

RURAL AND URBAN BREAST CANCER PATIENTS:
DIFFERENTIAL RELATIONSHIPS BETWEEN COPING RESPONSES AND
PSYCHOLOGICAL ADJUSTMENT

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REBECCA J. SCHLEGEL

Dr. Ann Bettencourt, Thesis Supervisor

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The undersigned, appointed by the dean of the Graduate School, have examined the thesis entitled

**RURAL AND URBAN BREAST CANCER PATIENTS:
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PSYCHOLOGICAL ADJUSTMENT**

presented by Rebecca Schlegel,

a candidate for the degree of master of arts

and hereby certify that, in their opinion, it is worthy of acceptance.

Professor Ann Bettencourt

Professor Laura King

Professor Jennifer Krull

Professor Stephanie Reid-Arndt

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Chapter 1

Introduction

A diagnosis of breast cancer signals a number of future challenges such as a potentially disfiguring surgery, arduous treatment and threats to health, well-being, social roles and interpersonal relationships. Research shows that, in general, breast cancer patients with no prior psychiatric disorder are unlikely to experience serious long-term psychological distress (e.g., Bloom et al., 1987; Penman et al., 1987). Nonetheless, empirical evidence documents that a nontrivial number of breast cancer patients experience severe depression and anxiety (e.g., Cuellar et al., 2003, Koopman et al., 2001).

Many studies have revealed that individual differences in coping responses to diagnosis and treatment of breast cancer are associated with psychological adjustment. The vast majority of these studies, however, focus on urban women. Some of the findings derived from the studies of urban women may generalize to rural women, yet rural breast cancer patients are likely to have distinct experiences that influence their physical and psychological well-being (e.g., Amey et al., 1997; Bettencourt & Molix, 2003; Coughlin et al., 2002; Eggebeen & Lichter, 1993; Marshall, Hays, Sherbourne & Wells, 1996; Shootman and Fuortes, 1999; Whitener, 1995; Wilcox et al., 2000). The purpose of this study is to examine whether associations between coping and psychological adjustment are different for rural and urban women.

Coping

Psychologists have long been interested in the ways that people cope with stressful experiences. Arguably, Lazarus and colleagues' theoretical and empirical work

significantly advanced our understanding of coping responses. Lazarus was among the first to offer a conceptual framework of stress and coping. This theoretical model consists of the following three processes: primary appraisal, secondary appraisal, and coping (Lazarus, 1966; Lazarus & Folkman, 1984). Primary appraisal is the process of perceiving a threat to oneself, such as the impending occurrence of something bad, harmful or painful, or the perception of loss of something valued. Secondary appraisal is the process of bringing to mind a potential response to that threat, and coping is the process of executing that response.

One key point of the Lazarus model is that people weigh options and consider the consequences of alternative responses before engaging in a particular coping response; that is the process of responding to a threat is not necessarily reflexive. A second key point is that the objective nature of whether a situation is actually threatening or not is much less important than the individual's subjective assessment of whether it is threatening. Thus, the experience of stress is actually an interaction between the situation and the person. Accordingly, the Lazarus model of stress, appraisal and coping acknowledges the importance of individual differences. What may be extremely distressing to one may be a minor annoyance to another. For example, one person may become incredibly distraught about receiving a speeding ticket, while another person may be relatively unaffected by the experience. Additionally, people vary in their propensity to respond to stressful situations in particular ways. Some may take action to try and eliminate the stressor, while others may merely try to stop thinking about the stressor or refuse to acknowledge that the stressor exists.

More recently Carver, Scheier and colleagues (Carver, Scheier, & Pozo, 1992; Carver & Scheier, 1993; 1999; 2002) have developed a model of coping, which was influenced by the Lazarus and Folkman tradition. Within Carver, Scheier and colleagues' model coping is defined as efforts at self-regulation in the face of adverse situations (Carver & Scheier, 2002), where self-regulation refers to efforts to create and maintain desired conditions in an individual's life. These desired conditions, or goals, can be stable (e.g., maintain a healthy life) or dynamic (e.g., find a new job). The process by which such goals are realized is the self-regulation process.

The self-regulation process is accomplished via feedback loops (Carver & Scheier, 1999). These feedback loops contain an input function, a reference value, a comparator, and an output function. The input function represents an individual's current perceptions of reality. An individual's goal serves as the reference value. The comparator's role is to compare a person's goals (reference value) to their perceptions of reality (input function). The comparator can then yield two outcomes, the reference value and input function are significantly discrepant or they are not. Following this comparison, the output function determines behavior. If the comparison yields no difference, the output function will remain whatever it was before the comparison. If the comparison yields a difference, the output function changes behavior in an attempt to reduce the discrepancy.

According to Carver and Scheier (1999) these self-regulatory efforts often run quite smoothly, however, people sometimes encounter difficulties in accomplishing their goals. That is, they are sometimes unable to reduce discrepancy between their goals and perceptions of reality. When these situations occur they are experienced as stressful. As

did Lazarus and Folkman, Carver and Scheier specify that coping is the process by which individuals attempt to deal with stress. Coping processes are efforts to create conditions that will foster continued movement toward desired goals or efforts to disengage from goals that are no longer attainable. Both engagement and disengagement are seen as adaptive in the appropriate situation. Engagement is beneficial in situations where a continued effort will eventually produce attainment of the goal. However, disengaging from a goal is necessary when that goal cannot be accomplished, so as to free up resources for the pursuit of other more attainable goals. For instance, an uncoordinated person may have a goal of becoming a professional athlete. It might be more adaptive for this person to give up this goal and channel his or her energy toward a more attainable career goal that does not require skilled coordination.

Carver and Scheier (2002) argue that there are likely individual differences in the tendency to engage or disengage from one's goals as observed through the coping responses that an individual employs when stress occurs. The way that a person responds, or copes, with a stressor that threatens goals is indicative of their tendency to *approach* (engage) or *avoid* (disengage) their goals.

Types of Coping Responses

Initially, previous researchers identified two general types of coping responses, problem-focused and emotion-focused (i.e., Gross, 1998; Lazarus & Folkman, 1984). The first type is aimed at problem-solving about or taking action to change the source of stress; the second is aimed at managing or reducing the emotional distress caused by the stressful situation. Although most stressors elicit both categories, people primarily adopt problem-focused coping strategies when they perceive that something constructive can be

done. By contrast, people tend to engage in emotion-focused coping strategies when they feel the situation cannot be changed and therefore must be endured (Folkman & Lazarus, 1980).

Carver and Scheier (2002) argue that the problem- versus emotion-focused distinction is too simplistic. They argue that coping efforts can also either be directed actively towards or actively away from the stressor. This approach-avoidance distinction is said to “cut across” the problem-focused versus emotion-focused distinction. Thus, coping responses can be distinguished along two dimensions. One dimension represents the emotion- versus problem-focused dimension and the other represent approach versus avoidance. Approach-oriented coping responses direct a person towards their problem or emotions, whereas avoidance coping responses direct a person away from their problem or emotions. Other coping theorists have similarly distinguished the various coping responses along these two dimensions (e.g., Moos, 1988; Tobin et al., 1989).

Although, theoretically there might be four basic categories of coping, in practice coping responses are often not easily categorized. Carver, Scheier and Weintraub's (1989) widely used COPE inventory includes 11 different types of coping responses. Although some can be placed into one of the four theoretical categories, some reflect more than one category. There are five subtypes within the problem-focused approach-oriented category: active coping, planning, suppression of competing activities, restraint coping and seeking of social support for instrumental reasons. Active coping is the process of taking direct action to remove the stressor or reduce its negative effects. Planning is thinking about how to cope with the stressor. This may include making plans of action or thinking about how to best handle the situation, but is different from actually

taking action. Suppression of competing activities is a funneling of one's resources to deal with the stressor by putting other projects aside, limiting involvement in other activities, or letting other things slide for the time being. The exercise of restraint is a problem-focused response in the sense that an individual waits until the time is appropriate to act in dealing with the stressor and avoids acting prematurely. Finally, seeking social support for instrumental reasons involves seeking advice, information or assistance from others.

There are two approach-oriented emotion-focused subtypes. One of these, seeking social support for emotional reasons is going to others for moral support, sympathy and/or understanding. Carver and colleagues discuss how this type of social support seeking is conceptually different from seeking support for instrumental reasons, but that the two often co-occur in reality. Second, focusing on and venting of emotions reflects the tendency to concentrate on the distressing experience and to vent the accompanying feelings. This response is believed to be functional at times, but dysfunctional if used for long periods and hinders moving forward or adjustment.

In addition, Carver included three additional coping subtypes in their COPE measure that are forms of approach-oriented coping but not categorized as problem- or emotion-focused. One of these is positive reinterpretation/growth, which reflects the tendency to reappraise the negative situation in a positive light. Carver explains that positive reinterpretation is related to emotion-focused coping because it is aimed at reducing distressing emotions, but it is also linked to problem-focused coping because adopting this coping strategy should lead to problem-focused actions. Another coping strategy is acceptance, which is considered the opposite of denial. Acceptance of the

reality of the stressful situation is considered a necessary precursor for problem-focused coping when actions can be taken to redress the situation, but also it is considered a necessary precursor for emotion-focused coping when the situation cannot be changed easily. Carver and colleagues argue that a person who accepts the reality of the stressor should be a person who is actively engaged in dealing with that stressor. The final coping response, turning to religion is considered both a problem-focused and an emotion-focused strategy, depending on individual and the situation. For example, a person might turn to religion as a source of emotional support, as either a method to positively reinterpret the situation or as a way to actively cope with it.

In the avoidant coping category, there are three subtypes, including behavioral disengagement, self-distraction, and denial. Each of these three sub-types are categorized by Carver as avoidant, but are not categorized as problem or emotion focused. The first, behavioral disengagement is the tendency to reduce one's efforts in dealing with the stressor or its effects. Behavioral disengagement may also reflect giving up on attaining the goals with which the stressor is interfering. Second, self-distraction reflects the tendency to engage in other activities that distract the individual from thinking about or taking action to handle the stressor. Common distracting activities include daydreaming, watching television or sleeping. Finally, denial reflects the tendency to avoid admitting or accepting the reality of the stressor. If a person does not admit the reality of the stressor, they are unlikely to take action in resolving it.

Breast Cancer and Coping

Serious illness is one possible threat to a person's ongoing life goals that creates stressful experiences in self-regulation (Carver & Scheier, 1999). A serious illness can

threaten a number of one's goals such as those related to good health, career, athletics, or caring for family. Even when a prognosis is relatively good, an illness is often interpreted as a crisis for the individual. Breast cancer is one example of a disease that has a relatively good survival rate, but that is nevertheless a major source of stress for those diagnosed with it. The diagnosis of breast cancer signals a number of hardships ahead. First, the treatment for the disease almost always includes a disfiguring surgical procedure followed by adjuvant therapy (radiation, chemotherapy or both). These adjuvant therapies are associated with a number of unpleasant side effects such as, hair loss, nausea, skin burns, and pain (e.g., Heishman, 1999; McGrath et al., 1999). Furthermore, women diagnosed with breast cancer report being worried about the recurrence of cancer, the metastasis of cancer, and the future of children and other family members if the cancer does not respond to treatment (Wilson et al., 2000). Understanding coping responses to the stress associated with breast cancer is important because it is the single most common type of cancer diagnosed in women, accounting for over 30% of all female cancer diagnoses (The North American Association of Central Cancer Registries, 2002).

The majority of the studies of coping strategies employed by women with breast cancer have focused on the differential influences of approach versus avoidance. Some theorists (e.g., Cox & Mackay, 1982; Greer & Morris, 1975) have expressed marked concern about the use of avoidant strategies in samples of cancer patients because suppression of emotional responses is a characteristic of the "cancer-prone personality." Despite this concern, it appears that breast cancer patients, on average, report more approach-oriented responses than avoidant responses (Epping-Jordon et al., 1999). At

least two studies revealed that (Carver et al., 1993; Stanton, Danoff-Burg, & Huggins, 2002), women with breast cancer reported using acceptance coping more often than any other type of coping and that this finding appears to be significant across different time points during the first year post-diagnosis. In support of this, Carver et al. (1993) found that reports of behavioral disengagement were significantly lower than any other scale and reports of denial and self-distraction were also relatively uncommon. Although reports of breast cancer patients adopting avoidant coping strategies are fairly infrequent, it appears that the adoption of these coping strategies can have detrimental consequences for psychological distress.

Approach-Oriented Coping in Response to Breast Cancer. Generally, cross-sectional and prospective studies show that breast cancer patients and survivors who adopt coping strategies that are categorized as “engaged” or “approach-oriented” such as acceptance, active coping, planning and seeking social support, report lower levels of psychological distress. The two terms are used interchangeably in this paper depending on which coping scale is used in the studies. Nevertheless, in part because studies use an assortment of coping measures as well as psychological adjustment indices and because studies include breast cancer samples that differ on a variety of dimensions, such as time since diagnosis, the results across studies do not always reveal significant associations between psychological adjustment and all the types of approach-oriented coping responses.

At least four studies (Carver et al., 1993; Culver, Arena, Antoni, & Carver, 2002; Stanton et al., 2000; Stanton, Danoff-Burg, Huggins, 2002) have utilized Carver’s COPE measure in studying women with breast cancer. Among these studies, acceptance has emerged as the only approach-oriented consistent predictor of lower psychological

distress; the results for the other approach-oriented responses have been mixed. One study by Carver et al. (1993) included participants who were diagnosed with early (stage I or II) breast cancer and were assessed at five measurement points across the first year after breast cancer diagnosis (pre-surgery, post-surgery, 3-month, 6-month and 12-month medical follow-ups). Higher levels of acceptance coping were significantly related to concurrent distress at all five time points. Additionally, levels of acceptance prior to surgery were prospectively related to lower levels of psychological distress at all subsequent time points. The results also showed that higher levels of positive reinterpretation were significantly related to lower levels of concurrent distress at all but the last time point, but positive reinterpretation prior to surgery did not predict psychological distress prospectively. Also, the study revealed that two additional types of approach-oriented coping uniquely predicted psychological distress, but these associations were not significant across all time points. First, higher levels of suppression of competing activities were associated with lower psychological distress concurrently, but only at the 12-month follow-up. Second, seeking social support was associated with higher distress at pre-surgery, but the authors did not explain this somewhat counter-intuitive relationship. No associations were found for active coping, planning, restraint, or turning to religion either concurrently or prospectively.

Supporting Carver et al.'s (1993) findings, Stanton et al. (2000) reported that early stage breast cancer patients reported levels of acceptance at the end of treatment predicted enhanced quality of life, but not psychological distress, three months later. Similarly, turning to religion at the end of treatment predicted decreased psychological distress, but not quality of life, three months later. Seeking social support and a

composite of panning and active coping did not predict distress and other approach-oriented scales (i.e., suppression of competing activities, restraint, positive reinterpretation) from the COPE were no included in the study.

Similarly, Stanton, Danoff-Burg, and Huggins (2002) found that acceptance, measured at diagnosis, predicted better psychological adjustment among survivors of early stage breast cancer, one year later. Interestingly, Stanton and colleagues study suggested that the effectiveness of engaged coping responses might depend on certain personal attributes of individuals. Specifically, the results of the study showed that high turning to religion was predictive of decreased psychological distress one year later for women low in dispositional hope, while low turning to religion was predictive of decreased distress for women high in hope. Further, both coping through positive reinterpretation and coping through seeking social support were more effective for highly hopeful women in reducing distress. A composite of planning and active coping was detrimental for women high in hope and predicted greater distress later. The “suppression of competing activities” and “restraint” coping subscales were not included in this study. These findings suggest that particular variables may moderate the nature of the association between coping responses and psychological adjustment. Later in this overview, I will review a few additional studies that suggest that group membership (e.g., race, religion, rurality) may be additional moderators.

Another study by Carver and colleagues (Culver, Arena, Antoni & Carver, 2002) also suggests that a higher level of acceptance among breast cancer patients is associated with psychological distress, but the results were less reliable. Across five measurement points, similar to those identified by Carver et al. (1993), only acceptance coping at pre-surgery

was associated with distress concurrently and predictive of post-surgical distress. Thus unlike Carver et al. acceptance coping was not predictive of distress at 3-, 6- and 12-month follow-ups and no other coping strategy emerged as a prospective predictor. Nevertheless, somewhat similar to the results of Carver et al. positive reinterpretation was concurrently associated with distress as the pre-surgery and 3-month time points, but not at the other three time points. Finally, seeking social support was concurrently associated with distress, but only prior to surgery.

