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## Cognitive Appraisals, Coping and Depressive Symptoms in Breast Cancer Patients

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### Abstract

Depression in breast cancer patients and survivors is related to negative disease outcomes and worse quality of life. Factors that explain this depression can serve as targets of intervention. This study, guided by the Transactional Theory of Stress, examined the relationship between cognitive appraisals, coping strategies, and depressive symptoms in a group of women with mostly advanced-stage breast cancer (N = 65), who scored mostly within the normal range for depressive symptoms. Path analysis was used to determine the relationships among variables, measured with the Cognitive Appraisals of Illness Scale, the Ways of Coping Questionnaire, and the Center for Epidemiological Studies Depression Scale. The results of the path analysis showed that higher appraisals of harm/loss and greater use of escape-avoidance coping predicted higher depressive symptoms. These findings enhance the prediction of depression among breast cancer patients and suggest the need to examine cognitive appraisals when attempting to understand depressive symptoms.

### Keywords

cancer; depression; coping; cognitive appraisals

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A significant minority of women with breast cancer are more depressed than healthy women as they receive the diagnosis (48% in Henselmans et al, 2010), go through treatment (34% in Gallagher, Parle, & Cairns, 2002), and live as survivors (42% in Kissane et al., 2004). Depressive symptoms in this population are disturbing because preoperative depression in late-stage breast cancer patients and post-operative depression in early-stage patients have been found predict mortality (Hjerl et al, 2003), and research has revealed a correlation between psychosocial variables and quality of life in this population (Cousson-Gelie, 2000). Transactional Theory of Stress: Depression as an Outcome of Appraisals and Coping.

Lazarus and Folkman's (1984) transactional theory of stress proposed that mental appraisals made when confronted with a stressful situation, such as cancer, were related to outcomes.

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Ethical Guidelines:

There was no conflict of interest for any of the authors that may have affected our work on this manuscript. The Indiana University Institutional Review Board approved this study, IRB # 0605-71, In August of 2006.

Appraisal is a process whereby individuals decide whether stressful situations are threats to their well-being or not (primary appraisals), and determine whether they have the resources to deal with the stressor if it is viewed as a threat (secondary appraisals).

Primary appraisals are typically categorized as one of four subtypes, based on their effect on well-being. Benign appraisals are made when individuals believe the situation poses no threat to their wellbeing. Harm/loss appraisals are made if an individual believes the stressor has already caused him/her damage. Threat appraisals are similar to harm/loss appraisals, except that they are focused on the possibility of future damage. Finally, challenge appraisals are made when individuals see the stressful situation as an opportunity for growth or development.

Breast cancer typically elicits appraisals of threat (Gallagher et al. 2002), which are associated with anxiety, or of harm/loss, which are associated with depression (Bjorck et al., 1999). Challenge appraisals are also possible when the patient interprets the cancer as an obstacle to overcome.

Appraisals matter because of their relationship to depression. For example, Gallagher and colleagues (2002) found that appraisals made at 2 months post-diagnosis predicted 40% of the variance in depression at 6 months post-diagnosis. Women who perceived breast cancer as a threat, and those who were not confident in their ability to cope with the disease, reported more depressive symptoms. These findings have been supported by the small number of research studies focused on appraisals and depression in cancer patients (Franks & Roesch, 2006).

Primary appraisals, in turn, are associated with secondary appraisals of resources and control over the situation, which are typically measured through the coping behaviors used. The types of appraisals made are closely related to the coping strategy employed (Wonghongkul et al., 2006). Appraisals of challenge may elicit effective coping strategies, whereas appraisals of threat are more likely to result in ineffective coping strategies.

An extensive body of research examines coping in breast cancer patients and its relationship to psychological outcomes. In general, problem-focused coping strategies are associated with better psychological outcomes in women with breast cancer (Ben-Zur, Gilbar, & Lev, 2001); emotion-focused coping strategies are associated with poorer outcomes throughout the illness trajectory (Epping-Jordan et al., 1999).

The present study was designed to determine the extent to which the transactional theory explained depressive symptoms among women with advanced breast cancer.

