwhelmed and socially isolated and therefore apt to use maladaptive coping strategies, which could result in depression or negative health behaviors that amplify disease progression (Antoni, 2002). The widespread use of highly active antiretroviral therapy (HAART) that became available in 1996 has transformed HIV infection from a terminal illness to a chronic disease, increasing survival time for HIV-seropositive people. Residents of rural communities have less access to health and social services for persons living with HIV, and therefore certain aspects of their coping processes may be very different from their counterparts living in urban areas. Efforts to understand the coping processes of this understudied population can assist behavioral medicine researchers in designing interventions that address the key components of the adjustment process, including identification of maladaptive stressor appraisals and coping strategies.

Lazarus and Folkman's (1984) Transactional Model of Stress and Coping provided the theoretical framework for the present study. The transactional model is built on the assumption that stress is a person-situation interaction, one that is dependent on the subjective cognitive judgment that arises from the interplay between the person and the environment (Zakowski, Hall, Klein, & Baum, 2001). No event or situation in itself is inherently stressful; instead, the stressor is defined by the subjective judgment of the situation that is appraised as threatening, harmful, or taxing of available resources (Lazarus & Folkman, 1984). Lazarus and Folkman (1984) suggest that coping will be most effective if there is a match between the changeability of the stressor currently confronting the individual and the appropriate form of coping applied to the stressor. Problem-focused coping applied to changeable stressors and emotion-focused coping applied to unchangeable stressors is proposed to be most adaptive; this proposal is also know as the *goodness-of-fit* hypothesis.

The foundation for the present study was based on previous research that has tested the transactional model in various community samples. While the empirical literature in this area is limited and reports discrepant findings, several researchers have found full or partial support for the goodness-of-fit hypothesis (e.g., Zakowski et al., 2001; Park, Folkman, & Bostrom, 2001; Aldwin & Revenson, 1987). The unique contribution of this study to the field of psychology is that this investigation sought to clarify the associations among control appraisals, coping, and stress in a sample of HIV-seropositive persons living in rural communities.

This study addressed two basic hypotheses from the transactional model. First, the matching hypothesis examined whether control appraisals of life events influence a person's choice of coping strategy. Second, the effectiveness of problem- versus emotion-focused coping as moderated by control appraisals (the goodness-of-fit hypothesis) was tested. Data collected in "Project Connect," an NIMH-funded study evaluating the efficacy of a telephone-delivered coping improvement group intervention based at Ohio University, was utilized for the analyses. Self-administered questionnaires were completed by 337 people living with HIV in rural communities from the years of 1997-2002. Participants were presented with a list of psychosocial stressors common to HIV-infected persons (provided in the Results section) and were then asked to identify their most prominent life stressor, as well as their perceived controllability over the stressor. Hierarchical regression analyses were used to evaluate the relationship between the participants' appraisal-coping fit and psychological health. These analyses expected to find (1) a significant and negative relationship between depression and problem-focused coping in persons who experienced changeable stressors and utilized more problem-focused coping relative to those who utilized more emotion-focused coping; and (2) lower levels of depression in individuals whose greatest stressor was unchangeable and who used more emotion-focused coping relative to those who used more problem-focused coping.

Review of the Literature

HIV/AIDS in Rural America

Since AIDS was first identified in the United States in 1981, over 816,000 cases have been diagnosed in the United States (CDC, 2002). While AIDS has primarily been viewed as a disease confined to large cities, the spread of HIV in rural communities is becoming increasing evident. A common theme in the literature is that AIDS has spread to rural areas in two "waves" (Lanksy et al., 2000). The first wave occurred as people, primarily gay white men and injecting drug users, migrated from urban areas to smaller cities to seek health care and social support. The second wave has seen an increase of locally-acquired infections, particularly among young, heterosexual, non-white women (Berry, 1993).

From 1981 to 2001, a total of 48,865 AIDS cases were reported in non-metropolitan areas. Buehler, Frey, and Chu (1995) recorded the migration patterns of persons with AIDS from 12 states during the years 1985 to 1992. Their study found that nearly one in ten persons with AIDS changed their place of residence from the time of diagnosis to death. Migration had relatively little net effect in large metropolitan areas, which accounted for approximately 90% of AIDS diagnoses; however, migration had a substantial net effect in non-metropolitan areas. While only 3% of the cumulative deaths occurred in non-metropolitan areas, nearly one third of persons dying from AIDS in rural communities had migrated from large cities.

Lansky and colleagues (2000) conducted a study in 1995 and 1996 to investigate the risk behaviors and migration patterns of 608 HIV-infected adults residing in small

cities (population less than 250,000) in Delaware, Florida, Georgia, and South Carolina. Results indicated that 65% of participants had lived away from their current county of residence for at least one month prior to becoming HIV-infected. Of those who had moved, the most commonly reported reason was to be closer to family. However, over a quarter (27%) of respondents indicated they had been infected locally, primarily via sexual acquisition.

Rural HIV/AIDS Epidemiological Data. Berry (2000) surveyed four rural communities in the United States in 1993 and again in 1998. Data were collected from two areas with relatively low cumulative rural AIDS cases and limited access to HIV services (southeast Idaho and southeast New Mexico) and from two areas with relatively high AIDS prevalence and access to service (Edisto District, South Carolina and Treasure Coast, Florida). Results revealed that the cumulative number of AIDS cases in southeast Idaho grew less than in any of the other sites. While AIDS cases in southeast New Mexico more than doubled (from 35 to 92), particularly among injecting drug users, the cumulative number of cases remained comparatively low. Analyses in the remaining two sites, however, portrayed a different picture. Cases in the South Carolina grew from 99 to 342, and cases in Treasure Coast Florida rose from 605 to 1,432. The number of infections among IV drug users dropped considerably in South Carolina (from 31% in 1993 to 20% in 1998), however increases were recorded in heterosexual and female cases. In both South Carolina and Florida, Blacks accounted for the majority of the cases in 1993 and again in 1998.

Steinberg and Fleming (2000) conducted analyses on the Centers for Disease Control and Prevention's 1996 national report of AIDS cases in adults and adolescents over 13 years of age. Communities of 500,000 or more residents were considered metropolitan statistical areas (MSAs), and areas with 50,000 or fewer residents were labeled as non-MSAs (i.e., rural communities). MSAs accounted for the majority (83%) of overall AIDS cases (containing 62% of overall population). Communities of 50,000 to 500,000 accounted for 10% of cases (18% of the population), and non-MSAs totaled 7% of cases (20% of the population). Analyses revealed that AIDS cases were disproportionately reported in the Northeast, totaling 32% of cases and only 20% of the overall U.S. population. While the South reported over four times as many non-MSA AIDS cases than any other region, it is important to note that these cases are spread over a large area (16 states) and population (35% of U.S. total). Hence, the resulting rate of infection in the South is relatively low (14 per 100,000), comparable to that found in the non-MSA Northeast (13 per 100,000). Nonetheless, these findings suggest the potential for small towns and communities to be severely affected by this disease.

The Impact of HIV on Black and Southern Communities. HIV prevalence among black Americans living in both rural and urban communities is particularly high. Steinberg and Fleming (2000) found rates among black Americans were uniformly higher than any other racial group. Their analysis found that blacks accounted for 43% of total U.S. cases, yet only 11% of the population. Of the 40,000 new HIV infections per year in the U.S., 54% occur among Blacks; black women account for nearly 64% of the new annual infections among females, and black men account for approximately 50% of new

male cases (Brown, 2002). A study sampling six southern, predominately rural states (Alabama, Georgia, Louisiana, Mississippi, North Carolina, and South Carolina) found that of those living with HIV in this area, 70% were black and 25% were female (Whetten-Goldstein, Nguyen, & Heald, 2001). While Caucasians accounted for the majority of non-MSAs cases in the Northeast, Midwest, and West (54%, 70%, and 68% respectively), black Americans accounted for the majority of cases (56%) in the South (Steinberg & Fleming, 2000). Berry (1993) reports that the number of AIDS cases among rural blacks is estimated to be 9 to 44 times higher in the South than any other region of the U.S.

Transmission of HIV in Rural Communities. Steinberg and Fleming (2000) found that over half of HIV-seropositive men residing in non-MSAs were infected via homosexual contact. Heterosexual contact only accounted for 7-8% of male cases in the rural Northeast, Midwest, and West, though this rate was nearly doubled (15%) in the South. Their analysis reported that intravenous drug users accounted for 40% of the male AIDS cases in the Northeast, compared to 23%, 22%, and 19% in the Midwest, South, and West, respectively. Injecting drug users accounted for 39% of the rural female cases in the Northeast and 47% in the rural West, however the majority of females in all regions were infected via heterosexual contact.

Recent studies have provided evidence of high-risk sexual behavior among at-risk groups living in smaller communities. For example, Zagumny and Holt (1999) surveyed 79 HIV-seropositive injecting drug users living in rural Tennessee, and found that women and younger participants were more likely to engage in high-risk sexual behavior (i.e.,

unprotected, receptive anal sex). Kelly and colleagues (1995) conducted a study from 1991-1992, sampling nearly 6,000 men at gay bars in 16 smaller cities (i.e., with populations between 50,000 to 180,000) throughout the U.S. Their analyses found that 27% of the non-partnered men in their sample reported having unprotected sexual contact in the previous two months.

The Future of Rural AIDS. Heckman, Kim, Pinkerton, and Akers (2003) analyzed biannual data on AIDS cases diagnosed between 1993 and 2001 published by the Centers for Disease Control and Prevention. The authors compared AIDS cases in non-metropolitan areas (communities with 50,000 or fewer residents) to metropolitan statistical areas (populations of 500,000 or more). Results showed that between 1993 and 2001, large cities accounted for an average of 84.6% of all AIDS cases diagnosed in the United States, while non-metropolitan areas accounted for an average of 5.6% of all cases. During this period, AIDS diagnoses in non-metropolitan and metropolitan areas increased by 217% and 155%, respectively. However, the difference between urban and rural infection rates is expected to narrow. Based on polynomial regression analyses, the authors predict that by June 2006, 6.7% of all persons diagnosed with AIDS in the United States will be living in non-metropolitan areas. Between June 1993 and June 2006, the number of AIDS cases diagnosed in non-metropolitan areas will increase by 270%, compared to an increase of 167% in large cities. Finally, the ratio of large city to non-metropolitan AIDS diagnoses in 1993 was 17.2 to 1; however, in June 2006, this ratio is expected to decrease to 12.7 to 1.

Transactional Model of Stress, Appraisal, and Coping

Conway and Terry (1992) suggest that theoretical approaches to the study of coping have historically taken one of three forms. The first of these approaches conceptualizes coping as an ego process that operates to reduce emotional tension. As argued by Folkman and Lazarus (1980), this conceptualization is considered problematic, as it equates coping with mastery over stressful demands; and hence the process of coping is confounded with its outcome. The second theoretical approach conceptualizes coping as a trait (Conway & Terry, 1992). This approach, however, fails to take into account that stressful situations are not static events, nor that individuals do not respond similarly to all stressful events (Lazarus & Folkman, 1984). The final conceptualization, proposed by Lazarus and Folkman (1984), views coping as a dynamic process, specific not only to the presenting situation but also to the stage of the encounter. According to Folkman and Lazarus (1988), coping is not merely a response to tension. Instead, coping is influenced by an individual's cognitive appraisal of an event; and one's cognitive appraisal subsequently influences emotional arousal (Folkman & Lazarus, 1988).

Lazarus and Folkman (1984) view psychological stress as a relationship between the person and the environment that is appraised as potentially endangering to one's well-being. Two critical processes mediate this person-environment relationship: (a) the *cognitive appraisal*, which is an evaluative process that determines why and to what extent a particular transaction between the person and environment is stressful; and (b) *coping*, the process through which the individual manages the demands of the person-environment relationship and the ensuing emotions generated from the situation.

The cognitive appraisal can be seen as the process of categorizing an encounter and its significance to one's well-being. Three appraisals make up this process, the first being the *primary appraisal*, which serves as a judgment of the encounter as being irrelevant, benign-positive, or stressful. Primary appraisals of stressful situations can take one of three forms: harm/loss (i.e., damage the person has already sustained), threat (i.e., anticipated harms or losses), or challenge (i.e., events that hold potential for mastery or gain). The *secondary appraisal* is a judgment concerning what might be done; it serves as an evaluation of the benefits and consequences of a particular coping strategy, given the person's goals and constraints. Finally, the *reappraisal* is a successive valuation that is based on new information obtained from the environment and/or person during the circumstance. The reappraisal differs from the primary appraisal only in that it follows an earlier cognitive evaluation. In summary, primary appraisals evaluate perceived control of the situation and resources available to the individual. Secondary appraisals guide the use of specific coping strategies. The effectiveness of these coping strategies determines the reappraisal, as well as the individual's psychological adjustment.

Coping is defined as "constantly changing cognitive and behavioral efforts to manage specific external and internal demands that are appraised as taxing or exceeding the resources of the person" (Lazarus & Folkman, 1984, p. 141). Coping is not considered a personality trait or style that remains stable across situations. Instead, coping is considered as a set of strategies that are available to be implemented to match-specific situations. Coping may take one of two general forms: *emotion-focused* or *problem-focused*. Emotion-focused coping strategies are focused on internal emotional

states, rather than on external situations that trigger emotional responses. Emotion-focused coping is most likely to occur when an appraisal has been made that nothing can be done to modify the harmful, threatening, or challenging environmental conditions. This form of coping is directed towards altering the individual's emotional response to the problem and includes strategies such as wishful thinking, minimization, or avoidance. Contrarily, problem-focused coping functions to alter the stressor by direct action. This form of coping is more probable when conditions are appraised as amenable to change. Problem-focused strategies include learning new skills, finding alternative channels of gratification, or developing new standards of behavior. Some coping strategies, such as seeking social support, may serve both emotion- and problem -focused functions simultaneously (Vitaliano, Maiuro, Russo, & Becker, 1987). Both emotion- and problem-focused forms of coping are used by most individuals in response to stressful events (Folkman & Lazarus, 1980). Prior research (e.g., Schmitz & Crystal 2000; Fleishman & Fogel, 1994) has found no significant correlation between problem- and emotion-focused coping, suggesting that the two dimensions are distinct constructs and not simply opposite poles on a single continuum. An increase in one dimension of coping does not imply a decrease in the other.

An individual's cognitive appraisal of the stressful circumstance plays an influential role in coping selection. While neither problem-focused nor emotion-focused coping is inherently adaptive or maladaptive, Folkman, Lazarus, Gruen, & DeLongis (1986) suggest that coping may need to be considered as it interacts with the appraisal of the situation in order to reliably predict psychological adjustment. According to the

goodness-of-fit hypothesis, the effectiveness of a coping strategy in reducing distress depends on the degree to which it matches the appraised situation. Perceived control is particularly important in determining the appropriate fit.

Controllable stressors may be best dealt with by focusing on the problem itself, whereas such efforts may be ineffective or detrimental in the face of an uncontrollable stressor. On the other hand, in the situation of an uncontrollable problem, coping strategies that are more emotion-focused may be more advantageous in reducing stress, as one's internal state may be more amenable to change than the situation itself. As Zakowski et al. (2001) explain, a 'good fit' between appraisal and coping consists predominately of emotion-focused coping when dealing with an uncontrollable stressor and predominately problem-focused coping for a controllable stressor.

Empirical Findings on the Goodness-of-Fit Hypothesis

Previous research on the goodness-of-fit hypothesis has found contradictory results. Below is a summary of studies that have found either full, partial, or no support for the hypothesis.

Research Finding Full Support of the Goodness-of-Fit. Only one study, Forsythe and Compas (1987), has fully supported the goodness-of-fit hypothesis. In this study, a sample of 84 college students reported the type of coping strategy used in response to both major (e.g., death of a relative) and minor distressing events (e.g., receiving a poor grade on a paper). Results indicated a significant coping by control interaction for major life events. In other words, psychological symptoms were highest when there was a poor fit between appraisals and coping, such as trying to directly change an event that was

perceived as uncontrollable. Significant effects, however, were not found for daily hassles. It is important to note that this interaction was found when comparing the ratio of problem- to emotion-focused coping in a weighted score, rather than with the absolute value of each type of coping assessed independently.

Research Finding Partial Support of the Goodness-of-Fit. Aldwin and Revenson (1987) conducted a longitudinal study with a metropolitan community sample (n=291), finding partial support for the transactional model. Two of the three problem-focused strategies (instrumental action and negotiation) showed small, but significant coping by control interaction effects. In support of the goodness-of-fit hypothesis, participants who utilized instrumental action (e.g., followed through with a plan of action) in situations perceived to be highly stressful demonstrated lower psychological symptoms. However, those who used negotiation (e.g., bargaining with others) in high-stress situations reported higher levels of symptomology. Emotion-focused coping showed only direct effects on psychological symptoms; the interaction between coping and low-control appraisals was not found to be significant for the emotion-focused coping scales utilized in the study (i.e, escapism, minimization, self-blame, and seeking meaning). Aldwin and Revenson (1987) additionally controlled for coping efficaciousness, or how the well respondents felt they dealt with their stressors. The authors reported that coping efficaciousness played a mediating effect in the problem-focused scales.

Vitaliano and colleagues (1990) also reported partial support for the goodness-of-fit hypothesis. Utilizing three different samples (spousal caregivers, patients with physical health problems, and camp counselors), analyses indicated that problem-focused

coping and depressed mood were negatively related when a stressor was considered changeable, but unrelated when the stressor was appraised as unchangeable. When examining emotion-focused coping strategies in each of the three samples, there was a trend ($p<.10$) for a positive correlation between emotion-focused coping and depression for stressors appraised as changeable, though the two variables were unrelated in uncontrollable situations. However, after pooling the three samples together, to determine if the lack of significance was a result of weak power in each sample, the relationship between emotion-focused coping and depression was significantly higher for controllable situations. Vitaliano and colleagues (1990) also collected data from samples with psychiatric conditions (sex offenders, people with anger/dyscontrol problems, and suicidal patients), however none provided empirical support for the goodness-of-fit hypothesis. It is important to note that Vitaliano and colleagues utilized *relative scores*, or the percentage of effort made on a specific coping strategy compared to total coping efforts, as their attempt to accurately reflect participants' emphasis on specific coping strategies and to reduce bias caused by the number of items available in the scale.

Consistent with Vitaliano and colleagues (1990) findings, Conway and Terry (1992) also found partial support for the goodness-of-fit hypothesis using a sample of 101 university students and community residents. As predicted by the transactional theory, high levels of control and the use of self-denigration (an emotion-focused coping strategy) was related to significant increases in depression. However, a significant interaction was not found with the study's second form of emotion-focused coping (escapism). No evidence was found for the hypothesis that problem-focused coping is

maladaptive in uncontrollable situation, nor that emotion-focused coping is adaptive in uncontrollable situations. The authors suggested, however, that one should interpret these findings with caution, given their concerns with the psychometric properties of the Ways of Coping Checklist - Revised (WCCL-R; Vitaliano, Russo, Carr, Maiuro, & Becker, 1985), which was utilized in the study. Low reliability was found in the avoidance scale of the WCCL-R, and the authors were unable to empirically distinguish the three emotion-focused scales (self-blame, wishful thinking, and avoidance) identified by Vitaliano and colleagues.

Christensen, Benotsch, Wiebe, and Lawton (1995) assessed a group of 57 hemodialysis patients and found partial support for the goodness-of-fit hypothesis in the association between coping and adherence. In more controllable aspects of the dialysis procedure, planful problem solving was associated with better adherence, while in less controllable situations, emotional self-control was more strongly associated with favorable adherence. Seeking informational support was found to be negatively correlated to adherence in uncontrollable situations, which also provides support for the hypothesis. Confrontive coping, regardless of the situation, was associated with poorer adherence; and positive reappraisal was not found to be significant in either scenario.

Terry and Hynes (1998) conducted a longitudinal study with 171 women adjusting to a failed in vitro fertilization (categorized as an uncontrollable stressor). In support of the goodness-of-fit hypothesis, they found that direct attempts to manage the stress (i.e., problem-focused coping) were related to poorer adjustment at a 2-week follow-up, while emotion-focused coping was associated with better adjustment (based

on a self-report measure of adjustment). Reliance on avoidant coping (i.e., escapism) was associated with poorer adjustment. In this study, it is important to note that only an uncontrollable stressor was utilized to test the model.

In a longitudinal study with a sample of 72 community members, Zakowski et al. (2001) found partial support for the goodness-of-fit hypothesis. Low-control appraisals combined with emotion-focused coping were associated with the least distress. Lower distress was also found in high-control appraisals combined with low usage of emotion-focused coping. However, no significant interactions were found for the usage of problem-focused coping. This finding is contrary to much previous research (i.e., support for emotion-focused coping interactions rather than problem-focused interactions). The authors suggest potential reasons for the null findings could be due to their small sample size (n=72) or measurement limitations (i.e., using only one problem-focused subscale).