Five studies (Classen, Koopman, Angell and Spiegel, 1996; Cohen, 2002; Epping-Jordon et al., 1999; Holland & Hollahan, 2003; Stanton & Snider, 1993) have reported relationships between psychological adjustment and approach-oriented responses, but have used measures of coping other than the COPE. Because nearly all of these studies used a distinct measure of coping, it is difficult to make direct comparisons among them. Nonetheless, the results appear to point to the positive outcomes of approach-oriented responses. Epping-Jordon et al. (1999) used Tobin's (1989) Coping Strategies Inventory with a sample of both early- and late-stage breast cancer patients. Their results revealed that levels of problem-focused *engagement* coping at diagnosis (i.e., problem solving and cognitive restructuring) were negatively related to anxiety and depression, concurrently but not prospectively (i.e., six months later). Moreover, emotion-focused *engagement* coping (i.e., emotional expression and using social support), was unassociated with anxiety and depression at all time points. In a study that used the Mental Adjustment to Cancer Scale to measure coping (MAC; Watson, Greer & Bliss, 1989), Classen, Koopman, Angell and Spiegel (1996) showed that “fighting spirit” was negatively associated with concurrent mood disturbance in a sample of women with advanced breast

cancer. Though fighting spirit is not talked about directly in the Carver and Scheier approach, it reflects a mindset to take on and beat the disease (Watson, Greer, & Bliss, 1989), and therefore these results support the finding that engagement coping may be associated with psychological adjustment.

Several studies have used versions of the Ways Of Coping Questionnaire (WOC; Folkman and Lazarus, 1980). The original scale includes two types of approach coping, problem focused coping and seeking social support. In her sample of both primary and recurrent patients who had completed treatment at least one year earlier, Cohen (2002) found that both problem solving and seeking social support were negatively associated with emotional distress, measured concurrently. In another study (Stanton & Snider, 1993), breast cancer patients who coped by seeking social support prior to breast biopsy reported higher levels of psychological adjustment after surgery, but only for one of the six Profile of Mood States subscales, namely vigor. Stanton and Snider did not measure problem solving. Using a revised WOC (Folkman et al., 1986), Holland and Hollahan (2003) showed that problem solving, seeking social support, and the newly included positive reappraisal were positively associated with concurrent psychological adjustment in a sample of women who had been diagnosed with breast cancer 1 to 24 months prior to the study. The results of these three studies generally support the notion that approach-oriented coping has beneficial outcomes and lends evidence that seeking social support may be associated with psychological adjustment.

Avoidant Coping in Response to Breast Cancer. The literature documents a long standing debate about the effectiveness of avoidant coping responses (Carver, Scheier & Weintraub, 1989). Some theorists (Breznitz, 1983; Wilson, 1981) have suggested that

avoidant coping strategies can be functional because they may help minimize distress and facilitate other types of coping responses. Typically, however, avoidant strategies are not effective in the face of illnesses, such as breast cancer. Lazarus and Folkman (1984) argued that avoidance in response to illness is ineffective because it keeps people from engaging in real action (e.g. seeking medical attention) designed to minimize the threat of the illness. Similarly, Carver and Scheier (1993) argue that, given that a cancer diagnosis and recovery is unchangeable, the avoidant strategies are particularly deleterious.

As mentioned previously, denial, self-distraction, and behavioral disengagement are types of avoidant coping strategies in Carver's COPE. With a few exceptions, research shows greater use of these avoidant strategies is associated with lower levels of adjustment in samples of breast cancer patients and survivors. Similar to the positive coping strategies, these relationships have been shown in both cross-sectional and prospective studies of women with breast cancer.

Of those studies discussed in the previous section that used the COPE measure, all four reported reliable findings regarding avoidance coping. Culver, Arena, Antoni, & Carver (2002) found that greater use of denial was positively correlated with concurrent psychological distress at all of five measurement points. Also, Culver et al. found that the more breast cancer patients reported that they engaged in self-distraction the higher their levels of concurrent distress at all but one time point (pre-surgery). Further, behavioral disengagement was positively related to concurrent psychological distress prior to surgery and again at least 6 months after treatment. The only prospective finding from this study suggested that higher levels of behavioral disengagement at 3 months predicted increased distress at the 6-month follow-up. Similarly Carver and

Scheier (1993) found that denial, self-distraction, and behavioral disengagement were associated with concurrent psychological distress at many but not all time points.

Moreover, as was true for Culver et al.'s findings, only one prospective outcome was reliable, which suggested that behavioral disengagement at 3 months predicted higher distress at 6 months.

Stanton et al.'s (2000) study revealed a prospective relationship between avoidant coping (composite of denial, self-distraction and behavioral disengagement) and psychological adjustment. Specifically, breast cancer patients who reported higher levels of avoidant coping after the completion of treatment experienced increased distress and decreased positive affect three months later. Nevertheless, one study (Stanton, Danoff-Burg & Huggins, 2002) showed that avoidance coping at breast cancer diagnosis predicted decreased distress 3 months later, but it also predicted greater fear of recurrence 1 year later.

Also, in studies not using the COPE, associations between avoidant coping strategies and psychological adjustment have been observed. Stanton and Snider (1993) found that higher levels of cognitive avoidance among breast cancer patients(similar to denial and self-distraction in the COPE) pre-biopsy were associated with greater negative affect at both post-biopsy and post-surgery. Consistent with this finding but using a different coping inventory, Hack and Degner (2004) found that the use of cognitive avoidance during the period when breast cancer patients were engaged in planning their treatment predicted greater levels of anxiety and lower levels of vigor at a 3 year follow-up. Also, McCaul et al.'s (1999) study, which included early stage breast cancer patients revealed that avoidant coping, both emotionally and behaviorally, predicted greater distress both

concurrently (3 months post-diagnosis) and prospectively (1 year later). Unlike Carver and colleague's findings (Carver et al., 1993; Culver et al., 2002), the results of these latter five studies suggest that the use of avoidant coping strategies at earlier time points may have negative longer-term consequences.

Specific Samples of Breast Cancer Survivors

At least a few reports suggest that associations between coping and psychological adjustment differ as a function of breast cancer patients' group memberships. For example, the study by Culver et al. (2002; see also Culver et al., 2004) discussed in the previous sections on coping also reported differences between racial groups in coping, psychological adjustment and the association between the two. The study included African American, Hispanic and non-Hispanic white breast cancer patients. The findings revealed that African American breast cancer patients reported lower levels of overall psychological distress (averaged across the 5 time points) than did their non-Hispanic white counterparts. Hispanic breast cancer survivors' reported mean level of distress was not different than those of the other two ethnic groups. Also, compared to the two other ethnic samples, Hispanic breast cancer survivors reported higher mean levels of coping by engaging in self-distraction and through venting emotions. Also, Non-Hispanic whites reported a lower mean level of religious coping than either of the other two ethnic groups. Finally, the results showed that behavioral disengagement coping prior to surgery predicted less distress after surgery for Hispanic breast cancer patients, but greater distress among non-Hispanic whites, but these relationships were not significant at all time points. The relationships between the remaining coping variables and psychological adjustment did not appear to be moderated by race.

In another study that included only a sample of Hispanic breast cancer survivors and using the same method as that used in other studies by Carver and colleagues, Alferi et al. (1999) document differences in coping responses and psychological distress depending on the survivors' religious group-membership (i.e., Catholic or Evangelical Christians). Compared to Evangelicals, greater levels of denial and behavioral disengagement were reported by Catholic breast cancer patients, but not at all five time points. Furthermore, higher levels of religious coping (attending church, praying, and talking to a minister) predicted lower levels of distress for Evangelical breast cancer survivors but higher levels of distress for their Catholic counterparts (at post-surgery and 6-month follow-up). No results were reported for the remaining COPE subscales regarding either mean level differences or differences in the association between coing and psychological adjustment.

Rural Breast Cancer Patients and Survivors

It has been argued (Bettencourt et al., 2006) that rural residency is one group distinction that may influence the ways in which women cope with breast cancer. Nevertheless, the overwhelming majority of the empirical studies on breast cancer survivors have focused on urban women. More specifically, researchers have largely ignored rural women's coping responses and psychological adjustment to breast cancer. Although some of the findings derived from studies of urban breast cancer survivors may generalize to their rural counterparts, rural women are likely to have distinct experiences that warrant investigation.

People living in rural areas place importance on their identity as "rural people" and their beliefs in a "rural way of life" (Woods, 2005). Consistent with this, Cloke and

Milbourne (1992) argue that rurality is best understood as a socially constructed term developed to describe a world of social, moral and cultural values endorsed by rural dwellers (see also Melton, 1983). Melton (1983) noted that, compared to their urban counterparts, rural people are said to be more religious, conservative, work-oriented, intolerant, fatalistic, and familial (see also Flax et al., 1979). Halfacree (1995) interviewed rural residents in England about what rurality meant to them. He found that rurality was strongly associated with relaxation, a slower pace, independence, simple and non-materialistic lifestyles, strong communities, traditional values, and a sense of nature. Not only do rural people articulate characteristics of rural culture and values, evidence that these facets of rural life continue to be important can be seen in the voracity with which they try to protect these cultural characteristics through a variety of organizations and other efforts (i.e., Nelson, 2005; Long Island Farm Bureau, 2004; Metropolitan King County Council, 2004;).

Consistent with this, definitions of rurality were traditionally based on the predomination of “rural values” (Woods, 2005). Although the notion of different rural and urban cultures is intuitive, contemporary theorists (i.e. Cloke & Milbourne, 1992; Melton, 1983) have noted that definitively describing what exactly rural life entails is difficult due to the constantly changing nature of rural culture. However, rural communities have historically been highly autonomous, cohesive, and integrated; ideals which are likely to remain even as rural culture merges with the larger American culture (Photiadis & Simon, 1983). Consistent with this, Cloke and Milbourne (1992) argue that a regional circulation of ideas exists that sustains the rural culture and that rural might be

best defined as a “state of mind.” Rural-cultural beliefs may lead rural women to cope with their diagnosis in socially prescribed ways.

Theoretically, cultural and environmental factors likely interact with rural women’s lives in ways that are likely to affect their subjective experiences with breast cancer. Research on rural women diagnosed with breast cancer supports this supposition. For instance, the type of treatment that women diagnosed with breast cancer choose and receive appears to be influenced by whether they live in rural or urban areas. Studies (Beaulieu et al., 2003; Davis et al., 2003; Girgis et al., 2000; Gray et al., 2004; McGrath et al., 1999; Tropman et al., 1999) show that, compared to their urban counterparts, rural breast cancer patients are more likely to undergo mastectomy and receive chemotherapy, and that they are less likely to undergo lumpectomy and receive radiation. Davis et al. (2003) suggest that one reason for this difference is that rural women’s decisions about their health care are not based on their physical health but instead on difficulties with transportation, lack of easily accessible health care services, and events occurring at home. Also, social-role disruption may be especially problematic for rural breast cancer patients and survivors. Girgis (2000) revealed that rural breast cancer survivors were 2.5 times more likely to report needing help with physical and daily living needs than were their urban counterparts and Girgis suggested that this outcome might reflect the traditional social role demands typically placed on women in rural areas. Similarly, Gray et al. (2004) showed that rural women felt that running a home and taking care of children during diagnosis and treatment was more difficult in a rural area, where services were less accessible. Consistent with this finding, Davis et al. (2003) showed that rural breast cancer patients who stay away from home during treatment reported disruption in

social roles related to their families and children. Importantly, for many women in these samples their role as mother and homemaker is central (McGrath et al., 1999). Rural women may be especially concerned about role disruption because their roles as caregivers position them as positive members of their communities (Lopez, 2005).

The more general literature on health and well-being also lends credence to the idea that the rural environment differs from the urban in some fundamental ways. For example, rural women are more likely to have lower education levels, lower income levels, and less adequate housing (e.g., Eggebeen & Lichter, 1993; Marshall, et al., 1996; Roberto & Scott 1987; Whitener, 1995). Preventative health, mental health, and medical health care services are often inadequate in rural areas (Marshall, et al., 1996; Whitener, 1995). Rural women, are more likely to be married (Coughlin et al., 2002; Garrison, 1998; Schootman & Fuortes, 1999) and to have greater informal support from family and friends compared to urban women (Barry, Doherty, Hope, Sixsmith, & Kelleher, 2000; Duncan, 2001). Finally, as compared to urban women, rural women are more likely to be religious (e.g., Mitchell & Weatherly, 2000) and adopt more traditional social roles (e.g., England & Finch, 1991). It is possible that demographic and cultural differences between the lives of rural and urban women may underlie preferences for coping strategies and differences in the relationships between coping and psychological adjustment.

Rural Breast Cancer Patients and Coping Strategies. Supporting the notion that rural women may cope with breast cancer differently than urban women, a quantitative study by Demaree (2000) suggested that rural women might be particularly inclined to use avoidance as a way of coping with breast cancer. Consistent with this idea, in her qualitative sample, Heishman (1999) found that avoidance was the most commonly

reported coping strategy used by rural breast cancer survivors. Heishman noted that many of the women in her sample used the words “don’t dwell on it” when describing their experiences with breast cancer. Neither of these studies, however, included an urban comparison group and therefore it is unclear that rural women’s inclination to use avoidance is greater than that of urban women’s. Nonetheless, these qualitative findings are of importance in light of studies of urban breast cancer patients (e.g., Carver et al., 1993; Epping-Jordon et al., 1999) that show that avoidant coping responses are often associated with poorer psychological adjustment. Thus, rural breast cancer patients may be at an increased risk for poor psychological adjustment.

Somewhat contradictorily, it also appears that rural women are likely to use approach-oriented responses. Heishman (1999) identified acceptance as another coping strategy that was common among her sample of rural breast cancer survivors. Somewhat consistent with this finding, Wilson, Anderson, and Meishke (2000) reported that a commonly used coping strategy of rural breast cancer survivors was “trying to maintain a positive attitude.” Specifically, these women reported feeling lucky or fortunate, trying to see the positive outcome of their breast cancer experience, being grateful they had better choices for treatment than women a generation ago, and appreciating life more since diagnosis. Again neither of these studies had urban comparison samples thus it is unclear if rural women use approach-oriented responses more or less than urban women. Nonetheless, based on the findings for urban breast cancer survivors in other studies (e.g., Carver et al., 1993; Stanton et al., 2000), if rural women are particularly likely to adopt approach-oriented coping strategies they may experience better psychological adjustment.

Rural women may also be disposed to turn to religion to cope with the stress associated with breast cancer treatment and survival. Religion plays an important role in the lives of many rural women (England & Finch, 1991), and recall that rural women are also more likely to be religious than their urban counterparts (e.g., Mitchell & Weatherly, 2000). However, a few qualitative studies suggest that the rates of religious coping in women diagnosed with breast cancer are relatively low. Specifically, Wilson, Anderson, & Meishke (2000) reported that just over 10% of their sample mentioned that relying on religious beliefs was helpful. Eight of the 36 women in Heishman's (1999) study reported using religion to cope. The results for religious coping and psychological adjustment among urban samples have been equivocal at best, but some studies of the rural elderly (Harvey, Bond, & Greenwood, 1991; Mitchell & Weatherly, 2000) suggest that religious coping and psychological adjustment are associated in rural samples.

The problems with these studies are that they are mostly qualitative and thus cannot examine relationships among these coping variables and psychological adjustment. The qualitative studies provide rich data, suggesting possible social-contextual and individual-difference variables that may be significant for rural women. However, by their nature, qualitative methods are unable to reveal interrelations among these variables or uncover the ways in which they influence psychological adjustment. Typically, quantitative studies are able to uncover such predictive relationships. However, the one quantitative study of rural breast cancer and coping had a sample size of only six breast cancer patients (Demaree, 2000). Small samples can yield unreliable results because of associated low power to detect stable relationships among variables. Finally, the majority of the existing studies of rural breast cancer patients have used very loose definitions of

rural. For example, Demaree (2000) defined rural as not living in a metropolitan area. Cuellar et al., (2003) and Wilson et al (2000) both defined their sample as residing in “rural communities” but offered no clarification on how they defined a rural community. Other studies have identified their sample as rural by recruiting participants from cancer care centers that predominantly serve rural communities (Sandgren et al., 2000; Shrock et al., 1999; Wilson et al., 2000). Of the studies reviewed in this paper, only two had clear definitions for rural. Heishman’s (1999) participants lived in a county with less than 50,000 residents and McGrath et al. (1999) used the Australian government’s rural and remote classifications.

At least one preliminary study (Bettencourt et al., 2006) has examined the relationships between coping strategies and psychological adjustment in both urban and rural breast cancer patients. In general, these unpublished findings suggest that the nature of the associations between specific types of coping strategies and psychological well-being may differ for urban and rural samples. Bettencourt and colleagues used the Mini-Mental Adjustment to Cancer scale (MINI-MAC; Watson *et al.*, 1994), which includes indices of anxious, avoidant, fatalism, fighting-spirit, and helpless coping. In addition, the study included a measure of religiosity, which they considered to be a measure of religious coping. Psychological well-being was measured with the Satisfaction with Life Scale (Diener, Emmons & Larson, 1985) and the PANAS (Watson, Clark, & Tellegen, 1988). The findings revealed no significant mean differences between the two groups in terms of levels of coping and psychological well-being.