## Method

### Participants

Participants were 65 women with breast cancer who were undergoing treatment at the Indiana University Simon Cancer Center in Indianapolis, who were part of a larger study that included partners. Partner data are not included in the present analyses. This sample size gave us 80% power for  $\alpha = .05$  and an effect size  $f^2 = .25$ . The patients were between the

ages of 28–80 ( $m = 51.98$ ,  $SD = 12.19$ ), all of whom were married or in a stable romantic relationship. See Table 1 for detailed demographic information.

Most participants (71.2%) reported no chronic or acute illnesses other than the breast cancer. The average number of months since diagnosis was 37.29 ( $SD = 46.76$ ). Information regarding illness characteristics is presented in Table 2.

## Procedures

Criteria for eligibility included a) breast cancer diagnosis, b) current chemotherapy or biological treatment, c) married or in a stable, live-in relationship, d) a partner willing to participate in the study, and e) ability to read and write in English. Patients who met all criteria were approached during clinic visits and given information about the study. The oncologist confirmed that the patient met eligibility criteria and was medically able to participate. Following oncologist approval, a research assistant contacted the couple by phone to confirm that both wanted to participate. Couples who agreed to participate were mailed survey packets with self-addressed, stamped envelopes to mail back upon completion.

Each assessment took approximately 60 minutes. Participants who failed to return their packets within 2 weeks received reminder phone calls. Once surveys were returned, participants were paid \$30 for their participation.

Of the 112 couples approached, 21 refused to participate (18.75%). Reasons for refusal were health problems ( $n = 11$ ), daily responsibilities ( $n = 7$ ), and lack of interest in the study ( $n = 3$ ). We mailed surveys to the 91 couples who agreed to participate. Of these, 25 couples did not return their packets (28.57%). Thus 65 patients participated, yielding a successful recruitment rate of 58%. These procedures for recruiting cancer patients and partners are regularly used in psycho-oncology research and typically produce similar or lower participation rates (Manne & Glassman, 2000).

## Measures

**Demographic characteristics**—A demographic questionnaire was developed for the study.

**Disease and treatment variables**—Disease status and treatment data were obtained from a review of the patients' medical charts. Data on stage, recurrence, and treatments were also collected from patients. Data from patients are presented because 1) it was more complete than chart data, and 2) it compared favorably with chart data when both were available.

**Cognitive appraisals**—The Cognitive Appraisal of Health Scale (CAHS; Kessler, 1998) was used to assess the primary appraisals of benign, threat, harm/loss, and challenge. Every participant had a score for each of the four appraisals. Reliability estimates for this scale range from  $\alpha = .76$  to  $\alpha = .88$  (Kessler, 1998).

**Coping**—Coping strategies were measured using the Ways of Coping Questionnaire (Folkman & Lazarus, 1998). The measure has internal consistency reliabilities ranging from  $\alpha = .61$  to  $\alpha = .79$ .

**Depressive symptoms**—Depressive symptoms were measured with the Center for Epidemiologic Studies Depression Scale (CES-D, Radloff, 1977). This 20-item self-report instrument has reliability at  $\alpha = .88$  (Radloff, 1977).

## Results

### Descriptive Analyses

Seven (11.9%) of the participants reported having ‘ever been diagnosed with a mood disorder’ and 23 (39%) reported having suffered from what they would describe as depression or anxiety. Patients’ mean score on the CESD was 8.32 ( $SD = 5.34$ ), placing patients within the normal range for mood. The median score was 6.5, the mode was 5.5, and 87.9% of patients scored below the cutoff score of 16 for this measure. The highest score for Ways of Coping subscales was for positive reappraisal, and the lowest was for accepting responsibility (see Table 3). Participants scored highest on challenge appraisals and lowest on benign appraisals. None of the demographic or disease variables were correlated with CESD total score, indicating no need to control for these variables in the path analysis. Most study variables were normally distributed, with the exception of CESD and accepting responsibility coping, which were slightly skewed to the left. Following the recommendations of Tabachnik and Fidel (1996), we decided not to transform these variables. We compared study variables by recurrence status and stage and found no differences by group ( $p > .05$ ).