Park and colleagues (2001) conducted a study with over 250 HIV-seropositive men and (HIV-seropositive and HIV-seronegative) caregivers. Their analysis found a significant interaction between coping, appraised controllability, and planful-problem solving in the sample of HIV-seropositive caregivers. Specifically, depressed mood was lower for those who employed planful-problem solving techniques in controllable situations. Since this interaction was not found in the samples of HIV- caregivers or HIV-seropositive non-caregivers, the authors suggest that the goodness-of-fit may have its greatest effects when a person's coping resources are taxed. In their analysis of emotion-focused coping, the use of distancing was found to be marginally significant

(p<.10) in terms of decreasing depressed mood when responding to uncontrollable stressors in all of the samples.

Research Finding No Support for the Goodness-of-Fit. Felton and Revenson (1984) examined the effects of coping in 151 non-hospitalized patients with one of four chronic illnesses of varying controllability (hypertension, diabetes, rheumatoid arthritis, and cancer) and found no support for the goodness-of-fit hypothesis. Utilizing the original Ways of Coping Questionnaire (WOC; Folkman & Lazarus, 1980) in a longitudinal design, coping was measured with two scales: problem-focused (information-seeking) and emotion-focused (wishful thinking). Results indicated that the effectiveness of coping strategies did not vary as a function of the perceived controllability of the illness. However, the authors suggested that the inherent uncontrollability found in any serious chronic illness may override the small variations of perceived control among the illnesses utilized in the study. In addition, the use of only two types of coping may have constrained the possibility of finding a relation between coping, control, and adjustment.

Utilizing the revised Ways of Coping Checklist (WCCL-R), Vitaliano and colleagues (1987) found no significant interaction between coping and appraisal. A sample of psychiatric outpatients (n=145), spouses of patients with Alzheimer's disease (n=66), and medical students (n=185) were asked to self-select a current stressor, assess appraised controllability, and complete the Beck Depression Inventory. Results indicated that the relationship between form of coping (i.e., problem-focused, wishful thinking, avoidance, seeking social support, and self-blame) and depression scores did not vary

with appraisal and source of stress. The authors suggest a potential reason for their non-significant findings was due to the fact that their study participants were generally more distressed than samples used in previous research (e.g., middle-aged community (Folkman & Lazarus, 1980) and college students (Forsythe & Compas, 1987)). The authors also suggest that in significantly distressed samples, cognitive distortions may cause appraisals to play a less critical role in modifying the relationship between stress and coping.

Critiques of Prior Goodness-of-Fit Research

The above review shows the inconsistent results of the existing literature, providing conflicting evidence for the adequacy of Lazarus and Folkman's model. Most studies have provided partial support for the goodness-of-fit hypothesis, particularly for the link between problem-focused coping and adjustment in high-control situations. The usage of numerous different operational definitions of emotion-focused coping could explain why many researchers have not found full support for the goodness-of-fit hypothesis. Zakowski et al. (2001) suggest that discrepant findings may be attributed to usage of different coping and distress measures, variant scoring methods of coping subscales, or dissimilar study samples. Measuring coping retrospectively may also be problematic due to study participants' memory biases (Penley, Tomaka, & Wiebe, 2002). Participants may forget or distort their actual coping efforts (e.g., present favorably for the researcher).

As Park and colleagues (2001) suggest, most research on the goodness-of-fit suffers from one or more limitations, such as not assessing for perceived controllability or

only utilizing cross-sectional analyses, which do not allow for the control of prior levels of distress. Some researchers suggest that rather than the fit between appraisal and coping determining psychological outcomes, prior levels of distress may influence coping choices and subsequent levels of disturbance. Four of the studies reviewed above utilized a longitudinal design (Felton & Revenson, 1984; Aldwin & Revenson, 1987; Zakowski et al., 2001; Park et al., 2001), and it is important to note that these findings are similar to those found in cross-sectional analyses. Though Felton and Revenson (1984) found no support for the goodness-of-fit hypothesis in their longitudinal study, Aldwin and Revenson (1987) and Park et al. (2001) found support for the interactional effect of appraisal and problem-focused coping on psychological distress; and Zakowksi and colleagues (2001) found support for the interactional effect of emotion-focused coping. Aldwin and Revenson (1987) suggest their results indicate evidence of bi-directionality in the relationship between coping and psychological symptoms; however they also note that coping efforts affected mental health independent of prior symptom levels and degree of stress.

Descriptive coping research has also been critiqued in terms of its generalizability and relevance to clinical interventions (Coyne & Racioppo, 2000). Coyne and Racioppo (2000) argue that participants are often asked to reflect upon too broad of stressors (e.g., "How do you cope with cancer?"), causing respondents to focus on widely different stressful episodes, and thereby limiting valid, practically applicable conclusions. In addition, the authors suggest that characteristics of stressful situations and characteristics of individual participants are easily confounded in coping research. For example, even

when asked to complete the Ways of Coping Questionnaire in reference to a well-defined class of stressors, respondents may still draw upon very different goals and options for coping. Coyne and Racioppo also advise that distress reduction may not be a universally appropriate indicator of a successful outcome. People often approach difficult situations with multiple goals, some of which (e.g., maintaining a relationship) may cause short-term increases in distress. They argue that current measurements used in descriptive coping research are too limited to measure such a complex process.

Finally, the vast majority of this research has been conducted in urban areas utilizing community-based or college samples. While some researchers have tested the goodness-of-fit hypothesis in samples of people living with chronic illness (e.g., Felton & Revenson, 1984; Vitaliano et al., 1987), only one has looked specifically at samples of HIV-seropositive individuals (Park et al., 2001). This investigation was based in a large metropolitan area, leaving to question the generalizability of this sample to those living with this socially-stigmatized illness in rural communities.

The Development of Alternative Coping Measures

Along with critiques of research methodology in testing the goodness-of-fit hypothesis are critiques of Lazarus and Folkman's questionnaire, which have spurred the development of alternative coping measures. Historically, the development of coping scales has been guided primarily by empirical considerations, rather than theoretical concerns. Hence, numerous coping measures and factor structures have been proposed for the same measure, leaving little agreement as to the conceptualization and measurement of coping (Aldwin & Revenson, 1987). Vitaliano et al. (1985) created a

shortened, revised version of the Ways of Coping Checklist (WCCL-R), which has been utilized in previous studies (e.g., Conway & Terry, 1992). The scales of the original Ways of Coping Questionnaire (WOC; Folkman & Lazarus, 1980) were developed by factor-analyzing 68 items on only 100 subjects. Given the small sample size utilized in this analysis, the generalizability and construct validity of the factors and scales were considered questionable (Aldwin & Revenson, 1987). The WOC had also been criticized in terms of its length and for the fact that certain items of the scales were empirically indistinguishable (Vitaliano et al., 1987). Vitaliano and colleagues (1987) additionally suggest that raw scores generated from the questionnaires may not take into account the individual differences in coping strategies that comprise a person's overall coping process. They argue that viewing participants' raw coping scores relative to their total coping efforts, termed as relative scores, may provide more insight into the relationship between coping and distress. More on this topic is presented in the Data Analysis section.

Tobin, Holroyd, Reynolds, and Wigal (1989) observed that although coping has been used greatly as an explanatory construct in psychological literature, few studies attempted to delineate the primary dimensions of coping. Research has provided some empirical support for the existence of the dimensions of coping, however little has been concluded about the actual structure of coping. Without clear empirical information about this structure, it remains difficult to integrate and compare findings that utilize varying dimensions of coping. Lazarus and Folkman (1984) hypothesized that primary coping strategies can best be organized into two higher-ordered categories: problem-

focused and emotion-focused. However, Tobin and colleagues (1989) proposed *approach* and *avoidance* as the higher-order categories.

In attempt to reduce the confusion about the higher-order structure of coping, Tobin and colleagues (1989) conducted a study to replicate the primary dimensions of coping found in previous studies, as well as explore the relationship between those primary dimensions through hierarchical analyses. Early work with the Ways of Coping Questionnaire yielded factors with only two or three items (Aldwin & Revenson, 1987); hence Tobin and colleagues proposed that revising the scale and adding new items could increase the possibility that all relevant factors would emerge, with a greater variety of items. The empirical findings of their research supported a hierarchical structure with three levels. At the primary level were eight coping strategies commonly identified in the factor analyses of other coping inventories: problem solving, cognitive restructuring, social support, expressing emotions, problem avoidance, wishful thinking, social withdrawal, and self criticism. The secondary level was organized into two types of problem-focused coping: problem engagement and problem disengagement, and two types of emotion-focused coping: emotion engagement and emotion disengagement. Finally, at the tertiary level were two basic approaches to dealing with stressful situation: engagement and disengagement. In summary, engagement- versus disengagement-oriented coping was found to comprise the highest-ordereded coping factor, which subsumed problem-focused and emotion-focused coping. Findings such as these are important to consider when reviewing the coping literature and meta-analyses that combine varying measures (e.g., Penley et al., 2002).

Considerations when Testing the Transactional Model

Social Support: Coping Strategy or Confound? Lazarus and Folkman (1984) consider social support to be a resource that influences the way one copes. Antoni (2002) suggests that social support can be viewed as a coping resource to the extent that it channels, facilitates, or perpetuates the use of coping strategies with stress-buffering qualities. Numerous studies have documented the relationship between social support and coping. For example, social support was found to be associated with higher levels of active coping in a sample of 295 parents with HIV living in New York City (Leslie, Stein, & Rotheram-Borus, 2002). Social resources and self-esteem also predicted active coping in a large sample of homeless Latina and African-American women (Nyamathi, Stein, & Brecht, 1995).

Schmitz and Crystal (2000) recently sought to bring clarity to the association between social support and coping. Schmitz and Crystal examined the interrelationship among social support, coping style, and psychological distress. They conducted model analyses that included both social support and coping, finding that models that placed social support prior to coping provided better explanations for the criterion variable (psychological distress) than those in which coping preceded social support. Their research suggests that an individual's perceptions of social support form the foundation from which coping choices are made. Findings contradictory to these, however, were recently reported by Song and Ingram (2002). Song and Ingram examined a sample of 116 African Americans with HIV and found that unsupportive social interactions were positively correlated with denial and disengagement coping, which in turn was associated

with greater mood disturbance. After controlling for coping strategy, the association between unsupportive social interactions and mood disturbance was no longer significant, suggesting that the use of denial/disengagement mediates the relationship between the social support and distress.

This research provides insight into the confusion that remains regarding the relationship between coping and social support. However, it is important to note that these studies, and the majority of social support literature, focus on the availability and satisfaction with one's perceived social support, rather than on the process of seeking support (Vitaliano et al., 1990). Within the present study, the specific coping strategy of seeking social support was not examined. As in previous tests of the goodness-of-fit hypothesis (e.g., Folkman et al., 1986; Aldwin & Revenson, 1987), a principle components analysis was used to guide interpretations of the nature of coping behaviors into the broad categories of problem-focused and emotion-focused coping. However, given the potential confounding relationship between support, coping, and distress, participants' perceptions of social support availability were controlled for prior to testing the goodness-of-fit hypothesis.

Coping Self-efficacy. Coping self-efficacy, defined as the belief in one's ability to manage stressful events (Bandura, 1988), is another important variable to consider when testing the goodness-of-fit model. Prior research has found coping self-efficacy to be associated with coping behaviors, particularly with higher levels of problem-focused coping (Endler, Speer, Johnson, & Flett, 2000). In addition, numerous studies have documented the association of coping self-efficacy and depression. For example, a study

by Pennix and colleagues (1998) explored the relationship between coping resources and depressive symptomology, comparing a sample of older persons living with chronic illness (e.g., cancer, diabetes, arthritis; n=1,051) to a healthy cohort (n=719). Their analysis found that regardless of illness presence, lower depressive symptomology was associated with higher levels of social support (i.e., having a partner and close relationships), self-esteem, mastery, and self-efficacy.

Research conducted by Benight et al. (1997) examined the importance of coping self-efficacy on health functioning after a severe natural disaster (i.e., Hurricane Andrew). In order to determine whether coping self-efficacy was associated with psychological disturbances differently as a function of HIV infection, the study compared a group of HIV-seropositive men to a healthy, non-infected cohort. Similar to the results found by Pennex et al. (1998), their analysis indicated that regardless of infection status, greater levels of coping self-efficacy were related to lower emotional distress and fewer posttraumatic stress disorder symptoms.

It is important to note that coping self-efficacy is different from measures of coping efficaciousness frequently utilized in tests of the goodness-of-fit hypothesis (e.g., Aldwin & Revenson, 1987; Terry & Hynes, 1998). Coping efficaciousness refers to how successful a type of coping strategy was in confronting a stressful situation (Endler et al., 2000). Contrarily, coping self-efficacy refers to one's perceived ability to produce desired outcomes in stressful situations. In the present study, we are concerned about the potential confounding relationship between coping self-efficacy, coping, and depression.

Therefore, prior to testing the goodness of fit hypothesis, analyses additionally controlled for effects of coping self-efficacy.

The Addition of Meaning-focused Coping. Park and Folkman (1997) recently conceptualized meaning-focused coping as third form of coping, in addition to problem- and emotion-focused coping. Meaning-focused coping does not attempt to change or alleviate the stressful event. Instead, this form of coping involves changing the appraisal of the situation to be more consistent with one's goals and beliefs. Examples of meaning focused coping involve making an attribution for a stressful event more benign, determining that an event is less important than originally perceived, or identifying opportunities for growth from the event (Park & Folkman, 1997). Park and Folkman suggest that meaning-focused coping (i.e., positive reappraisal) is likely to be adaptive, regardless of the perceived controllability of the stressor.

The first test of the goodness-of-fit for meaning-focused coping was conducted by Park and colleagues (2001). In a longitudinal study with over 200 caregivers and HIV-seropositive men, participants were instructed to describe a recent, stressful event related to HIV-infection or caregiving and rate their perceived level of control over the event. Positive reappraisal was not significantly related to the appraised controllability of the stressor, although the main effect of the coping strategy was significantly related to lower levels of depressed mood. The authors therefore suggest that positive reappraisal may be a useful coping strategy in many types of situations. While significant main effects were also found for problem-focused and emotion-focused coping strategies measured in this sample, the interactional effects found with these two forms of coping superceded the

main effect relationships. While this proposed theoretical revision is important to note, meaning focused coping was not tested in the current study. A principle component analysis created two factors from the Ways of Coping Questionnaire items: problem-focused and emotion-focused coping, and only these two general forms of coping were tested in the present analysis. Details regarding the principal component analysis are provided in the Results section, and more information on positive reappraisal coping is presented in the Discussion.

Potential Gender Differences. Aspects of personality and gender roles can have an affect on coping choices. Folkman and Lazarus (1980) found that men used more problem-focused coping than women, though no differences were observed in relation to emotion-focused coping. Additional studies have reported other gender differences among coping behaviors, including that women are more likely than men to engage in emotion-focused coping (Hart et al., 2000; Fleishman & Fogel, 1994). However, numerous studies utilizing the Ways of Coping Checklist have found no differences based on gender (e.g., Vitaliano et al., 1987; Conway & Terry, 1992; Zakowski et al., 2001). These conflicting findings emphasize the importance of testing for group differences in coping research. Findings from the present study are included in the Results section.

Association of Coping to Physical & Psychological Health Outcomes

Penley and colleagues (2002) conducted a meta-analysis investigating the association between coping strategies and health related outcomes. Their analysis reviewed 34 studies that included: (a) nonclinical adult samples 18 years of age and

older, (b) measurement of coping utilizing one of Folkman and Lazarus' original or revised Ways of Coping Questionnaires, or Vitaliano and colleagues' original or revised Ways of Coping Checklists; (c) one or more psychological or physical health outcome measures; and (d) enough information to extract an effect size. Each study was coded based on the following: (a) type of outcome (i.e., psychological or physical); (b) type of stressor (i.e., health-related, job-related, relationship-related, or self-selected); (c) duration of the stressor (i.e., acute, chronic, or undeterminable); and (d) controllability of the stressor (i.e., controllable, uncontrollable, or undeterminable), as judged by the research team. To determine the effect size of the study, Pearson's product-moment correlation coefficient (*r*) was utilized, reflecting the relationship between coping strategies and health outcomes. In order to overcome the skewed *r* distribution, the raw correlational scores were transformed into Fisher's *z* and then weighted according to sample size. Tests on the homogeneity of the sample were also calculated, revealing that the analysis was composed of heterogeneous samples. Due to the similarities between the Folkman and Vitaliano scales, the authors chose to combine three of the scales (i.e., seeking social support, wishful thinking, and self-blame) in the meta-analysis. However, Vitaliano's problem-focused and avoidance scales were analyzed separately, based on their conceptual differences from the Folkman scales.

A summary of the overall associations Penley and colleagues found between coping and health outcomes are displayed in Table 1. With the exception of planful problem solving and positive reappraisal, the meta-analysis found that all coping strategies were significantly correlated with health outcomes. Excluding positive

reappraisal, six of the seven emotion-focused strategies demonstrated small to moderate negative associations with health outcomes. In general, the problem-focused coping strategies also demonstrated small associations with health outcomes.

Table 1: Association of Coping to Health Outcomes: Penley et al. (2002)

		Type of Health Outcome		Type of Stressor				Controllability of Stressor		Duration of Stressor	
Strategy	Overall R	Physical	Psych	Health	Job	Relation	Self-selected	Control	Uncont	Acute	Chronic
CC	**-.15**	-.06	**-.22**	**-.10**	N/R	**-.26**	**-.15**	**-.19**	**-.16**	**-.26**	-.07
D	**-.06**	-.02	**-.08**	-.06	**-.15**	.05	-.06	**-.20**	-.02	-.06	**-.07**
S-C	**-.10**	**.11**	**-.23**	-.04	N/R	**-.14**	**-.14**	**-.16**	-.09	-.09	.06
SSS	**-.04**	**-.08**	-.03	-.02	**.21**	**-.14**	**-.10**	**-.14**	-.02	**-.10**	**.09**
AR	**-.16**	.08	**-.22**	**-.13**	.09	**-.17**	**-.21**	-.06	**-.21**	**-.21**	-.05
PPS	.02	.03	.02	-.02	.05	-.03	.07	-.03	.00	**.11**	-.03
E-A	**-.31**	.02	**-.47**	-.08	N/R	**-.39**	**-.47**	**-.23**	**-.23**	**-.38**	-.05
PR	-.05	.02	**-.10**	.03	N/R	**-.11**	**-.10**	-.01	**-.13**	-.01	.01
WT	**-.42**	.00	**-.42**	**-.45**	**-.36**	N/R	**-.33**	.00	**-.49**	**-.48**	**-.42**
VPFC	**.08**	-.06	**.10**	**.10**	N/R	N/R	.06	.00	-.08	**.11**	**.31**
VA	**-.34**	.00	**-.36**	**-.30**	N/R	N/R	**-.38**	.00	**-.33**	**-.41**	**-.16**

Note: Numbers in bold represent significant correlations ($p \leq .05$). N/R, not represented. CC, controntive coping. D, distancing. S-C, self-control. SSS, seeking social support. AR, accepting responsibility. PPS, planful problem solving. E-A, escape-avoidance. PR, positive reappraisal. WT, wishful thinking. VPFC, Vitaliano's problem-focused coping. VA, Vitaliano's avoidance.

This analysis provides a qualitative synthesis of the association between coping and health outcomes across a variety of samples, stressors, and outcomes. Of particular interest to the present study are findings on the interactions between the appraised controllability of a stressor and coping efforts. Perceived stressor controllability was found to moderate the association between coping strategy and health outcomes for all approaches reviewed with the exception of planful problem-solving and Vitaliano's problem-focused coping. Distancing, self-control, and seeking social support were significantly correlated with health outcomes for controllable stressors, while accepting responsibility, positive reappraisal, wishful thinking, and Vitaliano's avoidance were

significantly correlated with uncontrollable stressors. Confrontive coping and escape-avoidance were significantly correlated with outcomes for both controllable and uncontrollable stressors. While many of the findings of Penley and colleagues' meta-analysis are consistent with previous research, some inconsistencies arose, such as the lack of correlations found between problem-focused coping, appraised controllability, and health outcomes. While the reason for this discrepancy is unclear, one possibility is that stressor controllability was determined by the researchers, rather than according to study participants' perceptions.

Psychological Distress Associated with HIV Infection

HIV-infected people confront many stressful predicaments, such as multiple bereavements, discrimination, anger, hopelessness, financial burden, and concerns regarding job stability. At the initial onset of HIV-related symptoms, individuals may be overwhelmed and socially isolated and therefore apt to use maladaptive coping strategies. This response could result in increased depressive symptomology and/or negative health behaviors that lead to amplified disease progression (Antoni, 2002). Leserman and colleagues (1999) found that more cumulative stressful life events and less social support were also associated with faster disease progression in persons living with AIDS. Though the prevalence of depression in HIV-infected people has not been definitively determined, it is estimated that between 20% and 69% of all individuals with HIV/AIDS experience depression (Heckman, Kochman, Sikkema, & Kalichman, 1999). In a sample of over 730 people living with AIDS, Fleishman and Fogel (1994) found over 40% to have psychological distress and depressed mood.