Nevertheless, rurality (rural versus urban) moderated the magnitude of the associations between some of the coping strategies and psychological well-being. For

example, the results suggested that higher levels of fatalistic coping were associated with greater psychological well-being for rural women but not for urban women. Fatalism is a type of stoic acceptance, Watson et al. (1994) defined the fatalism coping subscale as characterizing cancer patients who are resigned and have fatalistic attitudes about cancer. Prior studies (Akechi et al., 2001; Watson et al., 1991; Schnoll et al., 1998) of urban breast cancer patients have shown a negative relationship between fatalistic coping and psychological adjustment. In the preliminary study, the positive association between fatalistic coping and psychological adjustment may suggest that for rural breast cancer patients, fatalism is an adaptive form of acceptance. Furthermore, consistent with prior studies greater levels of avoidant coping were associated with lower levels of psychological well-being for urban women, and if anything there appeared to be a trend toward the opposite direction of association for rural women. The fighting spirit subscale had very low internal reliability; as such the authors used single-item of the fighting spirit scale, "I am very optimistic". This item was more strongly associated with psychological well-being for the urban breast cancer patients than it was for rural breast cancer patients.

Other findings showed similar associations between coping styles and psychological well-being. For example, for both rural and urban women religiosity was associated with better psycholgocial well-being; a finding for urban women that has not been revealed in previous studies. The study revealed that both hopeless/helpless coping and anxious coping were detrimental to psychological adjustment for both groups of breast cancer patients.

The findings of this preliminary study are intriguing, but there are several problems associated with this study. First, the sample size is relatively small, consisting of 48

breast cancer patients (24 rural, 24 urban). Second, the sample is diverse in treatment stage; participants could be at any point in the treatment process and considered eligible for the study. Third, it is difficult to compare the studies with urban studies because the COPE measure was not used. Finally, the results are only cross-sectional. This precludes the investigation of possible differences in prospective relationships between the rural and urban samples.

The purpose of this study was to further examine the associations between coping strategies and psychological adjustment, especially among rural patients. The study was also designed to redress the problems associated with the prior qualitative studies and the preliminary study. To do so, an urban comparison group was included and an adequate sample size was obtained. Also, The sample was all recruited at a similar point in the treatment process as to reduce the heterogeneity found in the preliminary study. Also, the study includes the COPE measure as well as indices of psychological adjustment, commonly used in the breast cancer literature (POMS, depression). A stricter definition for rurality was used compared to those used previously in studies of adjustment of breast cancer. Finally, to determine prospective relationships between coping as a predictor and psychological adjustment as an outcome, a longitudinal design was employed.

Hypotheses

As discussed above, the previous research on rural breast cancer is quite limited. Thus, it is difficult to pose specific hypotheses for this study. Nevertheless, several tentative hypotheses are offered based on the findings of the qualitative studies and the preliminary study reviewed earlier. These hypotheses are about possible associations

between rurality and levels of reported coping responses and possible interactions between coping and rurality in predicting psychological well-being.

Although no differences in levels of reported coping strategies were found in the preliminary study conducted by Bettencourt et al. (2006), a few hypotheses regarding relationships between coping and rurality are offered. First, it is hypothesized that rurality will be positively associated with avoidant coping. Although, no studies to date have examined this hypothesized relationship utilizing the measures of avoidant coping included on the COPE (denial, behavioral disengagement, mental disengagement), two qualitative studies suggest that rural women may be especially inclined to use avoidant coping strategies (Demaree, 2000; Heishman, 1999). Second, because some studies (e.g., England & Finch, 1991; Mitchell & Weatherly, 2000) suggest that rural people are more likely to be religious it is expected that rurality will be positively associated with religious coping. This is also expected based on the findings of Culver et al. (2002) that urban non-Hispanic white breast cancer patients reported lower levels of religious coping than other groups, namely African-Americans and Hispanics. Third, although no studies have compared rural and urban breast cancer patients on their propensity to seek social support, it is expected that rurality will be positively related to social support seeking. This is hypothesized because rural breast cancer patients have reported needing more support (Davis et al., 2003; Demaree, 2000; Heishman, 1999; McGrath et al., 1999).

No relationships are expected between rurality and the remaining approach-oriented coping responses (planning, active coping, restraint, focus on and venting of emotions, suppression of competing activities). This is based on the lack of theoretical predictions or empirical evidence pointing to any differences for these coping responses.

Three hypotheses are offered regarding possible interactions between place of residence (rurality) and the associations between types of coping and psychological adjustment. First based on the findings of Bettencourt et al. (2006), it is expected that higher levels of avoidant coping will be negatively associated with psychological well-being for urban breast cancer patients but not rural breast cancer patients. Second, because Bettencourt et al.'s study revealed a positive association between religious coping and psychological adjustment, it is expected that higher levels of religious coping will be associated with better psychological adjustment for rural women. But because studies of urban breast cancer patients often find no association between religious coping and psychological adjustment (Carver et al., 1993) it is predicted that there will be no association for urban women. Finally, based on the findings from the preliminary Bettencourt et al. study that fatalism was positively associated with psychological well-being for rural women, but not their urban counterparts, it is expected that acceptance will be more highly correlated with well-being for rural women. That is, whereas acceptance will be associated with psychological well-being for both groups, the magnitude of the correlation will be greater for rural breast cancer patients.

No differences in the remaining coping subscales (active coping, suppression of competing activities, restraint, planning, focus on and venting of emotions, seeking support for emotional reasons, seeking support for instrumental reasons, positive reinterpretation/growth, alcohol-drug disengagement) association with psychological well-being are expected. Nevertheless, based on the findings of Carver et al. (1993) and Danoff-Burg, and Huggins (2002) positive reinterpretation/growth is expected to be positively related to psychological well-being for both rural and urban breast cancer

patients. Based on the findings of Carver et al. 1993 and Culver, Arena, Antoni, & Carver, 2002, active coping, suppression of competing activities, restraint, focus on and venting of emotions and planning are not expected to be associated with psychological well-being for either rural or urban breast cancer patients. Finally, because no studies with breast cancer samples report findings regarding the one-item coping measure of alcohol and drugs disengagement, no hypotheses are offered regarding its association with psychological well-being.

Chapter 2

Method

Participants

Two hundred and four women who received radiation therapy for breast cancer were recruited for participation. Two participants were missing data on the rural variable and 2 filled out the survey incorrectly, as such these women were not included in the sample. This resulted in a final sample of 200 women. Participants were recruited by oncology nurses at nine radiation clinics in Missouri. Seven of the radiation clinics, Ellis Fischel Cancer Center (University of Missouri), Boone Hospital and Mid-Missouri Cancer Associates in Columbia, the Capital Region Medical Center (University of Missouri) in Jefferson City, the Bothwell Regional Health Center in Sedalia, the James E. Cary Cancer Center in Hannibal, and North Kansas City Hospital treat both rural and urban patients. The George Rea Cancer Treatment Center in Kirksville and Southwest Missouri Hospital (Cape Girardeau) primarily serve rural patients.

To characterize the rurality of the participants, a continuous rural variable was created. This was done to portray the varying degree of rurality in the sample. Treating rurality as a continuum, as opposed to a dichotomy, is a recommended approach by a number of rural researchers (i.e., Melton, 1983; Wood, 2005). The rural variable was created using a combination of the rural-urban continuum codes for the county the woman resides in and the population of her town. The county continuum codes were developed by the United States Department of Agriculture (2003) and form a classification scheme that distinguishes counties by the population size, degree of urbanization and adjacency to a metro area. The codes range from 1 to 9 with increasing numbers corresponding to

increasing rurality (See table 1 for a definition of all nine codes). The population of each participant's city was also recorded using 2000 census data. Both indices of rurality (county code and city population) were then standardized. The standardized population variable was then reversed so that both indices of rurality would be scaled such that higher numbers indicated greater levels of rurality. Finally the two variables were averaged to create the final rurality variable that was used in the primary analyses.

Those women who were the most rural lived in counties with a rural-urban code of 9 and towns with a median population of 145. The most urban women in the sample lived in a county coded 1 and a city of 441,545. Women at the mean lived in counties that were coded either 4 or 5 (counties with a population over 200,000) and lived in towns with a median population of 565.

Measures

Predictors. Coping strategies were measured with the COPE scale (Carver et al., 1989). This scale has 13 subscales which include 4 items each and 1 subscale with 1 item. Carver reports relatively high reliabilities for most of the subscales, which include: Active Coping ($\alpha = .62$), Planning ($\alpha = .80$), Suppression of Competing Activities ($\alpha = .68$), Restraint Coping ($\alpha = .72$), Seeking Support for Instrumental Reasons ($\alpha = .75$), Seeking Social Support for Emotional Reasons ($\alpha = .85$), Positive Reinterpretation/growth ($\alpha = .68$), Acceptance ($\alpha = .65$), Turning to Religion ($\alpha = .92$), Focus on and Venting Emotions ($\alpha = .77$), Denial ($\alpha = .71$), Behavioral Disengagement ($\alpha = .63$), Self-distraction ($\alpha = .45$), and Alcohol-Drug Disengagement (one item). Carver (1989) reports that the test-retest reliabilities for the subscales range from .42 (behavioral disengagement) to .89 (turning to

religion) and suggest that coping strategies, as assessed through the COPE, are relatively stable, though not as stable as personality traits.

The instructions for the COPE direct participants to rate the degree to which each of the statements describes the way they typically deal with difficult situations. The response scale ranges from one to four with the anchors "I usually don't do this at all" and "I usually do this a lot". Examples of items include, "I take direct action to get around the problem" (Active Coping), "I try to come up with a strategy about what to do" (Planning), "I put aside other activities in order to concentrate on this" (Suppression of Competing Activities), "I force myself to wait for the right time to do something" (Restraint Coping), "I ask people who have had similar experiences what they did" (Seeking Social Support for Instrumental Reasons), "I talk to someone about how I feel" (Seeking Social Support for Emotional Reasons), "I try to see it in a different light, to make it seem more positive" (Positive Reinterpretation/growth), "I seek God's help" (Turning to Religion), "I let my feelings out" (Focus On and Venting of Emotions), "I refuse to believe that it has happened" (Denial), "I turn to work or other substitute activities to take my mind off things" (Self-distraction), "I give up the attempt to get what I want" (Behavioral Disengagement) and "I drink alcohol or take drugs in order to think about it less" (Alcohol-Drug Disengagement). Principal-factors factor analyses confirm that these scales primarily load on separate factors (Carver et al., 1989).

Covariates. A number of potentially important demographic variables were assessed for possible inclusion as covariates. These include: age, ethnicity, marital status, employment status, education level, household income, number of children, number of people residing

in the home, and stage of breast cancer. See appendix A for a complete listing of potential covariates.

Psychological Outcomes. Psychological well-being was assessed using measures of depression, mood disturbance and life satisfaction. The Center for Epidemiologic Studies-Depression Scale (CES-D; Radloff, 1977) was used to measure depression. On this 20-item scale, participants rated the intensity and frequency of depressive symptoms they had experienced in the previous week on a 4-point Likert-type scale. Example items include, "I felt sad" and "I had crying spells." Radloff (1977) reports good internal consistency ($\alpha = .90$) and test-retest reliability ($r = .54$ and $r = .58$). This scale is often used in studies of breast cancer and psychological health.

Mood disturbance was assessed with the Profile of Moods States Instrument (McNair, Lorr, & Droppleman, 1981). On the Profile of Moods States Instrument (POMS), participants were asked to report levels of six mood states experienced since their diagnosis. The mood states included on the POMS are Anxiety, Anger, Depression, Confusion, Vigor and Fatigue. Each subscale includes three to eight descriptors that are rated by respondents. Examples descriptors include, active and full of pep (vigor), and tense and nervous (anxiety). Response categories range from 1 (not at all) to 5 (extremely). Separate subscale scores as well as a total mood disturbance score can be calculated from the POMS. The POMS has been used in a majority of studies in the general literature on cancer and psychological adjustment.

Although life satisfaction is not typically measured in cancer studies of psychological adjustment, the Satisfaction with Life Scale was included in the current study for two reasons. First, compared to measures of emotional well-being, it provides a theoretically

different assessment of well-being. Diener (1984) argues that subjective well-being includes both cognitive assessments of life satisfaction as well as a preponderance of positive affect over negative affect. The Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) assesses one's cognitive evaluations of life using subjective standards of what is a good life (Diener, 1984). Second, unlike other measures of psychological well being, this measure asks participants to think about their life as a whole. The Satisfaction with Life Scale is 5 items which participants rate on a 7-point Likert-type scale. Example items include "In most ways, my life is close to ideal" and "If I could live my life over, I would change almost nothing". It should be noted that though the measure is very brief, Diener et al. (1985) report good internal consistency (internal reliability = .87) and test-retest reliability ($r = .82$).

Procedure. During a breast cancer patient's first visit to the radiation clinic, a nurse explained the study to eligible patients. All women about to undergo radiation therapy were considered eligible regardless of other treatments received. The nursing staff provided a survey packet to all eligible participants. Participants could then take this packet home with them to peruse and decide if they were interested in participation. The packet included a letter that described the general purposes and procedure of the study, a wave one survey that included measures of coping, psychological adjustment and demographic information, a return envelope, a payment form and a separate confidentiality envelope. The letter instructed the participants to seal the payment form in separate envelope from the survey to ensure the confidentiality of their responses. The surveys were only identified by a code number and could not be linked to the respondent by anyone other than the researchers. The packet also included a counseling information

sheet for the psychological services clinic at the University of Missouri-Columbia for any participant who may have experienced negative feelings after completing the survey materials or in general. All materials were returned to the research lab by the participant. A formal signed consent was not collected from the participants; a waiver of consent was obtained from the institutional IRB. The act of returning the first survey was considered a sign of consent.

A packet with a different survey was sent directly from the research office to the participant's homes 1 month (wave two) and 5 months (wave three) after the completion of radiation treatment. Participants were paid \$25 for each completed survey (total of \$75). The surveys are part of a larger project than what is discussed in this paper, and each survey is slightly different. The COPE was only included in the first and third surveys, but all outcomes and covariates were included in each survey.

Power Considerations

An “effective sample size” was calculated to determine the power to detect an interaction between rurality and coping. This “effective sample size” takes into account the number of participants, the number of measurement points and the degree of within-person similarity, which is the intraclass correlation coefficient (Snijders & Bosker, 1999). The intraclass correlation coefficients across the three measurement points for the three dependent variables were .58 (depression), .78 (life satisfaction) and .62 (mood disturbance). These values were used to compute a design effect, which is a value that accounts for the clustering of the data in determining the total “effective sample size” (Snijders & Bosker, 1999).

The total sample size was 520, which represents the number of surveys received for the three time points from 190 participants. The total sample size was divided by the design effect to compute the effective sample size. The effective sample size for the three dependent variables was 241 (depression), 203 (life satisfaction) and 232 (mood disturbance).

Using the calculated effective sample size, power analyses revealed that power was more than adequate for detecting medium effects ($R^2=.13$; Cohen, 1998) for the interaction between rurality and coping response; for all three dependent variables the associated power was in excess of .995. Power was insufficient, however, to detect small effect sizes ($R^2=.02$; power = .44, .35, .43 for depression, life satisfaction and mood disturbance respectively). If the actual size of the interaction effect falls between what is considered small and medium, associated power ranges from .35 to greater than .995. Considering that interaction effects are often quite small, the possibility of low power should be considered a limitation of the study.

Chapter 3

Results

Preliminary Analyses

Assessment of normality. All three dependent variables appeared to be normally distributed. However, two coping variables appeared to violate normality, the denial coping subscale and alcohol coping measure were positively skewed (2.05, 6.11, respectively). For the denial coping subscale, this problem was addressed by log transforming it (i.e., log-10; Tabachnick & Fidel, 2001) which improved normality (skew = 1.22). This transformed variable was used in all subsequent analyses. The alcohol measure was excluded from all primary analyses due to its gross departure from normality as well as its low test-retest reliability; both of these issues are discussed in the subsequent sections.

Scale Reliability. Descriptive statistics and Cronbach's alpha reliability coefficients for each of the COPE subscales can be found in Table 2. The majority of the COPE subscales demonstrated an acceptable level of reliability (i.e.; greater than .70; Nunnally and Bernstein, 1994). Nevertheless, the restraint, mental disengagement, and suppression of competing activities subscales had unacceptably low reliability (alpha's lower than .60), therefore these variables were excluded from the primary analyses. Those subscales that fell between .60 and .70 (active, acceptance and behavioral disengagement) were included in the primary analyses, but their relatively low reliability should be recognized as a limitation. Subscales with low reliability were examined to see if dropping an item would improve reliability, but these analyses showed that none of the subscales would be

improved by dropping items. It is important to note that because the mental disengagement subscale was dropped from the analyses it was impossible to create the planned avoidant composite. As such, hypotheses regarding avoidant coping could not be tested in that manner. The other two components of the avoidant composite (denial and behavioral disengagement) were kept separate for the primary analyses.

Additionally, alpha reliability coefficients were computed separately for the two groups (rural and urban; for the purposes of this analysis the groups were defined by a median split on the continuous variable). Because the COPE scale has not been used in previous studies of rural breast cancer patients, it was important to ensure that the scale evidenced similar reliability among these participants. Highly discrepant reliability between rural and urban participants might suggest that the scale was assessing separate constructs within the two groups. However, the reliability coefficients were largely similar between the two groups. The largest discrepancy between the two groups was on the denial scale (rural $\alpha = .64$, urban $\alpha = .78$). This discrepancy did not seem large enough to warrant concern. Also, as shown in the final column of the table, the reliabilities for the COPE subscales were similar to those reported by Carver et al. (1989).