### Main Analyses

Zero-order correlations were computed for all variables in the model (see Table 3). All cognitive appraisal subscales correlated with the CESD. Challenge appraisals correlated with planful problem solving, seeking social support, positive reappraisal, and confrontive coping. Threat appraisal correlated with positive reappraisal and escape avoidance coping. Harm/loss appraisal correlated with positive reappraisal and escape avoidance coping. Benign appraisals only correlated with escape avoidance coping. Among the coping subscales, only escape avoidance coping correlated with the CESD.

In five regressions, each of the coping subscales that correlated with at least one appraisal (see Table 3) was regressed onto the appraisals identified in the bivariate correlations. The regression for planful problem solving coping was significant,  $F(1, 64) = 7.91, p = .007$ ; challenge appraisal ( $\beta = .33$ ) entered the regression equation. The regression for positive reappraisal coping was significant,  $F(3, 62) = 13.03, p < .001$ ; only challenge appraisal ( $\beta = .63, p < .001$ ) entered the regression equation. The regression for seeking social support coping was significant,  $F(1, 64) = 7.51, p = .008$ ; challenge appraisal ( $\beta = .32$ ) entered the regression equation. The regression for confrontive coping was significant,  $F(1, 64) = 8.84, p = .004$ ; challenge appraisal ( $\beta = .35$ ) entered the regression equation. The regression for

escape/avoidance coping was significant,  $F(3, 62) = 4.28, p = .008$ ; no appraisal entered the regression equation.

In the final regression, CESD scores were regressed on all four appraisals in the first step, and escape-avoidance coping in the second step. The first step was significant,  $F(4, 61) = 12.28, p < .001$ , with 45% of the variance accounted for. The second step was also significant,  $F(1, 60) = 7.49, p = .008$ , with an additional 6% of the variance accounted for. In the final model, harm/loss appraisal ( $\beta = .36, p = .003$ ) and escape-avoidance coping ( $\beta = .27, p = .008$ ) entered the regression equation (see Figure 1). The final model accounted for 51% of the variance in CESD scores and showed direct effects of harm/loss appraisal and escape-avoidance coping.

## Discussion

We examined 65 patients with advanced breast cancer in an effort to better understand the complex relationships between cognitive appraisals, coping strategies, and depressive symptoms. We tested a path analysis model guided by the Transactional Theory of Stress that hypothesized that cognitive appraisals lead to coping strategies, which in turn lead to more or less depressive symptoms. The results indicated a direct effect for harm/loss appraisals and escape-avoidance coping, and predicted 51% of the variance in CESD scores. Our findings have implications related to each of the appraisals and coping strategies, but also as a whole, because no previous studies included all appraisals and all coping strategies.

### Appraisals

**Challenge appraisals**—Challenge appraisals were the most strongly endorsed of all the appraisals, and significantly correlated with the coping strategies: planful problem solving, positive reappraisal, confrontive, and seeking social support. The lack of a relationship between challenge appraisals and depressive symptoms was unexpected. The literature suggests that challenge appraisals are associated with less depression (Frank & Roesch, 2006), and, given that our sample scored within the normal range on depression, we expected to see challenge appraisals leading to coping strategies related to CESD scores. This was not the case. We also could have expected a direct relationship, given the strength of the bivariate correlation; however, this appraisal clearly lost its effect in the presence of the others, especially of harm/loss appraisals. Had we excluded harm/loss, our expected findings would likely have been supported.

**Harm/loss appraisals**—Harm/loss appraisals were endorsed less often than challenge and threat appraisals, and were the only appraisals related to depressive symptoms. Because harm/loss appraisals tend to appraise damage that has already occurred, this finding is not unexpected among a sample of mostly advanced cancer patients, most of whom were experiencing a recurrence of an earlier cancer. Having experienced cancer for some time, and maybe for a second time, it is not surprising that patients endorsed items consistent with a harm/loss appraisal and were more distressed.

Our findings are very similar to those of Mazanec, Daly, Douglas and Musil (2010), who examined adjustment to illness and its relation to all four appraisals in several cancers at

earlier stages, and of Amhad et al. (2005), who found that only harm/loss appraisals entered their regression equation, when including all four appraisals with advanced stage patients.

