The Mediating Effects of Situational Control on Social Support and Mood Following a Stressor: A Prospective Study of Dementia Caregivers in Their Natural Environments

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Objectives. The present study examined, prospectively and within the context of stress experienced in the natural environment, whether situational control served as a mediator between perceived social support and caregiver’s mood.

Methods. Data came from baseline assessments of individuals participating in health promotion interventions for women caregivers. Participants were 49 female caregivers of dementia patients who monitored their own acute psychological states during the day.

Results. Results revealed that although the occurrence of a situational stressor increased negative mood, greater perceived support reduced the detrimental impact of a stressor on negative mood. Moreover, path analyses revealed that changes in situational control partially mediated the relationship between perceived support and stress-induced negative mood changes. However, changes in control did not serve as a mediator in analyses focused on happiness.

Discussion. Results suggest that caregivers with greater perceived support were less emotionally reactive to stress occurring in their natural environments because of, in part, sustained or increased situational control.

One of the most consistent findings in the gerontology literature is that those providing informal care to an ill or disabled older adult are vulnerable to the experience of burden and psychological distress (R. Schulz, Visintainer, & Williamson, 1990; Zarit, 1989). The psychological well-being of those caring for relatives or friends with dementia (e.g., Alzheimer’s disease), in particular, has been of concern to researchers and clinicians because almost all studies have documented diminished psychological well-being among dementia caregivers (R. Schulz, O’Brien, Bookwala, & Fleissner, 1995) and those providing informal assistance to someone with dementia represent nearly one-quarter of all caregivers (National Alliance for Caregiving & The American Association of Retired Persons, 1997). Although the psychological well-being of caregivers has generated much empirical interest in the gerontological literature, few caregiving studies have focused on the everyday psychological well-being (e.g., emotional states) of caregivers as experienced in their natural environments.

In the general stress literature, daily stressors have been shown to diminish psychological or emotional well-being (e.g., mood states) as experienced in the natural environment (Bolger, DeLongis, Kessler, & Schilling, 1989; Marco & Suls, 1993). Research has also found that perceived social support can ameliorate or reduce the detrimental effects of stress on psychological or emotional well-being (see reviews by Barrera, 1986; S. Cohen & Wills, 1985; Dunkel-Schetter & Bennett, 1990; Kessler, Price, & Wortman, 1985; Thoits, 1995; Vaux, 1988). Not as well researched, however, are the potential mechanisms linking perceived social support and psychological well-being within the context of stress. One proposed mechanism is that high levels of perceived support may bolster or sustain a sense of control (Antonucci & Jackson, 1987), particularly during times of stress (Krause, 1997; Thoits, 1995). Control beliefs, in turn, may protect psychological well-being. To investigate this possibility, the present study examined whether change in situational control in response to stress occurring in the natural environment mediated the relationship between perceived support and psychological well-being (i.e., negative mood and happiness) among informal family caregivers, a group vulnerable to poorer psychological well-being due to daily stress (Clipp & George, 1993; R. Schulz et al., 1990; G. Schulz & Williamson, 1991; Zarit, 1989).

Theorists have argued that perceived social support is conceptually distinct from received (or actual) social support (Barrera, 1986; Dunkel-Schetter & Bennett, 1990; Heller & Lakey, 1985; Lakey & Heller, 1988; Sarason, Sarason, & Pierce, 1990; Thoits, 1995; Wethington & Kessler, 1986). Perceived social support generally represents moderately stable cognitive appraisals that support from others will be available when needed or that connections to others
are secure (S. Cohen & Matthews, 1987; S. Cohen & Wills, 1985; Sarason et al., 1990; Sarason, Sarason, & Shearin, 1986). In contrast to perceived social support, received social support generally refers to actual administered aid or the behavior of engaging in positive interpersonal social exchanges (Barrera, 1986; Dunkel-Schetter & Bennett, 1990). Consistent with the perspective that perceived and received social support are distinct constructs, prior research has found perceived support to be unrelated or weakly related to received support (Barrera, 1986; Clipp & George, 1990; Dunkel-Schetter & Bennett, 1990; Lakey & Heller, 1988).