Test-Retest Reliability. Because the COPE scale was only administered at two of the three time points, the coping variables must be treated as time invariant predictors in the primary HLM analyses. To determine if this was a reasonable approach, test-retest reliabilities were computed using intraclass correlation coefficients for the time 1 and time 3 administrations of the COPE subscales (McGraw & Wong, 1996). Generally, the test-retest reliabilities were quite high (Table 3). The average test-retest reliability was

.85 (not including the alcohol subscale). The alcohol subscale evidenced a reliability estimate of .02. Recall that this subscale is a single-item measure. In this sample of breast cancer survivors, 95% of participants at time 1 (92% at time 2) endorsed the response option “not at all” for this item. Due to the lack of variance, extreme skew, and lack of reliability associated with this measure, it was not included in the primary analyses. For the other subscales, test-retest reliabilities seemed high enough to reasonably treat these variables as time invariant. As such, the time 1 assessment of coping was utilized in the primary analyses.

Correlations. Zero-order correlations were computed to determine if any relationships existed between rurality and coping. These zero-order correlations used only the time 1 coping measure. It was predicted that rural breast cancer patients would engage in more avoidant forms of coping, more acceptance coping, and more turning to religion. None of these hypotheses were supported and rural women actually engaged in less of one form of avoidant coping (behavioral disengagement). As shown in Table 4 the results indicated that rurality was unrelated to most of the coping subscales. There were small but significant positive correlations, however, between rurality and a few of the coping subscales, these included, active coping and positive reinterpretation/growth. These findings suggest that increasing rurality was associated with the greater use of each of these coping responses. Also, rurality was negatively correlated with behavioral disengagement, indicating lower levels of behavioral disengagement among rural women. Finally, rurality was unrelated to levels of well-being, as measured by depression, mood disturbance and life satisfaction.

Zero-order correlations were computed between coping and well-being (using the time 1 measures only) to preliminarily examine the nature and magnitude of the relationships (See Appendix B). The correlations were either non-significant or in the expected direction. Correlations among the coping subscales can also be found in Appendix C.

Selection of covariates. All of the demographic variables measured in the Time 1 survey (a list of these is provided in Appendix A) were examined as possible covariates by examining correlations between these variables, the coping variables and well-being. From this set of demographics four were consistently related to the coping variables or to the well-being variables or both; those variables were age, income, stage of cancer, and marital status. Age was related to all three outcomes, depression ($r = -.28, p < .01$), life satisfaction ($r = .18, p < .01$) and mood disturbance ($r = -.43, p < .05$). Income was related to two of the outcomes, including depression ($r = -.17, p < .05$) and life satisfaction ($r = .29, p < .01$). Stage of cancer was related to life satisfaction ($r = -.17, p < .05$) and mood disturbance ($r = .16, p < .05$). Marital status was related to depression ($r = -.17, p < .05$) and life satisfaction ($r = .32, p < .01$), such that married women were less depressed and more satisfied with life. Income was the only demographic variable related to rurality ($r = -.19, p < .01$). Participants' age and income were related to several of the coping subscales. Increasing age was related to higher levels of acceptance ($r = .17, p < .05$), turning to religion ($r = .17, p < .05$), focus on and venting of emotions ($r = -.16, p < .05$), and behavioral disengagement ($r = .15, p < .05$). Increasing income was related to active coping ($r = .15, p < .05$), planning ($r = .20, p < .01$), turning to religion ($r = -.19, p < .05$), and behavioral disengagement ($r = -.28, p < .01$). These four variables have often

been used as covariates in the previous literature on breast cancer and well-being and will be used in the HLM analyses as covariates for each of the well-being outcomes (e.g., Classen et al., 1996; Carver et al., 1993; Stanton & Snider, 1993; McCaul et al., 1999).

HLM Analyses

Missing data. Due to the constraints of the HLM program, any participant that had missing data at Level-2 (the individual difference level) could not be included in data. The age variable was missing for one participant and income data were missing for 9 participants. Because the number of participants missing these data was relatively few and because research reveals these covariates of age and income are important, participants were included in the primary analyses only if data for age and income was available (over 95% of the total sample).

Inspection of the data also revealed a preponderance of missing data for the stage of breast cancer diagnosis variable. Forty six of the participants (almost 25% of the sample) either answered “don’t know” or did not answer this question. This figure is consistent with prior research (Bettencourt, Molix, Talley, in press; Wilson, Anderson, & Meischke, 2000). Because dropping this large portion of the sample would result in an appreciable reduction in power as well as a loss of meaningful data, I conducted further analyses to determine if dropping this covariate from the primary analyses was warranted. A dichotomous variable was created that represented whether or not one knew their stage of cancer. This variable was related to age ($r = -.26, p < .01$), specifically older women were more likely to not know their stage of cancer, but knowing one’s stage of cancer was unrelated to rurality, income, education, depression, life satifaction and mood disturbance. Also as reported in the previous section (titled selection of covariates) the

stage variable was unrelated to the coping variables and was unrelated to rurality. Moreover, although stage was not related to depression it was only modestly related to life satisfaction and mood disturbance. Based on these analyses, it was decided that not including the stage variable in the primary HLM analyses was an acceptable solution. Nevertheless, it will be important to keep in mind that although not in the models, stage of breast cancer was associated at the zero order level with life satisfaction and mood disturbance.

The final sample for the primary analysis was 190 participants at time 1. However, because the project is ongoing and the data have yet to be collected for some participants, the number of participants at time 2 is 176 and that at time 3 is 154. This results in a total of 520 observations at level 1.

Data analysis approach. A separate series of HLM analyses were conducted for each of the three dependent variables, including depression, mood disturbance, and life satisfaction. Level-1 is the repeated measures level and includes the three measurements of the dependent variables. At Level-1, the HLM analysis estimates individual-level change as a function of time on these dependent variables. Level-1 analyses provide estimates of each individual's status at Time-1 as well as each individual's rate of change over time. Because this study did not include any time-varying predictors, time is the only predictor included in the Level-1 model. Also, because there are only three measurements in this study, only linear growth is tested. This is because at least four unique time values are required to appropriately test other forms of growth (e.g., quadratic growth). This results in the following model:

$$Y_{ti} = \pi_{0i} + \pi_{1i}T_{ti} + e_{ti}$$

where T is the time of measurement and π_{0i} is individual i 's status at time 1, and π_{1i} is the growth rate for person i .

Time was coded as either 0, 1 or 2, with the first survey (during treatment-the actual point in the 8 week treatment process varied across participants) as time 0, the second survey (1 month after treatment is complete) as time 1 and the third survey (5 months after the completion of treatment) as time 2. Coding time in this manner distorts the actual scale of the time variable to a certain degree because it suggests that the surveys are equally spaced, which is not the case. Indeed, there is a greater amount of elapsed time (and more variability in amount of elapsed time) between surveys 2 and 3 ($M = 109.11$ days, $SD = 41.44$) than between surveys 1 and 2 ($M = 88.51$ days, $SD = 19.62$). Because less time elapses between the first two surveys than between the last two, modeling linear change based on the survey number actually results in a greater rate of change per unit of time (e.g., month) between the first two time points than between the last two time points. Because the first time period includes the transition from active treatment to post-treatment, this is not incompatible with my expectations regarding the nature of change during this time. It is reasonable to expect that a rapid reduction in psychological distress would occur at the time of completing radiation therapy. Indeed, examination of the pattern of means across the study period confirms that a sharp decline occurs between times 1 and 2.

At Level-2, HLM is used to test the potential influences of the individual differences on measures of psychological well-being at Time-1 (π_0 ; differences between individual's status at time 1) as well as the influence of individual differences on rates of change in psychological well-being (π_1). There are two potential equations at level 2, one for the

intercept (π_0) and one for change (π_1). For the models to be tested, the models (including only the predictors of interest) were as follows:

$$\pi_{0i} = \beta_{00} + \beta_{01}(\text{rurality}) + \beta_{02}(\text{coping}) + \beta_{03}(\text{rurality} \times \text{coping}) + r_{0i}$$

$$\pi_{1i} = \beta_{10} + \beta_{11}(\text{rurality}) + \beta_{12}(\text{coping}) + \beta_{13}(\text{rurality} \times \text{coping}) + r_{1i}$$

For each dependent variable, models were first run to assess the effect of time. This was done by examining the beta coefficient, β_{10} , which is the average growth rate across all individuals. The initial model was also used to determine if significant variability existed between individuals in growth rates. It is possible that individuals do not significantly differ in rates of change, if this is the case the growth coefficient should be treated as a fixed effect (Bryk & Raudenbush, 1992). This means, that the growth parameter is treated as the same value for everyone in the sample. The HLM program provides χ^2 tests of the Level-2 variance components (i.e. a test of whether or not individuals differ in growth rates). As is typically done, if the χ^2 tests suggested that there was significant variability across individuals in the effect of time, the effect was treated as random (Snijders & Bosker, 1999). Conversely, if the results of the χ^2 suggested that significant variability in growth trajectories did not exist, “fixed slope” and “random slope” models were compared using chi-square tests of deviance (a test of model misfit) to determine which model was most appropriate (Bryk & Raudenbush, 1992).

Two separate HLM analyses were conducted for each coping variable. First, a model was run which included just rurality and the coping variable; this was done to understand the unmoderated relationships between rurality, coping and well-being. Second, a model was run which included rurality, coping and their interaction. Both rurality and the coping variables were centered at their respective means. If an interaction

was significant, tests of simple slopes were conducted using recentering at one standard deviation above and one standard deviation below the mean of the rurality variable (Aiken & West, 1991).

Finally, for each dependent variable, an exploratory analysis was conducted. For these analyses, a model included all of the (1) coping strategies that were found to be reliably associated with the dependent variable, (2) interactions that were found to reliably influence the dependent variable, and (3) the rurality variable. Although this is not an approach that is typically used in the literature, in light of the intercorrelations among many of the coping strategies, it was employed as an attempt to further understand the nature of the influences of the coping responses and the interactions between the coping variables and rurality on well-being. The reports of the analyses in the following subsections are organized according to this general model building approach

Depression

Unconditional Growth Model. Typically, hierarchical analyses begin by fitting an unconditional model (Raudenbush & Bryk, 2002). For growth models, an unconditional model includes the effect of time at Level-1 and no Level-2 predictors. This model provides information regarding the nature of growth in the dependent variable; specifically the model provides an estimate of the mean effect of time across individuals as well as the extent to which this effect of time varies between individuals around that mean.

The unconditional growth model indicated that participants' levels of depression, on average, decreased over the course of the study ($\pi = -0.69, p < .05$), but there was very little variability between participants in this effect of time, $\chi^2(173) = 178.99, p = .37$.

Additionally, the analysis suggested that the reliability of the individual growth estimates ($\lambda = .02$) was lower than the suggested minimum level of reliability of .05 (Bryk & Raudenbush, 1992). This suggests that even if individual differences in growth parameters existed, it would be difficult to detect relationships between Level-2 predictors and those growth parameters.

Given the lack of variability in growth between persons, a model that treated growth as a fixed effect was tested and compared to the random effect model. The deviance change test statistic suggested that the more restrictive model (i.e., the fixed effect model) did not significantly increase deviance (model misfit) $\chi^2(2) = .06, p > .50$. Thus, a model which treated time as a fixed variable was used in the subsequent analyses that tested the predictors of interest. This means that, for the purposes of these analyses, it is assumed that individual levels of depression decrease in a uniform fashion. This assumption appeared to be a reasonable based on the non-significance of the variability estimate, and the fixed versus random model comparison.

Covariates. Recall that the covariates were age, marital status, and income. These three covariates were tested in the Level-2 intercept equation. Both income ($\beta = -.69, p < .001$) and age ($\beta = -.18, p < .001$) were negatively related to depression. Also, married women were somewhat less depressed than unmarried women ($\beta = -2.45, p < .10$).

Coping. Following the procedure outlined previously, models were conducted to test for influences of rurality, coping, and their interaction for each of the ten coping measures. The results showed that rurality was unassociated with depression in all models (all p 's $> .60$). However, the results suggested that rurality and three of the coping responses interacted in their influences on depression. First, active coping was not related

to depression ($\beta = -0.81$, $p = .19$) when the interaction was absent from the model. However, the results from the second model revealed that the interaction between rurality and active coping reliably predicted depression ($\beta = -0.94$, $p < .05$). This was contrary to my hypothesis that the influence of active coping would be unrelated to well-being for both rural and urban women. Tests of simple slopes were conducted at +1 and -1 standard deviations of the rural variable. As shown in Figure 1, these tests revealed that active coping was negatively related to depression for the rural women ($\beta = -2.04$, $p < .05$), but unrelated to depression for the urban women ($\beta = -.40$, $p = .44$). Thus, active coping appears to be beneficial for rural breast cancer survivors, but does not appear to be beneficial for their urban counterparts. It is important to note, that although the simple relationships are referred to in terms of rural and urban, these terms are only relative because the rural variable is continuous, not categorical (i.e. the sample is not split into groups based on a definition of what is “rural” or what is “urban”).

Second, behavioral disengagement was related to depression ($\beta = 2.78$, $p < .001$) in the first model. This relationship was also qualified by a significant interaction with rurality ($\beta = 0.96$, $p < .05$; See Figure 2). Tests of the simple slopes revealed that behavioral disengagement was positively related to depression for both rural and urban women, but as the interaction suggests, this relationship was stronger for rural ($\beta = 3.70$, $p < .001$) than urban women ($\beta = 2.04$, $p < .01$). As shown in Figure 4, the pattern of results suggests that higher levels of behavioral disengagement coping are related to greater depression for all women, but using behavioral disengagement may be particularly deleterious for rural women. This is the opposite of the predicted interaction for avoidant coping (behavioral disengagement is one of the subscales of the avoidant

composite that could not be created). It was predicted that avoidant coping would be negatively related to well-being for urban women, but unrelated to well-being for rural women.

Finally, positive reinterpretation/growth was unrelated to depression ($\beta = -0.91$, $p = .13$) when the interaction term was absent from the model. In the second model, however, the interaction between positive reinterpretation/growth and rurality was marginally significant ($\beta = -.74$, $p = .10$). As shown in Figure 3, tests of simple slopes revealed that positive reinterpretation/growth was marginally negatively related to depression for rural women ($\beta = -1.69$, $p = .06$), whereas positive reinterpretation/growth was unrelated to depression for urban women ($\beta = -.41$, $p = .49$). This suggests that positive reinterpretation may be more beneficial for rural women than for urban women. This interaction was contrary to my prediction that positive reinterpretation/growth would be positively related to well-being for both rural and urban women. Nonetheless, the interaction patterns were similar across all three of the interactions in that these three coping strategies (active coping, behavioral disengagement, positive reinterpretation/growth) were stronger predictors of depression for rural women than urban women.

Both coping through denial ($\beta = 2.57$ $p < .001$) and focusing on and venting of emotions ($\beta = 2.35$, $p < .05$) were positively related to depression, but neither interacted with rurality in influencing depression. As shown in Figure 4, higher levels of denial coping were associated with higher levels of depression. This was contrary to my prediction that avoidant coping would be unrelated to well-being for rural women. Similarly, and as shown in Figure 5, higher levels of focusing on and venting of emotions

was associated with higher levels of depression. This was contrary to my prediction that this coping strategy would be unrelated to well-being for all women. Also, five of the coping strategies were unrelated to depression, including acceptance, planning, religious coping, seeking social support for instrumental reasons and seeking support for emotional reasons (all p 's $> .20$). That planning and both types of social support seeking were unrelated to well-being is consistent with my predictions, however, it was predicted that both acceptance and religious coping would be related to well-being for rural women.

Exploratory model. A single model was run that simultaneously entered the rurality variable as well as the coping variables and interactions that were revealed as significant predictors of depression in the single models. The results showed that none of the interactions entered into the simultaneous model were significant predictors of depression (p 's $> .15$). As such, the interaction term for behavioral disengagement was removed from the model to test if the unmoderated influence of this coping variable was significant. This was not done for the other two interaction terms (active coping, positive reinterpretation/growth) because neither of these had significant unmoderated relationships with depression in the previous analyses. The results showed that denial, behavioral disengagement, and focus on and venting of emotions were reliably related to depression ($\beta = 1.81, 1.68, 1.70$, respectively, p 's $< .01$). Thus, although the interactions were no longer significant in this simultaneous model, all of the simple relationships that were previously significant remained so in this larger model. This final model explained 35.9% of the Level-2 variance (between-person variance).

Mood Disturbance

Unconditional Growth model. The first model fit for mood disturbance was the unconditional model. Again, this model includes only the effect of time (no Level-2 predictors). The results of this analysis indicated that participants levels of mood disturbance, on average, decreased over the course of the study ($\pi = -5.87, p < .001$). Furthermore, unlike depression, there was significant variability in these growth rates around the mean $\chi^2 (173) = 306.26, p < .001$. Additionally, individual's growth trajectories could be estimated with an adequate reliability ($\lambda = .41$). Because it is likely that the variability in the change of mood disturbance may be predicted by the primary variables, all of the subsequent models that tested the relationships between the coping variables, rurality, and their interactions included the potential predictors in both the intercept and slope equations.