Anxiety, inability to accept loss, anger, guilt, and helplessness are also common to HIV-seropositive individuals. Many experience anger, suicidal ideation, resentment, loneliness, and lack social support (Jacobsen, Perry, & Hirsch, 1990; Sikkema, Kalichman, Kelly, & Koob, 1995). Studies suggest that risk for suicide may be greater soon after testing positive for HIV, rather than after learning to adjust to living with the infection, at which time suicide rates become similar to that of the general population (Dannenberg, McNeil, Brundage, & Brookmeyer, 1996). However, suicide risk may resurge in this population as the infection progresses to symptomatic HIV disease (Rabkin, Remien, Katoff, & Williams, 1993).

Living with HIV in Urban vs. Rural Communities

The majority of studies investigating psychosocial distress among those living with HIV/AIDS have been conducted in large metropolitan areas. The generalizability of these studies to HIV-seropositive living in rural communities remains questionable; however in the past five years, researchers have begun investigating this urban-rural comparison. Heckman, Somlai, Kalichman and colleagues (1998) conducted a study with a sample of HIV-infected persons living in urban (n=90) and rural (n=43) communities of Wisconsin. Compared to urban counterparts, rural residents reported a significantly lower satisfaction with life, lower perceptions of social support from family and friends, elevated levels of loneliness, reduced access to health care, greater stigmatization, and heightened fear that others might learn of their serostatus. This research also found that rural residents were more likely to cope via distancing

themselves from their HIV infection. They were also less apt to utilize positive reappraisal.

A similar study, conducted by Ullrich, Lutgendorf, and Stapleton (2002) investigated the association between sexual orientation, social constraints (e.g., stigmatization, limited social networks), and mental health in a sample HIV-seropositive men and women residing in metropolitan (n=73) and non-metropolitan (n=48) Iowa. Neither sexual orientation nor place of residence appeared to be directly related to level of social constraints or mental functioning. However, follow-up tests indicated a significant interaction between area of residence and sexual orientation. Specifically, gay/bisexual men residing in rural communities reported more social constraints and higher levels of depression than both heterosexual men living non-metropolitan towns and gay/bisexual men residing in metropolitan areas. Analyses also revealed an association between social constraints and depression. The authors suggest that for gay men, residing in a non-metropolitan town is related to increased social constraints that appear to mediate higher levels of depression. Ullrich and colleagues' findings are inconsistent with those reported by Heckman, Somlai, Kalichman and colleagues (1998). However, it is important to note that Heckman and colleagues did not address associations among sexual orientation in their analyses. In addition, the studies utilized different definitions of rural and urban communities. Ullrich's study considered participants to be metropolitan residents if they resided in a county with a population of 100,000 or more and with at least one city with 50,000+ people. Those who did not fall into this criteria were considered non-metropolitan residents. This definition was much

broader than the one utilized by Heckman and colleagues, who considered urban areas to be cities of 100,000 or more and rural communities to be comprised of 25,000 or fewer residents and located at least 15 miles from a large city.

Utilizing a sample of 226 HIV-seropositive men and women living in Wisconsin, Heckman, Somlai, Peters and colleagues (1998) investigated geographic, psychosocial, and resource-related barriers that may prevent HIV-infected people living in urban and rural communities from receiving life-care services. Respondents residing in both urban and rural communities indicated that insufficient financial resources, lack of employment opportunities, lack of knowledge about HIV among fellow citizens, and lack of supportive work environments complicated their life circumstances. However, rural respondents considered the following barriers to be more significant problems than their urban counterparts: shortage of adequately trained medical and mental health care professionals, the need to travel long distances to access sufficient medical care, lack of personal or public transportation, and community residents' stigma towards persons living with HIV.

Associations of Coping & Health in HIV-seropositive Samples

Whether stress will lead to maladaptive functioning or poor health depends largely on the type of coping style employed and how well the person copes with a stressor. The majority of research on coping efforts of people living with HIV has reported on the usage of active coping, denial, and disengagement.

Active Coping. More active coping and less passive coping has been associated with greater health care satisfaction and less substance abuse among people living with

HIV (Leslie et al., 2002). In a sample of over 1,400 homeless African-American and Latino women, more active coping was found to be associated with less drug use and fewer AIDS-risk behaviors (Nyamathi et al., 1995). Active coping has also been associated with a decrease in HIV progression at a one-year follow-up (Mulder, Antoni, Duivenvoorden, Kauffmann, & Goodkin, 1995), as well as greater life satisfaction (Heckman, 2003). Additional research has found that for those dealing with chronic HIV infection, engagement in active problem-focused behaviors is negatively related with depression (Fleishman & Fogel, 1994). Cross-sectional research by Fleishman and Fogel (1994) found that active coping, seeking social support, and positive coping (e.g., "Look on the bright side" or "Tell yourself to accept it") were significantly related to lower depressive symptoms. However, after controlling for prior levels of depressive symptomology in longitudinal analyses, the authors found that only positive coping was significantly related to decreased symptoms. It is important to note that in this study, coping was measured by asking respondents to indicate how they reacted in the first month after they learned of their HIV infection. In addition, Fleishman and Fogel suggest that their study was limited due to their utilization of a scale measuring only 16 coping behaviors with a dichotomous response format, as opposed to a more extensive measure, such as the Ways of Coping Questionnaire. Their study was therefore limited in the distinctions able to be made among coping behaviors.

Denial. Penedo and colleagues (2001) found that HIV-seropositive homosexual men who used disengagement coping or denial to deal with ongoing symptoms and threat of disease progression showed greater substance abuse and mood disturbances.

Similarly, in a study with 115 HIV-seropositive individuals, Hart and colleagues (2000) found that those who utilized denial as a coping strategy reported greater pain severity. Vosvick and colleagues (2002) examining 141 people with HIV and found that those who used maladaptive coping strategies (e.g., alcohol-drug use, denial, venting, mental and /or behavioral disengagement) reported poorer mental health, lower cognitive functioning, and greater health distress. Similarly, Leserman and colleagues (2000) conducted a 7.5-year longitudinal study with 82 HIV-seropositive men from urban and rural areas of North Carolina and found that denial was associated with faster progression to AIDS, whereas planning and positive reinterpretation were not significantly related to disease progression. From a slightly different perspective, Reed, Kemeny, Taylor, Wang, and Visscher (1994) studied 74 men with AIDS and found that *realistic acceptance* of one's future dehabilitation and mortality significantly predicted decreased survival time. This suggests that both denial and realistic acceptance may have negative impacts on HIV progression.

Avoidant Coping. In a sample of 50 HIV-seropositive men (Namir, Wolcott, Fawzy, & Alumbaugh, 1990), avoidance and rumination were found to be positively correlated with anxiety and depression, whereas active-positive coping and distraction demonstrated a negative relationship with distress. Given Namir and colleagues' small sample size and the fact that this research was conducted utilizing a coping scale with a factor analyses of 47 items, the stability of the results of this study have been questioned. However, Schmitz and Crystal (2000) reported similar findings in their sample of 212

HIV-seropositive people: those who employ avoidant coping (i.e., denied the existence of their illness) demonstrate poorer psychological health.

Testing the Goodness-of-Fit in HIV-seropositive Samples

As summarized above, several researchers have documented the relationship between coping strategies and psychological distress among HIV-seropositive individuals. Many of these studies have assessed coping strategies utilizing varying self-report measures, such as the Coping Orientation to Problems Experienced (COPE, Carver, Scheier, & Weintraub, 1989). Few have used Lazarus and Folkman's coping measure in a sample of HIV-seropositive individuals. DeGenova and Patton (1994) utilized the Ways of Coping Questionnaire in a sample of 85 HIV-seropositive people living in the state of Indiana to examine whether subjects who used specific coping strategies experienced more symptoms of depression and physical illness. Participants of the study were not asked to identify predominant life stressors, nor rate appraised controllability, and therefore a full analysis of the goodness-of-fit hypothesis was not conducted. Therefore, results only reported main effects: emotion-focused coping was marginally related to higher levels of depression and poorer physical health. With the exception of Park et al. (2001), no studies have conducted a full investigation of the goodness-of-fit hypothesis utilizing Folkman and Lazarus' Ways of Coping Questionnaire with an HIV-seropositive sample.

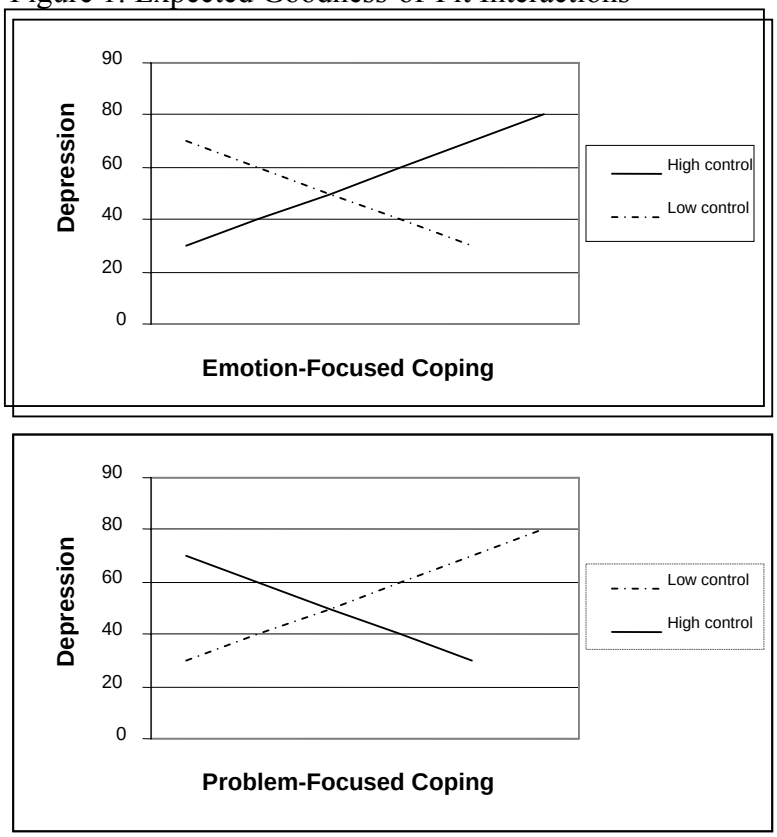
The Present Study

The two basic hypotheses from the transactional model were examined in the current study. Psychosocial stressors common to HIV-infected rural persons were

examined, as well as participants' perceived controllability over such stressors. Study participants in the sample identified their most prominent life stressors and their perceived control over those situations/events. This allowed for the examination of whether control appraisals of life events influence a person's coping strategy (matching hypothesis). In accord with the goodness-of-fit hypothesis, analyses were conducted to determine if HIV-infected rural persons who confront changeable stressors and utilize more problem-focused coping evidenced greater adjustment relative to those who use less problem-focused coping. Additionally, individuals whose greatest stressor is unchangeable and who utilize more emotion-focused coping were examined for improved adjustment.

It was hypothesized that in situations perceived as controllable, a high proportion of problem-focused coping would be related to low levels of depression, while a reliance on emotion-focused coping would be related to high levels of depression. For situations with low perceived controllability, high levels of emotion-focused coping were hypothesized to be associated with a low level of depression; and reliance on problem-focused coping was expected to be associated with a higher level of depression. Figure 1 visually portrays the expected findings.

Figure 1: Expected Goodness-of-Fit Interactions



Objectives, Hypotheses, and Rationales

In summary, the current study undertook two major objectives. These study objectives, along with their hypotheses and specific rationales are summarized below.

Objective 1: To investigate if coping strategies are related to control appraisals.

Hypothesis 1: (Matching hypothesis): Participants' control appraisals of life events will be associated with their coping efforts.

Rationale for Hypothesis 1: Lazarus and Folkman (1984) theorize that coping strategies tend to match the level of the appraised controllability of a stressor. They suggest that emotion-focused coping is most likely to occur when a person appraises that

nothing can be done to change a stressor. In contrast, problem-focused coping is most probable when situations are appraised as amenable to change.

Objective 2: To determine if appraisal and coping strategies interact to affect level of psychological distress.

Hypothesis 2: (Goodness-of-fit hypothesis): Participants who confront a changeable stressor (e.g., not knowing how to access information about HIV) will report better adjustment (i.e., fewer depressive symptoms) if they apply a relatively greater amount of problem-focused coping than emotion-focused coping. Contrarily, individuals whose primary stressor has fewer changeable characteristics (e.g., death of a friend to AIDS) will evidence greater adjustment if they apply relatively more emotion-focused coping than problem-focused coping.

Rationale for Hypothesis 2: The Transactional Model presumes that the effects of particular coping strategies are moderated by the appraised controllability of a stressor (Lazarus & Folkman, 1984). Prior research (e.g. Forsythe & Compas, 1987) has found support for Lazarus and Folkman's goodness-of-fit hypothesis. In addition, numerous studies have found at least partial support for the hypothesis (e.g., Zakowski et al., 2001; Conway & Terry, 1992).

Method

Project Connect

Project Connect was an NIMH-funded study that evaluated a telephone-delivered coping improvement group intervention for HIV-infected rural persons. The study originally began at The Medical College of Wisconsin in 1997 and relocated to Ohio

University in 2000. After receiving approval from The Institutional Review Board, printed recruitment materials about the clinical trial were sent to AIDS-service organizations (ASOs) in Rhode Island, New York, Pennsylvania, Virginia, West Virginia, Ohio, Indiana, Michigan, Wisconsin, Montana, Arizona, and Alaska. These packages included fliers, cover letters describing the project, and stamped envelopes that ASOs could address and forward to clients. The brochures informed the rural clients about the study, including criteria for enrollment, and provided a toll free number for the study institution. Inclusion criteria included: (1) being 18-plus years of age; (2) living in a community of 50,000 residents or fewer that was 20 or more miles from a city of 100,000-plus residents; (3) self-report of being HIV-seropositive; and (4) provision of informed consent. The cutoff of 50,000 residents was employed because that is the figure the Centers for Disease Control and Prevention uses to designate communities as "non-metropolitan."

Eligible clients who contacted the study institution were sent a packet containing a cover letter that explained program requirements, a request for informed consent, a 30-page survey, and self-addressed, stamped envelopes for returning documents. Participants completed the self-administered survey in the privacy of their own homes, which required approximately 45 minutes. Participants were compensated $30 for completing the survey. A total of 337 participants completed the survey, resulting in a response rate of 96.6%. Of these 337, a total of 304 were utilized in this sample (see Data Screening section for more information).

Participant Characteristics. Seventy-one percent (71%) of the sample was male and twenty-eight percent (29%) was female. The sample was 74% Caucasian, 17% African American, and 9% of another ethnicity. Ages ranged from 18 to 72 (mean=43 years, sd=9 years). Education levels ranged from 7 to 17+ years of schooling. Seventeen percent of participants (17%) completed less than twelve years of school; thirty-two percent (32%) had their high school diploma. Thirty-one percent (31%) had between 13-14 years of schooling, and 20% completed 15+ years. Fifteen percent (15%) of the participants reported full-time employment, 4% were full-time students, 10% worked part-time, and 18% were unemployed. Sixty-two percent (62%) of participants earned less than $10,000 annually, while 24% earned between $10,000 and $20,000 annually. The majority (57%) were receiving social security disability; and another 7% were applying for social security benefits.

Relationship status was reported as follows: 42% single, 16% married, 16% separated or divorced, 23% partnered, and 3% widowed. The average participant had been living with HIV infection for 10 years (sd=5 years). Forty-two percent of the sample (42%) stated their mode of infection as being via homosexual contact, while 28% reported acquiring the virus via heterosexual contact. An additional 8% reported infection via intravenous drug use. Table 2 provides a summary of participant characteristics.

Table 2: Sociodemographic Characteristics of Sample

Variable	Percentage
Gender	
Male	71%
Female	29%
Ethnicity	
White	74%
African American	17%
Other	9%
Employment Status	
Working full-time/Student	19%
Working part-time	10%
Unemployed	18%
Social Security Disability	57%
Income	
$ 0 - $ 10,000	62%
$ 10,001 - $ 20,000	24%
$ 20,001 - $ 30,000	8%
Over $ 30,001	6%
Relationship Status	
Single	42%
Married	16%
Divorced/Separated	16%
Partnered	23%
Widowed	3%
Mode of Infection	
Homosexual sex (men)	42%
Heterosexual sex	28%
IV drug use	8%

Comparing the current sample to national seroprevalence data indicated that study participants were representative of persons living with HIV in nonmetropolitan areas in terms of gender. Data from the Centers for Disease Control (2003) indicates that through the year 2001, 79% of persons living with HIV in rural communities were men. The present sample was also representative of persons infected via sexual transmission: male-

to-male sexual contact accounted for 40% of all rural HIV cases through 2001, and heterosexual sex comprised 24% of infections (CDC, 2003). However, the present sample appears to under-represent African Americans infected with HIV, given that through 2001, approximately 44% of all nonmetropolitan HIV cases were Caucasian, and 41% were African American. In addition, the CDC reports that intravenous drug use accounted for nearly 25% of cases of rural HIV cases through 2001. Study participants infected via IV drug use encompassed only 8% of the current sample; hence, the present study is likely to have also under-represented HIV rural persons infected through intravenous needles.

Assessment Instruments

All information was collected via self-report from participants. The following are the assessment measurements employed in the study:

Severity of HIV-Related Life Problem Scale (Sikkema et al., 2000). Respondents completed a 19-item measure to assess the severity of psychosocial stressors common to people living with HIV (e.g., "Lack of employment opportunities" and "AIDS-related discrimination"). Participants rated the severity of each stressor on a 5-point Likert scale (1 = "Not a problem" to 5 = "Most serious problem"). After completing the scale, participants were then asked to identify the stressor that caused them the greatest distress. Chronbach's alpha for the scale equals .84.

Controllability Appraisal. Based on their self-identified stressor, participants indicated how much control they believed to hold over the situation/event. Scores were

provided on a Likert scale, ranging from “1” (Never/Not at all) to “4” (Most/All of the time).

The Ways of Coping Questionnaire (WOC, Folkman & Lazarus, 1988). The 66 items on the Ways of Coping Checklist assessed thoughts and behaviors employed to deal with stress. Having identified their most prominent stressor in the Life Stressor Burden Scale, participants indicated the extent to which they utilize each coping strategy on a 4-item Likert scale, with scores ranging from "1" (Not Used), "2" (Used Somewhat), "3" (Used Quite a Bit), to "4" (Used A Great Deal). From the full WOC ($\alpha = .94$), problem-focused and emotion-focused subscales were selected for use in the present study.

Factor analyses on the Ways of Coping Questionnaire have been published with a variety of samples, including a community sample of middle-aged married couples (Folkman & Lazarus, 1980), college students (Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986), and a large urban community sample (Aldwin & Revenson, 1987). As recommended by Folkman and Lazarus (1984), a principal components analysis was performed in order to examine the factor structure of the 66 Ways of Coping Questionnaire items in the current sample. Prior to performing the analysis, the suitability of the data were assessed. Inspection of the correlation matrix revealed the presence of numerous coefficients above 3.0. In addition, the Kaiser-Meyer-Oklin value was .88, exceeding the recommended value of .60 (Tabachnick & Fidell, 1996). As additional support of the factorability of the correlational matrix, the Bartlett’s Test of Sphericity reached statistical significance.

The initial principle components analysis revealed the presence of eighteen components with eigenvalues greater than 1.0. An inspection of the screeplot displayed a clear break after the second component; hence two components were retained for further analysis (see Figure 2). To aid in the interpretation of these analysis, a Varimax rotation was performed. The rotated solution resulted in two components showing a strong number of loadings with coefficients above 0.4. The two factor solution explained 30.5% of the total variance, with the first factor accounting for 23.0% and the second contributing 7.5%. The scales were then reviewed for their theoretical consistency with previous research on the two scales of problem-focused and emotion-focused coping. Items that loaded above 0.4 on a theoretically predicted scale, and below 0.3 on the second scale, were retained. This resulted in a total of 20 items on the problem-focused scale (e.g., “I got professional help”; "I tried to analyze the problem in order to understand it better") and 17 items on the emotion-focused scale (e.g., "Criticized or lectured myself”; “Went on as if nothing happened”). Table 3 provides a summary of the factor loadings; the highlighted items represent those retained for the present analysis. Chronbach’s alpha for the final problem-focused coping scale equals .91; and Chronbach’s alpha for emotion-focused coping is .87.