Research investigating both perceived and received social support in relation to well-being has generally followed one of two theoretical models: the main effects model and the stress-buffering model (Cobb, 1976; S. Cohen & Wills, 1985). According to the main effects model, social support is hypothesized to be associated with better well-being, irrespective of stress. In contrast, the stress-buffering model posits that social support benefits well-being by protecting individuals from the detrimental effects of stress. Prior research has consistently reported that perceived support buffers (or reduces) the detrimental impact of stress on psychological well-being, whereas the evidence for the stress-buffering effects of received (or actual) social support on psychological well-being has been mixed (Dunkel-Schetter & Bennett, 1990; Kessler, Price, et al., 1985; Thoits, 1995; Wethington & Kessler, 1986). In the caregiving literature where studies have primarily focused on received social support as a potential buffer of the stress–psychological well-being relationship, findings have also been mixed. Some researchers have found that received support reduced the detrimental effects of stress on well-being (Bass, Tausig, & Noelker, 1988), whereas other have failed to detect stress-buffering effects of received support or have found effects opposite of those expected by the buffering hypothesis (Franks & Stephens, 1996). Not as well studied in the caregiving literature is whether perceived social support serves as a buffer of the detrimental effects of stress on caregiver’s psychological well-being.

In the general social support literature, the consistent finding that perceived support can buffer the detrimental effects of stress on psychological well-being has prompted calls from theorists to extend social support research by examining possible underlying (i.e., mediating) mechanisms of the relationship between social support and well-being (Antonucci & Jackson, 1987; S. Cohen, 1988; Krause & Borawski-Clark, 1994; Thoits, 1995). A sense of control has been proposed as one psychological mechanism underlying the relationship between perceived support and psychological well-being during stressful experiences (Krause, 1997; Thoits, 1995). Knowing that others are available when needed to help manage stressors or difficulties may sustain or bolster an individual’s sense of control over particular stressful or difficult situations that occur. Subsequently, a sense of control concerning one’s ability to handle particular situations may protect or promote psychological or emotional well-being (Bandura, 1997; Rodin, Timko, & Harris, 1985).

A handful of studies have provided preliminary evidence that control beliefs may mediate the relationship between perceived support and psychological well-being, though each study operationalized perceived support and control beliefs differently. In one cross-sectional study of older adults, greater perceived satisfaction with support network members was related to higher levels of psychological well-being (i.e., depressive symptoms and life satisfaction), and control beliefs specific to social relationships partially mediated this relationship (Hisconti & Bergeman, 1999). A second, longitudinal study of women giving birth reported that greater perceived availability of support was related to better postdelivery psychological well-being (i.e., depressive symptoms at 3 months), and postdelivery control beliefs specific to parenting mediated this relationship (Cutrona & Troutman, 1986). Moreover, another longitudinal study that examined women’s adjustment to abortions found that greater perceived support from others for the abortion contributed to better postsurgical psychological well-being (i.e., overall mood states, depressive symptoms), and presurgical control beliefs about anticipated coping behavior served as a mediating mechanism (Major et al., 1990). In addition to these prior longitudinal studies that focused primarily on negative aspects of psychological well-being, some researchers have suggested that positive aspects of psychological well-being, such as happiness, may also be influenced by both social support and control (Myers & Diener, 1995). However, little prospective data exist on whether change in situation-specific control mediates the stress-reducing effects of perceived social support on either negative or positive aspects of psychological well-being. Furthermore, studies examining control as a mediator of perceived social support have typically not examined caregivers.

The primary aim of the present study was to prospectively (i.e., before and after a stressor) examine whether situational control mediates the relationship between perceived support and psychological well-being (i.e., negative mood and happiness) in a family caregiving sample. On the basis of research indicating that daily stressors diminish psychological well-being (Bolger et al., 1989; DeLongis, Folkman, & Lazarus, 1988; Kanner, Coyne, Schaefer, & Lazarus, 1981; Marco & Suls, 1993), stress in the present study was conceptualized as experiences or events occurring within the daily environments of caregivers (e.g., a negative interaction with the care recipient at home) that were appraised as stressful. On the basis of studies reporting that perceived social support is moderately stable over time (S. Cohen & Matthews, 1987; Sarason et al., 1986, 1990), the present study conceptualized perceived social support as a moderately stable, generalized cognitive appraisal that support from others will be available if needed. Control was conceptualized as the belief about one’s capability or competence to influence or manage the specific situation at hand (Bandura, 1997; Rodin et al., 1985).