**Threat and Benign Appraisals**—Threat appraisals were endorsed less often than challenge but more than harm/loss appraisals. Benign appraisals were endorsed the least. It is surprising that threat appraisals did not relate to coping efforts or depressive symptoms. This finding does not match earlier findings that threat appraisals predict negative outcome and less effective coping (Gallagher, Parle, & Cairns, 2002; Henderson et al., 2008; Lynch et al., 2008).

**Conclusions regarding appraisals**—It was surprising that, in the model, challenge appraisals did not relate to depressive symptoms, that harm/loss appraisals did so directly, and that threat appraisals played no role in the model. However, our findings should not necessarily match earlier findings, as they differed in sample, design, and measurement.

In terms of sample, we examined mostly advanced disease patients, the majority of whom were experiencing a recurrence. This characteristic is very likely to affect the appraisals of these patients. Another unique characteristic of our sample was the very low rate of depressive symptoms reported. Patients scored very low on the CESD, and almost 90% were below the cutoff of 16, which indicates concerns about a depressive disorder. Although there was sufficient variability in the sample to conduct the analyses, it is very likely that a sample of depressed advanced disease patients would yield different results.

In terms of design, most studies that examine appraisals examine only one or two appraisals. They may only assess threat (Herzer et al., 2006; Lynch et al., 2008), or threat and challenge (Stanton & Snider, 1993). When all appraisals are measured, as in the present study, patients receive scores on each, which allows for a fuller understanding of their impact. For example, although they may score high on threat, they might have scored even higher on challenge or harm/loss, had those been measured. Including all appraisals allows for an evaluation of their relative weight. Not doing so provides an incomplete and possibly confusing picture of the patient, as each appraisal may both be associated with different behaviors and outcomes and share variance with other appraisals.

Therefore, the findings presented here contribute significantly to the literature in that they show that, when all appraisals are examined together, challenge and harm/loss will relate to coping more than the others, and harm/loss will relate to depressive symptoms above all others. These findings are especially important because few studies have examined appraisals and focused on advanced disease patients.

In terms of measurement, many studies measure appraisals with one- or two-item scales created by the researchers (Bowman, Rose, & Deimling, 2006; Gallagher et al., 2002; Henderson et al., 2008; Schou, Ekeberg, & Ruland, 2005). The CAHS, used in the present study, is a published, well-established instrument with good reliability and validity (Kessler, 1998). Finally, many studies that report appraisals actually measure constructs related to appraisals, such as stress (Hughes Halbert et al., 2004), perceived risk and worry (Herzer et

al., 2006), uncertainty (Northouse et al., 2000), or meaning (Lynch et al., 2008), instead of the appraisals themselves.

### **Coping Strategies**

The coping strategies that have frequently been found to predict depression, such as positive reappraisal, planful problem solving, and distancing did not enter the model tested in the present study. Most of the coping strategies did not even relate to depressive symptoms at the bivariate level. Most of the literature that reports relationships among these variables examined either early stage breast cancer patients or mixed stage samples. Therefore, it is not possible to determine whether it is the advanced stage, or the recurrence status of the patients in this sample, that explains these findings. It is sensible to conclude that patients who are struggling with a recurrence and/or advanced disease will cope differently from those facing cancer for the first time.

Escape-avoidance coping was the only coping variable related to both an appraisal and depressive symptoms. The correlation between escape-avoidance coping and harm/loss appraisals has been well documented in the literature; a recent meta-analysis of 15 studies found a significant association between these two constructs (Franks & Roesch, 2006). It is assumed that people who view their cancer as having already caused a great amount of loss engage in escape and avoidance behaviors in an effort to turn their attention away from the situation (Franks & Roesch, 2006). A vast amount of literature is congruent with our findings regarding the use of escape-avoidance coping and depression in cancer patients (Costanzo et al, 2006; Donovan-Kicken & Caughlin, 2011). Escape and avoidance may provide temporary relief from dealing with the stress of cancer; however, they do not change the outcome of the situation; if that is the goal, then efforts to cope in this manner will be futile.

Although only one of the appraisals and one of the coping strategies affected depressive symptoms, the model examined here predicted 51% of the variance among our patients, who were undergoing active treatment for mostly advanced and mostly recurrent breast cancer.