Covariate Selection. To test covariates for mood disturbance, a model was run which included the covariates of age, income, and marital status in the Level-2 equations for both the intercept and growth parameters. The results indicated that, similar to the model for depression, all three covariates were related to initial level of mood disturbance. Income ($\beta = -1.03, p < .05$) and age ($\beta = -.80, p < .001$) were both negatively related to mood disturbance. Also, married women experienced less mood disturbance, though this relationship was only marginally significant ($\beta = -5.41, p = .10$).

The only significant covariate in the Level-2 growth equation was age ($\beta = .09, p < .001$). This suggests that younger women experience greater decreases in mood disturbance over time. As shown in Figure 6, age is related to both initial status and growth rate. Considering both of these relationships together, it appears that younger women experience higher levels of mood disturbance initially, but that these elevated

levels of mood disturbance nearly disappear relatively quickly. The average rate of change in mood disturbance was -5.87, this influence of age on that parameter suggests that for each year increase in age from the mean, the value of the change parameter is .09 smaller (i.e., the value of the growth parameter moves closer to 0 for each year increase in age).

Coping. Again, coping strategies and their interactions with rurality were tested in succession. These models differed from those for depression as these included a random effect of time and the possibility of interactions between the time effect and the other predictors. For mood disturbance, each coping response, the rurality variable, and the respective interactions were tested for possible relationships with both initial status and rates of change. As with depression, rurality was unrelated to mood disturbance in all models (p 's > .20).

Three coping responses interacted with rurality in predicting mood disturbance. These interactions were all similar to those found for depression, but none met the conventional level of statistical significance (i.e. the patterns found for depression are replicated, but these are only marginally significant). All three of these relationships were at the level of the intercept, and none of the interactions or the coping responses alone evidenced relationships with change in mood disturbance (all p 's > .40). First, active coping was unrelated to mood disturbance ($\beta = -1.31, p = .36$) in the no interaction model. However, the second model revealed a marginally significant interaction with rurality ($\beta = 1.61, p = .09$). As shown in Figure 7, the pattern of the interaction was similar to that for depression. The tests of simple slopes indicated that active coping was somewhat

negatively related to mood disturbance for rural women ($\beta = -2.98$, $p = .10$), but was unrelated to mood disturbance for urban women ($\beta = 0.17$, $p = .90$).

Second, behavioral disengagement was related to mood disturbance ($\beta = 6.11$, $p < .001$) when entered into the model alone. This relationship was qualified by a marginal interaction with rurality ($\beta = 2.11$, $p = .09$, see figure 8). Tests of the simple slopes for this interaction suggested that behavioral disengagement was positively related to mood disturbance for both rural and urban women, but that this relationship might be stronger for rural women ($\beta = 7.85$, $p < .001$) than urban women ($\beta = 4.17$, $p < .01$).

Finally, positive reinterpretation/growth was related to mood disturbance ($\beta = -3.02t$, $p < .05$) when entered into the model alone. This relationship was also qualified by a marginal interaction with rurality ($\beta = -1.70$, $p = .09$, see figure 9). Tests of these simple slopes revealed that positive reinterpretation/growth was negatively related to mood disturbance for rural women ($\beta = -4.75$, $p < .05$), but unrelated to mood disturbance for urban women ($\beta = -1.81$, $p > .10$).

Also mirroring the depression results, two coping strategies were related to mood disturbance but did not interact with rurality. First, denial was related to the initial levels of mood disturbance ($\beta = 5.14$, $p < .001$). There was no relationship between denial and change in mood disturbance, which suggests that this relationship between denial and mood disturbance continues across time. These findings suggest that breast cancer patients who cope through denial experience higher levels of mood disturbance. Second, also, focus on and venting of emotions was positively related to initial levels of mood disturbance ($\beta = 6.48$, $p < .001$). Moreover, focus on and venting of emotions was marginally related to the change in mood disturbance over time ($\beta = -1.78$, $p = .06$). As

shown in Figure 10, these findings suggest that breast cancer patients who focus on and vent emotions experience higher levels of mood disturbance initially. Mood disturbance decreases over time for all breast cancer patients, however, the magnitude of change in mood disturbance for those that focus on and vent emotions may be somewhat different. That is, those women who report higher levels of focus on and venting of emotions may experience sharper declines in mood disturbance.

Also, the results showed that the same variables that were unrelated to depression were also unrelated to both initial levels of and change in mood disturbance, these included acceptance, planning, religious coping, seeking social support for instrumental reasons and seeking support for emotional reasons (all p 's $> .10$).

Exploratory model. Again a single model was run that simultaneously entered the rurality variable as well as the coping variables and interactions that were revealed as significant predictors of depression in the single models. The results showed that none of the interactions entered into the simultaneous model were significant predictors of mood disturbance (p 's $> .15$). As such, the interaction terms for behavioral disengagement and positive reinterpretation/growth were removed from the model to test the unmoderated influence of those coping variables (both of which were previously found to be statistically significant). The results showed that focus on and venting of emotions, denial and behavioral disengagement were reliably related to the intercept of mood disturbance ($\beta = 6.31, 3.28, 3.04$, respectively, p 's $< .05$). Positive reinterpretation and growth was marginally related to mood disturbance ($\beta = -2.60, p = .06$). Also, the interaction between focus on and venting of emotions and time was significant in this simultaneous model, ($\beta = -1.72, p < .05$). Thus, the results of this simultaneous model for mood disturbance were

very similar to the simultaneous model for depression. Specifically, the interactions were no longer significant, whereas, all of the main effects that were previously significant remained so in this larger model (with the exception of positive reinterpretation/growth, which was approaching significance). This final model explained 30.8% of the Level-2 variance (between-person variance) in intercept and 10.4% of the Level-2 variance in rates of change.

Life Satisfaction

Unconditional Growth Model. The first model tested for the life satisfaction dependent variable was the *unconditional growth* model. Again, this model includes only the effect of time (no Level-2 predictors). Unlike the findings for depression and mood disturbance, the results of this unconditional analysis indicated that participants levels of life satisfaction did not change over time ($\pi = 0.02, p > .10$). Furthermore, there was not significant variability among participants in the effect of time $\chi^2 (173) = 178.79, p = .38$. The growth trajectories could be estimated with a reliability of .051, just slightly over the minimum suggested level of .05 (Bryk & Raudenbush, 1992). Thus, a model which set the time effect to fixed was compared to the random effect of time model (these tests used FIML estimation). The deviance change test statistic suggested that the more restrictive model (fixed effect of time) did not significantly increase deviance $\chi^2 (2) = 2.68, p > .10$. Next, a model which excluded the effect of time entirely was compared to the fixed effect model. Again, the deviance change test statistic suggested that the more restrictive model (no effect of time) did not significantly increase deviance $\chi^2 (2) = 0.14, p > .10$. These analyses suggest that the effect of time explains an insignificant amount of the variance in life satisfaction scores. This is not too surprising considering the nature of

the life satisfaction questions, which ask the participant about their feelings about their life as a whole, as opposed to their current feelings (such as the depression and mood disturbance scales). As such, the following models for life satisfaction are really assessing each person's overall level of life satisfaction. That is, the effect of time is not modeled at all.

Covariates. The three potential covariates (age, income, marital status) were tested in the Level-2 equation. All three were related to life satisfaction. Income was positively related to life satisfaction ($\beta = 0.11$, $p < .001$) as was age ($\beta = 0.03$, $p < .001$). Married women were more satisfied with life than non-married women ($\beta = 0.59$, $p < .01$).

Coping. Using the procedure previously described, coping strategies and interactions were tested in succession. Rurality was unrelated to life satisfaction in all models ($p > .10$). Unlike depression and mood disturbance, the analyses revealed only one interaction between coping and rurality. Yet, similar to the results for depression and mood disturbance, positive reinterpretation/growth interacted with rurality in influencing life satisfaction ($\beta = 0.22$, $p < .05$). As shown in Figure 11, tests of simple slopes revealed that positive reinterpretation/growth was positively related to life satisfaction for rural women ($\beta = .36$, $p < .01$), but unrelated to life satisfaction for urban women ($.09$, $p > .30$).

Five coping strategies were related to life satisfaction but did not interact with rurality. Two of these relationships were consistent with the previous results for depression and mood disturbance, behavioral disengagement was somewhat negatively related to life satisfaction ($\beta = -0.16$, $p = .06$) and focus on and venting of emotions was negatively related to life satisfaction ($\beta = -0.19$, $p < .05$). The other three coping

responses evidenced relationships with only life satisfaction: religious coping was positively related to life satisfaction ($\beta = 0.20$, $p < .05$), also both seeking support for emotional reasons and seeking support for instrumental reasons were positively related to life satisfaction ($\beta = 0.16$, 0.17 respectively; both p 's $< .05$) This pattern of results was inconsistent with my predictions that religious coping would be related to well-being for rural women only and that seeking social support would be unrelated to well-being for all women.

Four coping strategies were unrelated to life satisfaction, two of which were unsurprising (acceptance and planning) because neither were related to depression or mood disturbance. However, the other two (active coping and denial) were previously found to be related to both depression and mood disturbance (all p 's $> .30$).

Exploratory model. To determine which coping strategies were the strongest unique contributors to life satisfaction, a model was fit that included the main effects and interactions that were found to be significant in the previous section. Only two relationships were significant in this simultaneous model; the main effect of focus on and venting of emotions ($\beta = -0.23$, $p < .05$) and the positive reinterpretation/growth by rurality interaction ($\beta = .16$, $p < .05$). Thus, the simultaneous model for life satisfaction was different from those for depression and mood disturbance. First, the interaction was significant in the model. Second, a number of the unmoderated relationships were not significant in the simultaneous model. More specifically, the relationships for seeking support for instrumental reasons, seeking support for emotional reasons, religious coping, and behavioral disengagement were not significant in the simultaneous model (p 's $> .15$).

A summary of the results from the separate HLM analyses is presented in Table 5 (this does not include the results from the exploratory simultaneous models).

Chapter 4

Discussion

The purpose of the present study was to understand whether coping strategies predicted well-being, especially among rural breast cancer survivors. To meet this aim, the study sampled rural and urban breast cancer survivors and measured coping strategies and several indices of well-being. For the analyses, the rural-urban variable was treated as a continuum, such that higher values on the variable indicated that breast cancer survivors lived in more rural areas. Preliminary analyses were conducted to examine whether rurality was related to the frequency with which breast cancer patients report utilizing certain coping strategies. The primary analyses were designed to examine whether the relationships between well-being and particular coping strategies in response to breast cancer were moderated by rurality. Because of the dearth of theorizing about coping and well-being for rural women, the current study hypotheses were tentative. Nevertheless, some of the findings supported the general hypothesis that the relationships between particular coping strategies and well-being are moderated by rurality.

Coping Responses, Rurality and Well-Being

Based on qualitative studies of rural breast cancer patients and survivors (i.e., Demaree, 2000; Heishman, 1999; Wilson et al., 2000), it was hypothesized that, compared to their urban counterparts, rural breast cancer patients would report using particular coping strategies more frequently. Specifically, rural breast cancer patients were expected to engage in more frequent religious coping, social support seeking coping, and avoidant coping. The study findings failed to reveal any relationship between rurality and either religious coping or social support seeking. In addition, I was unable to

test whether rurality was related to avoidant coping, because one of the subscales within the avoidant index lacked sufficient reliability. Nevertheless, although not predicted, the findings showed that rural women were more likely to use positive reinterpretation/growth and active coping, as well as less likely to use behavioral disengagement, which is one of the subscales in the index of avoidant coping. Finally, rurality was unrelated to the remaining nine coping variables. That rurality is unrelated to most of the coping variables but related to positive reinterpretation/growth, active coping, and behavioral disengagement may suggest that these latter coping strategies are uniquely important for the psychological adjustment of rural women. Consistent with this, the primary analyses suggested that these three coping strategies seemed particularly influential on the well-being of rural breast cancer patients.

The primary analyses were designed to test whether rurality interacted with particular coping strategies to predict breast cancer patient's well-being. It was predicted that religious coping and acceptance coping would interact with rurality in their relationships on well-being, but the findings failed to support these predictions. Nevertheless, the more general supposition that rurality would moderate the relationships between particular coping variables and well-being, received support. Specifically, positive reinterpretation/growth, active coping, and behavioral disengagement interacted with rurality in predicting most of the indices of well-being.

The results suggested that higher levels of positive reinterpretation/growth were related to lowered mood disturbance and higher life satisfaction, but not depression. However, the relationships between positive reinterpretation/growth and all three indices of well-being were qualified by significant interactions with rurality. The nature of these

interaction suggested that while positive reinterpretation/growth was unrelated to well-being for urban women, this coping strategy was positively related to life satisfaction and negatively related to mood disturbance and depression for rural women.

The significant interaction findings for the active coping and behavioral disengagement were mostly similar to those for reinterpretation/growth. The relationship between active coping and well-being was not significant when the rurality of the participants was not considered; however, active coping interacted with rurality in its relationships with both mood disturbance and depression. The nature of this relationship indicated that active coping was unrelated to well-being for urban women, but negatively related to depression and mood disturbance for rural women. These results suggest that active coping is associated with better well-being among rural breast cancer patients. Previous research has shown that active coping among breast cancer patients is unrelated to well-being (i.e., Carver et al., 1993; Stanton et al., 2002). The present findings suggest that whether there is an association between active coping and well-being may be a function of whether breast cancer patients live in rural areas. Behavioral disengagement was positively associated with mood disturbance and depression as well as negatively associated with life satisfaction. The relationships for mood disturbance and depression, however, were qualified by interactions between rurality and behavioral disengagement. These interactions suggested that coping through behavioral disengagement was more detrimental for the well-being of rural breast cancer patients.

Taken together, the results suggest that, compared to their urban counterparts, rural breast cancer patients are more likely to engage in particular coping responses (i.e., positive reinterpretation/growth, active coping, behavioral disengagement) and that these

same coping responses have greater influences on their psychological well-being. It may be that these findings reflect the relative fit between these coping strategies and the rural culture in which the women live. It may be, for example, that the coping strategies of positive reinterpretation/growth and active coping are in concordance with rural ideals. If this supposition is true, these findings support Folkman et al.'s (1986) theorizing that the effectiveness of any particular coping strategy should be understood in reference to the environment in which it is used. That behavioral disengagement appears to be particularly detrimental to rural breast cancer patient's well-being may suggest a lack of concordance between this coping strategy and rural culture. According to Lazarus and Folkmann's (1984) theorizing, such a mismatch would lead to stress and therefore compromise well-being.

That these three coping strategies may be of particular relevance in rural areas may be supported by the qualitative literature on rural breast cancer patients and rural communities. Slama (2004) notes that greater distances between rural people and resources (i.e., services and other people) make values such as independence and self-reliance important and practical. Consistent with this, rural people are often characterized as stoic, independent, and as endorsing ideals such as "picking yourself up by your own bootstraps" (Davis et al., 2003; Photiadis & Simon, 1983). Active coping reflects these ideals; it is defined as actively taking steps toward solving one's problems. Theoretically, the opposite of active coping is behavioral disengagement; the latter is the tendency to purposefully reduce one's efforts toward taking action in response to the stressor.

There is some evidence that rural women may feel they should adopt a positive attitude in response to their breast cancer (Wilson et al., 2000; Lopez et al., 2005;

McGrath et al., 1999). For example, McGrath et al. found that rural breast cancer survivors reported that they felt they should “keep on going for the sake of others” and to maintain a positive attitude to prevent close others from worrying. Similarly, participants in Lopez et al.’s study reported that they refrained from dwelling on their problems in an attempt to avoid being burdensome to others. These sentiments are echoed in the coping strategy of positive reinterpretation/growth. This strategy is characterized as directing effort towards managing distressing emotions through the positive reappraisal of the stressor. As such, coping through positive reinterpretation/growth should serve as an effective vehicle for maintaining a positive attitude among rural breast cancer patients. These findings from the qualitative literature support the notion that it may be that the key interaction findings of the present study are at least partially driven by the relative fit between these coping strategies and the rural culture in which the women live.

Another interesting possibility is that, compared to urban women, rural women may be particularly likely to cope in ways that are prescribed by their local cultures. This might be the case for at least two reasons. First, because of the lack of anonymity in rural areas, rural breast cancer patients may feel that their whole town is watching them. Consistent with this, Slama (2004) notes there is a strong pressure to conform to rural ideals in small communities. Second, because rural breast cancer patients are unlikely to have contact with other breast cancer patients or survivors, they may feel that they lack cancer-specific role models. Concordant with this, rural breast cancer patients regularly report the desire to meet with breast cancer survivors because this experience helps normalize their fears and offers a survivorship perspective (Gray et al., 2004; Wilson et al. 2000; Dunaway et al., 1995). Without interaction with these much needed role models,

rural breast cancer patients may be likely to adopt forms of coping that are habitual and/or functional within their rural communities.