Psychological well-being was assessed as everyday moods. Although the structure of affect and/or mood has been a topic of much debate (e.g., Bradburn, 1969; Cacioppo, Gardner, & Berntson, 1999; Green & Salovey, 1999; Lawton, Kleban, & Dean, 1993; Russell & Carroll, 1999; Tellegan, Watson, & Clark, 1999; Watson & Tellegen, 1999; Zautra, Potter, & Reich, 1997), a full discussion of the literature in this area is beyond the scope of the present paper. However, researchers have documented that happiness and
sadness (also termed pleasantness/unpleasantness) represent a unidimensional construct that is conceptually and empirically distinct from negative mood and/or affect (also termed negative emotional activation; Green & Salovey, 1999; Tellegen et al., 1999). Therefore, the present study examined both negative mood and happiness as outcomes.

Two hypotheses were tested in the present investigation. First, it was hypothesized that perceived social support would mitigate (i.e., buffer) the negative impact of stress on psychological well-being among caregivers. Specifically, it was predicted that caregivers with higher levels of perceived social support would be less emotionally reactive (i.e., less change in negative mood and happiness) in response to a stressor compared to caregivers with lower levels of perceived social support. Second, it was hypothesized that changes in situational control would mediate the beneficial effects of perceived support on stress-induced mood responses.

Some researchers have argued that the relationship between perceived support and psychological well-being may be confounded by individual tendencies to respond in a socially acceptable or defensive manner (e.g., admit or deny negative information in a defensive manner; Gottlieb, 1981). Thus, it may be possible that the relationships between perceived support, situational control, and stress-induced mood changes in caregivers could be influenced by social desirability response tendencies. To examine if this form of response bias influenced perceived support and situational control levels, a measure of social desirability/defensiveness was included in the present study.

METHODS

Participants

Data for the current investigation came from the baseline assessment of individuals participating in the Teaching Healthy Lifestyles to Caregivers (TLC) study, a randomized controlled trial examining the effectiveness of health promotion interventions for women caregivers (King et al., 1999; Wilcox & King, 1999). Participants were recruited from several counties in northern California. Participants were recruited in a number of ways, including newspaper and radio advertisements, posters placed on public transportation, notices sent to Alzheimer’s disease and other caregiver organizations, and newspaper articles describing the research project.

A total of 594 women were screened for participation. Baseline eligibility criteria specified that the participant must: (a) be a woman, in light of the fact that the vast majority of family caregivers are women (Stone, Cafferata, & Sangl, 1987); (b) provide care to a family member or friend diagnosed with some form of dementia, as documented by the care recipient’s physician, in the caregiver’s home; (c) be 50 years of age or older, (d) not be participating in a regular program of physical activity (defined as three or more times per week of exercise lasting 20 min or more per session over the past 6 months); (e) be free of cardiovascular disease or physical limitations that would hinder participation in light to moderate intensity exercise; (f) be stable on all medications for at least 3 months prior to study entry; (g) agree to visit the outpatient clinic at Stanford University for two health assessments; and (h) not have plans to move from the study area during the next year. Of the individuals screened for eligibility, 83% (n = 494) were ineligible for participation or did not wish to participate. The primary reasons for ineligibility were not interested (25%), too active (12%), not providing care to someone with dementia (18%), and not in the target age range (5%).

One hundred caregivers were assessed at baseline. Participants were scheduled for morning clinic health assessments, during which they were interviewed about their caregiving experience and asked to complete a number of questionnaires. Participants left the clinic after the morning assessment (typically around 1:00 p.m.) and were subsequently asked to record their current mood states while engaging in typical activities in their natural environments (e.g., home, work). They recorded their current moods (e.g., upset, anger, happiness) and level of control over their situation on an hourly basis using a light-weight (440 g), pocket computer diary (Casio PB-1000, Casio Corporation, Tokyo, Japan) until they retired for the night. In addition, the pocket computer asked whether the caregiver experienced a “stressful interaction” during the past hour and with whom (e.g., care recipient, other family, friends). Caregivers were also asked to indicate whether they experienced any “other stressful event” during the past hour. The pocket computer further asked whether caregivers experienced a “positive or uplifting interaction” during the past hour and with whom (e.g., care recipient, other family, friends). The pocket computer was programmed to automatically inform the participant each hour, via a series of auditory beeps, that it was time to complete the diary. The PB-1000 has been found to be an accurate and reliable method of obtaining momentary psychological information in the natural environment (detailed description of the Casio PB-1000 provided by King, Oka, & Young, 1994).