Figure 2: Ways of Coping Principal Components Screeplot

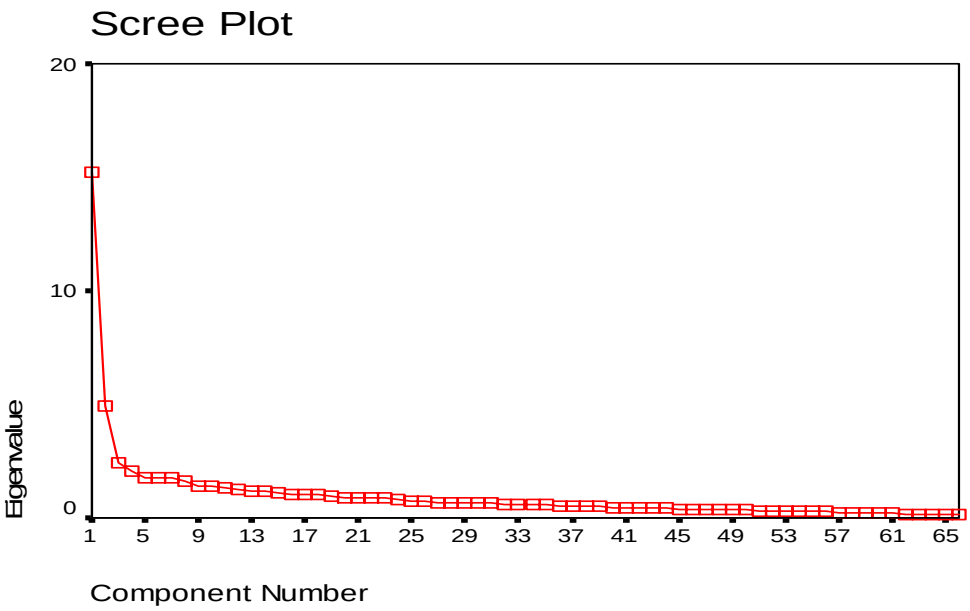


Table 3: Final Factor Loadings for Ways of Coping Questionnaire

Theorized Strategy		Factor 1: PF	Factor 2: EF
PPS	1. Just concentrated on what I had to do next--the next step.	.357	
PF	2. **I tried to analyze the problem in order to understand it better.**	**.478**	
Not Used	3. Turned to work or substitute activity to take my mind off things.		
Detach	4. I felt that time would make a difference-- the only thing to do was to wait.		.314
Not Used	5. Bargained or compromised to get something positive from the situation.	.375	.335
Confront	6. I did something which I didn't think would work, but at least I was doing something.	.348	.398
Confront	7. Tried to get the person responsible to change his/her mind.		
SSS	8. Talked to someone to find out more about the situation.	.548	
Accept resp	**9. Criticized or lectured myself.**		**.576**
Self-cont	10. Tried not to burn my bridges, but to leave things open somewhat.	.406	
Esc-avoid	**11. Hoped a miracle would happen.**		**.558**
Distance	**12. Went along with fate; sometimes I just had bad luck.**		**.544**
Distance	**13. Went on as if nothing happened.**		**.460**
Self-cont	**14. I tried to keep my feelings to myself.**		**.573**
Distance	15. Looked for the silver lining, so to speak; tried to look on the bright side of things.	.540	
Esc-avoid	16. Slept more than usual.		.383
Confront	17. I expressed anger to the person(s) who caused the problem.	.389	.322
SSS	18. Accepted sympathy and understanding from someone.	.454	
Not Used	19. I told myself things that helped me to feel better.	.592	
Pos reap	20. I was inspired to do something creative.	.584	
Distance	**21. Tried to forget the whole thing.**		**.514**
SSS	22. I got professional help.	.430	
Pos reap	23. Changed or grew as a person in a good way.	.749	
Not Used	24. I waited to see what would happen before doing anything.		.478
Accept resp	25. I apologized or did something to make up.	.415	.323
PPS	**26. I made a plan of action and followed it.**	**.716**	
Not Used	27. I accepted the next best thing to what I wanted.	.435	
Confront/SSS?	28. I let my feelings out somehow.	.557	
Accept resp	**29. Realized I brought the problem on myself.**		**.429**
Pos reap	30. I came out of the experience better than when I went in.	.629	
SSS	31. Talked to someone who could do something concrete about the problem.	.603	
NU/tension reduction	32. Got away from it for a while; tried to rest or take a vacation.	.383	
Esc-avoid	**33. Tried to make myself feel better by eating, drinking, smoking, using drugs or medication, etc.**		**.434**
Confront	34. Took a big chance or did something very risky.		.362
Self-cont/PF	**35. I tried not to act too hastily or follow or follow my first hunch.**	**.417**	
Pos reap	36. Found new faith.	.613	
Not Used	37. Maintained my pride and kept a stiff upper lip.	.548	

Table 3: Continued

Pos reap	38. Rediscovered what is important in life.	.743	
PPS	**39. Changed something so things would turn out all right.**	**.713**	
Esc-avoid	**40. Avoided being with people in general.**		**.593**
Distance	41. Didn't let it get to me; refused to think to much about it.		
SSS	42. I asked a relative or friend I respected for advice.	.541	
Self-control	43. Kept others from knowing how bad things were.		.530
Distance	44. Made light of the situation; refused to get too serious about it.	.325	.327
SSS	45. Talked to someone about how I was feeling.	.548	
Confront	46. Stood my ground and fought for what I wanted.	.671	
Esc-avoid	47. Took it out on other people.		.344
PPS	**48. Drew on my past experiences; I was in a similar situation before.**	**.441**	
PPS	**49. I knew what had to be done, so I doubled my efforts to make things work.**	**.644**	
Esc-avoid	**50. Refused to believe that it had happened.**		**.512**
Accept resp	51. I made a promise to myself that things would be different next time.		.380
PPS	**52. Came up with a couple of different solutions to the problem.**	**.641**	
Not Used	53. Accepted it, since nothing could be done.		.388
Self-control	54. I tried to keep my feelings from interfering with other things too much.	.367	.334
NU/wishful thinking	**55. Wished that I could change what had happened or how I felt.**		**.642**
Pos reap	56. I changed something about myself.	.663	
Wishful thinking	**57. I daydreamed or imagined a better time or place than the one I was in.**		**.661**
Esc-avoid/wish	**58. Wished that the situation would go away or somehow be over with.**		**.669**
Esc-avoid	**59. Had fantasies or wishes about how things might turn out.**		**.639**
Pos reap	60. I prayed.	.480	
Not Used	61. I prepared myself for the worst.	.306	.475
Self-control	62. I went over in my mind what I would say or do.	.465	.459
Self-control	63. I thought about how a person I admire would handle this situation and used that as a model.	.585	
PF	**64. I tried to see things from the other person's point of view.**	**.609**	
Not Used	65. I reminded myself how much worse things could be.	.503	
Tension reduction	66. I jogged or exercised.		

Beck Depression Inventory (BDI; Beck & Steer, 1993). The BDI was utilized to measure depressive symptoms. The 21 items on the scale reflect cognitive, affective, and somatic symptoms of clinical depression in the previous two weeks. Responses to each item are made along four levels of severity, scored from 1 to 4, yielding a total score

range from 21 to 84. Chronbach's alpha for this measure equals .90. Additionally, a shortened, 14-item version of the BDI was utilized to assess the cognitive-affective symptoms of depression. The 14-item version was utilized to minimize potential overlap between the somatic symptoms of depression, HIV symptomology, and medication side effects (Heckman et al., 2004).[1] Chronbach's alpha for the subscale in this sample equals .89. (See the Results section for greater detail on the subscale measure.)

SCL-90-R (Derogatis, 1983). The SCL-90-R assessed both global psychiatric distress and specific symptoms of distress. Using the full SCL-R-90, a single measure of current overall distress was assessed (Global Severity Index). The sub-scale measurements for depression, anxiety, somatization, interpersonal sensitivity, hostility, obsessive-compulsiveness, paranoid ideation, psychoticism, and phobic anxiety were not calculated for this study. The SCL-90-R scale yields a score between 0.0 and 4.0, with higher scores indicative of greater distress. For this sample, Chronbach's alpha equals .98.

---

[1] The clinical cutoff for depression on the Cognitive-Affective subscale of the BDI was formulated using the formula: $16/63 = x/42$, with the x representing the recommended clinical cutoff for moderate depression when all 21 BDI items are used, and the 42 representing the total possible score on the 14-item Cognitive-Affective subscale (Heckman et al., 2004). Given the above equation, x=10.7; hence, a clinical cutoff of 11.0 was used for the subscale.

The Provision of Social Relations Scale (PSR; Turner, Frankl, & Levin, 1983). This 15-item instrument measures two dimensions of social support: support provided by family and support provided by friends. Participants answered questions such as "When I'm with my friends, I feel completely able to relax and be myself" and "Sometimes I'm not sure if I can completely rely on my family" on a 5-point Likert scale. Utilizing reverse scoring for negatively-worded items, answers range from 1 ("Not at all like me") to 5 ("Very much like me"). The total possible score summed to 75, with higher numbers representing higher perceptions of social support. Within this sample, Chronbach's alpha for social support from family is .87, while support from friends equals .83.

Coping Self-efficacy (Chesney, Folkman, & Chambers, 1996). This 26-item scale provides a measure of perceived self-efficacy for coping with challenges and threats. Participants were asked to rate on a 10-point Likert scale the extent to which they perceived themselves as being able to perform adaptive coping behaviors (0 = "Cannot do at all" to 10 = "Certain can do"). Items included statements such as, "Sort out what can be changed, and what cannot be changed," "Break an upsetting problem down into smaller parts," and "Get emotional support from friends and family." The overall score was created by summing the item ratings, with larger scores referencing higher levels of coping self-efficacy. Chronbach's alpha for the measure equals .95.

As mentioned in the Introduction, it is important to note that this measure of coping self-efficacy is different from measures of coping efficaciousness frequently utilized in tests of the goodness-of-fit hypothesis. While this measure of coping self-efficacy refers to the participant's perceived ability to cope adaptively in general,

measures of coping efficaciousness refer to participant's perceived handling of a specific stressor (e.g., Terry & Hynes, 1998).

Statistical Analyses

In order to address the study's research hypotheses, analyses were undertaken utilizing the Statistical Package for the Social Sciences for Windows Version 11.5. First, a descriptive analysis of demographic characteristics of study participants was computed. Second, measurements of psychological distress were calculated, allowing scores from the current HIV-seropositive rural sample to be compared to norms established for other clinical samples. Third, a correlational descriptive analysis for the variables and scales utilized in the study was composed. Demographic variables that correlated with psychological distress were employed as covariates in later analyses. Given that the matching hypothesis proposes that coping efforts typically match the appraised controllability of a stressor, correlational analyses were also used to test the significance of the interaction between the coping behaviors and control appraisals.

Finally, because our primary concern was the unique effect of coping on psychological adjustment, hierarchical regression analyses were used to evaluate the amount of variance in adjustment that could be explained by coping strategies, beyond that which could be explained by appraised controllability (Felton & Revenson, 1984; Conway & Terry, 1992). Psychological distress (scored by the cognitive-affective subscale of the Beck Depression Inventory) served as the dependent variable. The independent variables included: (1) appraised controllability (main effect term), (2)

coping strategy utilized (main effect term), (3) control appraisal x coping (interactional term).

Results

Data Screening and Preparation

Study data were analyzed using the Statistical Package for the Social Sciences for Windows Version 10.0. The accuracy of the raw data file was verified by confirming each case after initial entering. All variables of interest (sociodemographics, depression, coping strategies, perceived social support, perceived coping self-efficacy) were examined for missing values and assumptions of relevant multivariate analyses. Missing values in sociodemographics were replaced by participants' reported values in subsequent surveys. All other missing variables of interest were replaced by the variable's mean, with the exception of missing distances to cities of 50,000 or more (n=12), which were replaced by the sample median. Fourteen cases in which participants reported living nearer than 20 miles to a city of 50,000 were deleted from all analyses. In addition, three cases with missing data on the Ways of Coping Questionnaire and perceived stressor control were deleted from all analyses. This procedure left 304 cases for all analyses. Reliability coefficients for all scales and subscales are listed in Table 4, indicating measures of internal consistency.

Table 4: Reliability Coefficients for all Scales and Subscales

Scale	# Items	α
Beck Depression Inventory (BDI, Beck & Steer, 1993)	21	.90
BDI Cognitive-Affective subscale	14	.89
SCL-90-R (Derogatis, 1983)	90	.98
Ways of Coping Checklist – full (WOC; Folkman & Lazarus, 1988)	66	.94
Problem-focused coping subscale	20	.91
Emotion-focused coping subscale	17	.87
Coping Efficacy	26	.96
Social Support – Family	6	.87
Social Support – Friends	7	.84

Several steps were employed to ensure that the assumption of multivariate normality was met. Distributions were inspected for univariate outliers utilizing SPSS boxplots. While a number of outliers were indicated, no scores were found to be extreme outliers (i.e., more than 3 box-lengths from the median). Based on the minimal differences between the true mean to the 5% trimmed mean (without the influence of outliers), all affected variables were retained. A check of Mahalanobis distance revealed no multivariate outliers.

Examination of normal probability plots and scores for skewness and kurtosis revealed that the assumption of normality was not met by the following variables: age, BDI depression scores, SCL-90 distress scores. The SCL-90 variable was transformed using a Log10 transformation; however, given that BDI scores were positively skewed without transformation and negatively skewed with one, the BDI was not transformed. Age was also retained, given that its distribution appeared to follow that of a normal curve, although the Kolmogorov-Smirnov test of normality was not met. Given the large sample size, the non-normal distributions were unlikely to affect results. The

assumptions of linearity and homoscedasticity appeared to be met based on the examination of scatterplots.

Concerns regarding multicollinearity among predictor variables were addressed by examining intercorrelations between criterion and predictor variables using Pearson product-moment correlation coefficients. Table 5 presents intercorrelations among selected variables. Tabachnick and Fidell (1996) suggest deleting one of two variables that show intercorrelations of .70 or more. Given the strong correlations between the BDI and the SCL-90-R, $r(304) = .82$, $p < .01$ and the BDI and the cognitive-affective subscale, $r(304) = .96$, $p < .01$, only one measure was chosen for subsequent analysis.

Consideration of Outcome Measures. When diagnosing depression in HIV-seropositive persons, it is important to note that HIV symptomology and antiretroviral medication side effects may mimic characteristics of depression (Heckman et al., 1999). Instruments that measure depression often assess both somatic (e.g., energy levels, sleep patterns, appetite) and affective (e.g., mood, feelings of worth) symptoms. Kalichman, Sikkema, and Somlai (1995) performed a principal component analysis of the BDI with a sample of HIV-seropositive individuals. Their analysis indicated that depressive symptoms could be broken into two subscales: cognitive-affective and somatic. Physical symptoms of depression (i.e., fatigue, change in appetite) were found to be most closely related to symptoms of HIV/AIDS (i.e., diarrhea, night sweats, fatigue, muscle aches), while cognitive-affective symptoms were associated with anxiety, hypochondriasis, and number of months since HIV-diagnosis. Hence, Kalichman et al. (1995) suggest that somatic depressive symptoms in HIV-seropositive persons may be due in part to physical

Table 5: Intercorrelations among Selected Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Age	1.00															
2. Gender	-.21**	1.00														
3. Ethnicity	-.03	.15*	1.00													
4. Education	.34**	-.12*	-.07	1.00												
5. Income	.13+	-.07	-.13*	.27**	1.00											
6. Duration of illness	.14*	-.12*	.10+	.16**	.02	1.00										
7. Symptom severity	.23**	-.12*	-.09	.02	-.14*	-.02	1.00									
8. Appraised control	-.14*	.03	-.07	-.11+	.02	-.07	-.03	1.00								
9. Problem focused coping	-.02	.06	.21**	.04	-.11*	.09	.03	.15**	1.00							
10. Emotion focused coping	-.03	.10+	.07	-.18**	-.16**	-.14*	.13*	-.04	.33**	1.00						
11. Social support – family	-.10+	.09+	.09	.07	.05	.02	-.06	.30**	.19**	-.27**	1.00					
12. Social support – friends	-.09	-.00	-.02	.09	.09	.07	-.13*	.21**	.28**	-.23**	.46**	1.00				
13. Coping self efficacy	-.04	-.03	.20**	.07	.01	.09	-.12*	.24**	.45**	-.25**	.44**	.53**	1.00			
14. BDI – full	.02	.08	.00	-.13*	-.15*	-.11+	.26**	-.15**	-.04	.56**	-.37**	-.45**	-.58**	1.00		
15. BDI cognitive affective	-.02	.09	.00	-.14*	-.09+	-.14*	.15**	-.17**	-.07	.58**	-.38**	-.46**	-.60**	.96**	1.00	
16. SCL-90-R	.00	.11+	.04	-.13*	-.19**	-.11+	.26**	-.09	.10+	.62**	-.33**	-.35**	-.51**	.82**	.78**	1.00

** $p < .01$ (2-tailed)
* $p < .05$ (2-tailed)
+ $p < .10$ (2-tailed)

characteristics of HIV infection. As mentioned in the Assessment Instruments section, previous research has utilized the 14-item subscale of the BDI in order to minimize this potential overlap between the somatic symptoms of depression, HIV symptomology, and medication side effects (e.g., Sikkema et al., 2000; Heckman et al., 2004). Given these findings, the BDI cognitive-affective subscale was deemed the most appropriate measure to utilize within this sample as well.

Test-retest Reliability of Outcome Measures. A paired samples t-test was also conducted to compare test-retest reliability of measures of depression among participants from baseline to post measure (approximately 3 months apart). Since Project Connect is a treatment intervention, only those in the control group (n = 97) were included in this analysis. The cognitive-affective subscale of the BDI did not show a significant change from Time 1 (M=13.12, sd=8.26) to Time 2 (M=12.13, sd=8.81), t(96)=1.49, p=.139. However, the full Beck Depression Invention showed a trend towards a statistically significant decrease from Time 1 (M=21.20, sd=10.91) to Time 2 (M=19.55, sd=11.62), t(96)=1.90, p=.060. In addition, the SCL-90-R also showed a decreasing trend from Time 1 (M=1.34, sd = .76) to Time 2 (M=1.24, sd=.80), t(96)=1.94, p=.055. This result additionally supports the usage of the BDI cognitive-affective subscale as the primary criterion variable.

Descriptive Statistics and Frequencies

The means and standard deviations for continuous variables representing sociodemographic characteristics of HIV-infected rural persons are presented in Table 6.

Table 6: Descriptive Statistics for Continuous Variables

Variable	Mean	Possible range	Actual range	Standard Deviation
Sociodemographic Variables:				
Age	42.9	18+	18-72	8.58
Education	12.9		7-17+	2.05
Health Related Variables:				
Duration of Illness	10.3	0+	1-23	4.58
Health Status	2.50	1-5	1-5	1.32
Predictor Variables:				
Appraised Control	2.17	1-4	1-4	0.95
Problem-Focused Coping	2.14	1-4	1.0-4.0	0.57
Emotion-Focused Coping	2.37	1-4	1.12-3.65	0.56
Covariate Variables:				
Perceived Social Support	2.41	1-4	1-4	0.64
Perceived Coping Self-Efficacy	5.20	0-10	.42-10.0	1.98
Outcome Variables:				
BDI	20.52	0-63	0-58	10.57
BDI cognitive affective subscale	12.71	0-42	0-38	7.91
SCL-90-R (mean)	1.36	0-4	.04-3.28	0.75

Depressive Symptomology in Rural Persons Living with HIV/AIDS

Depressive symptoms were characterized using descriptive statistics for the 21-item BDI and 14-item cognitive-affective subscale of the BDI (see Table 7). Using cutoff values recommended by Beck and Steer (1993), 16.4% of participants had minimal depression (BDI score of 0-9), 22.1% had mild depression (score of 10-16), 40.8% had moderate depression (score of 17-29), and 20.7% had severe depression (score of 30-63). The samples' mean BDI score was in the moderately depressed range (M = 20.5), with no

differences between men (M = 20.0) and women (M = 21.8), $t(292) = -1.31$, p=.11. The magnitude of differences in the means between the genders was very small (eta square=.004), accounting for only .4% of the variance in depression.

Table 7: Psychological Indices among HIV+ Rural Adults

	Current Study			Normative data	
Variable	M	SD		M	SD
Beck Depression Inventory			% over cut-off		
Total	20.5	10.6	65.8%	≥16 = Depressed[1]	
Cognitive/Affective	12.7	7.9	58.2%	≥11 = Depressed[2]	
SCL-90-R			% above mean		
Global Severity Index	1.36	0.75	53.0%	1.26[3]	0.68
Somatization	1.49	0.86	68.4%	0.87[3]	0.75
Obsessive-Compulsive	1.58	0.90	50.0%	1.47[3]	0.91
Interpersonal Sensitivity	1.46	0.91	53.6%	1.14[3]	0.89
Depression	1.68	0.90	49.0%	1.79[3]	0.94
Anxiety	1.28	0.93	71.2%	1.47[3]	0.88
Hostility	1.06	0.86	36.2%	1.10[3]	0.93
Phobic Anxiety	0.71	0.79	35.5%	0.74[3]	0.80
Paranoid Ideation	1.30	0.80	49.7%	1.16[3]	0.92
Psychotocism	1.01	0.77	42.4%	0.94[3]	0.70

[1]Cut-off scores for clinical depression on the BDI (Beck & Steer, 1993);
[2]Cut-off scores for the BDI Cognitive-Affective subscale (Heckman et al., 2004);
[3]Norms from a psychiatric outpatient sample (Derogatis, 1983).

An analysis of variance also indicated that Caucasian (M = 20.7, n = 226), African American (M = 18.3, n = 56), participants of other ethnicities (M = 21.7, n = 22) did not differ significantly on scores of depression, $F(2, 301) = .62$, p=.54. The magnitude of differences in the means between ethnicities was also very small (eta square=.004), accounting for only .4% of the variance in depression. Depressive symptoms were also comparable among those who were infected via homosexual contact (M = 19.7, n = 134),

heterosexual contact (M = 19.2, n = 81), IV drug use (M = 21.0, n = 21), blood transfusions (M = 26.1, n = 10), another form of infection (M = 23.2, n = 9), or who were uncertain of the mode of their exposure (M = 23.3, n = 49), $F(5, 298) = 1.84$, p=.10. The effect size, calculated using eta squared, was .03 for mode of infection.