### **Limitations**

The present study is cross-sectional in nature; therefore, it is impossible to make causal attributions or determine the directionality of the relationships between variables. Another shortcoming was the small sample size. Finally, participant demographics were fairly homogeneous (especially in respect to race); thus the results may not generalize well to other populations. Especially when examining psychosocial variables, samples containing people of relatively high socioeconomic status may misrepresent patients who struggle with financial difficulties and stressors, in addition to the disease.

As mentioned previously, this cohort of cancer patients reported a notably low rate of depressive symptoms, although with enough variability for statistical analyses. This is somewhat unique for a cancer population, and it is possible that findings may not generalize to all cancer patients, specifically those who are depressed. Cancer patients with co-morbid depression or a high level of depressive symptoms may make different types of attributions and chose different types of coping strategies than those who are not depressed. Further

research should aim to replicate the findings in a cohort of depressed cancer patients, and to explore the potential differences in the attribution-coping relationship between depressed and non-depressed cancer patients.

Despite these limitations, the present research enhances our understanding of the relationships among cognitive appraisal, coping strategies, and depressive symptoms among women with mostly advanced-stage and recurrent cancer, and it provides rich information for research and practice.

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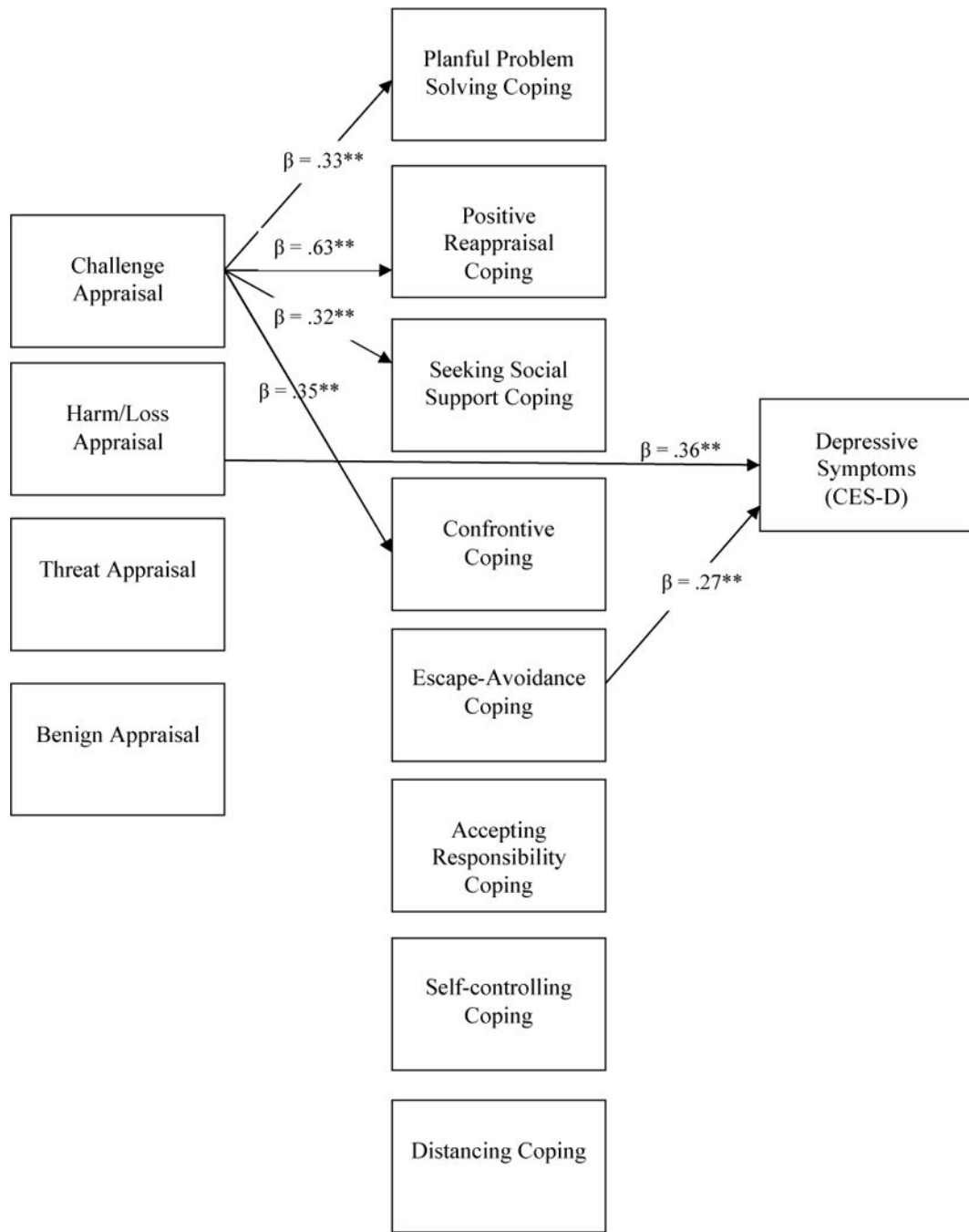
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**Figure 1.**  
Results of the path analysis.