Eighteen of the participants were excluded from analyses because of missing computer diary or questionnaire data. Sixteen additional participants were excluded because they did not report a stressor during the recorded day. Of those who reported experiencing a stressor during the day, 17 participants lacked computer diary data during the hour before the stressor. Because of the prospective nature of this study, these participants were excluded from analyses. Thus, the effective sample size for the present study was N = 49.

MEASURES

Social Support

We assessed perceived social support using the Interpersonal Support Evaluation List (ISEL; S. Cohen & Hoberman, 1983). The ISEL is a 40-item scale that asks participants to indicate whether each statement (e.g., “I am closer to my friends than most other people”) is “probably true” or “probably false” about themselves. The ISEL has been shown to possess adequate reliability and validity (Brookings & Bolton, 1988; S. Cohen, Mermelstein, Kamarack, & Hoberman, 1985). All of the scale items were aggregated to form a general or global perceived social support index. The alpha coefficient for the ISEL in the present sample was .93. Scores on the
ISEL could range from 0 to 40, with higher scores reflecting greater perceived social support. The average perceived support score in the present sample was 27.0 ($SD = 8.7$, range = 6–38). In comparison, prior studies have reported average levels of perceived support in the general population to range from approximately 32 to 38 (S. Cohen et al., 1985; Oka, King, & Young, 1995).

**Situational Control**

We assessed a sense of control over the situation (situational control) using the pocket-sized computer diary described earlier (King et al., 1994). At the beginning of each hour, participants were asked to rate on a 10-point scale (1 = "low" to 10 = "high") the amount of control they felt over their current situation. Higher scores indicated greater situational control. We examined the caregiver's level of situational control ratings at the hour before the stressor (pre-stressor or T1) and at the hour after the stressor (post-stressor or T2). The average pre-stressor (T1) and post-stressor (T2) situational control scores were 7.3 ($SD = 2.9$, range = 1–10) and 5.0 ($SD = 3.3$, range = 1–10), respectively. We calculated change in situational control by regressing pre-stressor (T1) from post-stressor (T2) situational control scores to produce residualized change scores (J. Cohen & Cohen, 1983).

**Mood**

We assessed current mood states hourly using the pocket-sized computer diary described earlier. Similar to prior research measuring mood in situ (Marco & Suls, 1993), we limited the number of items to reduce the time and effort needed to complete multiple ratings across the day. At the beginning of each hour, participants were asked to rate on a 10-point scale (1 = "none" to 10 = "extreme") their current level of "emotional upset," "anger," "tension/anxiety," "happiness," and "sadness." These computer-assessed items have been found to be sensitive to change across the day in similar caregiver samples (King et al., 1994).

Prior research has indicated that happiness and sadness represent a unidimensional bipolar construct that is conceptually distinct from negative mood and/or affect (Green & Salovey, 1999; Tellegen et al., 1999). As few studies examining mood have focused on caregivers, we examined the structure of mood in the present caregiving sample by conducting two principal components factor analyses using varimax rotation. We conducted one factor analysis on the pre-stressor (T1) mood items and a second factor analysis on the post-stressor (T2) mood items. For the pre-stressor (T1) mood items, two factors emerged. Upset, anger, and tension/anxiety loaded most strongly on one factor to represent negative mood (.81, .69, and .86, respectively). Happiness loaded most strongly on the second factor to represent pleasant mood (.86). Sadness loaded most strongly on the factor representing negative mood (.69), but also loaded moderately on the factor representing pleasant mood (.44). For the post-stressor (T2) mood items, two factors also emerged. Upset, anger, and tension/anxiety loaded distinctly on a single factor to represent negative mood (.94, .92, and .88, respectively). Happiness and sadness loaded distinctly on the second factor to represent pleasant–unpleasant mood (.87 and -.76, respectively).