Relationships between Coping and Well-Being

Five of the remaining coping responses were related to the well-being of breast cancer patients regardless of their rurality. First, denial, an index of avoidant coping, was related to all three indices of well-being and was always found to be detrimental. This is consistent with previous research (e.g., Culver et al., 2002; Carver & Scheier, 1993; Stanton et al.; 2000; Hack & Degner, 2004) that consistently finds negative consequences of avoidant coping responses in samples of breast cancer patients and survivors.

Additionally, these findings provide further support for both Lazarus and Folkman's (1984) and Carver and Scheier's (1993) contentions that whereas avoidance might be functional in response to some stressors, it is not functional in response to major illness. The findings for the denial subscale did not support my hypothesis that avoidant coping might not be detrimental for rural women.

It was predicted that focus on and venting of emotions would not be related to well-being for either rural or urban breast cancer patients. Contrary to this, focus on and venting of emotions emerged as a significant predictor of all three dependent variables and emerged as the only significant predictor of change in mood disturbance. The results indicated that focus on and venting of emotions was detrimental for psychological well-being. However, higher levels of focus on and venting of emotions were related to more rapid decreases in mood disturbance level. The previous breast cancer studies have largely dropped this scale (Carver et al., 1993; Stanton et al., 2002; Stanton et al., 2000) or found negative relationships with well-being for the response (Culver et al., 2002).

Three coping responses (seeking support for instrumental reasons, seeking support for emotional reasons and turning to religion) were related only to life satisfaction, but not to mood disturbance or depression. The previous literature (Carver et al., 1993; Culver et al., 2002; Stanton, 2000) regarding social support seeking revealed mixed results for its relationship with well-being. Two studies found that social support seeking related to concurrent well-being before surgery, but at no other time points of assessment (Carver et al., 1993; Culver et al., 2002). However, one study (Culver) found that the relationship was negative and the other (Carver) found that the relationship was positive. Stanton (2000) found no relationship between social support seeking and well-being. That the current findings show that the social support seeking strategies are related to life satisfaction, but not depression and mood disturbance, seems somewhat consistent with the mixed findings in the previous literature.

Finally, turning to religion was related to life satisfaction but not to depression and mood disturbance. These outcomes seem counter to those of Stanton and colleagues (Stanton et al., 2000) who found that turning to religion was unrelated to quality of life but related to psychological distress. Importantly, however, most studies fail to reveal a relationship between turning to religion and well-being (Carver et al., 1993). Overall, the current and previous findings may suggest that the influences of turning to religion may only be evident with particular measures of well-being.

Finally, two coping responses (acceptance and planning) were unrelated to any of the dependent variables. For planning, this outcome was consistent with our predictions. Previous studies have typically not found significant relationships between planning coping and well-being (Carver et al., 1993; Stanton et al., 2002; Culver et al. 2002). That

acceptance was unrelated to well-being inconsistent with my hypothesis because most studies have found it to be a reliable predictor of well-being (Carver et al., 1993; Stanton et al., 2000; Stanton, Danoff-Burg & Huggins, 2002; Carver et al., 1993). Nevertheless, these same studies sometimes find that acceptance coping is unrelated to particular measures of well-being.

Limitations

The current study is limited in a number of ways. First, the exploratory analyses showed that most of the interactions that had been significant in the separate HLM analyses were not significant in the HLM analyses that simultaneously considered all previously not significant predictors in a single model. More specifically, the only interaction that remained significant in the simultaneous model was between positive reinterpretation/growth and rurality predicting life satisfaction. This finding may cast doubt that the remaining interactions are important predictors of well-being. Alternatively, these results might suggest that the interactions were correlated with each other or with the other measures, or that the power was not adequate for testing the simultaneous models. It is important to note that the approach of building a simultaneous model based on a number of single models is not typical in the literature and therefore it may not be appropriate to discount the interactions revealed in the separate HLM analyses.

One of the key predictor variables, coping, was measured at only two of the three time points. Because I used multilevel modeling, it was necessary to assume that coping was stable across time. The test-retest reliability analysis between the time one and time three surveys (approximately 5 months apart) provided some support for this assumption.

The multilevel modeling results would have been more informative if coping had been measured at each time point during the study. For example, three assessments of coping would have allowed me to examine if changes in coping over time were related to changes in well-being and the ways in which these changes might have interacted with rurality.

Additionally, a limitation of the current study was the lack of reliability for the mental disengagement and suppression of competing activities subscales. This problem appears to be a limitation of these subscales because Carver, Scheier and Weintraub (1989) have reported similarly low reliabilities, particularly for the mental disengagement scale.

Another limitation of this study was that coding time based on survey number distorted the actual time elapsed in this design. Because there are only 3 time points the analyses are limited in that the only polynomial form of growth that could be tested was linear. Time was coded as linear based on time points (i.e., 0, 1 and 2), rather than the actual amount of time elapsed. Coding time in this manner despite the unequal spacing of surveys means that a linear trend actually represents change that was more rapid between the first two time periods than between the last two. This is actually consistent with the expectations that there is likely a greater amount of change in well-being between the first two surveys as the participants have gone from being in active treatment to being done with treatment between these two surveys. Indeed, examining the means across time points suggests that more change occurs between the first two surveys. Further, this limitation is not likely to be overly problematic because the coding of the time variable does not affect the great majority of the substantive results of the study. More specifically, all of the interactions between coping and rurality revealed in the results

were in the intercept equations and were independent of any effect of time. Only two effects were revealed in the linear slope equations, one for a covariate (age) and one for a main effect of coping (focus on and venting of emotion). Despite that the linearity of form presented in Figures 6 and 10 for these two effects is somewhat misleading; the differences in relative slopes between rural and urban women illustrated in the Figures are still valid.

Also, some relationships were not significant across all three indices of well-being (i.e., life satisfaction, depression, and mood disturbance). Recall that the significant interactions between rurality and both active coping and behavioral disengagement for depression and mood disturbance were unnot significant for life satisfaction. By contrast, coping through seeking social support and turning to religion reliably predicted life satisfaction but not depression and mood disturbance. Taken together these findings suggest that life satisfaction is distinct from depression and mood disturbance. Importantly, life satisfaction is supposed to tap the cognitive component of well-being whereas depression and mood disturbance should tap the affective component of well-being. Moreover, in the present study, the life satisfaction measure was a global assessment of one's life as a whole, and the other two indices of well-being were measured in reference to the last few weeks.

Another limitation is that participants were not asked about their rural cultural ideals. Though we can use the previous qualitative literature to inform our theorizing regarding why these coping variables might be important for these women, we cannot be sure that these women experienced social pressure to cope in certain ways. Further, it is likely that there is variability among the rural women in this sample in their level of identification

with the rural subculture. Measures of the level of social identification would have likely been informative. Due to the lack of questions regarding the social climate surrounding the rural and urban participants, it is unclear what might underlie these differences between rural and urban breast cancer patients.

Future Directions

Future research should first aim to replicate the findings from the current study. In particular, it appears that more participants may be necessary to examine such a large number of predictors and potential interactions in a simultaneous fashion. Studies should also be conducted to try to examine more specifically what variables might underlie the observed differences between rural and urban breast cancer patients. Specifically, research should be conducted that assesses the potential effect of the culture in a more direct and quantitative way than has occurred in the previous literature. This should include both measures of level of identification with the rural culture as well as measures assessing rural people's perceptions of what rural culture means to them. Additionally, it would be interesting to investigate whether breast cancer patients feel pressured to cope in certain ways and if so, try to determine if that pressure is coming from external sources (i.e., community members), internal sources (i.e., personal standards related to rural identity), or both.

Another interesting avenue for the future would be to examine the dynamic relationships between coping, rurality, and well-being over time by administering the cope subscale at multiple time points. This would allow researchers to examine how changes in coping behavior are related to changes in well-being and how changes in either of these might be influenced by rurality. This seems particularly important

considering the findings that focus on and venting of emotions might be related to both initial levels of well-being and the rate of change in well-being after the conclusion of treatment for breast cancer. Because this subscale has typically been omitted from studies of breast cancer patients, it will be important to learn more about these dynamics in the context of breast cancer.

Researchers should also examine rural people and coping behavior more generally as well. It would be interesting to know whether the findings from the current study generalize to other types of stressors (i.e., other illnesses, familial stressors, financial concerns). Also, without further investigation, it is unclear whether the findings generalize to other rural people (i.e., men with cancer, women with other types of cancer).

Conclusions

The current study is one of the first to quantitatively examine both rural and urban breast cancer patients. Recall that theorists have traditionally grouped coping strategies based on certain theoretical dimensions such as problem versus emotion focused and approach versus avoidant (Gross, 1998; Lazarus & Folkman, 1984; Carver & Scheier, 2002). Thus, previous researchers have often placed coping strategies into four theoretical categories (emotion focused approach, problem focused approach, emotion focused avoidant, problem focused avoidant). The current findings cast doubt on the utility of these classifications. More specifically, the pattern of results that emerged in the current study support the notion that, in practice, the effectiveness of each coping response is unique.

Additionally, the findings of the current study support Folkman's (1986) suggestion that the effectiveness of any coping response cannot be fully understood without attention to the context in which the coping response is used. Specifically, the study examined the effectiveness of coping responses imbedded in two contexts, breast cancer treatment and rural areas. That the study revealed differences between rural and urban breast cancer patients, suggests that area of residence might be one important contextual variable to be examined in the larger coping literature. Specifically, the match between individual's coping styles and their cultural ideals (i.e. rural ideals) might be an important determinant of the relationship between certain coping strategies and well-being.

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Appendix A

Demographics

How many miles is it from your home to the Clinic where you are receiving radiation treatment?

Do you go to a breast cancer support group? If so, how many times a month?

What stage of breast cancer were you diagnosed with?

What is your date of birth?

Please list any other major illnesses you have been diagnosed with.

In the last 12 months, has a close relative or friend passed away?

Where are you in the treatment process?

What best describes your work situation right now? (check as many as apply)

- | | |
|--|--|
| <input type="checkbox"/> Homemaker/House-manager | <input type="checkbox"/> Managerial, profession or technical |
| <input type="checkbox"/> Retired from work | <input type="checkbox"/> Retired from work, but took another job |
| <input type="checkbox"/> Skilled or semi-skilled blue collar | <input type="checkbox"/> Clerical, sales, service or other |
| <input type="checkbox"/> Manage a farm | <input type="checkbox"/> Own my own business |
| <input type="checkbox"/> Other _____ | <input type="checkbox"/> Volunteer work (not paid) |
| <input type="checkbox"/> White Collar Professional | |

What is the total yearly income (estimated) for all of the members who contribute to your household income?

Which best describes your relationship status?

What religious community or group do you belong to?

What is your ethnicity?

How many children do you have?

If you have children, how many of them live in your home right now?

Of the children who live in your home, what are their ages?

In your home, are you a regular caregiver to anyone other than your own children?

What best describes your employment in the last month?

I was not working outside of home. I was working Part-time

I was working Full-time I was working but recently left work.

I was on Medical Leave I was self-employed and still working.

Other, please specify

What best describes your education?

Less than 4 years high school Graduated with 2 year college degree

Graduated high school Graduated with four year college degree

Some college Some graduate work/finished graduate

degree

Appendix B

Coping response	Depression	Life Satisfaction	Mood
			Disturbance
Active coping	-.18**	.19**	-.12
Planning	-.12	.19**	-.06
Suppression of C.A.	-.01	-.00	.03
Restraint	-.07	.07	-.02
Seeking of instrumental support	-.11	.24**	-.08
Seeking of emotional support	-.04	.12	.03
Positive reinterpretation	-.22**	.28**	-.18*
Acceptance	-.16*	.11	-.08
Turning to religion	-.03	.17*	-.11
Focus on/venting of emotions	.26**	-.19**	.44**
Denial	.23**	-.16*	.26**
Behavioral Disengagement	.29**	-.18**	.21**
Mental Disengagement	.19**	-.14*	.17*
Alcohol	.20**	-.13	.18*

Note. * $p < .05$ ** $p < .01$.

Appendix C

Correlations among coping subscales

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. act													
2. plan	.75**												
3. sca	.62**	.48**											
4. rest	.28**	.29**	.30**										
5. sis	.39**	.46**	.39**	.17*									
6. ses	.24**	.28**	.17*	.11	.61**								
7. prg	.50**	.49**	.33**	.25**	.31**	.31**							
8. acc	.37**	.26**	.33**	.30**	.17*	.22**	.40**						
9. rel	.10	.08	.08	.12	.17*	.23**	.33**	.16*					
10. foc	.11	.13	.10	.03	.25**	.36**	.01	.07	.01				
11. de	-.18*	-.24**	.04	.08	-.18*	-.09	-.13	.01	-.07	.12			
12. bd	-.19**	-.19**	.12	.24**	.02	.07	-.12	.01	.06	.20**	.37**		
13. md	.14*	.10	.32**	.20**	.10	.15*	.18*	.21**	.22**	.141*	.24**	.30**	
14. al	-.05	-.01	.08	-.18*	-.03	-.04	-.02	-.10	-.20**	.05	.10	.15*	.05

Note. act = active coping, plan = planning, sca = suppression of competing activities, rest = restraint, sis = seeing support for instrumental reasons, ses = seeking support for emotional reasons, prg = positive reinterpretation and growth, acc = acceptance, rel = turning to religion, foc = focus on and venting of emotions, de = denial, bd = behavioral disengagement, md = mental disengagement, al = alcohol and drugs disengagement. * $p < .05$ ** $p < .01$.

Table 1

Definitions of the USDA Rural-Urban County Continuum Codes

<i>Code Number</i>	<i>Description</i>
1	Counties in metro areas of 1 million population or more
2	Counties in metro areas of 250,000 to 1 million population
3	Counties in metro areas of fewer than 250,000 population
4	Urban population of 20,000 or more, adjacent to a metro area
5	Urban population of 20,000 or more, no adjacent to a metro area
6	Urban population of 2,500 to 19,999, adjacent to a metro area
7	Urban population of 2,500 to 19,999, not adjacent to a metro area
8	Completely rural or less than 2,500 urban population, adjacent to a metro area
9	Completely rural or less than 2,500 urban population, not adjacent to a metro area

Table 2

Means, Standard Deviations, Alpha Reliability, Alpha Reliabilities split by group and Carver's reported Alpha for COPE scales.

Coping response	M	SD	α	Rural	Urban	Carver's α
Active coping	3.19	.59	.67	.69	.64	.62
Planning	3.30	.64	.79	.84	.73	.80
SUPPRESS OF COMPETING ACTIVITIES	2.68	.60	.58	.52	.62	.68
Restraint	2.41	.59	.54	.58	.52	.72
Seeking of instrumental support	2.98	.71	.72	.72	.72	.75
Seeking of emotional support	2.87	.80	.84	.86	.81	.85
Positive reinterpretation	3.22	.65	.81	.78	.83	.68
Acceptance	3.00	.64	.67	.72	.63	.65
Turning to religion	3.33	.85	.92	.90	.94	.92
Focus on/venting of emotions	2.31	.67	.70	.68	.71	.77
Denial	1.36	.85	.73	.64	.78	.71
Behavioral Disengagement	1.56	.68	.61	.60	.63	.63
Mental Disengagement	2.10	.61	.55	.51	.57	.45
Alcohol	1.08	.40				

Note. M = Mean, SD = Standard Deviation, α = Cronbach's alpha

Table 3

Test-Retest Reliabilities (ICC)

Coping response	<i>ICC</i>	<i>ICC - Rural</i>	<i>ICC - Urban</i>
Active coping	.73	.68	.76
Planning	.84	.83	.85
Suppress of competing activities	.68	.67	.68
Restraint	.67	.55	.75
Seeking of instrumental support	.84	.85	.83
Seeking of emotional support	.88	.89	.87
Positive reinterpretation/growth	.87	.85	.88
Acceptance	.75	.71	.78
Turning to religion	.95	.96	.95
Focus on and venting of emotions	.78	.78	.79
Denial	.79	.73	.83
Behavioral Disengagement	.75	.78	.73
Mental Disengagement	.64	.57	.69
Alcohol	.01	.01	.14

Note. ICC = Intraclass Correlation Coefficient.

Table 4

Correlations among rurality, coping, and well-being

Coping Response	Rurality
Active coping	.15*
Planning	-.02
Restraint	.04
Seeking of instrumental support	.13
Seeking of emotional support	-.05
Positive reinterpretation and growth	.14*
Acceptance	.07
Turning to religion	.08
Focus on and venting of emotions	-.06
Denial	-.03
Behavioral Disengagement	-.14*
Alcohol	-.01
Depression	.01
Mood Disturbance	.02
Life satisfaction	.03

*Note. The mental disengagement and suppression of competing activities subscales were omitted due to the low reliability evidenced by these scales. * p < .05*

Table 5

Summary of results from HLM analyses

Coping Response	Mood		Life
	Depression	Disturbance	Satisfaction
Rurality	-	-	-
Positive reinterpretation and growth	-	-3.02*	.21*
Positive reinterpretation and growth X	-.74 [†]	-1.70 [†]	.16*
Rurality	-	-	-
Active coping	-	-	-
Active X Rurality	-0.94*	1.61 [†]	-
Behavioral Disengagement	2.78***	6.11***	-.16 [†]
Behavioral Disengagement X Rurality	0.96*	2.11 [†]	-
Seeking of instrumental support	-	-	.16*
Seeking of emotional support	-	-	.17*
Turning to religion	-	-	.20*
Denial	2.57***	5.14***	-
Focus on and venting of emotions	2.35***	6.48***	-.19*
Planning	-	-	-
Acceptance	-	-	-

Note. - indicates a non-significant relationship ($p > .10$). b values reported are unstandardized coefficients. Non-significant interactions not included in table. Interaction between focus on and venting of emotions not included in table. [†] $p < .10$ * $p < .05$ ** $p < .01$ *** $p < .001$.

