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## Stress Generation, Avoidance Coping, and Depressive Symptoms: A 10-Year Model

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### Abstract

This study examined (a) the role of avoidance coping in prospectively generating both chronic and acute life stressors and (b) the stress-generating role of avoidance coping as a prospective link to future depressive symptoms. Participants were 1,211 late-middle-aged individuals (500 women and 711 men) assessed 3 times over a 10-year period. As predicted, baseline avoidance coping was prospectively associated with both more chronic and more acute life stressors 4 years later. Furthermore, as predicted, these intervening life stressors linked baseline avoidance coping and depressive symptoms 10 years later, controlling for the influence of initial depressive symptoms. These findings broaden knowledge about the stress-generation process and elucidate a key mechanism through which avoidance coping is linked to depressive symptoms.

### Keywords

life stressors; stress generation; coping strategies; avoidance coping; depressive symptoms

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Two cardinal assumptions guided early stress research: The stress process is initiated by life stressors, and these stressors cause psychological and physical distress. Contemporary research has provided a more refined understanding of the stress process and a revision of both of these assumptions. Research on stress generation has revealed that the stressor–illness relationship can operate in both directions, with emotional distress producing new stressors (for a review, see Hammen, 1999). Moreover, an extensive body of research has identified the central role of coping strategies in individuals' differential vulnerability to life stressors (for a review, see Holahan, Moos, & Bonin, 1999). Surprisingly, these ideas about the role of stress generation and coping strategies in the stress process have evolved

independently. The purpose of this study was to integrate the stress-generation and coping perspectives to test a prospective model of depressive symptoms over a 10-year period.

In an important revision of traditional stress models, Hammen (1991) proposed that depressed individuals, through their depression and related behaviors, generate life stressors, which, in turn, increase subsequent depressive symptomatology. Hammen found that unipolar depressed women generated more interpersonal life stressors across a 1-year period than did control groups of bipolar, medically ill, and healthy individuals. Later research extended the stress-generation model to depressed late-adolescent women (Daley et al., 1997) and clinic-referred youngsters (Rudolph et al., 2000) and, in nonclinical samples, to children of depressed women (Adrian & Hammen, 1993; Hammen, Shih, & Brennan, 2004), wives in newlywed couples (Davila, Bradbury, Cohan, & Tochluk, 1997), and college students (Potthoff, Holahan, & Joiner, 1995). An association between depression and subsequent stressors has been identified for both acute events (Cui & Vaillant, 1997; Hammen, 1991; Potthoff et al., 1995) and chronic strains (Davila et al., 1997; Russell & Cutrona, 1991).

Hammen (1992) suggested that stress generation involves associated behavioral styles; however, the nature of such behaviors was unspecified. Later research by Davila, Hammen, Burge, Paley, and Daley (1995) focusing on women high school seniors implicated poor interpersonal problem solving in stress generation. In a three-wave prospective model, Davila et al. found that a combination of acute and chronic interpersonal stressors at 6 months fully mediated the association between baseline interpersonal problem solving and depressive symptoms a year later. Independently, stressors at 6 months partially mediated the association between baseline depressive symptoms and depressive symptoms at 1 year.

Consistent with Hammen's (1992) belief that stress generation involves associated behavioral styles and extending Davila et al.'s (1995) findings on poor interpersonal problem solving and stress generation, we speculated that avoidance coping might play a key role in stress generation. There is some evidence that poor interpersonal problem solving and less effective coping strategies are positively related (Nezu & Carnevale, 1987). Avoidance coping involves cognitive and behavioral efforts oriented toward denying, minimizing, or otherwise avoiding dealing directly with stressful demands and is closely linked to distress and depression (Cronkite & Moos, 1995; Penley, Tomaka, & Wiebe, 2002). Although the potential stress-generating role of avoidance coping has not been examined previously, reliance on avoidance coping seems especially likely to generate a broad range of stressors. For example, cognitive avoidance may permit incipient stressors, such as financial or health problems, to fester and grow. Behavioral avoidance may actively promote new stressors, such as when emotional discharge aggravates strains in family or work relationships.