Depressive symptoms were also categorized using only the cognitive-affective items of the BDI. As mentioned previously, this subscale was utilized to minimize potential overlap between somatic symptoms of depression, medication side effects, and HIV manifestation. This analysis indicated that 58.2% of participants reported elevated symptoms of depression. Similar to the full-scale BDI, cognitive-affective symptoms did not vary significantly by gender, race, or mode of exposure.

Sociodemographic correlates of psychological symptoms. Correlational analyses revealed that participants who endorsed more psychological symptoms were likely to be less educated $r(304) = -0.14$, $p < .05$ and have been living with HIV for fewer years $r(304) = -0.14$, $p < .05$. In addition, more depressed participants reported earning a lower annual income $r(304) = -0.09$, $p < .10$, as well as more limitations in daily activities due to their HIV symptomology, $r(304) = 0.15$, $p < .01$. However, no group differences were found regarding age $r(304) = -0.02$, $p > .10$. Based on these findings, subsequent analyses utilized level of education, duration of illness, symptom severity, and annual income as statistical covariates.

*Psychosocial correlates of depressive symptom*s. Correlational analyses also indicated that participants who reported higher levels of depressive symptomology also reported less support from family members, $r(304) = -0.38$, $p < .01$, less support from

friends, $r(304) = -0.46$, $p < .01$, lower levels of coping self-efficacy, $r(304) = -0.60$, $p < .01$, less appraised control over their most prevalent stressor $r(304) = -0.17$, $p < .01$, and greater use of emotion-focused coping $r(304) = 0.58$, $p < .01$. Based on the theoretical basis of testing the goodness-of-fit, appraised control and coping efforts were included in subsequent hierarchical regression analysis regardless of their association with depression. Given the significant associations of social support and coping self-efficacy to depressive symptomology, these variables were also included in the model as statistical covariates.

Differential Stressors among the Sample

The most commonly reported stressors among the sample included finances, maintaining one's health, relational concerns, and worrying about one's health. As can be seen in Table 8, major stressors did not differ between those who were infected via homosexual contact, heterosexual contact, or IV drug use. Note that Table 8 provides a summary of most reported stressors, as well as a rank-order list of stressors by mode of infection.

Table 8: Summary of most Frequently Reported Stressors

Most stressful problem	Total %	Gay	Hetero	IV drug
11. Finances (paying bills)	25.0	27.3 (1)	22.6 (1)	17.4 (2)
13. Maintaining my health	9.2	7.8 (3)	8.3 (4)	21.7 (1)
6. Worrying about my health	9.2	8.6 (2)	9.5 (2)	13.0 (3)
17. Marital/relationship concerns	7.9	7.8 (4)	9.5 (3)	--
1. Not having someone to talk with about HIV	6.3	7.8 (5)	3.6 (13)	13.0 (4)
15. Family problems	5.6	7.0 (6)	4.8 (9)	--
3. Discrimination due to HIV	5.3	1.6 (16)	7.1 (5)	4.3 (7)
10. Alcohol/drug use	4.6	5.5 (7)	4.8 (8)	--
19. Loss/death of partner or family to AIDS	4.3	4/7 (8)	3.6 (10)	13.0 (5)
14. Transportation	3.9	4.7 (9)	6.0 (7)	--
18. Loss/death of friends to AIDS	3.6	3.1 (13)	3.6 (11)	4.3 (8)
7. Affordable housing	3.3	1.6 (15)	6.0 (6)	8.7 (6)
4. Medical/health care	3.0	3.1 (10)	1.2 (16)	4.3 (9)
5. Employment	3.0	3.1 (11)	3.6 (12)	--
9. Receiving social services	2.3	3.1 (12)	2.4 (15)	--
2. Getting good information about HIV/AIDS	1.0	0.8 (17)	--	--
12. Staying sexually safe	1.0	1.6 (14)	1.2 (17)	--
16. Child care issues	1.0	--	2.4 (14)	--
8. Sexual discrimination	.7	0.8 (18)	--	--
Total percentage	100.0	100.0	100.0	100.0
Total sample size	n=304	n=128	n=84	n=23

Differential Controllability of Stressors. In order to facilitate the examination between depression and appraised control, respondents were dichotomized into two groups ("depressed" and "nondepressed"). Those reporting BDI scores of 15 or less were labeled as "non-depressed" (34.2%, N=103) and those reporting moderate to severe levels of depression, with 16 or more on the BDI, were termed as "depressed" (65.8%, N=200). The cutoff score of 16 has been used in previous studies assessing depression in HIV seropositive persons (Kalichman et al., 1995; Heckman et al., 1999).

To investigate the possibility that depressed participants (BDI $\geq$ 16) may perceive having less control of their stressors than those not depressed (BDI $\leq$ 15), a comparison was conducted using an analysis of covariance (ANCOVA). The analysis compared

depressed and nondepressed respondents on perceived level of control over their greatest personal stressors. Depression group served as the independent variable, and education, income, duration of illness, and symptom severity were held as statistical covariates. The ANCOVA revealed that after adjusting for the covariate variables, depressed participants (M = 2.31) reported lower controllability appraisals than nondepressed participants (M = 2.09), $F(1, 297) = 4.73$, $p<.05$. Hence, the results suggest that while depressed and non-depressed participants did not differ in their sources of stress, depressed participants perceived their stressors to be less controllable than those who were not depressed. However, it is important to note that although significant, only 1.6% of the variance in appraised control is explained by depression group (eta squared = .016).

Scoring of the Ways of Coping Questionnaire

Four sets of scores were computed for each coping strategy: mean item scores, relative percentage scores, ratio scores, and standardized factor scores. The hierarchical regression analyses were run four times to compare the varying effects of scoring methodology. Mean item (MI) scores were created by simply summing the coping scores of each scale and dividing by the total number of items, eliminating bias due to varying numbers of items per scale. Raw scores, a scoring method commonly used in the test of the goodness of fit, were not utilized in the sample, as such scoring as been critiqued has being biased by the differential number of items per scale (Vitaliano et al., 1987). Vitaliano and colleagues (1987) reason that two individuals who have identical frequencies of emotion-focused coping (raw scores) may have very different coping profiles based on how frequently they utilize other coping strategies, hence they

recommend the usage of relative scoring, or the proportion of overall coping efforts used on a particular strategy. Relative scores were computed by dividing the mean item score for each scale by the sum of all MI scores (e.g., PF% = MI (problem focused) / Sum of all MI Scores). Ratio scores were obtained by dividing the mean item score for one coping scale by another. Finally, standardized factor scores were computed using SPSS DATA REDUCTION regression approach factor scoring. The factor scores serve as an estimate of the scores subjects would receive on each of the factors should they have been measured directly. A subject's factor score can be conceptualized as a properly weighted combination of that subject's scores on the factors that underlie it (Tabachnick & Fidell, 1996). Factor scores serve as helpful estimates, given that they are nearly uncorrelated when factors are orthogonal, as in this sample.

Hierarchical Regression Modeling

Preliminary analyses were undertaken in order to identify significant relationships between predictor variables and criterion measures for inclusion into regression analyses. A significance level of $p < .10$ was required for the variables to be included as statistical covariates in the main regression analyses (i.e., education, income, duration of illness, health status, self-efficacy, and social support). However, because this analysis is a test of theory, necessary predictor variables (i.e., control appraisal, problem focused coping) with $p > .10$ were retained.

From a theoretical point of view, it was important to control for the effects of sociodemographic predictors prior to evaluating the predictive ability of appraised control and coping. In the attempt to answer the research question "Do HIV-infected rural

adults, who are consistent with the goodness-of-fit hypothesis, also report lower levels of depression?", it was important to determine if appraisal and coping added any additional explanation of depressive symptomology above-and-beyond the predictive ability of annual income, symptom severity, education, duration of illness, self-efficacy, and social support. Hence, these six variables were entered into the regression equation in Block 1. Table 9 provides an overview of variables included in the regression analyses.

Table 9: Predictors in Regression Analyses

Hierarchical Multiple Regression Analysis (Criterion: Depression)	
Block 1:	Sociodemographic Variables: • Annual income • Symptom severity • Education • Illness duration • Self-efficacy • Social support
Block 2:	Appraisal: • Control Appraisal
Block 3	Coping Variable: • Coping Strategy
Block 4	Interaction Term: • Appraisal x Coping

The Matching Hypothesis

To test the first hypothesis (that participants' control appraisals of life events influence their coping choices), correlations between coping strategies and control appraisals were examined. As hypothesized, perceived control was positively correlated with the problem-focused coping (r=.15, p<.01, mean item score). However, control appraisal was not significantly associated with emotion-focused coping (r=-.04, p=.45,

mean item score), although the association was in the hypothesized direction. Results were similar when utilizing standardized coping scores (r=.16, p<.01 and r=-.04, p=.44, respectively).

While the matching hypothesis was not supported for participants' mean emotion-coping scores, results were not similar when considering their proportional coping efforts. Examination of participants' relative use of coping scores revealed that perceived control was found to be positively correlated with problem focused coping (r=.18, p<.01) and negatively associated with emotion-focused coping (r=-.18, p<.01). Results were similar when using the ratio scores (r=.17, p<.01 and r=-.19, p<.01, respectively). Therefore, when considering participants' proportion of overall coping efforts used on a particular strategy, the matching hypothesis was supported: higher ratings of perceived control were associated with greater problem-focused coping, and lower perceived control was correlated with more emotion-focused coping.

Goodness-of-Fit Hypothesis

Hypotheses 2 proposed to investigate the goodness-of-fit hypothesis (whether control appraisal and coping strategies interact to affect level of psychological distress). Therefore, the second set of analyses examined the relationship between control appraisals, coping, and distress, with the BDI cognitive-affective subscale serving as the criterion variable. Sociodemographic variables (education, income, illness duration, symptom severity, coping self-efficacy, and social support from family and friends) were included as covariates on Step 1, appraised control was entered on Step 2, coping strategy

was entered on Step 3, and finally, the interaction term of appraised control x coping was added at Step 4.

Analyses using Mean Item Scores

The first set of analyses examined the mean item coping scores with the BDI cognitive-affective subscale as the criterion variable. Table 10 displays the standardized regression coefficients (β), R^2 for each block of predictor variables, and statistical significance for the increments in R^2. As the table shows, sociodemographic predictors alone accounted for 41.5% of the variance in scores of depression, $F_{change}(7, 295) = 29.9$, $p < .001$. The addition of perceived control in the second block did not account for any significant contribution to the model, $F_{change}(1, 294) = .043$, $p = .84$.

Emotion focused coping. The addition of the main effect of emotion-focused coping at Step 3 contributed an additional 15.8% to the variance in depression, $F_{change}(1, 293) = 108.2$, $p < .001$. However, the "Appraisal x Coping" interaction did not reliably improve R^2, $F_{change}(1, 292) = .78$, $p = .38$. In the full model containing emotion-focused coping along with all other predictor variables, the only significant predictors of depressive symptomology were coping self efficacy, $\beta = -.40$, $t(292) = -8.52$, $p < .001$, social support from friends $\beta = -.13$, $t(292) = -2.71$, $p < .01$, and use of emotion-focused coping, $\beta = .51$, $t(292) = 5.19$, $p < .001$. After removing the overlapping effects of all other variables in the equation, these results suggest that depressive symptoms were more severe when participants had lower self-efficacy, less support from friends, and utilized more emotion-focused coping.

Problem focused coping. The addition of the main effect of problem-focused coping at Step 3 contributed an additional 5.1% to the variance in depression, $F_{change}(1, 293) = 28.12$, $p < .05$. However, the "Appraisal x Coping" interaction did not reliably improve R^2, $F_{change}(1, 292) = .086$, $p = .77$. In the full model, the only significant predictors of depressive symptomology were coping self efficacy, $\beta = -.56$, $t(292) = -9.98$, $p < .001$, social support from friends $\beta = -.17$, $t(292) = -3.19$, $p < .01$, and use of problem-focused coping, $\beta = .23$, $t(292) = 2.17$, $p < .05$. After controlling for all other variables in the equation, the results suggest that depressive symptoms were more severe when participants had lower self-efficacy, less support from friends, and utilized more problem-focused coping.

Table 10

Hierarchical multiple regression analysis modeling psychological distress (mean item)

	R^2	ΔR^2	β*	F_{ch}	df
Depression (BDI cognitive-affective subscale)					
Step 1: Sociodemographic Variables	.415	.415		29.88**	7, 295
Income			.003		
Symptom severity			.026		
Education			-.028		
Illness duration			-.029		
Coping self-efficacy			-.404**		
Social support from family			-.012		
Social support from friends			-.129**		
Step 2: Appraised control	.415	.000	.114	.043	1, 294
Step 3: Emotion-focused coping	.573	.158	.510**	108.2**	1, 293
Problem-focused coping	.466	.051	.231*	28.12*	1, 293
Step 4: Control x Emotion-focused coping	.574	.001	-.163	.776	1, 292
Control x Problem-focused coping	.466	.000	.056	.086	1, 292

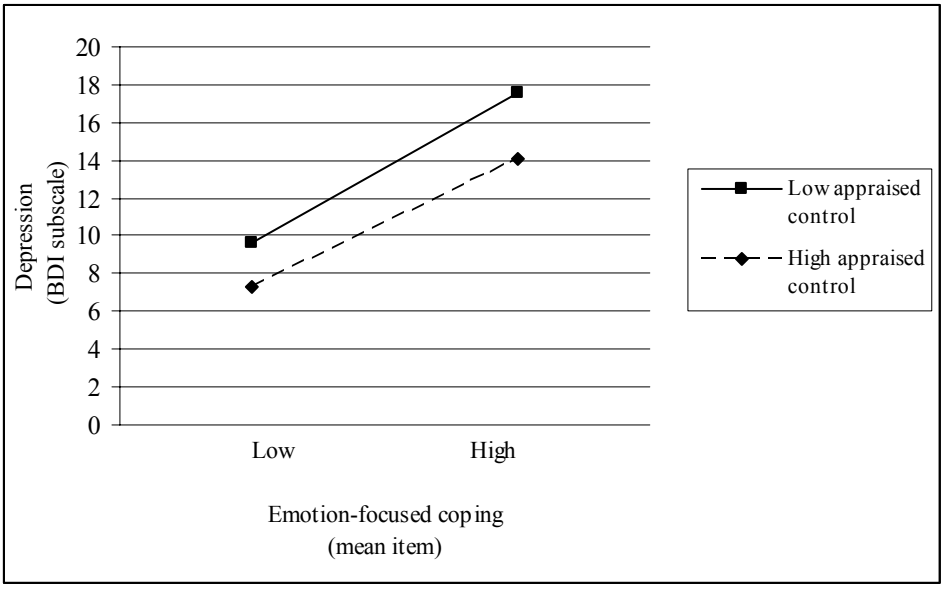
* $p < .05$, ** $p < .001$

*The Beta coefficients through Step 2 represent the emotion-focused coping model.

Control x coping interaction for emotion-focused coping. The table below summarizes BDI cognitive-affective scores for participants with low/high control appraisals and low/high usage of emotion-focused coping. Median splits were used to dichotomize the control and coping variables. Analysis of covariance was used to calculate adjusted means for the BDI subscale, controlling for the sociodemographic variables of education, income, duration of illness, symptom severity, self-efficacy, and social support from family and friends. Finally, regression lines were plotted for each of the interactions (or lack thereof). As Figure 3 depicts, for both low and high control appraisals, greater use of emotion-focused coping was associated with higher levels of depression.

Figure 3

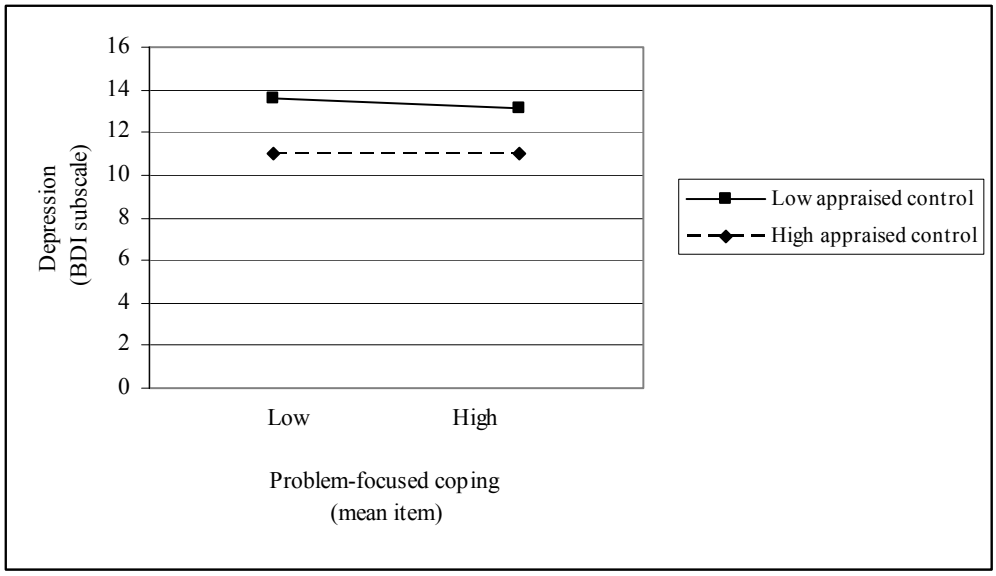
	Low control	High control	Sample size
Low use of emotion-focused coping (mean item)	9.6	7.3	153
High use of emotion-focused coping (mean item)	17.6	14.1	150



Control x coping interaction for problem-focused coping. The table below displays the adjusted mean BDI cognitive-affective scores for participants with low/high control appraisals and low/high usage of problem-focused coping. Figure 4 depicts the findings from the mean item coping scores: perception of control had a minor association between use of problem-focused coping and level of depression.

Figure 4

	Low control	High control	Sample size
Low use of problem-focused coping (mean item)	13.6	11.0	167
High use of problem-focused coping (mean item)	13.1	11.0	136



Analyses using Relative Percentage Scores

The second set of analyses utilized the relative percentage scores (i.e., mean item coping score divided by total coping effort), again with the BDI cognitive-affective subscale serving as the criterion variable. Table 11 displays the findings from this

analysis. As shown in the previous model, sociodemographic predictors alone accounted for 41.5% of the variance in scores of depression, and perceived control did not account for any significant contribution to the model.

Emotion focused coping. The addition of the main effect of emotion-focused coping at Step 3 contributed an additional 2.5% to the variance in depression, $F_{change}(1, 293) = 13.20$, $p < .001$. However, the "Appraisal x Coping" interaction did not reliably improve R^2, $F_{change}(1, 292) = .14$, $p = .71$. In the full model, the only significant predictors of depressive symptomology were coping self efficacy, $\beta = -.36$, $t(292) = -5.93$, $p < .001$, social support from friends $\beta = -.12$, $t(292) = -2.19$, $p < .05$, and use of emotion-focused coping, $\beta = .25$, $t(292) = 2.22$, $p < .05$. After controlling for other variables in the equation, the results suggest that depressive symptoms were more severe when participants had lower self-efficacy, less support from friends, and utilized more emotion-focused coping relative to total coping efforts.

Problem focused coping. The addition of the main effect of problem-focused coping at Step 3 contributed an additional 2.5% to the variance in depression, $F_{change}(1, 293) = 13.20$, $p < .001$. However, the "Appraisal x Coping" interaction did not reliably improve R^2, $F_{change}(1, 292) = .140$, $p = .71$. In the full model, the only significant predictors of depressive symptomology were coping self efficacy, $\beta = -.36$, $t(292) = -5.93$, $p < .001$, social support from friends $\beta = -.12$, $t(292) = -2.19$, $p < .05$, and use of problem-focused coping, $\beta = -.25$, $t(292) = -2.22$, $p < .05$. Depressive symptoms were more severe when participants had lower self-efficacy, less support from friends, and utilized less problem-focused coping relative to total coping efforts.