Thus, we constructed two negative mood scales to assess the caregiver's negative moods. First, we aggregated the upset, anger, and tension/anxiety pre-stressor items into one scale, reflecting negative mood at the hour before a stressor (T1). Second, we aggregated the upset, anger, and tension/anxiety post-stressor items into another scale, reflecting negative mood at the hour after a stressor (T2). The alpha coefficients for the pre-stressor (T1) and post-stressor (T2) negative mood scales were adequate, .80 and .93, respectively. Scores for each hourly negative mood scale could range from 3 to 30, with higher scores indicating greater negative mood. The average pre-stressor (T1) and post-stressor (T2) negative mood scores were 5.4 ($SD = 3.6$, range = 3–18) and 10.5 ($SD = 6.8$, range = 3–23), respectively.

As the factor analyses indicated that only the happiness items (T1 and T2) were each clearly distinct from the negative mood factor, only the happiness items were used to represent happiness and/or pleasant mood. Correlational analyses further revealed that the pre-stressor (T1) happiness and sadness items were unrelated ($r = .01$), whereas the post-stressor happiness and sadness items were only moderately correlated ($r = -.39$). (Given that the sadness item loaded strongly on the negative mood factor at Time 1, we conducted another set of analyses, not shown, in which we included the sadness items [T1 & T2] in the negative mood scales [T1 & T2]. Given that the pattern of results was identical to the results presented with the sadness items excluded from the negative mood scales, only the original analyses are presented). Thus, scores for pre-stressor (T1) and post-stressor (T2) happiness could range from 1 to 10, with higher scores indicating greater happiness. The average pre-stressor (T1) and post-stressor (T2) happiness scores were 4.9 ($SD = 2.6$, range = 1–10) and 3.9 ($SD = 2.7$, range = 1–10), respectively.

We calculated change in mood scores by regressing pre-stressor mood scores from post-stressor mood scores to produce residualized change scores (J. Cohen & Cohen, 1983). Specifically, we regressed pre-stressor negative mood (T1) from post-stressor negative mood (T2). Similarly, we regressed pre-stressor happiness (T1) from post-stressor happiness (T2).

**Social Desirability and/or Defensiveness**

We assessed social desirability/defensiveness using the Marlowe-Crowne Social Desirability Scale (M-C SDS; Crowne & Marlowe, 1960). This 33-item scale asks participants to indicate whether each item (e.g., “I have never intensely disliked anyone.”) was “true” or “false.” The KR20 reliability coefficient for this scale in the present sample was .89. Scores on this scale can range from 0 to 33 with higher scores reflecting greater social desirability or defensive response patterns. The average score on this scale was 18.6 ($SD = 5.9$, range = 6–30).

**Analysis Plan**

In the present study we used a microanalytic, prospective strategy to test the study hypotheses. Specifically, we examined psychological states (i.e., control and mood) at the hours before and after a stressor occurring in the participants’ natural environments. Although some participants re-
ported a stressor (i.e., stressful interaction or other stressful event) on more than one hourly assessment, we gave priority to the first stressor in which there was an absence of any stressor in the preceding hour. Thus, we assessed change in psychological states (i.e., control and mood) for each participant around a single stressor occurring in the caregiver's natural environment. We assessed perceived social support and social desirability/defensiveness at one point in time, on the basis of observations that these cognitive constructs are moderately stable (S. Cohen & Matthews, 1987; Crowne & Marlowe, 1964; Sarason et al., 1986, 1990) and, subsequently, were not expected to change over this brief time period. We conducted correlational analyses to examine the bivariate relationship between the study variables. Moreover, we examined also the bivariate relationships between social desirability/defensiveness and each of the other study measures to determine whether social desirability/defensiveness should be included as a covariate.

Concerning the first hypothesis (i.e., stress-buffering), different analytical stress-buffering models have been previously discussed (cf. Baron & Kenny, 1986; S. Cohen & McKay, 1984; Wheaton, 1985), with the interaction (or moderation) model most commonly used in past studies. Although different analytic models have been proposed, theorists have shared a common conceptualization of stress-buffering as a process by which a particular factor reduces or mitigates the impact of a stressor or stressful event on an outcome (e.g., psychological well-being; S. Cohen & McKay, 1984; Kobasa & Puccetti, 1983; Wheaton, 1985). Based on this conceptual definition of stress-buffering, we suggest that an analytic strategy with prospective data could be used to examine how a stable factor and/or characteristic (e.g., perceived support) influences the emotional response to a stressor over time by assessing the change in mood from before to after a stressor. Specifically, if individuals with higher levels of a stable factor (e.g., perceived support) responded (i.e., change in emotional reaction) less intensely to a stressor than those with lower levels of the factor, evidence would be provided that the impact of the stressor on mood was dampened (i.e., reduced) by the holding of higher levels of the stable factor. Employing this strategy, we regressed stress-induced changes in mood (i.e., residualized negative mood and happiness) on perceived social support to examine the hypothesis that perceived social support would buffer the impact of stress on mood responses over time.