The strongest and most consistent associations between coping efforts and emotional distress involve avoidance coping, which is generally linked to more depressive symptoms (Holahan, Moos, & Bonin, 1999). For example, reliance on avoidance coping has been linked to increased depressive symptoms among community adults (Blalock & Joiner, 2000; Marchand & Hock, 2003), college students (Penland, Masten, Zelhart, Fournet, & Callahan, 2000), older adults (Powers, Gallagher-Thompson, & Kraemer, 2002), and cardiac patients (Holahan, Moos, Holahan, & Brennan, 1997). Reliance on avoidance-coping efforts has also been linked to relapse among individuals treated for clinical depression (Cronkite, Moos, Twohey, Cohen, & Swindle, 1998; Sherbourne, Hays, & Wells, 1995) and alcohol abuse (Chung, Langenbucher, Labouvie, Pandina, & Moos, 2001). Despite the consistency of these findings, the mechanisms through which avoidance coping is linked to emotional distress are

not known. The potential role of avoidance coping in generating new stressors suggests a key path through which avoidant strategies may predict depressive symptoms.

## The Present Study

The purpose of this study was to test over a 10-year period a model of depressive symptoms integrating coping (Holahan, Moos, & Bonin, 1999) and stress-generation (Hammen, 1999) models of depression. Specifically, the study addressed (a) the role of avoidance coping in prospectively generating both chronic and acute life stressors and (b) the stress-generating role of avoidance coping as a prospective link to future depressive symptoms. We examined these issues in a sample of 1,211 late-middle-aged women and men assessed three times over a 10-year period.

A strength of the present study is that it extends stress-generation research, which has generally involved younger persons (e.g., Adrian & Hammen, 1993; Daley et al., 1997; Davila et al., 1997; Potthoff et al., 1995; Rudolph et al., 2000), to a late-middle-aged sample. The growing aging population in the United States has made depression among older persons a key mental health concern, with clinical psychologists focusing increasingly on the etiology (Gatz, 2000) and treatment (Karel, Ogland-Hand, Gatz, & Unuetzer, 2002) of later-life depression. The multiple waves of data and long time interval provided a unique opportunity to view the temporal unfolding of the stress-generation process (also see Chun, Cronkite, & Moos, 2004). Representation of both women and men in the sample allowed us to broaden the stress-generation model beyond the traditional focus on women (Daley et al., 1997; Davila et al., 1997; Hammen, 1991).

The present study is part of a longitudinal project on an initial sample of 1,884 late-middle-aged individuals. Previous research with this sample has examined the emergence and course of late-life drinking (Moos, Brennan, & Moos, 1991; Schutte, Brennan, & Moos, 1994, 1998; Schutte, Byrne, Brennan, & Moos, 2001) and adjustment to cardiac illness (Holahan et al., 1997).

Integrating previous research on avoidance coping (Chung et al., 2001; Cronkite et al., 1998; Sherbourne et al., 1995) and stress generation (Adrian & Hammen, 1993; Daley et al., 1997; Hammen, 1991), we first predicted that baseline avoidance coping would be prospectively associated with both more chronic and more acute life stressors 4 years later. Second, extending Davila et al.'s (1995) findings on interpersonal problem solving and stress generation, we predicted that the prospective association between baseline avoidance coping and depressive symptoms 10 years later would operate through intervening life stressors at 4 years. This second prediction was tested in an integrative structural equation model that included a measurement model for avoidance coping, life stressors, and depressive symptoms latent constructs (see Figure 1).

## Method

### Sample Selection and Characteristics

The sample at baseline included individuals between the ages of 55 and 65 years who had had contact with one of two medical health care facilities as outpatients within the previous 3 years for a wide variety of reasons, including minor health concerns. Participants were a representative sample of individuals seeking health services and were not selected because of any specific physical or mental health problems. The sample is comparable to similarly aged community samples with respect to health characteristics such as prevalence of chronic illness and hospitalization (for additional information on the full sample, see Brennan & Moos, 1990). Psychosocial and physical health data were obtained from self-report

inventories at baseline and at 4-year and 10-year follow-ups. The study was approved by the Stanford University Medical School Panel on Human Subjects; after the project was fully explained, participants provided written signed consent. Of eligible respondents contacted, 92% agreed to participate in the survey, and 89% (1,884) of these individuals provided complete data at baseline. The participation rate for respondents who were living was 95% (1,620 participants) at the 4-year follow-up and 93% (1,291 participants) at the 10-year follow-up.

A total of 1,211 respondents provided complete data on all variables used here across the 10-year period; these individuals constituted the present sample. The present sample included 500 (41%) women and 711 (59%) men. At initial assessment, the present sample was an average of 61 years of age ( $SD = 3.20$ ) with an average of 14 years of education ( $SD = 2.33$ ). The sample was predominantly Caucasian (92%), with the remainder of the sample African American (3%), Hispanic (2%), Asian American (1%), Native American (1%), and other ethnic backgrounds (1%).