Table 11

Hierarchical multiple regression analysis modeling psychological distress (relative scores)

	R^2	ΔR^2	β*	F_{ch}	df
Depression (BDI cognitive-affective subscale)					
Step 1: Sociodemographic Variables	.415	.415		29.88**	7, 295
Income			.003		
Symptom severity			.026		
Education			-.028		
Illness duration			-.029		
Coping self-efficacy			-.359**		
Social support from family			-.068		
Social support from friends			-.120*		
Step 2: Appraised control	.415	.000	.111	.043	1, 294
Step 3: Relative emotion-focused coping	.440	.025	.249*	13.20**	1, 293
Relative problem-focused coping	.440	.025	-.249*	13.20**	1, 293
Step 4: Control x Relative EF coping	.440	.000	-.114	.140	1, 292
Control x Relative PF coping	.440	.000	.116	.140	1, 292

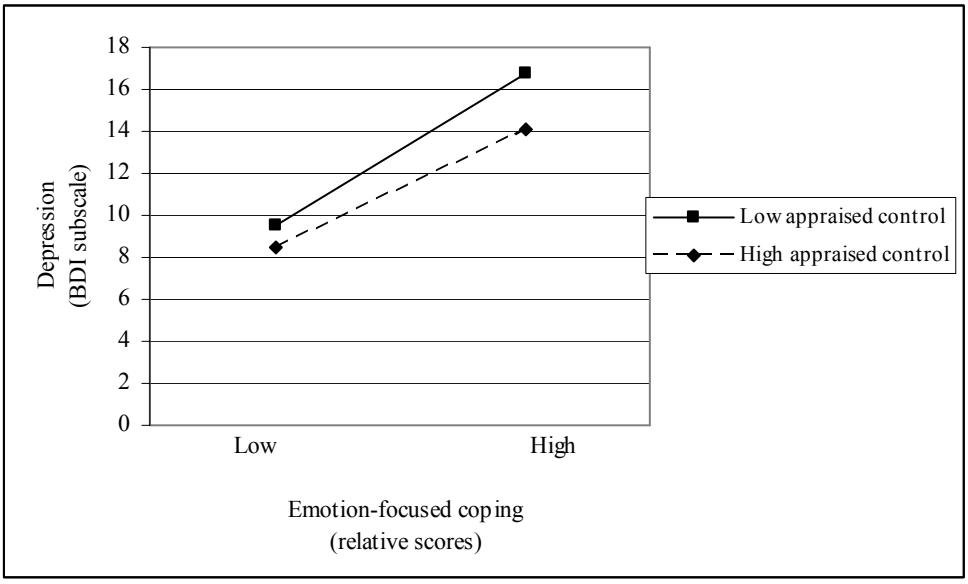
* $p < .05$, ** $p < .001$

*The Beta coefficients through Step 2 represent the emotion-focused coping model.

Control x coping interaction for emotion-focused coping. The table below summarizes the adjusted mean BDI cognitive-affective scores for participants with low/high control appraisals and relative low/high usage of emotion-focused coping. As Figure 5 depicts, greater use of emotion-focused coping was associated with higher levels of depression with both low and high control appraisals.

Figure 5

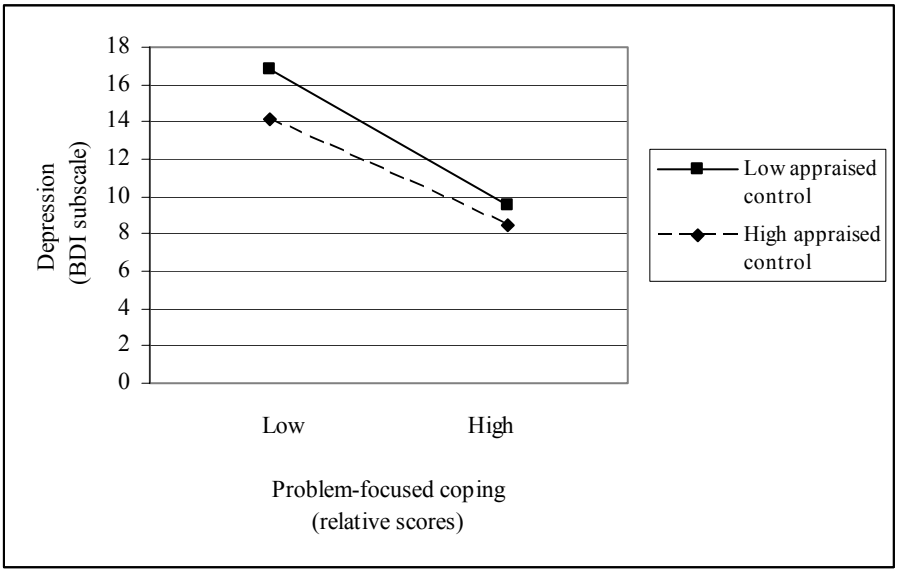
	Low control	High control	Sample size
Low use of emotion-focused coping (relative scores)	9.5	8.5	148
High use of emotion-focused coping (relative scores)	16.8	14.1	155



Control x coping interaction for problem-focused coping. The table below displays the adjusted mean BDI cognitive-affective scores for participants with low/high control appraisals and low/high relative use of problem-focused coping. Given that the relative scores represent participants' specific coping scores divided by their total coping efforts, the problem-focused graph simply mirrors the emotion-focused display. As Figure 6 depicts, lower scores of depression were associated higher usage of problem-focused coping for participants with both low and high control appraisals.

Figure 6

	Low control	High control	Sample size
Low use of problem-focused coping (relative scores)	16.8	14.1	155
High use of problem-focused coping (relative scores)	9.5	8.5	148



Analyses using Ratio Scores

For the third set of analyses, ratio scores were used (i.e., the ratio of one coping effort divided by the other). Table 12 summarizes the findings from this analysis.

Emotion focused coping. The addition of the main effect of emotion-focused coping at Step 3 contributed an additional 1.8% to the variance in depression, $F_{change}(1, 293) = 9.46$, $p < .05$. However, the "Appraisal x Coping" interaction did not reliably improve R^2, $F_{change}(1, 292) = .001$, $p = .98$. In the full model, the only significant predictors of depressive symptomology were coping self efficacy, $\beta = -.38$, $t(292) = -6.28$, $p < .001$ and social support from friends $\beta = -.13$, $t(292) = -2.30$, $p < .05$. In addition, there was a trend towards significance for emotion-focused coping, $\beta = .17$,

$t(292) = 1.62$, $p = .11$. These results suggest that depressive symptomology were more severe when participants had lower self-efficacy, less support from friends, and utilized more emotion-focused coping in comparison to problem-focused coping.

Problem focused coping. The addition of the main effect of problem-focused coping at Step 3 contributed an additional 2.7% to the variance in depression, $F_{change}(1, 293) = 14.42$, $p < .001$. However, the "Appraisal x Coping" interaction did not reliably improve R^2, $F_{change}(1, 292) = .455$, $p = .50$. In the full model, the only significant predictors of depressive symptomology were coping self efficacy, $\beta = -.36$, $t(292) = -5.87$, $p < .001$, social support from friends $\beta = -.12$, $t(292) = -2.14$, $p < .05$, and use of problem-focused coping, $\beta = -.290$, $t(292) = -2.48$, $p < .05$. In this model, depressive symptoms were more severe when participants had lower self-efficacy, less support from friends, and utilized less problem-focused coping in comparison to emotion-focused coping.

Table 12

Hierarchical multiple regression analysis modeling psychological distress (ratio scores)

	R^2	ΔR^2	β*	F_{ch}	df
Depression (BDI cognitive-affective subscale)					
Step 1: Sociodemographic Variables	.415	.415		29.88**	7, 295
Income			-.047		
Symptom severity			.065		
Education			-.057		
Illness duration			-.049		
Coping self-efficacy			-.379**		
Social support from family			-.072		
Social support from friends			-.127*		
Step 2: Appraised control	.415	.000	-.007	.043	1, 294
Step 3: Emotion-focused coping ratio	.433	.018	.174+	9.46**	1, 293
Problem-focused coping ratio	.442	.027	-.290*	14.42**	1, 293
Step 4: Control x EF coping ratio	.433	.000	.005	.001	1, 292
Control x PF coping ratio	.443	.001	.128	.445	1, 292

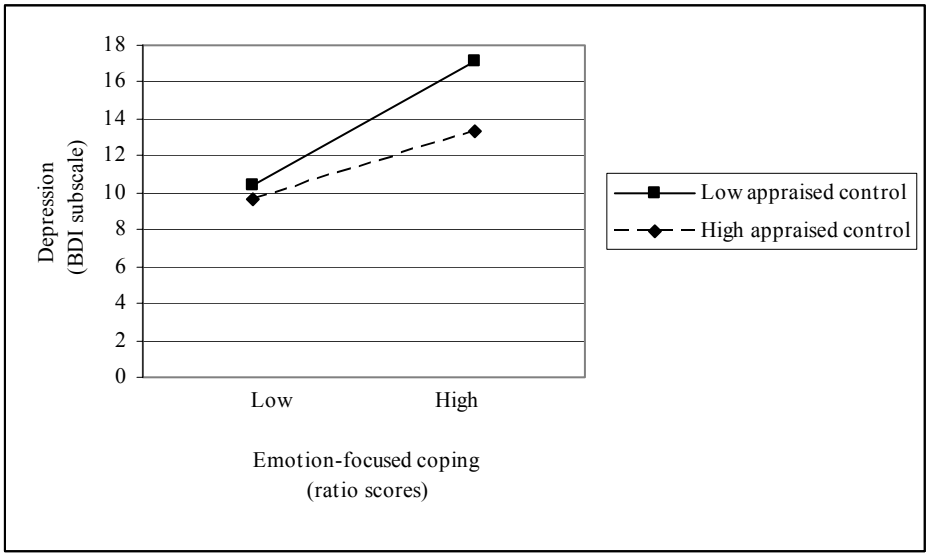
* $p < .05$, ** $p < .001$, + $p < .15$

*The Beta coefficients through Step 2 represent the emotion-focused coping model.

Control x coping interaction for emotion-focused coping. The table below summarizes the adjusted mean BDI cognitive-affective scores for participants with low/high control appraisals and low/high usage of emotion-focused coping (in comparison to problem-focused coping). Similar to the table presented previously, median splits were used to dichotomize these variables, and then regression lines were plotted for each of the interactions (or lack thereof). As Figure 7 depicts, with both low and high control appraisals, greater use of emotion-focused coping was associated with higher levels of depression.

Figure 7

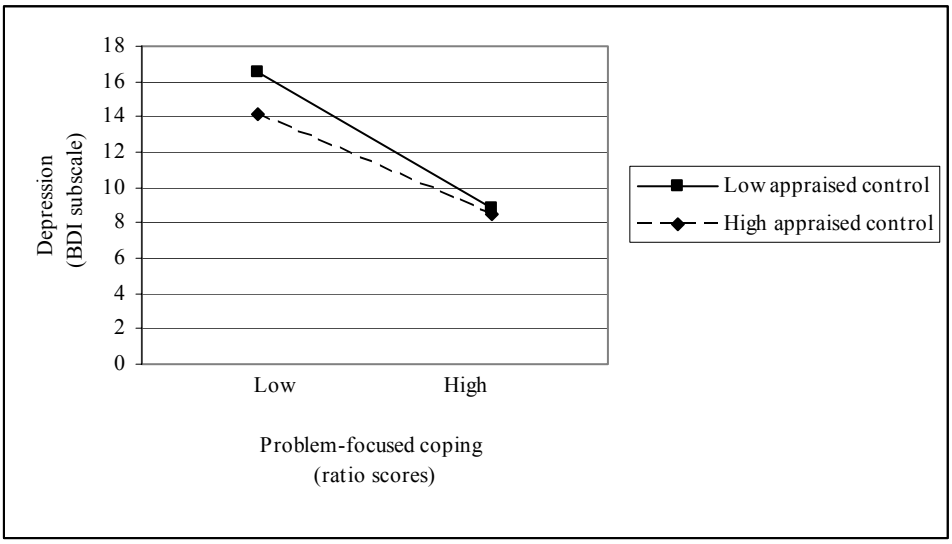
	Low control	High control	Sample size
Low use of emotion-focused coping (ratio scores)	10.4	9.6	172
High use of emotion-focused coping (ratio scores)	17.1	13.3	131



Control x coping interaction for problem-focused coping. The table below displays the adjusted mean BDI cognitive-affective scores for participants with low/high control appraisals and low/high usage of problem-focused coping (compared to emotion-focused coping). Figure 8 depicts the findings from the ratio coping scores: for participants with both low and high control appraisals, greater use of problem-focused coping was associated with lower scores of depression.

Figure 8

	Low control	High control	Sample size
Low use of problem-focused coping (ratio scores)	16.5	14.1	169
High use of problem-focused coping (ratio scores)	8.8	8.5	134



Analyses using Standardized Factor Scores

The final set of analyses examined standardized factors scores (i.e., weighted scores of participants' coping scores based on factors generated in the principle components analysis). See Table 13 for a summary of the results from this analysis.

Emotion focused coping. The addition of the main effect of emotion-focused coping at Step 3 contributed an additional 16.3% to the variance in depression, $F_{change}(1, 293) = 113.2$, $p < .001$. Again, the "Appraisal x Coping" interaction did not reliably improve R^2, $F_{change}(1, 292) = .428$, $p = .51$. In the full model, the significant predictors of depressive symptomology were coping self efficacy, $\beta = -.41$, $t(292) = -8.61$, $p < .001$, social support from friends $\beta = -.13$, $t(292) = -2.68$, $p < .05$, and use of emotion-focused

coping, $\beta = .50$, $t(292) = 5.06$, $p < .001$. In this model, depressive symptoms were more severe when participants had lower self-efficacy, less support from friends, and employed more emotion-focused coping.

Problem focused coping. The addition of the main effect of problem-focused coping at Step 3 contributed an additional 4.8% to the variance in depression, $F_{change}(1, 293) = 26.33$, $p < .001$. However, the "Appraisal x Coping" interaction did not reliably improve R^2, $F_{change}(1, 292) = .100$, $p = .75$. In the full model, the only significant predictors of depressive symptomology were coping self efficacy, $\beta = -.564$, $t(292) = -9.91$, $p < .001$, social support from friends $\beta = -.17$, $t(292) = -3.16$, $p < .05$, and use of problem-focused coping, $\beta = .22$, $t(292) = 2.07$, $p < .05$. Results from this model suggest that depressive symptomology was more severe when participants had lower self-efficacy, less support from friends, and utilized more problem-focused coping.

Table 13

Hierarchical multiple regression analysis modeling psychological distress (standardized scores)

	R^2	ΔR^2	β*	F_{ch}	df
Depression (BDI cognitive-affective subscale)					
Step 1: Sociodemographic Variables	.415	.415		29.88**	7, 295
Income			-.001		
Symptom severity			.028		
Education			-.027		
Illness duration			-.029		
Coping self-efficacy			-.406**		
Social support from family			-.012		
Social support from friends			-.127*		
Step 2: Appraised control	.415	.000	-.024	.043	1, 294
Step 3: Standardized emotion-focused coping	.578	.163	.495**	113.21**	1, 293
Standardized problem-focused coping	.463	.048	.222*	26.32**	1, 293
Step 4: Control x standardized EF coping	.579	.001	-.063	.428	1, 292
Control x standardized PF coping	.463	.000	.032	.100	1, 292

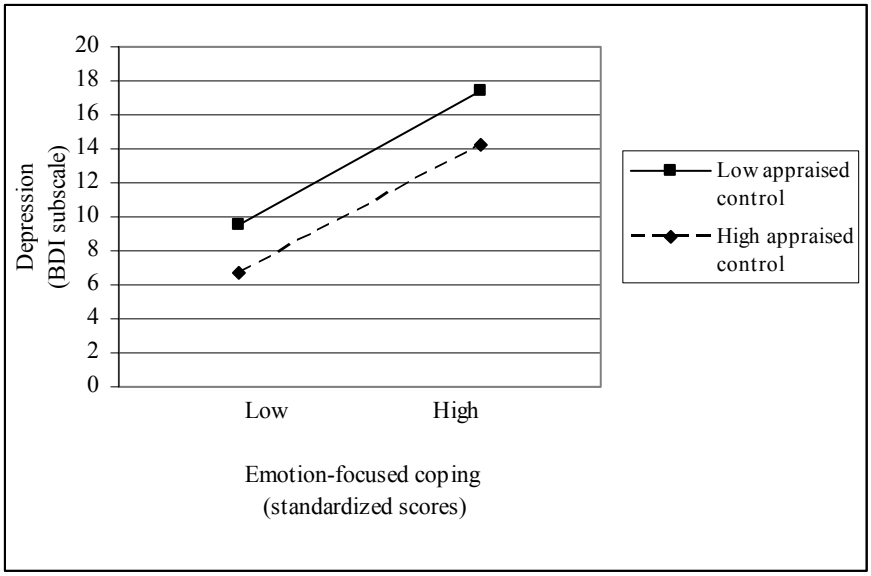
* $p < .05$, ** $p < .001$

*The Beta coefficients through Step 2 represent the emotion-focused coping model.

Control x coping interaction for emotion-focused coping. The table below summarizes the adjusted mean BDI cognitive-affective scores for participants with low/high control appraisals and low/high standardized scores on emotion-focused coping. Similar to previous results, Figure 9 depicts that with both low and high control appraisals, greater use of emotion-focused coping was associated with higher levels of depression.

Figure 9

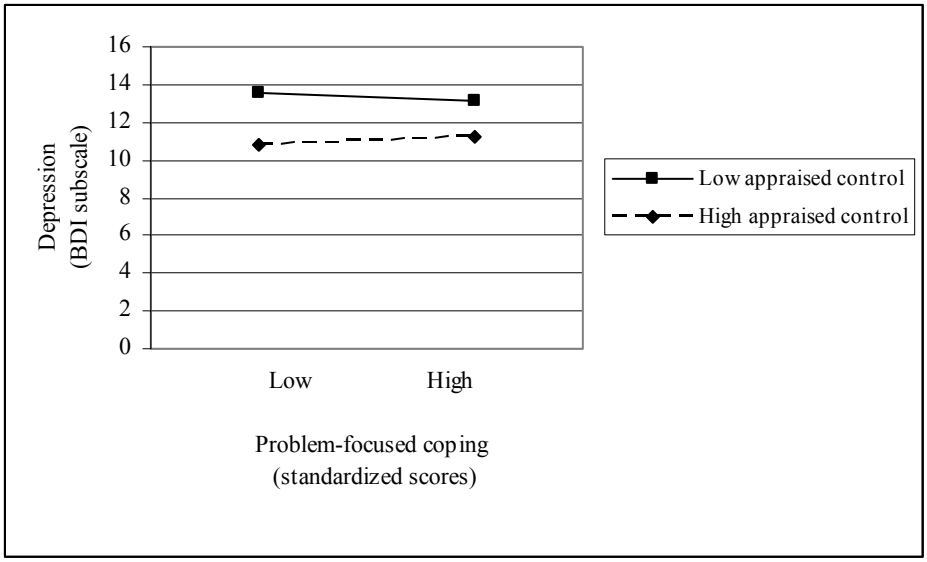
	Low control	High control	Sample size
Low use of emotion-focused coping (standardized scores)	9.5	6.7	148
High use of emotion-focused coping (standardized scores)	17.4	14.2	155



Control x coping interaction for problem-focused coping. The table below displays the adjusted mean BDI cognitive-affective scores for participants with low/high control appraisals and low/high standardized scores of problem-focused coping. As Figure 10 depicts, perception of control had minimal association with use of problem-focused coping and level of depression.

Figure 10

	Low control	High control	Sample size
Low use of problem-focused coping (standardized scores)	13.6	10.8	168
High use of problem-focused coping (standardized scores)	13.1	11.2	135



Analysis with Selected Sample

A final hierarchical regression analysis was run using standardized scores with only men who reported being exposed to HIV from sex with an infected male partner. This analysis was run in explore the possibility that participants' coping efforts may vary by mode of exposure. As can be seen in Table 14, the results of this analysis were similar to those found with standardized scores in the full sample. Sociodemographic predictors accounted for 46.6% of the variance in scores of depression, $F_{change}(7, 119) = 14.8$, $p < .001$. The addition of perceived control did not account for any significant contribution to the model, $F_{change}(1, 118) = 1.02$, $p = .31$.

Emotion-focused coping. Main effects for emotion-focused coping contributed a significant proportion of variance in depression scores, $F_{change}(1, 117) = 74.32$, $p < .001$. While the "Appraisal x Coping" interaction showed a stronger trend towards significance than in the full sample, the interaction still did not reliably improve R^2, $F_{change}(1, 116) = 2.14$, $p = .15$. In the full model, the significant predictors of depressive symptomology were coping self efficacy, $\beta = -.437$, $t(126) = -6.67$, $p < .001$, social support from friends $\beta = -.12$, $t(126) = -1.82$, $p < .10$, and use of emotion-focused coping, $\beta = .323$, $t(126) = 2.32$, $p < .05$. Similar to the full sample, depressive symptoms were more severe in homosexual male participants who had lower self-efficacy, less support from friends, and who employed more emotion-focused coping.

Problem-focused coping. Main effects for problem-focused coping also contributed a significant proportion of variance in depression scores, $F_{change}(1, 117) = 22.82$, $p < .001$. Again, the "Appraisal x Coping" interactions did not reliably improve R^2, $F_{change}(1, 116) = 1.00$, $p = .32$. Results from the full model, however, were slightly different from those found with the entire sample. The significant predictors of depressive symptomology included coping self-efficacy, $\beta = -.667$, $t(116) = -8.49$, social support from friends $\beta = -.134$, $t(116) = -1.70$, $p < .10$, and $p < .05$ and symptom severity, $\beta = .136$, $t(116) = 2.11$, $p < .05$. Use of problem-focused coping was not a significant predictor of depression, $\beta = .190$, $t(116) = 1.23$, $p = .22$. These results suggest that depression was more severe in homosexual male participants who had lower self-efficacy, less support from friends, and more limitations in their daily activities due to HIV symptomology.