**Table 1**

## Demographic Characteristics of Patients

<b>Variable</b>	<b>Means (SD)/Frequencies</b>
Age of participants	51.98 (12.19)
Race/Ethnicity	
White Non-Hispanic	93.9%
Education	
High School Graduate or less	29.6%
Some College	14.1%
College Graduate or more	34.4%
Completed Post Graduate	21.9%
Employment Status	
Employed part-time	12.5%
Employed full-time	25.0%
Unemployed	3.1%
Retired	18.8%
Disabled	15.6%
Full-Time Homemaker	23.4%
Other	1.6%
Household Income	
\$40 000 and below	24.6%
\$40 001 to \$70 000	28.0%
Above \$70 000s	47.4%
Has the breast cancer affected the household income?	55.9% Yes

**Table 2**Illness Characteristics of Patients<sup>a</sup>

Variable	Frequencies
Severity of cancer	
Stage 0	1.6%
Stage I	1.6%
Stage II	4.7%
Stage III	20.3%
Stage IV	71.9%
Treatments <sup>b</sup>	
Mastectomy	36.9%
Lumpectomy	21.5%
Radiation Therapy	52.3%
Chemotherapy	95.3%
Hormone Therapy	33.8%
Breast cancer	
First	30.3%
Recurrence	68.7%

Notes:

<sup>a</sup>: as reported by patients;<sup>b</sup>: patients could report more than one treatment

Table 3

Zero Order Correlations among Path Analysis Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Challenge Appraisal	◆	-.50	-.44	.40	.11	.05	.33	.32	.21	.35	.62	-.19	-.43
2. Threat Appraisal	◆	◆	.55	-.59	.04	.00	-.21	.06	-.06	-.17	-.27	.29	.49
3. Harm/loss Appraisal			◆	◆	.20	.04	.00	-.04	.20	-.11	-.30	.34	.60
4. Benign Appraisal				◆	.07	.16	-.00	-.15	-.18	.09	.09	-.36	-.48
5. Self-controlling Coping				◆	◆	.50	.46	.33	.56	.26	.32	.27	.10
6. Distancing Coping					◆	◆	.09	-.02	.49	.14	.16	.31	.14
7. Planful Problem-solving						◆	◆	.58	.23	.51	.55	.08	-.06
8. Seeking Social Support							◆	◆	.19	.43	.57	.12	.08
9. Accepting Responsibility								◆	◆	.18	.25	.25	.20
10. Confrontive Coping									◆	◆	.59	.05	-.17
11. Positive Reappraisal											◆	◆	-.19
12. Escape-Avoidance												◆	◆
13. CESD													◆
Means	3.79	3.01	2.72	2.13	1.19	1.11	1.45	1.54	0.48	.063	1.90	0.85	8.32
Standard Deviations	(0.59)	(0.83)	(0.77)	(0.72)	(0.44)	(0.41)	(0.59)	(0.60)	(0.49)	(0.31)	(0.64)	(0.38)	(5.34)

Note: Correlations between .25 and .31 are significant at  $p < .05$ ; correlations above .32 are significant at  $p < .01$

Ways of Coping subscale scores were divided by the number of items in each subscale so they would be comparable.