## Measures

In addition to sociodemographic data, the database included information on avoidance-coping strategies, life stressors, and depressive symptoms. All of the self-report indices were designed for survey research with community samples. The indices have strong psychometric properties and are associated with one another and with psychological adjustment in expected ways. Descriptive and psychometric information on the measures is available in the following sources: (a) Coping Responses Inventory (CRI; Moos, 1993) for the avoidance-coping strategies measures, (b) Life Stressors and Social Resources Inventory (LISRES; Moos & Moos, 1994) for the life stressors measures, and (c) Health and Daily Living Form (HDL; Moos, Cronkite, & Finney, 1992) for the depressive symptoms measures.

**Avoidance-coping strategies**—Avoidance-coping strategies were measured at baseline with the CRI (Moos, 1993). Respondents were asked to identify the “most important problem or stressful situation” they had experienced in the past 12 months and to rate how frequently they had engaged in each of a variety of cognitive and behavioral coping responses to deal with it using a 4-point scale ranging from 0 (*not at all*) to 3 (*fairly often*). On the basis of previous research with this (Moos, 2004; Moos, Brennan, Schutte, & Moos, 2004) and related (Powers et al., 2002) coping indices that are anchored on the most important stressor in the past 12 months, such measures index a stable component in coping. Avoidance coping indexed by these measures has shown moderate stability across time (1-year stability = .56; 6-year stability = .51) and across life domains (i.e., interpersonal, health, and financial stressors).

Following previous research that examined avoidance coping as a predictor of depressive symptoms (see Holahan, Moos, Holahan, & Brennan, 1995, 1997), we indexed avoidance-coping strategies by *cognitive avoidance* (a cognitive strategy) and *emotional discharge* (a behavioral strategy). (For a fuller discussion, see Moos & Schaefer, 1993.) Cognitive avoidance is the sum of six items that tap cognitive attempts to avoid thinking realistically about the problem. Emotional discharge is the sum of six items that tap behavioral attempts to reduce tension by expressing negative feelings rather than dealing directly with the problem. Cronbach’s alphas are .71, and .60 for the measures of cognitive avoidance and emotional discharge, respectively. These internal consistencies are comparable to those of other commonly used coping measures (see Moos & Holahan, 2003).

**Life stressors**—Life stressors were assessed at baseline and 4 years with the LISRES (Moos & Moos, 1994). The LISRES indexes both *acute stressors* and *chronic stressors* within each of eight life domains: spouse, children, extended family, friends, physical health, home/neighborhood, financial, and work (for scoring details, see Moos & Moos, 1994; for applications, see Holahan et al., 1997; Mertens, Moos, & Brennan, 1996; Skaff, Finney, & Moos, 1999). Acute stressors involve 74 negative life events (such as fired from a job, divorced, and serious conflict with a friend) that have occurred in the past year. Acute stressors are scored dichotomously for occurrence as 0 (*no*) versus 1 (*yes*). A total acute stressors measure was computed as a count of all acute stressors.

Chronic stressors involve 83 ongoing stressors (such as insufficient money for food and clothing, conflicts with coworkers, and disagreements with one's spouse about important things) that began previous to the past year. Physical health chronic stressors are scored dichotomously for occurrence as 0 (*no*) versus 1 (*yes*). Home/neighborhood and financial chronic stressors are responded to on a 4-point scale varying from 0 (*definitely yes*) to 3 (*definitely no*). Work and interpersonal chronic stressors are responded to on a 5-point scale varying from 0 (*never*) to 4 (*often*). The range of scores was comparable across chronic stressor domains. A total chronic stressors measure was computed by standardizing and then summing chronic stressors across the eight subscales.

Previous research has found that stress generation occurs with dependent stressors (i.e., stressors that are at least partly dependent on an individual's behavior) but not with independent stressors (Chun et al., 2004; Cui & Vaillant, 1997; Daley et al., 1997; Hammen, 1991; Harkness & Luther, 2001; Rudolph et al., 2000). We operationalized dependent stressors as those that are primarily self-related (e.g., financial difficulties and interpersonal strains) and independent stressors as those that are primarily other related (e.g., death or medical illness of family members or friends).<sup>1</sup> Nine of the 83 chronic stressors and 11 of the 74 acute stressors we assessed are independent by these criteria, and to be consistent with previous research on stress generation, we excluded these from the primary analyses.