Table 14

Hierarchical multiple regression analysis modeling psychological distress with gay/bisexual males (standardized scores)

	R^2	ΔR^2	β*	F_{ch}	df
Depression (BDI cognitive-affective subscale)					
Step 1: Sociodemographic Variables	.466	.466		14.82**	7, 119
Income			-.027		
Symptom severity			.035		
Education			.074		
Illness duration			-.008		
Coping self-efficacy			-.437**		
Social support from family			-.006		
Social support from friends			-.122^		
Step 2: Appraised control	.470	.005	.026	1.02	1, 118
Step 3: Standardized emotion-focused coping	.676	.206	.323*	74.32**	1, 117
Standardized problem-focused coping	.557	.086	.190	22.82**	1, 117
Step 4: Control x standardized EF coping	.682	.006	.200	2.14	1, 116
Control x standardized PF coping	.561	.004	.149	1.00	1, 116

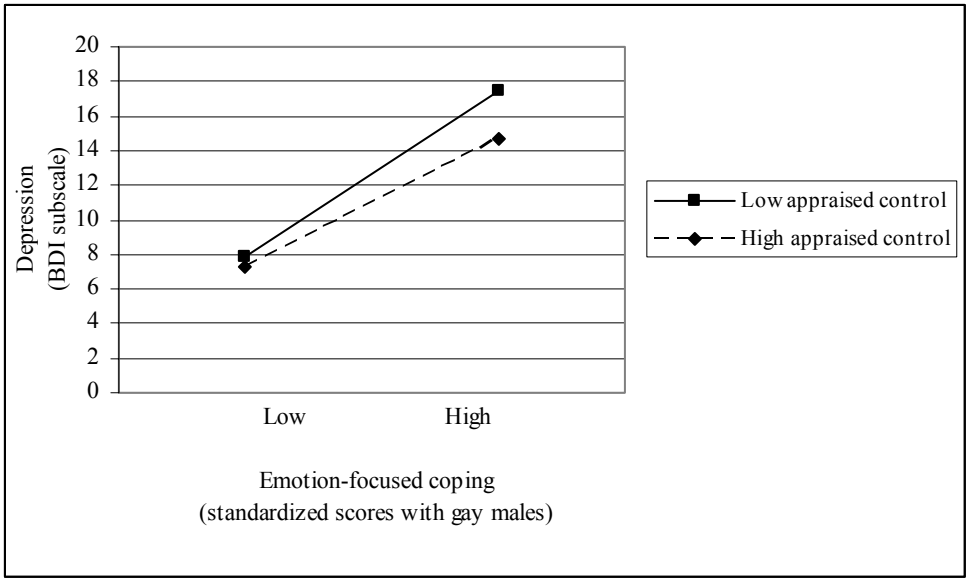
* $p < .05$, ** $p < .001$, ^ $p < .10$

*The Beta coefficients through Step 2 represent the emotion-focused coping model.

Control x coping interaction for emotion-focused coping. The table below summarizes the adjusted mean BDI cognitive-affective scores for gay males with low/high control appraisals and low/high standardized scores on emotion-focused coping. Similar to the results with the full sample, Figure 11 depicts that with both low and high control appraisals, greater use of emotion-focused coping was associated with higher levels of depression.

Figure 11

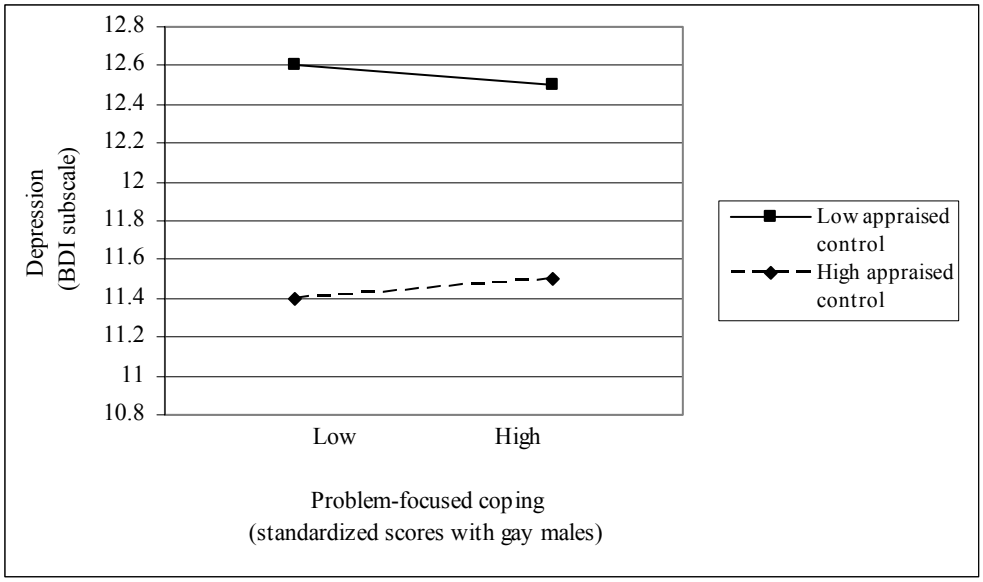
	Low control	High control	Sample size
Low use of emotion-focused coping (standardized scores)	7.9	7.3	63
High use of emotion-focused coping (standardized scores)	17.4	14.7	64



Control x coping interaction for problem-focused coping. The table below displays the adjusted mean BDI cognitive-affective scores for gay males with low/high control appraisals and low/high standardized scores of problem-focused coping. Similar to the results with the full sample, Figure 12 depicts that perception of control had minimal association with use of problem-focused coping and level of depression.

Figure 12

	Low control	High control	Sample size
Low use of problem-focused coping (standardized scores)	12.6	11.4	74
High use of problem-focused coping (standardized scores)	12.5	11.5	53



Analyses using Varying Outcome Measures

As can be seen in the above analyses, results were consistent when comparing the varying methods of scoring, as well as when comparing the full sample to only homosexual male participants. The same analyses were run to compare results based on the varying outcome measures (i.e., the full BDI, cognitive-affective subscale of the BDI, and SCL-90-R). As expected, results were also found to be similar across the three measures of distress; and therefore those analyses will not be included in this document.

Altering the Order of the Hierarchical Regression Model

In order to explore the influence of coping self-efficacy and social support on coping and depressive symptomology, an additional hierarchical regression analysis was conducted after changing the block order of the variables in the model. This analysis was completed in order to determine whether coping self efficacy and social support accounted for a significant proportion of variance in depression symptomology, above and beyond that accounted for by coping efforts and sociodemographic variables. Table 15 details the order of variables included in the model. Mean items scores were used for this analysis.

Table 15

Altered Hierarchical Multiple Regression Analysis (Criterion: Depression)

Block 1:	Sociodemographic Variables: • Annual income • Symptom severity • Education • Illness duration
Block 2:	Appraisal: • Control Appraisal
Block 3	Coping Variable: • Coping Strategy
Block 4	Interaction Term: • Appraisal x Coping
Block 5	Alter-ordered Variables • Self-efficacy • Social support

As can be seen in Table 16, sociodemographic predictors (education, income, illness duration, and symptom severity) accounted for 5.9% of the variance in scores of

depression, F_{change} (4, 298) = 4.66, $p < .001$. The addition of perceived control accounted for an additional 3.5% of the variance, F_{change} (1, 297) = 11.63, $p < .001$.

Emotion-focused coping. The main effect of emotion-focused coping at Step 3 contributed an additional 27.7% to the variance in scores of depression, F_{change} (1, 296) = 130.55, $p < .001$. However, similar to the original model, the "Appraisal x Coping" interaction did not reliably improve R^2, F_{change} (1, 295) = .114, $p = .74$. In the final block, coping self-efficacy and social support accounted for an additional 20.2% of the variance in the model, F_{change} (3, 292) = 46.16, $p <.001$. The results of the full model were the same as those from the original analysis: depressive symptoms were more severe when participants had lower self-efficacy, less support from friends, and who utilized more emotion-focused coping.

Problem focused coping. The addition of the main effect of problem-focused coping at Step 3 did not reliably improve R^2, F_{change} (1, 296) = .448, $p = .50$. However, the "Appraisal x Coping" interaction entered at Step 4 showed a trend towards significance, F_{change} (1, 295) = 2.74, $p < .10$. Yet, it is important to note that the interaction only accounts for an additional .8% of the variance in depression scores. Similar to the emotion-focused model, coping self-efficacy and social support contributed a significant portion to the variance in depression, $\Delta R^2 = .36$, F_{change} (3, 292) = 66.08, $p < .001$.

Table 16

Hierarchical multiple regression analysis (altered order)

	R^2	ΔR^2	β*	F_{ch}	df
Depression (BDI cognitive-affective subscale)					
Step 1: Sociodemographic Variables	.059	.059		4.66**	4, 298
Income			-.013		
Symptom severity			.049		
Education			-.077^		
Illness duration			-.084^		
Step 2: Appraised control	.094	.035	-.069	11.63**	1, 297
Step 3: Emotion-focused coping (mean item)	.372	.277	.329*	130.55**	1, 296
Problem-focused coping (mean item)	.096	.001	.231*	.448	1, 296
Step 4: Control x EF coping	.372	.000	.373	.114	1, 295
Control x PF coping	.104	.008	.056	2.74^	1, 295
Step 5: Alter-ordered Variables	.466	.362		66.08**	3, 292
Coping self-efficacy			-.564**		
Social support from family			-.082		
Social support from friends			-.171*		

* $p < .05$, ** $p < .001$, ^ $p < .10$

*The Beta coefficients through Step 2 and at Step 5 represent the problem-focused coping model.

Analyses with varying scoring methods. Results similar to those found with mean items scores were found when testing the altered model with standardized scores. The "Control x Coping" interaction began to approach significance for problem-focused coping, however the emotion-focused interaction remained non-significant. No significant interactions were found using either ratio or relative scores.

Discussion

This study examined the goodness-of-fit hypothesis proposed by Lazarus and Folkman's (1984) transactional model of stress and coping using a sample of HIV-seropositive persons living in rural communities of the United States. The goodness-of-fit hypothesis proposes that the effectiveness of a particular coping strategy is dependent on the appraised controllability of stressful events. The use of problem-focused coping is

hypothesized to be most adaptive in situations appraised as controllable and less adaptive in those perceived as uncontrollable. The reverse is expected for emotion-focused coping: high levels of emotion-focused coping are proposed to be most adaptive in situations perceived as uncontrollable and maladaptive in controllable circumstances.

Contrary to expectations in the present study, depressive symptomology did not differ according to the degree of fit between participants' cognitive appraisals and choice of coping strategy. Only main effects for coping were found to be significant: regardless of appraised controllability of an event, emotion-focused coping was associated with elevated depression. When comparing the ratio of problem-focused coping to emotion-focused, lower depressive symptoms were associated with greater problem-focused coping. While Felton and Revenson (1984) and Vitaliano et al. (1987) found similar null results (i.e., only main effects) in their tests of the goodness-of-fit, numerous others have found either full (e.g., Forsythe & Compas, 1987) or partial support (e.g., Zakowski et al., 2000) for the model.

The failure to find support for the transactional model in the current study could be a result of several factors. In order to query the potential reasons, listed below is a summary of findings, including results regarding appraisals, coping efforts, social support, and coping self-efficacy. Findings are then discussed in consideration of the study's limitations, and finally, future recommendations are proposed.

Summary of Findings

The current study demonstrated that a considerable number of HIV-infected rural persons experience elevated levels of depression. Over 65% of the study participants

reported at least mild depression, and a fifth of the sample reported severe depression. This finding is cause for concern, given that rates of depression in general rural samples have been found to range from 5% to 31% (Munatanar & Barnett, 2000**).** In order to explore the relationship between depression and coping in rural residents living with HIV, this study examined the relationship between participants' level of reported distress, appraised stressor controllability, and coping efforts.

Appraised control. Exploration of potential interactions between appraised control and coping efforts revealed that participants who endorsed high control appraisals also reported greater use of problem-focused coping. However, emotion-focused coping was found to be significantly related to control appraisals only when considering participants' relative coping efforts. Relative and ratio scores of emotion-focused coping were correlated with appraisal, though mean item and standardized scores were not. Hence, Hypothesis 1 was partially supported: participants who perceived high controllability over their stressors utilized greater amounts of problem-focused coping. When considering relative coping efforts, participants with lower control appraisals utilized more emotion-focused coping.

Preliminary correlational analyses indicated that participants who perceived less control over their stressors also reported higher levels of depressive symptomology than those with higher control appraisals. However, later analyses revealed that after controlling for education, income, illness duration, symptom severity, and social support, the predictive ability of appraised control became non-significant.

Emotion-focused coping. As found in previous studies (e.g., Folkman & Lazarus, 1980), emotion-focused and problem-focused coping were significantly correlated, indicating that participants use both types of coping in their daily functioning. When exploring additional correlations, results indicated emotion-focused coping was significantly associated with elevated depressive symptomology, less education, lower income, increased HIV-related symptomology, lower coping self-efficacy, less social support from family and friends, and living with HIV for a shorter period of time. Even in hierarchical regression analyses, after accounting for sociodemcographic variables correlated with depression, emotion-focused coping still emerged as a significant predictor of depression. However, contrary to Hypothesis 2, the "Appraisal x Coping" interaction was also not found to be a significant predictor of depressive symptomology.

Problem-focused coping. Correlational analyses indicated that more frequent use of problem-focused coping was correlated with being non-White and having a higher income, higher coping self-efficacy, elevated perceptions of stressor control, and increased social support from family and friends. While depression and problem-focused coping were not significantly associated in initial correlational analyses, hierarchical logistic regression analyses were still calculated in order to test the goodness-of-fit model. Similar to the results found in emotion-focused coping, the "Appraisal x Coping" interaction was not found to be a significant predictor of depression.

Social support. Numerous studies have documented the association between coping and social support. Analyses from this study additionally revealed a significant relationship between coping and perceived social support: problem-focused coping was

associated with higher perceptions of social support, and emotion-focused coping was related to lower levels of support. Initial correlational analyses revealed a negative association between social support and depression; this association remained significant even after controlling for education, income, illness duration, symptom severity, coping self-efficacy, appraised stressor controllability, and coping behaviors.

Given the cross-sectional nature of this study, we are unable to draw conclusions regarding causality among coping and social support. However, it is important to note that even prior longitudinal research has found conflicting results regarding the influence of these two variables. For example, Schmitz and Crystal (2000) found that model analyses that placed social support prior to coping provided better explanations for level of psychological distress, suggesting that that an individual's perceptions of social support form the foundation from which coping choices are made. However, research by Song and Ingram (2002) found that after controlling for coping strategy, the association between social support and mood disturbance was no longer significant, suggesting that the coping behaviors mediate the relationship between social support and distress. Given the confusion that remains regarding the interaction between coping and social support, additional research is necessary to understand the mediating and moderating effects of these two variables.

Coping self-efficacy. Preliminary analyses revealed a significant relationship between coping self-efficacy and both problem-focused and emotion-focused coping; greater coping self-efficacy was associated with more frequent use of problem-focused coping strategies and less emotion-focused coping. In the hierarchical regression

analysis, after controlling for education, income, illness duration, symptom severity, perceptions of social support, appraised stressor controllability, and method of coping, self-efficacy still remained as a significant predictor of depression. Prior research has documented similar associations between elevated coping self-efficacy and lower emotional distress (Pennix et al., 1998; Benight et al., 1997).

An additional analysis was conducted to explore the influence of coping self-efficacy and social support on coping and depressive symptomology in the present study. Results indicated that prior to controlling for the influences of coping self-efficacy and social support, the "Appraisal x Problem-focused Coping" interaction was marginally associated with depressive symptomology. This finding suggests that coping self-efficacy, social support, and "Appraisal x Coping" fit account for some shared variance in scores of depressive symptomology. Given that results were not similar when conducting analyses with emotion-focused coping, additional variables must be considered when testing the goodness-of-fit hypothesis. Given that problem-focused coping and coping self-efficacy were correlated within this study, it is plausible that the measures used to calculate these two variables simply addressed the same construct. However, this finding suggests the importance of considering the influence of coping self-efficacy and social support when modeling psychological health and distress.

Limitations of the Study

The absence of support for the goodness-of-fit hypothesis in the current study may have resulted from several factors, including specific limitations of this study.

Limitations of this research are related not only to the sample, but also the cross-sectional design, operationalization of study variables, and selected outcome measures.

Sample limitations. HIV-infected rural adults who self-enrolled into Project Connect may differ from people with HIV/AIDS not enrolled in such a study. Given that all participants had enrolled into a mental health intervention, it is likely that the study oversampled people experiencing distress and individuals sufficiently motivated to seek enrollment such a project. In addition, all participants in this study were also clients of AIDS service organizations and therefore likely already connected to support services. This limits the generalizability of the findings, given that those who are not connected to such organizations may have very different resources available to deal with stress. Finally, as detailed in the Results section, when compared to national trends, this study appears to have undersampled African Americans and persons infected with HIV through intravenous drug use.

It is also important to remember that the participants in this sample are infected with an incurable virus. Although some studies have found partial support for the goodness-of-fit model utilizing samples of people suffering with chronic conditions (e.g., Christensen et al.,1995; Park et al., 2001), most other tests of the goodness-of-fit model have used generally less distressed community samples (e.g., Forsythe & Compas, 1987). Given that the specific sample utilized in this study shares a common life stressor (i.e., HIV infection), the particular stressors that participants selected for the questionnaire may not be as influential as the problem situation in which they are living. The inherent uncontrollability found in living with a serious chronic illness may override the small

variations of perceived control among stressors utilized in the study (Vitaliano et al., 1990). In addition, Vitaliano et al. (1987) suggest the possibility that in highly distressed samples, appraisal may play a less critical role in modifying the relationship between coping and distress because heavily distressed persons are more likely to cognitively distort and be less perceptive to situational nuances.

Cross-sectional design. One limitation of this study was the cross-sectional nature of the analysis of the relationships between coping and psychological distress. Cross-sectional analyses provide information about the interplay of controllability, coping, and adjustment at a given point; however, they are unable to consider the changes that may occur in these relationships over the passage of time. Some researchers suggest that in addition to the fit between appraisal and coping determining psychological outcomes, prior levels of distress may influence coping choices and subsequent levels of disturbance. While previous tests of the goodness-of-fit model have utilized longitudinal designs (Felton & Revenson, 1984; Aldwin & Revenson, 1987; Zakowski et al., 2001; Park et al., 2001), it is important to note that these findings are similar to those found in cross-sectional analyses. However, given the nature of the study, causality between coping and the outcome measure cannot be concluded; and hence, bi-directionality between coping and distress must be considered.

Operationalization of variables. Implicit to the goodness-of-fit hypothesis is the assumption that appraisal influences coping, which is, in turn, related to an outcome. However, it is important to consider that identifying a unidirectional link between cognitions, coping, and distress is difficult because of the continual feedback loop

between these variables (Lazarus & Folkman, 1984). Hence, even on a theoretical level, conceptualizing appropriate operational definitions is challenging.

Operational definition of coping. As recommended by Folkman and Lazarus (1984), a principal components analysis was performed on Ways of Coping Questionnaire for the current sample. From this analysis, two factors were retained: one representing problem-focused coping and another representing emotion-focused coping. Retaining only two factors is distinct from many previous tests of the goodness-of-fit, which frequently classify problem-focused and emotion-focused coping into smaller scales, such as problem solving, distancing, and positive reappraisal (e.g., Park et al., 2001). In addition, the criteria used to load items onto scales may be different from that used by other researchers. Using different standards, such a more stringent minimal loading for items on the second factor, may have ensured greater orthogonality among the scales in the current sample. As Zakowski et al. (2001) suggest, the use of numerous and different operational definitions of emotion-focused and problem-focused coping could explain why researchers report discrepant findings for the goodness-of-fit hypothesis.

Operational definition of appraisal. Given that a single item was used to assess participants' appraised control in this study, it is possible that this measure was psychometrically limited. Although appraisal was found to be significantly correlated with problem-focused coping, it is possible that the limited sensitivity of this single measure may not have been powerful enough to adequately represent control appraisals (e.g., for emotion-focused coping). Given that the lack of significant differences in perceived control could not be accounted for by sociodemographic characteristics, such

as mode of infection or illness duration, it seems important to consider this possibility. Future research could benefit from a more comprehensive appraisal measure.

Operational definition of stressors. It is also important to consider that levels of sources of stressors utilized in the study may have been too heterogeneous. A single stressor can have several smaller stressors (e.g., treatment adherence can cause stress due to medication side effects or financial burden). As Coyne and Racioppo (2000) suggest, characteristics of stressful situations and characteristics of individual participants are easily confounded in coping research. Even when participants are asked to complete the WOC in reference to a specific set of stressors, respondents may still draw upon widely different stressful episodes, goals, and options for coping. In addition, measuring coping retrospectively can be problematic due to study participants' memory biases (Penley et al., 2002).