Figure 1.

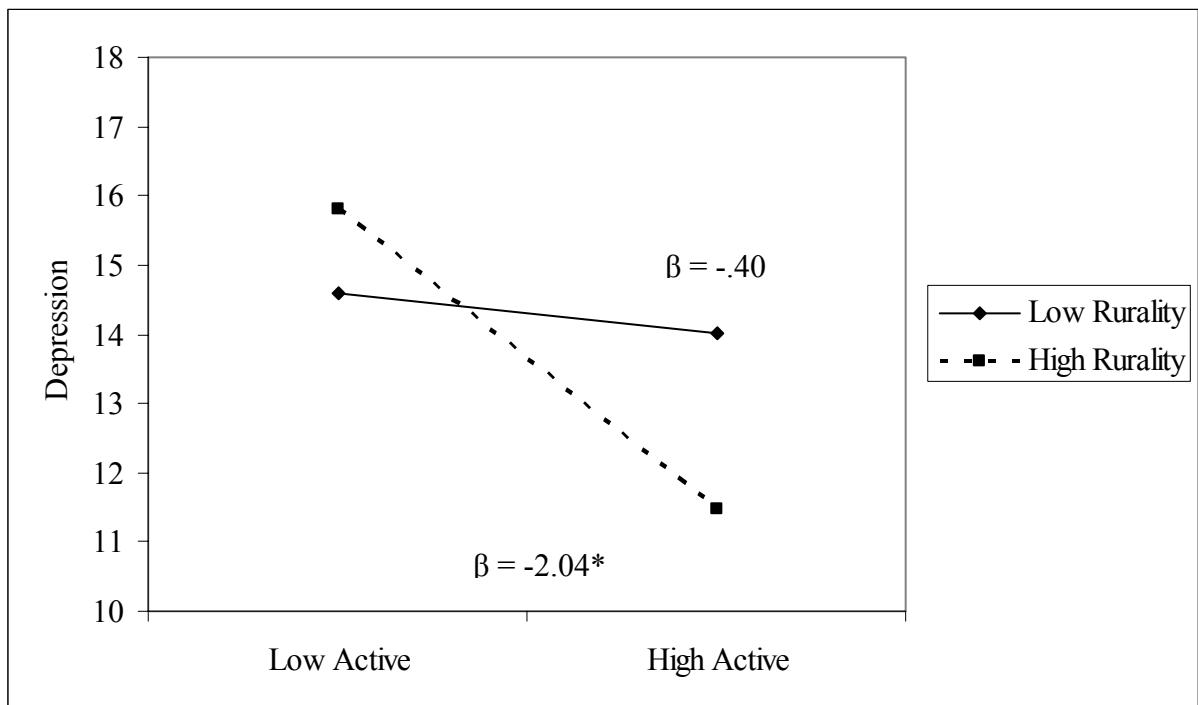


Figure 1. Levels of depression for rural and urban women according to individual levels of active coping. Note: b values reported in the figures are unstandardized coefficients. ${}^t p < .10$ ${}^* p < .05$ ${}^{**} p < .01$ ${}^{***} p < .001$.

Figure 2.

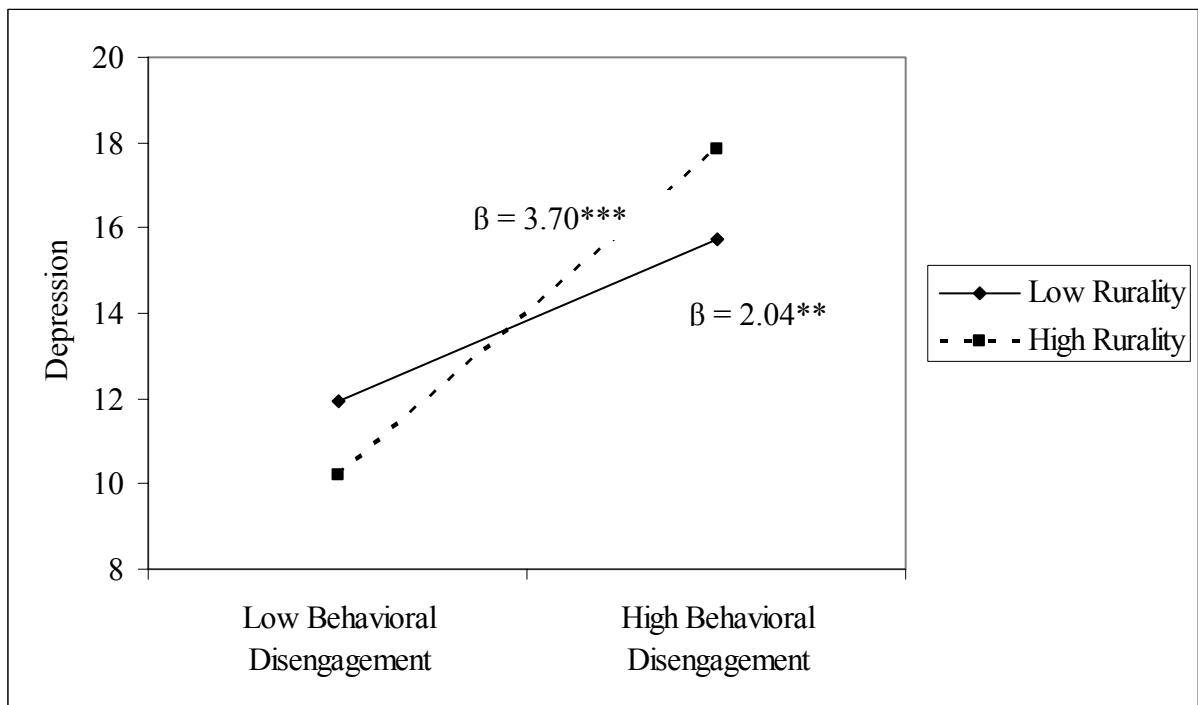


Figure 2. Levels of depression for rural and urban women according to individual levels of behavioral disengagement. Note: b values reported in the figures are unstandardized coefficients. $^t p < .10$ $^* p < .05$ $^{**} p < .01$ $^{***} p < .001$.

Figure 3.

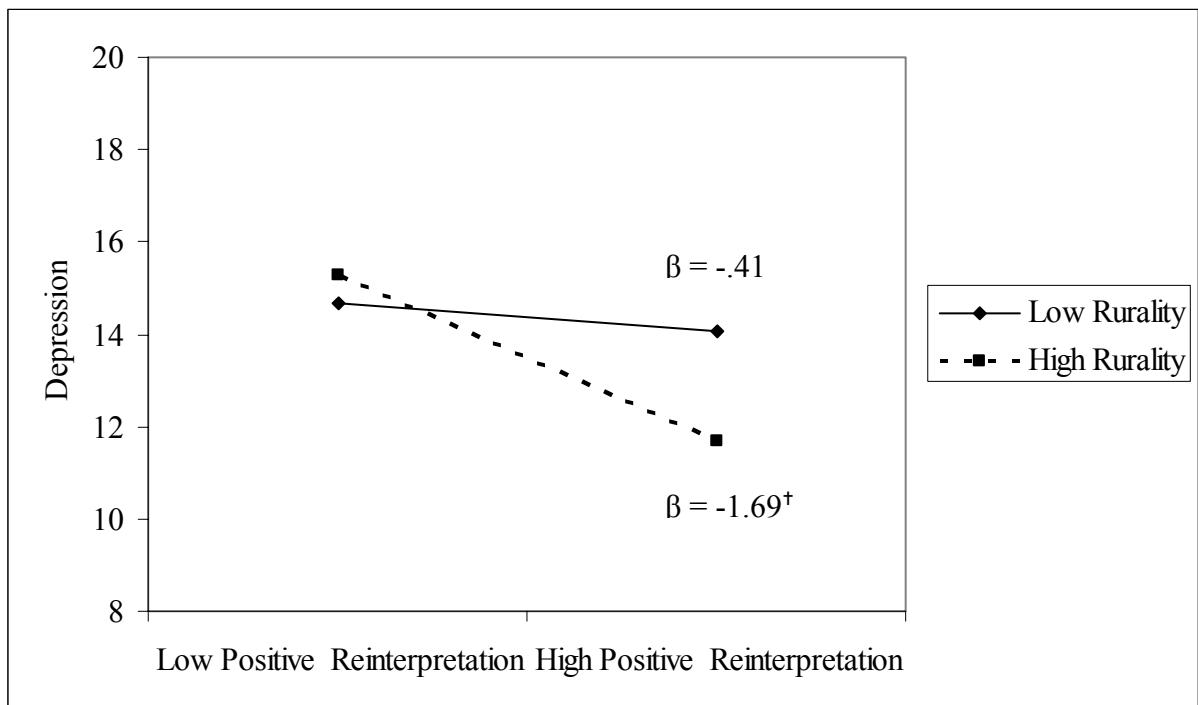


Figure 3. Levels of depression for rural and urban women according to individual levels of positive reinterpretation and growth. Note: b values reported in the figures are unstandardized coefficients. ${}^{\dagger} p < .10$ ${}^{*} p < .05$ ${}^{**} p < .01$ ${}^{***} p < .001$.

Figure 4.

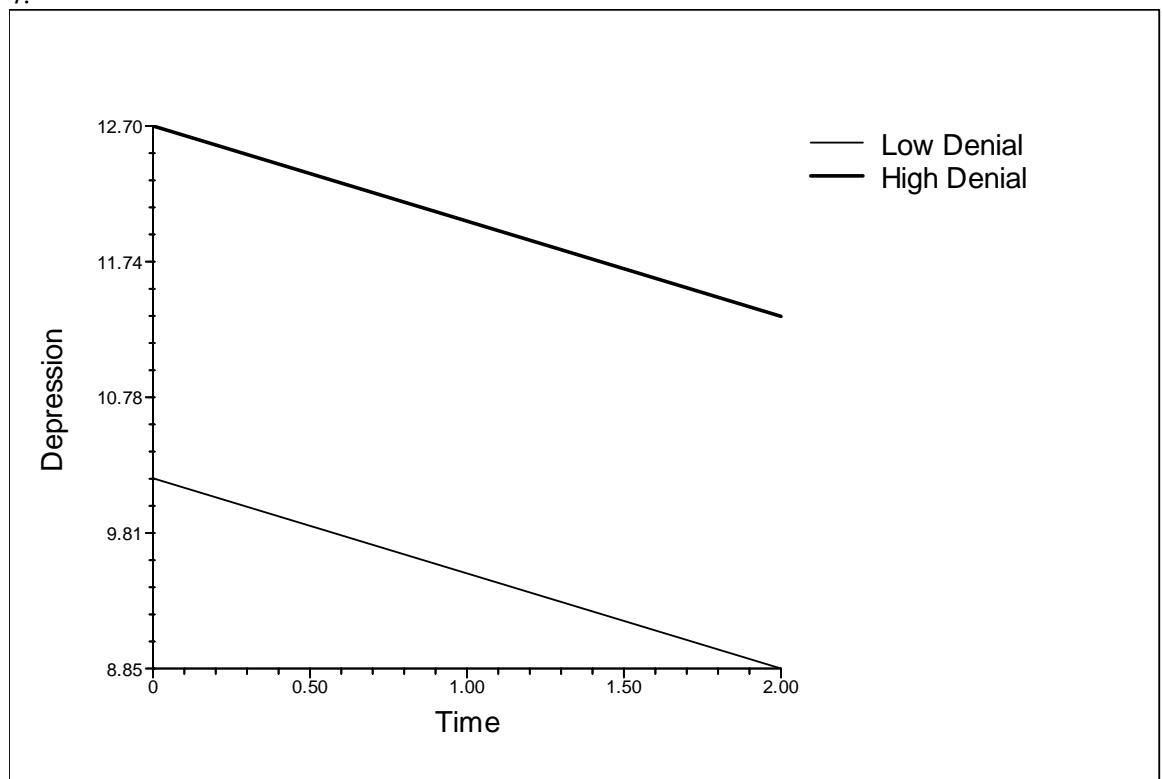


Figure 4. Relationship between denial and depression over time. Note: The plotted lines represent values of +1 and -1 standard deviation for denial.

Figure 5.

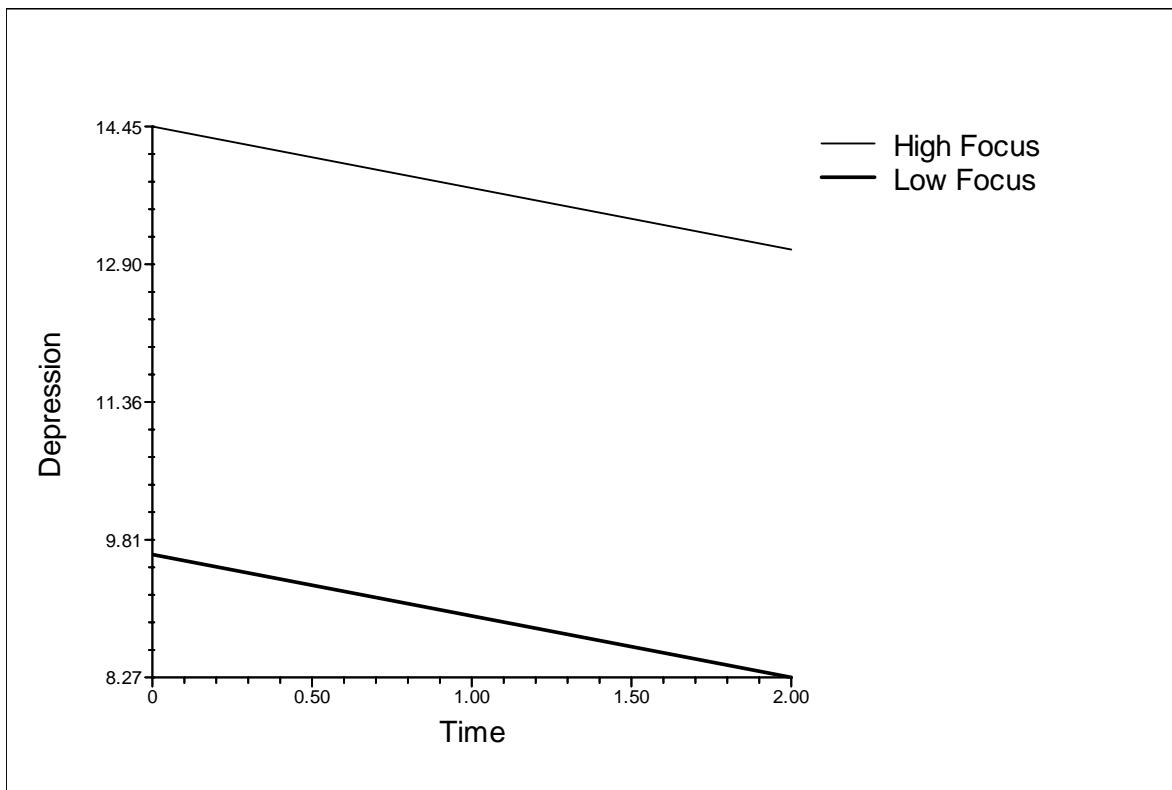


Figure 5. Relationship between focus on and venting of emotions and depression over time. Note: The plotted lines represent values of +1 and -1 standard deviation for focus on and venting of emotions.

Figure 6.