**Depressive symptoms**—Depressive symptoms were measured at baseline and 10 years with the HDL (Moos et al., 1992). The depressive symptoms measure comprises 18 symptoms experienced during the previous month, derived from the Research Diagnostic Criteria (Spitzer, Endicott, & Robins, 1978). For each item, respondents indicated how often they had experienced the symptom during the past month, from 0 (*never*) to 4 (*often*). The depressive symptoms measure is divided into two subscales: *depressed mood and ideation* and *depressive features* (for applications, see Holahan & Moos, 1991; Schutte, Hearst, & Moos, 1997). The depressed mood and ideation score is the sum of seven items that tap mood-related symptoms (e.g., feeling guilty, worthless, or down on yourself; feeling negative or pessimistic; Cronbach's alpha = .91). The depressive features score is the sum of 11 symptoms that tap behavioral manifestations of depression (e.g., crying; feeling resentful, irritable, angry; Cronbach's alpha = .88). In a validity check with a sample of depressed patients (Billings & Moos, 1985), the depressive symptoms index was highly correlated with the Beck Depression Inventory at treatment intake,  $r(52) = .88$ , and at posttreatment follow-up,  $r(29) = .92$ .

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<sup>1</sup>To examine the reliability of our initial coding of dependent and independent stressors, a research psychologist who was not involved in the present study independently coded the stressors. Agreement between our initial coding and that of the independent rater was 100%.

## Results

### Formulation of the LISREL Model

We tested the study hypotheses in structural equation models using LISREL 8 (Jöreskog & Sörbom, 2001). Consistent with recent recommendations concerning mediational models with longitudinal data (see Cole & Maxwell, 2003; Loehlin, 2004), the primary analyses used latent variable modeling. The hypothesized mediational model includes four latent variables. An exogenous variable for baseline avoidance coping was measured by two indicators (cognitive avoidance and emotional discharge). A second exogenous variable, baseline depressive symptoms, was measured with two indicators (depressed mood and depressive features). Baseline depressive symptoms were included in the model to control for the stable component in depressive symptoms in predicting subsequent life stressors and depressive symptoms. Baseline avoidance coping and baseline depressive symptoms were assumed to have a positive bidirectional relationship. An endogenous variable, 4-year life stressors, was measured with two indicators (chronic and acute stressors) and was included in the model as a mediator between both avoidance coping and depressive symptoms at baseline and subsequent depressive symptoms at 10 years. A second endogenous variable, 10-year depressive symptoms, was measured with two indicators (depressed mood and depressive features) and was included as an outcome variable.

To provide a metric for the latent constructs and to identify the measurement model, we set the first indicator loading for each latent construct to 1.0 in the unstandardized solution. The measurement model was examined before each structural model was tested. For all models, the measurement model showed a good fit to the data, and construct loadings were significant at the .01 level. Several standard assumptions related to time-lagged measures were included in the models (e.g., see Holahan & Moos, 1991; Holahan, Moos, Holahan, & Cronkite, 2000). We assumed that the factor loadings in the measurement model were identical for depressive symptoms across the two measurement times. In addition, we assumed that the unique variances for the two measures of depressed mood would be correlated across measurement times and that the unique variances for the two measures of depressive features would be correlated across measurement times.<sup>2</sup> Variance–covariance matrices were used in the LISREL analyses. Zero-order correlations, means, and standard deviations for the full set of study variables are presented in Table 1. Listwise deletion of missing values was used, with an *N* of 1,211 across all analyses.

### Preliminary Analyses

**Avoidance coping and life stressors**—Before using chronic and acute stressors at 4 years as indicators of a common life stressors latent construct, we tested the association between baseline avoidance coping and each of these indicators of life stressors in separate LISREL analyses. In these preliminary analyses, chronic and acute stressors were examined separately and measured by single indicators. Baseline avoidance coping was measured by two indicators (cognitive avoidance and emotional discharge), as described above.<sup>3</sup> Baseline avoidance coping was significantly associated with both chronic stressors ( $\beta = .46$ ),  $t(1211) = 10.05$ ,  $p < .01$ , and acute stressors ( $\beta = .28$ ),  $t(1211) = 6.74$ ,  $p < .01$ , 4 years later. These effects remained significant in prospective analyses that controlled for the outcome variable at baseline. Baseline avoidance coping remained significantly associated with both chronic

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<sup>2</sup>Each of these assumptions was systematically examined. The assumption that the unique variances for the two measures of depressive features would be correlated across measurement times resulted in a nonsignificant improvement in model fit and was not retained.