Operational definition of depression. One possible explanation for this study's failure to demonstrate support for the goodness of fit hypothesis may be related to the operational definition of the outcome variable. Lazarus and Folkman (1984) suggest that the appropriateness of a strategy can be determined not only by its effect in a given encounter, but also by its long-term impact. However, prior research has suggested that the more distal an outcome, the more likely that it will be affected by extraneous variables (Vitaliano et al., 1990). Hence, it is possible that the BDI score of depression may have been too distal a variable to reflect the specific effects of coping.

Given the inherent difficulty in assessing self-reported depressive symptoms in HIV-seropositive persons, a reduced scale of cognitive-affective symptoms of the Beck

Depression Inventory was utilized in this study. As mentioned in the Results section, previous studies have assessed the relationship between symptoms of depression and physical symptoms of HIV infection. Somatic symptoms of depression have been found to be most closely related to physical symptoms of HIV (i.e., HIV symptomology, medication side effects; Sikkema et al., 1995). Therefore, in order to minimize overlap, the cognitive-affective subscale of the BDI was used as the outcome variable in this research. While this outcome measure is different from measures used in prior tests of the goodness-of-fit measure, it is unlikely that this measure altered the study findings, given that correlations between the subscale and all variables used in the study were similar to those found with the full BDI and SCL-90-R.

Given that a self-report measure of psychological adjustment was the only outcome variable utilized in the study, the variance able to be observed in coping (e.g., coping behaviors that occur unconsciously) was limited. Finally, as Coyne and Racioppo (2000) suggest, distress reduction may not be a universally appropriate indicator of successful outcome. People often approach difficult situations with multiple goals, some of which (e.g., maintaining a relationship) may cause short-term increases in distress, but have long-term benefits.

Operational definition of rural communities. The operational definition of a rural community utilized in this study is also important to note. The Centers for Disease Control and Prevention defines a rural community as a place with 50,000 or fewer residents. However, Project Connect defined rural as a community 50,000 or less and at least 20 miles from a city of 100,000 or more. Therefore, we must consider that different

community size cut-offs could yield different findings. In comparison to persons living in closer proximity to urban communities, persons living in remote rural areas likely face even greater social constraints and difficulties accessing sufficient health care (Ullrich et al., 2002; Heckman, Somlai, Kalichman et al., 1998).

Future Directions

In spite of these limitations, this research adds to mental health literature by being the first study to test the goodness-of-fit hypothesis in a sample of HIV-seropositive persons living in rural communities. While study findings were somewhat contrary to expectations of the transactional model of stress and coping, this research provides a foundation for future studies. Research examining appraisal and coping processes in HIV-seropositive persons should not be abandoned, but rather expanded, particularly through longitudinal designs. As mentioned above, important considerations for future research on the goodness-of-fit model include the impact of social support and coping self-efficacy on coping behavior. In addition, consideration should also be given to variant methods of scoring the Ways of Coping Questionnaire, the inclusion of additional coping strategies (i.e., positive reappraisal), and future potential for coping-training interventions.

Scoring coping behaviors from WOC. While using varying forms of scoring for the Ways of Coping Questionnaire (e.g., relative scores) has intuitive appeal, few studies have compared varying scoring methods. Two studies, Conway and Terry (1992) and Zakowski et al. (2001), compared mean-item and relative scores and concluded that both scoring methods behave in a mathematical similar manner. While results from the

present study reveal that variant scoring methods yield similar conclusions, the amount of variance accounted for in depression symptomology varied among scoring methodologies. Relative and ratio coping scores accounted for much less variance in depression (1.8%-2.7%) than mean item and standardized scores (4.8%-16.3%). This finding suggests that mean item and standardized scores act in a mathematically similar manner, as do relative and ratio scores. In addition, this finding proposes the importance of considering participants' joint use of emotion-focused and problem-focused coping when testing the goodness-of-fit. Given these results, further research concerning scoring methodologies is warranted.

Positive Reappraisal. As mentioned in the Introduction, Park and Folkman (1997) recently suggested the addition of meaning-focused coping (i.e., positive reappraisal) to the testing of the goodness-of-fit. According to Park and colleagues, meaning-focused coping involves changing the appraisal of the situation to be more consistent with one's goals and beliefs, such as by making an attribution for a stressful event more benign or identifying opportunities for growth from the event. In a study with HIV-seropositive men and caregivers, Park et al. (2001) found that positive reappraisal was related to lower levels of depressed mood.

Recent research by Sears, Stanton, and Danoff-Burg (2003) has helped to clarify the process comprising meaning-focused coping. Sears and colleagues examined predictors and outcomes of benefit finding (i.e., the identification of benefit from adversity), positive reappraisal coping (i.e., the extent to which individuals intentionally use benefit-related information as a coping strategy), and posttraumatic growth (i.e., the

extent to which a positive change emerges from a struggle with a major life crisis) in a longitudinal study with breast cancer patients. Results indicated that the three variables were related but distinct constructs. Education and optimism were found to uniquely predict benefit finding, while hope predicted positive reappraisal. Time since diagnosis and perceived cancer stress was found to predict posttraumatic growth at a one-year follow-up. Additionally analyses indicated that positive reappraisal coping – but not benefit identification – predicted posttraumatic growth, positive mood, and perceived physical health at a one-year follow-up. Sears and colleagues conclude that simply asking clients to identify benefits from their experiences (i.e., benefit finding) is insufficient. Instead, helping people make use of benefit information (i.e., positive reappraisal coping) is what appears to be most beneficial. Given that the present study only reviewed the broad structures of emotion-focused and problem-focused coping, positive reappraisal coping was unable to be analyzed. However, this literature suggests the importance of considering meaning-focused coping in future studies.

Potential for coping-training interventions. What remains compelling about these findings, and those from other tests of the goodness-of-fit, is the indication that coping does influence the process of adaptation. Lazarus and Folkman (1984) believe that the skills that people need to cope with stressful situations are often learned through experience. Those who have learned to indiscriminately use a particular coping response to deal with stressful situations may have higher levels of depression because of the ineffectiveness of their coping mechanisms. Therefore, continued research in this area

has potential implications for stress management interventions that teach individuals to accurately assess stressor controllability and choose the most adaptive coping strategy.

References

Aldwin, C., & Revenson, T. (1987). Does coping help? A reexamination of the relation between coping and mental health. *Journal of Personality and Social Psychology, 53(2),* 337-348.

Antoni, M. (2002). HIV and AIDS. In Christensen, A. & Antoni, M. (Eds.), *Chronic Physical Disorders: Behavioral Medicine's Perspectives* (pp. 191-219). Oxford: Blackwell.

Bandura, A. (1988). Self-conception of anxiety. *Anxiety Research, 1,* 77-98.

Beck, A.T., & Steer, R.A. (1993). *BDI: Beck Depression Inventory Manual*. New York: Psychological Corp.

Benight, C.C., Antoni, M..H., Kilbourn, K., Ironson, G., Kumar, M.A., Fletcher, M.A., et al. (1997). Coping self-efficacy buffers psychological and physiological disturbances in HIV-infected men following a natural disaster. *Health Psychology, 16(3)*, 248-255.

Berry, D.E. (1993). The emerging epidemiology of rural AIDS. *The Journal of Rural Health, 9,* 293-304.

Berry, D.E. (2000). Rural Acquired Immunodeficiency Syndrome in low and high prevalence areas. *Southern Medical Journal, 93(1),* 36-43.

Brown, E.J. (2002). Recruitment feasibility and HIV prevention intervention acceptability among rural north Florida blacks. *Journal of Community Health Nursing, 19(3),* 147-160.

Buehler, J.W., Frey, R.L, & Chu, S.Y. (1995). The migration of persons with AIDS: Data

from 12 states, 1985 to 1992. *American Journal of Public Health, 85(11),* 1552-1555.

Carver, C.S., Scheier, M.F., & Weintraub, J.K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology, 56,* 267-283.

Centers for Disease Control and Prevention. (2003). Characteristics of Persons Living with AIDS and HIV, 2001. *HIV/AIDS Surveillance Supplemental Report*, *9*(No. 2): 10-17.

Centers for Disease Control and Prevention (2002). HIV/AIDS surveillance report. Retrieved September 21, 2003 from http://www.cdc.gov/hiv/stats.htm#cumaids

Chesney, M., Folkman, S., & Chambers, D. (1996). Coping effectiveness training for men living with HIV: Preliminary findings. *International Journal of STDs and AIDS, 7*(Suppl. 2), 75-82.

Christensen, A.J., Benotsch, E.G. Wiebe, J.S., & Lawton, W.J. (1995). Coping with treatment-related stress: Effects on patient adherence in hemodialysis. *Journal of Consulting and Clinical Psychology, 63(3),* 454-459.

Conway, V.J., & Terry, D.J. (1992). Appraised controllability as a moderator of the effectiveness of different coping strategies: A test of the goodness-of-fit hypothesis. *Australian Journal of Psychology, 44(1),* 1-7.

Coyne, J.C., & Racioppo, M.W. (2000). Never the twain shall meet? Closing the gap between coping research and clinical intervention research. *American Psychologist, 55(6),* 655-664.

Dannenberg, A.L., McNeil, J.G., Brundage, J.F., & Brookmeyer, R. (1996). Suicide and HIV infection: Mortality follow-up of 4,147 HIV-seropositive military service applicants. *Journal of American Medical Association, 276,* 1743-1746.

DeGenova, K., & Patton, D.M. (1994). Ways of coping among HIV-infected individuals. *Journal of Social Psychology, 134(5),* 655-663.

Derogatis, L.R. (1983). *Administration, scoring, and procedures manual II*. Towson, MD: Clinical Psychometric Research.

Endler, N.S., Speer, R.L., Johnson, J.M., & Flett, G. (2000). Controllability, coping, efficacy, and distress. *European Journal of Personality, 14,* 245-264.

Felton, B., & Revenson, T. (1984). Coping with chronic illness: A study of illness controllability and the influence of coping strategies on psychological adjustment. *Journal of Consulting and Clinical Psychology, 52,* 343-353.

Fleishman, J.A., & Fogel, B. (1994). Coping and depressive symptoms among young people with AIDS. *Health Psychology, 13(2),* 156-169.

Folkman, S., & Lazarus, R.S. (1980). An analysis of coping in a middle-aged community sample. *Journal of Health and Social Behavior, 21,* 219-239.

Folkman, S. & Lazarus, R.S. (1988). The relationship between coping and emotion: Implications for theory and research. *Social Science Medicine, 26(3),* 309-317.

Folkman, S., Lazarus, R., Dunkel-Schetter, C., DeLongis, A., & Gruen, R. (1986). The dynamics of a stressful encounter: Cognitive appraisal, coping, and encounter outcomes. *Journal of Personality and Social Psychology, 50,* 992-1003.

Folkman, S., Lazarus, R., Gruen, R., & DeLongis, A. (1986). Appraisal, coping, health

status, and psychological symptoms. *Journal of Personality and Social Psychology, 48,* 571-579.

Forsythe, C.J., & Compas, B.E. (1987). Interaction of cognitive appraisals of stressful events and coping: Testing the goodness-of-fit hypothesis. *Cognitive Therapy and Research, 11(4),* 473-485.

Hart, S., Gore-Felton, C.G, Maldonado, J., Lagana, L., Blake-Mortimer, J., Israelski, D., et al. (2000). The relationship between pain and coping styles among HIV-positive men and women. *Psychology and Health, 15,* 869-879.

Heckman, T.G. (2003). The chronic illness quality of life (CIQOL) model: Explaining life satisfaction in people living with HIV disease. *Health Psychology, 22(2),* 140-147.

Heckman, T.G., Anderson, E.S, Sikkema, K.J, Kochman, A., Kalichman, S.C., & Anderson, T. (2004). Emotional distress in nonmetropolitan persons living with HIV disease enrolled in a telephone-delivered, coping improvement group intervention. *Health Psychology, 23(1)*, 94-100.

Heckman, T.G, Kim, S., Pinkerton, S., & Akers, T. (2003). *AIDS Cases Diagnosed in Non-Metropolitan Areas of the United States: 1993-2001*. Unpublished manuscript.

Heckman, T.G., Kochman, A., Sikkema, K.J., & Kalichman, S.C. (1999). Depressive symptomatology, daily stressors, and ways of coping among middle-age and older adults living with HIV disease. *Journal of Mental Health and Aging, 5(4),* 311-322.

Heckman, T.G., Somlai, A.M., Kalichman, S.C., Franzio, S., & Kelly, J.A. (1998). Psychosocial differences between rural and urban persons living with HIV/AIDS. *Journal of Rural Health, 14(2),* 138-145.

Heckman, T.G., Somlai, A.M., Peters, J., Walker, J., Otto-Salaj, L., & Galdabini, C.A. (1998). Barriers to care among persons living with HIV/AIDS in urban and rural areas. *AIDS Care, 10(3),* 365-376.

Jacobsen, P., Perry, S., & Hirsch, D. (1990). Behavioral and psychological responses to HIV antibody testing. *Journal of Consulting and Clinical Psychology, 58,* 31-37.

Kalichman, S. C., Sikkema, K. J., Somlai, A. M. (1995). Assessing persons with human immunodeficiency virus (HIV) infection using the Beck Depression Inventory: Disease process and other potential confounds. *Journal of Personality Assessment, 64,* 86 – 100.

Kelly, J.A., Sikkema, K.J, Winnet, R.A., Solomon, L.J., Roffman, R.A., Heckman, T.G., et al. (1995). Factors predicting continued high-risk behavior among gay men in small cities: Psychosocial, behavioral, and demographic characteristics related to unsafe sex. *Journal of Consulting and Clinical Psychology, 63(1),* 101-107.

Lansky, A., Nakashima, A.K., Diaz, T., Fann, S.A., Conti, L., Herr, M., et al. (2000). Human Immunodeficiency Virus in rural areas and small cities of the southeast: Contributions of migration and behavior. *Journal of Rural Health, 16(1),* 20-30.

Lazarus, R., & Folkman, S. (1984). *Stress, appraisal, and coping.* New York: Springer Publishing Company.

Leserman, J., Jackson, E.D, Petitto, J.M, Golden, R.N, Silva, S.G, Perkins, D.O., et al.

(1999). Progression to AIDS: The effects of stress, depressive symptoms, and social support. *Psychosomatic Medicine, 61,* 397-406.

Leserman, J., Petitto, J.M., Golden, R.N., Gaynes, B.N, Hongbin, G., Perkins, D.O., et al. (2000). Impact of stressful life events, depression, social support, coping, and cortisol on progression to AIDS. *American Journal of Psychiatry, 157(8),* 1221-1228.

Leslie, M.B., Stein, J.A., & Rotheram-Borus, M.J. (2002). The impact of coping strategies, personal relationships, and emotional distress on health-related outcomes of parents living with HIV or AIDS. *Journal of Social and Personal Relationships, 19(1),* 45-66.

Mulder, C.L., Antoni, M.H., Duivenvoorden, H.J., Kauffmann, R.H., & Goodkin, K. (1995). Active confrontational coping predicts decreased clinical progression over a one-year period in HIV-infected homosexual men. *Journal of Psychosomatic Research, 39(8),* 957-965.

Muntaner, C., & Barnett, E. (2000). Depressive symptoms in non-metropolitan West Virginia: Labor market and health services correlates. *Journal of Health Care for the Poor and Underserved, 11,* 284-300.

Namir, S., Wolcott, D.D., Fawzy, F.I., & Alumbaugh, M.J. (1990). Implications of different strategies for coping with AIDS. In A. Baum & L. Temeshok (Eds.), *Psychosocial Aspects of AIDS* (pp. 173-190). Hillsdale, NJ: Erlbaum.

Nyamathi, A., Stein, J.A., & Brecht, M. (1995). Psychosocial predictors of AIDS risk

behavior and drug use behavior in homeless and drug addicted women of color. *Health Psychology, 14(3),* 265-273.

Park, C.L., & Folkman, S. (1997). Meaning in the context of stress and coping. *Review of General Psychology, 1(2),* 115-144.

Park, C.L., Folkman, S., & Bostrom, A. (2001). Appraisals of controllability and coping in caregivers and HIV-seropositive men: Testing the goodness-of-fit hypothesis. *Journal of Consulting and Clinical Psychology, 69(3),* 481-488.

Penedo, F.J., Antoni, M.H., Schneiderman, N., Ironson, G.H., Malow, R.M., Cruess, S., et al. (2001). Dysfunctional attitudes, coping, and depression among HIV-seropositive men who have sex with men. *Cognitive Therapy and Research, 25(5),* 591-606.

Penley, J.A., Tomaka, J., & Wiebe, J.S. (2002). The association of coping to physical and psychological health outcomes: A meta-analytic review. *Journal of Behavioral Medicine, 25(6),* 551-603.

Pennix, B., van Tilburg, T., Boeke, A., Deeg, D., Kriegsman, D., & Eijk, J. (1998). Effects of social support and personal coping resources on depressive symptoms: Different for various chronic diseases? *Health Psychology, 17(6)*, 551-558.

Rabkin, J.G., Remien, R., Katoff, L, & Williams, J.B. (1993). Suicidality in AIDS long-term survivors: What is the evidence? *AIDS Care, 5(4),* 401-411.

Reed, G.M., Kemeny, M.E., Taylor, S.E., Wang, H.J., & Visscher, B.R. (1994). Realistic acceptance as a predictor of decreased survival time in gay men with AIDS. *Health Psychology, 13(4),* 299-307.

Schmitz, M.F., & Crystal, S. (2000). Social relations, coping, and psychological distress among persons with HIV/AIDS. *Journal of Applied Social Psychology, 30(4),* 665-685.

Sears, S.R., Stanton, A.L., & Danoff-Burg, S. (2003). The yellow brick road and the emerald city: Benefit finding, positive reappraisal coping, and posttraumatic growth in women with early-stage breast cancer. *Health Psychology, 22(5),* 487-497.

Sikkema, K.J., Kalichman, S. C.; Hoffmann, R.; Koob, J. J., Kelly**,** J. A., & Heckman, T. (2000). Coping strategies and emotional wellbeing among HIV-infected men and women experiencing AIDS-related bereavement. *AIDS Care, 12(5),* 613-624.

Sikkema, K.J., Kalichman, S.C., Kelly, J.A., & Koob, J.J. (1995). Group intervention to improve coping with AIDS-related bereavement: Model development and an illustrative clinical example. *AIDS Care, 7(4),* 463-475.

Song, Y., & Ingram, K. (2002). Unsupportive social interactions, availability of social support, and coping: Their relationship to mood disturbance among African Americans living with HIV. *Journal of Social and Personal Relationships, 19(1),* 67-85.

Steinberg, S., & Fleming, P. (2000). The geographic distribution of AIDS in the United States: Is there a rural epidemic? *Journal of Rural Health, 16(1),* 11-19.

Tabachnick, B. G., Fidell, L. S. (1996). *Using Multivariate Statistics* (3rd Ed.). Boston, MA: Allyn & Bacon.

Terry, D., & Hynes, G. (1998). Adjustment to a low-control situation: Reexamining the

role of coping responses. *Journal of Personality and Social Psychology, 74,* 1078-1092.

Tobin, D.L, Holroyd, K.A., Reynolds, R.V., & Wigal, J.K. (1989). The hierarchical factor structure of the coping strategies inventory. *Cognitive Therapy and Research, 13(4),* 343-361.

Turner, R. J., Frankel, B. G., & Levin, D. M. (1983). Social support: Conceptualization, measurement, and implications for mental health. *Research in Community Mental Health, 3,* 67 – 111.

Ullrich, P.M., Lutgendorf, S.K., & Stapleton, J.T. (2002). Social constraints and depression in HIV infection: Effects of sexual orientation and area of residence. *Journal of Social and Clinical Psychology, 21(1),* 46-65.

Vitaliano, P., Dewolfe, D., Maiuro, R., Russo, J., & Katon, W. (1990). Appraised changeability of a stressor as a modifier of the relationship between coping and depression: A test of the hypothesis of fit. *Journal of Personality and Social Psychology, 59(3),* 582-592.

Vitaliano, P., Maiuro, R., Russo, J., & Becker, J. (1987). Raw versus relative scores in the assessment of coping strategies. *Journal of Behavioral Medicine, 10(1),* 1-18.

Vitaliano, P., Russo, J., Carr, J., Maiuro, R.,& Becker, J. (1985). The ways of coping checklist: Revision and psychometric properties. *Multivariate Behavioral Research, 20,* 3-26.

Vosvick, M., Gore-Felton, C., Koopman, C., Thoresen, C., Krumboltz, J., & Spiegel, D.

(2002). Maladaptive coping strategies in relation to quality of life among HIV-seropositive adults. *AIDS and Behavior, 6(1),* 97-106.

Whetten-Goldstein, K., Nguyen, T.Q., & Heald, A.E. (2001). Characteristics of individuals infected with the Human Immunodeficiency Virus and provider interaction in the predominately rural Southeast. *Southern Medical Journal, 94(2),* 212-222.

Zagumny, M.J., & Holt, T.R. (1999). Gender differences in sexual practices and beliefs among rural injecting drug users in treatment. *Journal of Alcohol and Drug Education, 44(2),* 1-11.

Zakowski, S., Hall, M., Klein, L., & Baum, A. (2001). Appraised control, coping, and stress in a community sample: A test of the goodness-of-fit hypothesis. *Annals of Behavioral Medicine, 23(3),* 158-165.