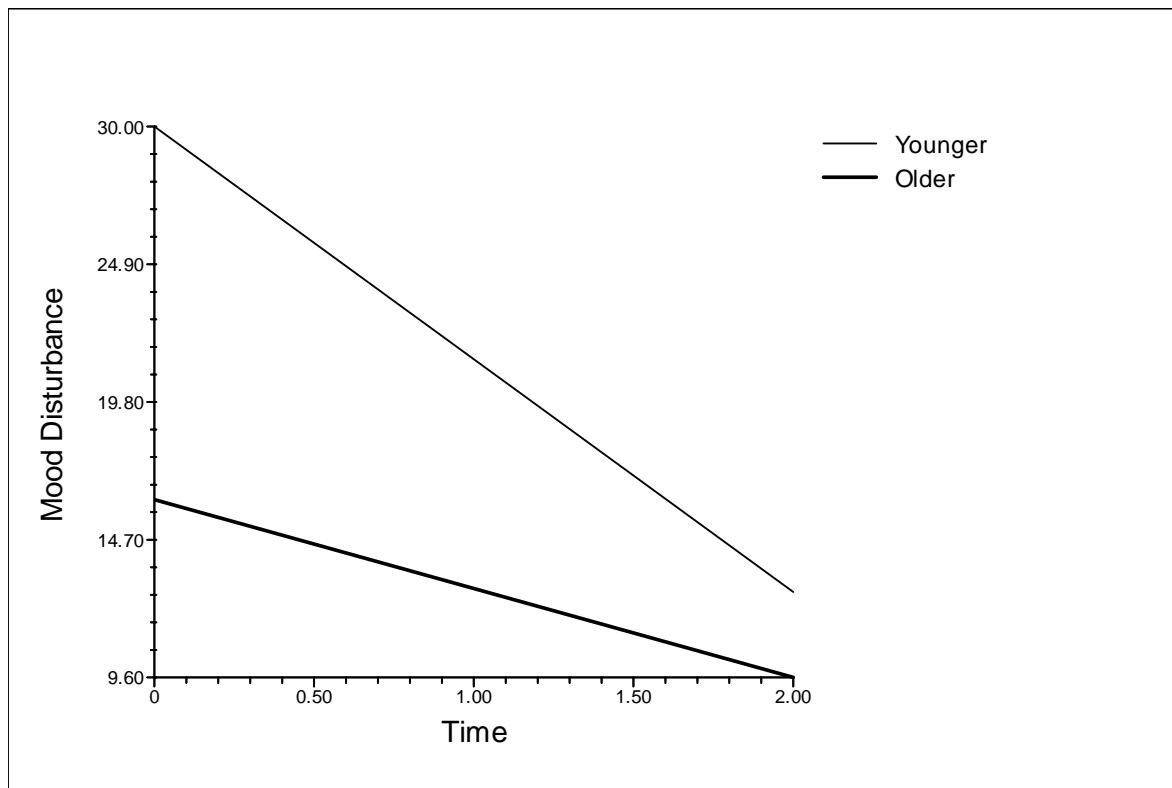


Figure 6. Relationship between age and both intercept and rates of change of mood disturbance.. Note: The plotted lines represent values of +1 and -1 standard deviation for age.

Figure 7.

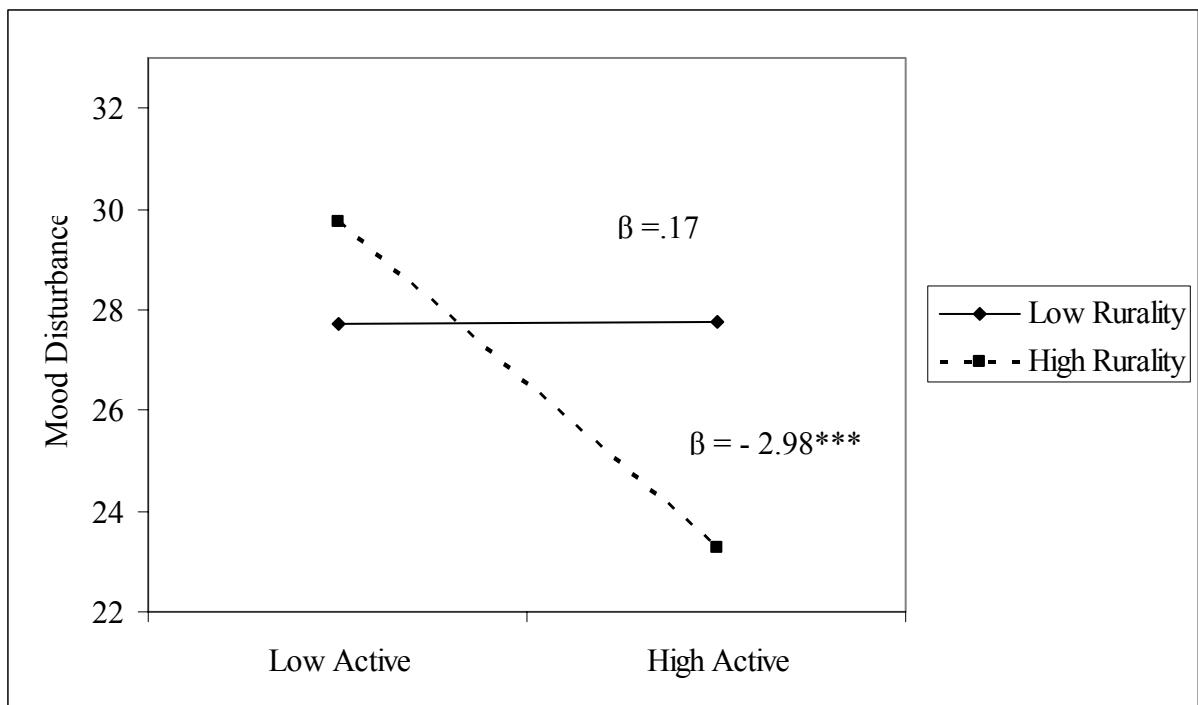


Figure 7. Levels of mood disturbance for rural and urban women according to individual levels of active coping. Note: b values reported in the figures are unstandardized coefficients. $^t p < .10$ $^* p < .05$ $^{**} p < .01$ $^{***} p < .001$.

Figure 8.

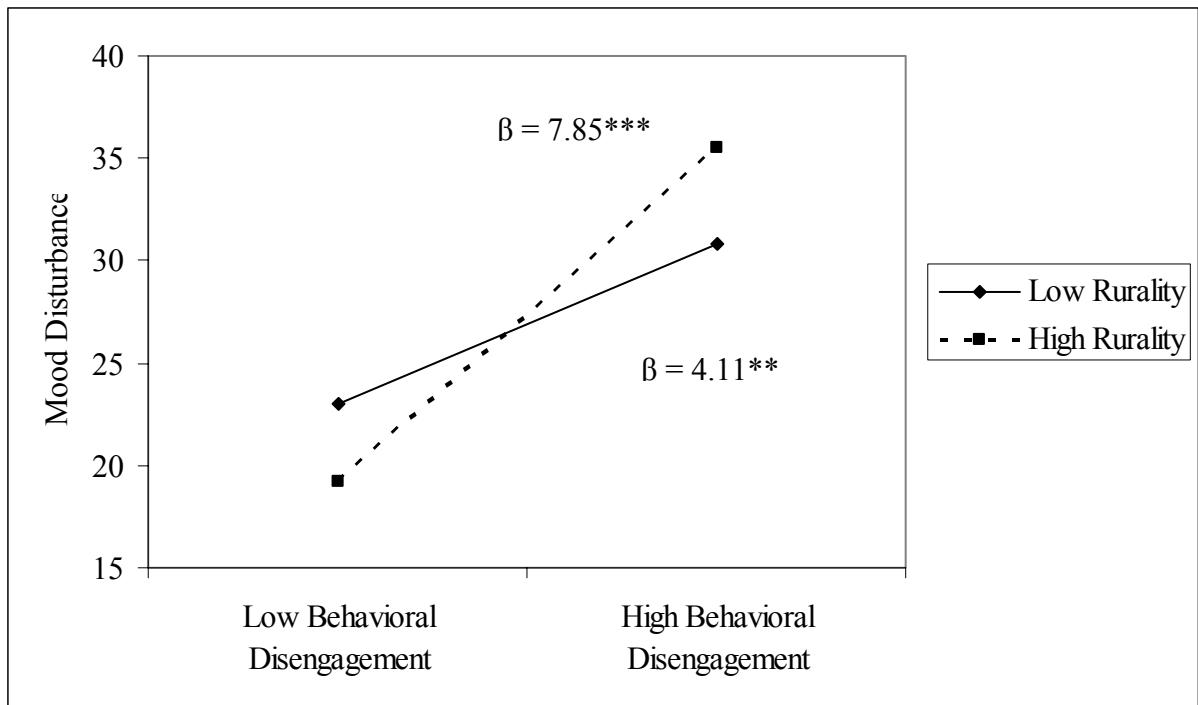


Figure 8. Levels of mood disturbance for rural and urban women according to individual levels of behavioral disengagement. Note: b values reported in the figures are unstandardized coefficients. $^t p < .10$ $^* p < .05$ $^{**} p < .01$ $^{***} p < .001$.

Figure 9.

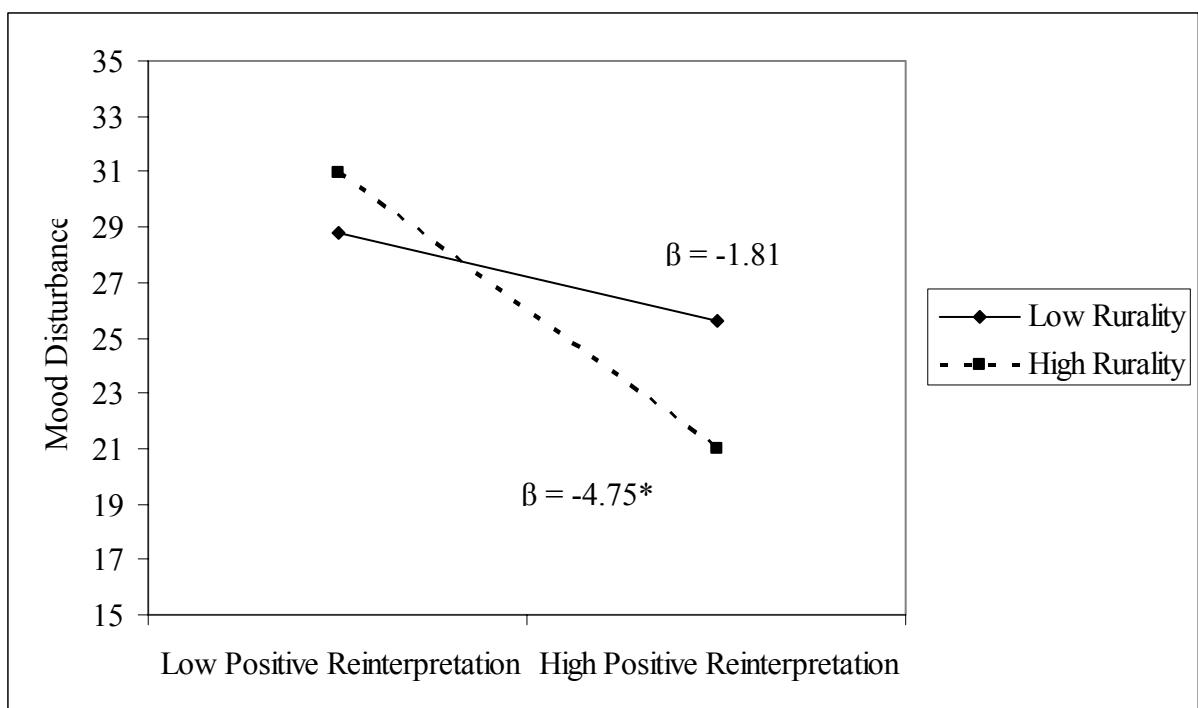


Figure 9. Levels of mood disturbance for rural and urban women according to individual levels of positive reinterpretation and growth. Note: b values reported in the figures are unstandardized coefficients. ${}^t p < .10$ ${}^* p < .05$ ${}^{**} p < .01$ ${}^{***} p < .001$.

Figure 10.

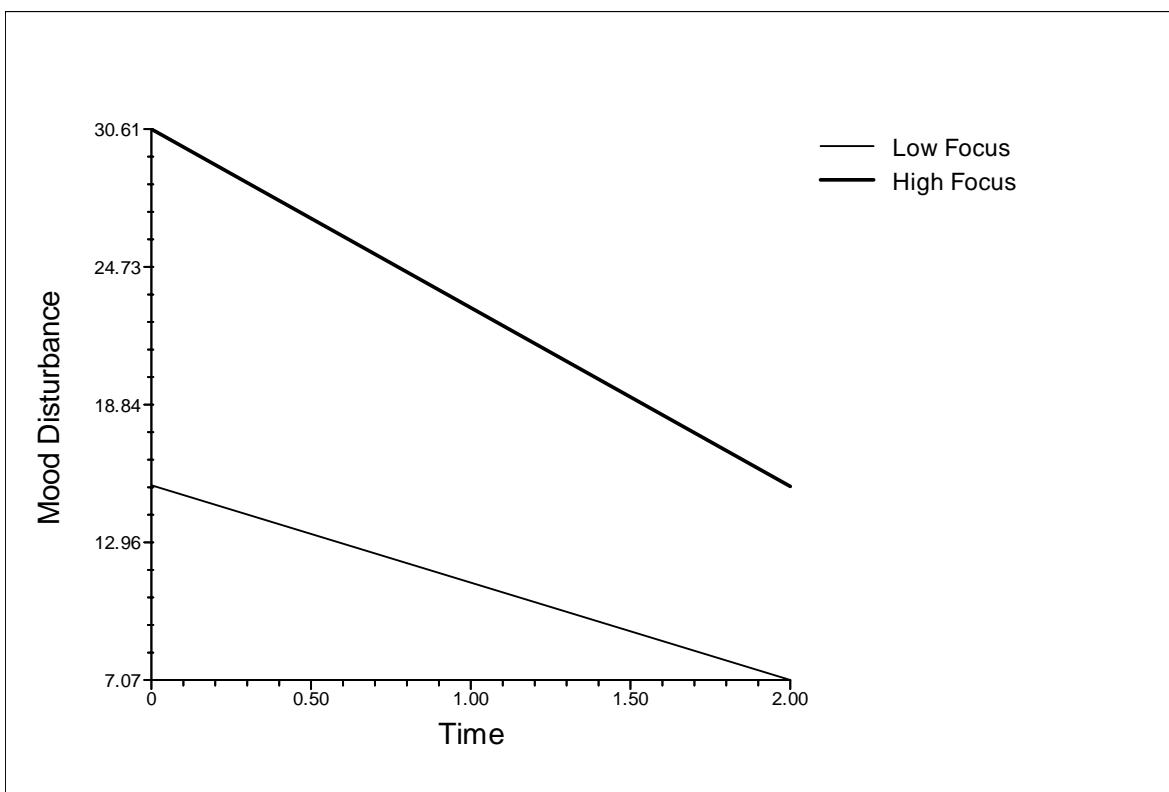


Figure 10. Relationship between focus on and venting of emotions and both intercept and rates of change of mood disturbance. Note: The plotted lines represent values of +1 and -1 standard deviation for focus on and venting of emotions.

Figure 11.

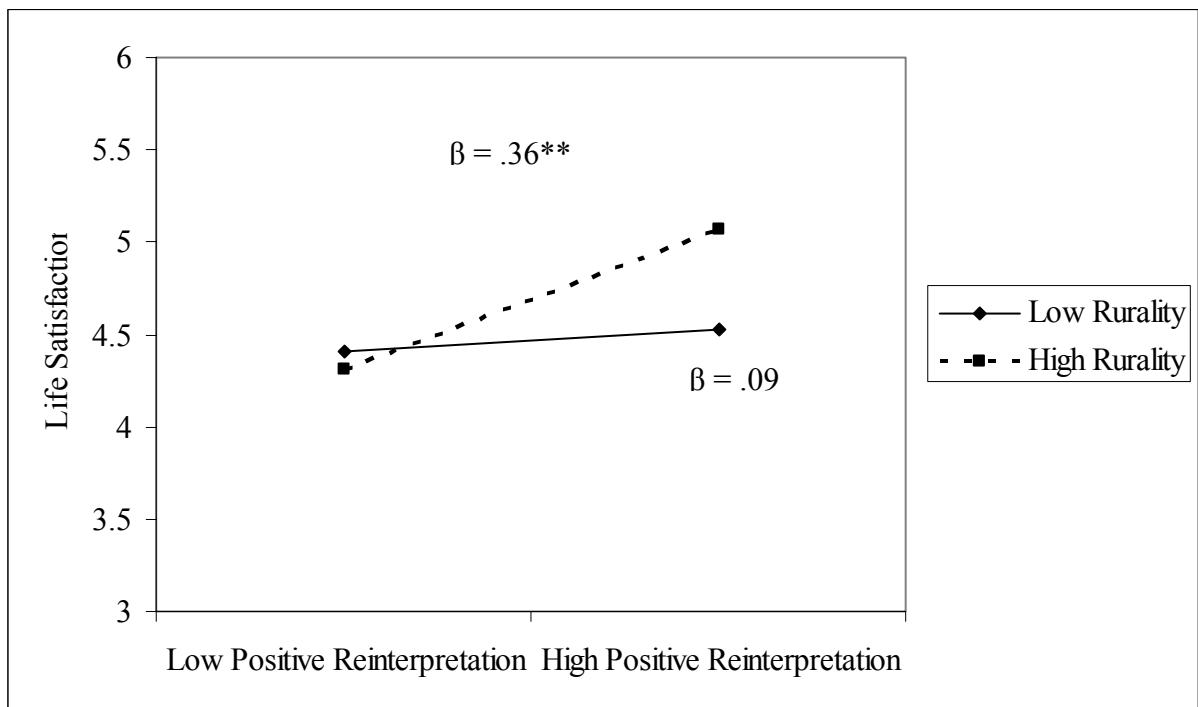


Figure 11. Levels of life satisfaction for rural and urban women according to individual levels of positive reinterpretation and growth. Note: b values reported in the figures are unstandardized coefficients. $^t p < .10$ $^* p < .05$ $^{**} p < .01$ $^{***} p < .001$.