<sup>3</sup>We also examined baseline cognitive avoidance and emotional discharge separately as predictors in multiple regression analyses. Both components of avoidance coping were significantly ( $p < .05$ ) associated with both chronic and acute stressors at 4 years in longitudinal analyses and in prospective analyses that controlled for the corresponding outcome variable at baseline.



stressors ( $\beta = .10$ ),  $t(1211) = 3.00$ ,  $p < .01$ , and acute stressors ( $\beta = .15$ ),  $t(1211) = 4.34$ ,  $p < .01$ , at 4 years, controlling for the corresponding outcome variable at baseline.

**Avoidance coping and depressive symptoms**—Following Baron and Kenny's (1986) rationale for demonstrating mediation, we first tested a direct model to show that baseline avoidance coping was significantly related to 10-year depressive symptoms when 4-year life stressors were not included in the variance–covariance matrix. This direct model included three of the latent variables described above: exogenous variables for baseline avoidance coping and baseline depressive symptoms and an endogenous variable for 10-year depressive symptoms. The direct model provided a good fit to the data: Overall  $\chi^2(4, N = 1211) = 3.36$ ,  $p > .40$ ; standardized root-mean-square residual (SRMR) = 0.008; adjusted goodness-of-fit index (AGFI) = 1.00; normed fit index (NFI) = 1.00; root-mean-square error of approximation (RMSEA) = 0.0 (90% confidence interval = 0.0; 0.04).<sup>4</sup> All parameter estimates in the measurement model were significant at the .01 level. In addition, the hypothesized parameter in the structural model showing a direct link between baseline avoidance coping and 10-year depressive symptoms was significant at the .01 level ( $\beta = .22$ ). This initial model demonstrates that more avoidance coping at baseline was significantly related to more depressive symptoms 10 years later, controlling for initial depressive symptoms. The zero-order correlation between the latent constructs for baseline avoidance coping and 10-year depressive symptoms was .53 ( $df = 1209$ ,  $p < .01$ ).

### Integrative Structural Equation Model

**Mediational model**—The results of the LISREL test of the hypothesized mediational model are presented graphically in Figure 2, which includes standardized estimates of parameters in the measurement and structural models. The model provided a good fit to the data: Overall  $\chi^2(13, N = 1211) = 18.59$ ,  $p > .10$ ; SRMR = 0.015; AGFI = 0.99; NFI = 1.00; RMSEA = 0.018 (90% confidence interval = 0.0; 0.036). All parameter estimates in the measurement model were significant at the .01 level. In addition, all parameter estimates in the structural model were significant at the .01 level.

As predicted, baseline avoidance coping was related to 4-year life stressors, and in turn, 4-year life stressors were linked to 10-year depressive symptoms.<sup>5</sup> Depressive symptoms at baseline were correlated with baseline avoidance coping and were independently related to depressive symptoms at 10 years both directly and indirectly through 4-year life stressors. Baseline avoidance coping uniquely predicted 5% of the variance in depressive symptoms at 10 years, independent of initial depressive symptoms, and shared another 14% of the predicted variance with initial depressive symptoms. With 4-year life stressors in the model, the effect for avoidance coping that was independent of initial depressive symptoms operated entirely through life stressors. In addition, life stressors at 4 years uniquely predicted 27% of the variance in depressive symptoms at 10 years independent of both avoidance coping and depressive symptoms at baseline.

**Alternative full model**—We also compared the hypothesized mediational model with an alternative full model that included a parameter reflecting a direct path between baseline avoidance coping and 10-year depressive symptoms, as well as the hypothesized indirect

<sup>4</sup>On the basis of examination of the modification indices, we included parameters reflecting correlation between the unique variances for the measure of Time 1 depressed mood and the measures of both Time 1 cognitive avoidance and emotional discharge in the model. Including these two parameters in the model significantly improved overall model fit without altering the significance of any paths in the measurement or structural models.

<sup>5</sup>Consistent with previous research on stress generation (Chun et al., 2004; Cui & Vaillant, 1997; Daley et al., 1997; Hammen, 1991; Harkness & Luther, 2001; Rudolph et al., 2000), if this model were tested with independent stressors, the path from avoidance coping to subsequent stressors would not be significant ( $\beta = .09$ ),  $t(1211) = 0.75$ ,  $p > .10$ , and removing it from the full model would result in a nonsignificant change in model fit,  $\chi^2(1, N = 1211) = 0.37$ ,  $p > .50$ .

path through 4-year life stressors. Consistent with the proposed mediational model, adding the parameter reflecting a direct path between baseline avoidance coping and 10-year depressive symptoms to the model did not significantly improve model fit compared with the hypothesized model,  $\chi^2(1, N = 1211) = 1.37, p > .20$ . Similarly, although the additional parameter reflecting a direct path between baseline avoidance coping and 10-year depressive symptoms was not significant ( $p > .20$ ), the hypothesized indirect paths between baseline avoidance coping and 4-year life stressors and between 4-year life stressors and 10-year depressive symptoms remained significant at the .01 level. In further support of the hypothesized importance of the path from avoidance coping to subsequent stressors, removing this path from the full model resulted in a significant decrement in model fit,  $\chi^2(1, N = 1211) = 17.73, p < .01$ .

**Controlling baseline stressors**—We also repeated the LISREL test of the hypothesized mediational model controlling for the influence of baseline life stressors on 4-year life stressors. Following Holahan, Moos, Holahan, and Cronkite (1999, 2000), to index new stressors at the mediational point in the model, we indexed the endogenous variable for 4-year life stressors by the residuals from the simple regressions of 4-year chronic stressors on baseline chronic stressors and of 4-year acute stressors on baseline acute stressors. The overall model fit and the size of the hypothesized path coefficients were comparable to those in the mediational model reported above. The model provided a good fit to the data: Overall  $\chi^2(13, N = 1211) = 16.22, p > .20$ ; SRMR = 0.015; AGFI = 0.99; NFI = 1.00; RMSEA = 0.014 (90% confidence interval = 0.0; 0.033); and all parameter estimates in the measurement model and all hypothesized parameters in the structural model remained significant at the .01 level. Avoidance coping was linked to more new stressors at 4 years ( $\beta = .33$ ), and these new stressors, in turn, predicted more depressive symptoms at 10 years ( $\beta = .54$ ).<sup>6</sup>

**Two-group model**—Because previous research on stress generation has focused almost exclusively on women, we also examined the hypothesized mediational model for women and men separately in a two-group LISREL analysis. The hypothesized two-group model, with measurement model and structural model parameters equated across groups, provided a good fit to the data: Overall  $\chi^2(47, N = 1211) = 61.69, p > .05$ ; SRMR = 0.039; goodness-of-fit index = 0.98; NFI = 0.99; RMSEA = 0.021 (90% confidence interval = 0.0; 0.036). However, comparing the hypothesized model to the alternative full model revealed a difference between the structural models for women and men. For men, as in the model for the full sample, adding the parameter reflecting a direct path between baseline avoidance coping and 10-year depressive symptoms did not significantly improve model fit,  $\chi^2(1, N = 1211) = 2.12, p > .10$ . For women, in contrast, adding the direct path between baseline avoidance coping and 10-year depressive symptoms significantly improved the model,  $\chi^2(1, N = 1211) = 5.59, p < .05$ .<sup>7</sup>

A revised two-group model, with the addition of a direct path between baseline avoidance coping and 10-year depressive symptoms in the structural model for women (but not for men), provided a good fit to the data: Overall  $\chi^2(46, N = 1211) = 56.10, p > .10$ ; SRMR = 0.044; goodness-of-fit index = 0.99; NFI = 0.99; RMSEA = 0.018 (90% confidence interval = 0.00; 0.034). All parameter estimates in the measurement model and all hypothesized parameter estimates in the structural model were significant at the .01 level, with parameters

<sup>6</sup>When we controlled for the influence of baseline life stressors throughout the model, the model continued to provide a good fit to the data, and all hypothesized parameters in the structural model, although attenuated, remained significant at the .05 level.

<sup>7</sup>Allowing all other parameters in the structural model to differ between groups did not further improve the model,  $\chi^2(4, N = 1211) = 3.08, p > .50$ . Similarly, allowing the measurement model to differ between groups did not further improve the model,  $\chi^2(3, N = 1211) = 1.63, p > .50$ .



and predicted variance comparable to those in the model for the full sample. Thus, the hypothesized indirect paths through 4-year life stressors remained significant in the models for both women and men. In addition, the direct path between baseline avoidance coping and 10-year depressive symptoms in the structural model for women was significant at the .05 level ( $\beta = .13$ ). The effect for baseline avoidance coping that was independent of initial depressive symptoms operated entirely through 4-year life stressors for men and predominantly through 4-year life stressors for women.

## Discussion

This study tested a 10-year model of depressive symptoms that integrates coping (Holahan, Moos, & Bonin, 1999) and stress-generation (Hammen, 1999) models of depression. As predicted, baseline avoidance coping was prospectively associated with more life stressors 4 years later. Furthermore, as predicted, these intervening life stressors linked baseline avoidance coping and depressive symptoms 10 years later, controlling for the influence of initial depressive symptoms.

Baseline avoidance coping was prospectively associated with both more chronic and more acute life stressors 4 years later. This finding extends previous research on depression and stress generation (Adrian & Hammen, 1993; Daley et al., 1997; Davila et al., 1997; Hammen, 1991) to encompass the role of avoidance-coping strategies in generating life stressors. Moreover, consistent with previous research that has documented stress generation with both acute life events (Cui & Vaillant, 1997; Hammen, 1991; Potthoff et al., 1995) and chronic strains (Davila et al., 1997; Russell & Cutrona, 1991), we found that avoidance coping prospectively predicted both chronic and acute stressors.

In an integrative structural equation model, the prospective association between baseline avoidance coping and depressive symptoms 10 years later operated through intervening life stressors at 4 years. The life stressor measure presumably tapped a general, enduring pattern of stress, with life stressors at 4 years linked over time to subsequent stressors and associated depressive reactions. Especially important, these associations controlled for the influence of initial depressive symptoms, which were independently related to follow-up depressive symptoms both directly and indirectly through 4-year life stressors. Moreover, additional analyses controlling for the influence of baseline stressors demonstrated that part of the predictive link between avoidance coping and subsequent depressive symptoms operated through new stressors at 4 years.

The finding that coping strategies and depressive symptoms independently predicted subsequent depressive symptoms through intervening life stressors replicates Davila et al.'s (1995) 1-year model of stress generation in the context of interpersonal problem solving. In addition, the present findings are consistent with an interpretation that depressive symptoms operate partially through avoidance coping in predicting subsequent life stressors. This finding extends previous research by Davila et al., who did not find a significant association between initial depressive symptoms and interpersonal problem solving.

Although previous research on stress generation has focused on women (see Adrian & Hammen, 1993; Daley et al., 1997; Davila et al., 1997; Hammen, 1991), the present findings extend this perspective to men, modeling both similarities and differences in stress generation between women and men. We found that intervening life stressors completely explained the link between baseline avoidance coping and depressive symptoms at 10 years among men and partially explained the link between baseline avoidance coping and follow-up depressive symptoms among women. The additional direct path between avoidance coping and subsequent depressive symptoms for women suggests that, for women,

avoidance coping may be linked to future depressive symptoms in an internal way as well as externally through life stressors. The internal route between avoidance coping and future depressive symptoms among women may reflect the role of rumination (see Nolen-Hoeksema, 1998; Nolen-Hoeksema, Morrow, & Fredrickson, 1993). By definition, rumination is a passive coping strategy. Furthermore, rumination is more common among women than men and is linked to stronger and more persistent depressive symptoms.

Hammen and her associates (Davila et al., 1995; Hammen, 1991, 1992) have underscored the need to identify specific behaviors associated with stress generation. Our results elucidate part of what depressed persons are doing that promotes life stressors. Depressive symptoms are associated with a reliance on avoidant coping strategies, and the use of avoidance coping creates a route to subsequent chronic and acute stressors. The 10-year time frame allowed us to view the unfolding of the stress-generation process over a longer interval than has been possible in most previous research on stress generation, which has typically been limited to 1 year (see Daley et al., 1997; Davila et al., 1997; Hammen, 1991). Our findings and those of a recent study by Chun et al. (2004), which found evidence of stress generation in the context of depression for up to 10 years, demonstrate that, once set in motion, stress generation may be remarkably enduring.

More broadly, the present findings help to explain both the endurance of depression and the tendency for depression to spread among family members. Many depressed patients relapse after treatment, and recurrent depression remains a significant clinical concern (Angst, Gamma, Sellaro, Lavori, & Zhang, 2003; Kanai, Yhoshimura, Imaizumi, Kitamura, & Takahashi, 2003). Stress generation links depressive reactions over time. Moreover, accumulating evidence demonstrates that depression can be contagious, spreading between spouses (Benazon & Coyne, 2000) and between parents and children (Goodman & Gotlib, 2002). Because many life stressors are experienced at a family level, stress generation also links depressive reactions among family members (see Adrian & Hammen, 1993; Davila et al., 1997; Hammen et al., 2004).

These findings also contribute to understanding the coping process. Despite the consistency of evidence that avoidance coping is linked to psychological distress among diverse community (Blalock & Joiner, 2000; Penland et al., 2000) and clinical (Cronkite et al., 1998; Sherbourne et al., 1995) samples, the mechanisms through which avoidance coping is linked to emotional distress are unknown. The stress-generating role of avoidance coping identifies a key path by which these coping strategies are linked to psychological distress. From a preventive perspective, this finding reinforces Aspinwall and Taylor's (1997) call for research on proactive coping. Active, future-directed coping efforts may operate as a positive analog of the present model, reducing future stressors and, indirectly, protecting against subsequent depressive reactions.

Some limitations should be noted in interpreting these results. Self-report measures are subject to both social desirability and common method variance. Future research is needed to extend our findings to include objective indexes of coping efforts, life stressors, and psychological functioning. In addition, the internal consistency of the measures of avoidance coping is relatively low. Although this concern has been reduced by the use of latent variable modeling, the present models may underestimate the role of avoidance coping in stress generation. Although coping measures that are anchored on a specific salient stressor show moderate temporal and cross-situation stability (Moos, 2004; Moos et al., 2004; Powers et al., 2002), they also reflect some situational variability and therefore may underestimate the role of more general avoidance-coping strategies in stress generation.

Furthermore, in generalizing the present findings, it should be emphasized that they pertain to milder levels of depressive symptoms. Consistent with previous work on depressive symptoms among older adults (see Kasl-Godley, Gatz, & Fiske, 1998), we found that the present sample showed a level of depressive symptoms comparable to that in younger community samples (see Holahan, Moos, et al., 1999). However, we also found a wide range in depressive symptoms among these older adults, with 5% of individuals reporting a level of depressive symptoms above the median of a clinically depressed sample entering treatment and 19% of individuals reporting a level of depressive symptoms above the median of a clinically depressed sample 1 year after entering treatment (Holahan et al., 2000). Generalizability of the present findings is also limited by our use of a late-middle-aged sample of individuals who were seeking outpatient health services. Future research is needed to extend the present findings on avoidance coping and stress generation to clinically depressed individuals, as well as to samples that are more representative with respect to age, ethnicity, and health status.

Davila et al. (1995) have argued that the stress-generation perspective does not blame depressed individuals for their problems. Likewise, we do not blame depressed individuals for relying on avoidance coping. Impoverished psychosocial resources, rather than a weakness in resolve, typically underlie maladaptive coping choices (Holahan, Moos, & Bonin, 1999). A fuller understanding of the coping process can help to identify points of intervention, including formal and informal sources of social support, that can enhance coping efforts and promote a sense of mastery among depressed individuals, who often feel powerless in the face of life's mounting obstacles.

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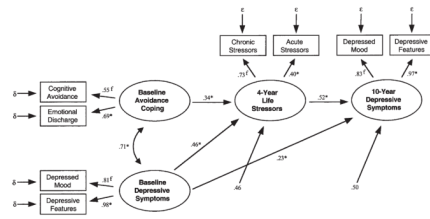
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**Figure 1.** Hypothesized structural equation and measurement models predicting depression over a 10-year period. Latent constructs are shown in ellipses, and observed variables are shown in rectangles.



**Figure 2.** Results of the LISREL test (standardized estimates) of the structural equation and measurement models predicting depression over a 10-year period ( $N = 1,211$ ). Latent constructs are shown in ellipses, and observed variables are shown in rectangles.  $\delta$  and  $\varepsilon$  represent unique variance in the observed  $X$  and  $Y$  variables, respectively. The unlabeled arrows pointing to the two endogenous latent variables show the residual (unaccounted for) variance for each of these variables. <sup>†</sup>Parameter was set to 1.0 in the unstandardized solution. \* $p < .01$ .

**Table 1**  
Zero-Order Correlations, Means, and Standard Deviations for the Study Variables (N = 1,211)

Variable	1	2	3	4	5	6	7	8	9	10	M	SD
Baseline												
1. Cognitive avoidance	—	.39	.29	.13	.38	.39	.25	.15	.23	.27	6.53	4.23
2. Emotional discharge		—	.39	.29	.49	.48	.33	.21	.32	.36	3.49	3.11
3. Chronic stressors <sup>a</sup>			—	.33	.50	.57	.72	.29	.38	.45	0.00	4.02
4. Acute stressors				—	.32	.40	.31	.34	.19	.25	2.71	2.68
5. Depressed mood					—	.80	.43	.20	.53	.48	7.41	5.72
6. Depressive features						—	.50	.27	.48	.56	12.59	8.05
Four years												
7. Chronic stressors <sup>a</sup>							—	.30	.42	.49	0.00	4.02
8. Acute stressors								—	.17	.25	2.40	2.43
Ten years												
9. Depressed mood									—	.80	6.99	5.57
10. Depressive features										—	13.07	8.28

<sup>a</sup>Computed as the sum of standardized subscales.