We used path analyses, using ordinary least squares regression analyses, to test the second hypothesis (mediation). We tested mediation effects using the four conditions specified by Baron and Kenny (1986) and Kenny, Kashy, and Bolger (1998). The first condition specifies that the predictor variable (i.e., social support) should be significantly associated with the outcome variable (i.e., residualized change mood scores). The second condition specifies that the predictor variable (i.e., social support) should be significantly associated with the mediator (i.e., residualized change situational control scores). The third condition specifies that the mediator should be significantly related to the outcome variable when the predictor variable is held constant. The fourth condition specifies that the relationship between the predictor and outcome variables should be zero, when the effects of the mediator on the outcome variable are held constant. If the first three conditions are met and the relationship between the predictor and outcome variable is not zero, but is substantially reduced when the effects of the mediator are held constant, then partial mediation is indicated. We used two sets of path analyses, one for each outcome variable (i.e., negative mood and happiness).

RESULTS

The participants whom we included in the analyses (n = 49) did not differ from those whom we excluded from analyses (n = 51) in: perceived social support (M: 28.4 vs. 27.0, respectively; p = .42); age (M: 61.8 vs. 63.6, respectively; p = .34); number of years of education (M: 15.3 vs. 14.8, respectively; p = .31); proportion of Alzheimer’s disease patients (M: 0.6 vs. 0.7, respectively; p = .07); number of hours per week providing care (M: 70.5 vs. 73.1, respectively; p = .79); number of years providing care (M: 4.9 vs. 4.5, respectively; p = .61); nor level of depressive symptoms (M: 13.1 vs. 11.2, respectively; p = .17; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). However, participants whom we included differed from those whom we excluded by having higher annual incomes (M: $60,807.37 vs. $39,053.63, respectively; p < .007). Among those included, 51% reported either a stressful interaction with the caregiver or both a stressful interaction with the care recipient and an “other stressful event”; 27% reported either a stressful interaction with someone other than the care recipient (e.g., other family member) or both a stressful interaction with others and an “other stressful event”; and 22% reported experiencing only an “other stressful event.”

Table 1 displays the demographics of the present sample. The average age of participants was about 62 years. More

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<th>Characteristic</th>
<th>Mean (SD) or %</th>
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<tbody>
<tr>
<td>Age</td>
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<tr>
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<tr>
<td>Hours Providing Care</td>
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<tr>
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<td>Other type of relative</td>
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than four fifths of the sample was married. Most participants were White (93.9%). On average, participants had approximately 15 years of education and an annual household income greater than $60,000. Participants had been providing assistance to the care recipient for approximately 5 years and spent about 70 hours per week assisting the care recipient, on average. The mean age of the care recipient was approximately 80 years. With respect to activities of daily living (ADLs), more than three fourths (77.6%) of the care recipients required assistance with personal care and greater than 90% needed help with shopping, food preparation, housekeeping, laundry, transportation, finances, or supervision of medication.

Table 2 displays the bivariate correlations between each of the study variables. The pre-stressor situational control and happiness measures (T1) were significantly and positively correlated with their respective post-stressor measures (T2). Pre-stressor negative mood (T1) was not significantly related to post-stressor negative mood (T2). The negative and positive mood measures were not significantly correlated before a stressor (T1). However, greater negative mood was mildly related to lower levels of happiness after a stressor (T2) ($r = -0.28$, $p \leq .05$). Social desirability/defensiveness was not significantly correlated to any of the study measures and was therefore not included in the analyses.

A t test for dependent samples indicated that participants reported higher levels of negative mood after a stressor (T2), compared to their negative mood levels before a stressor (T1), $t = 5.10$, $p \leq .001$. In addition, participants reported lower levels of happiness after a stressor (T2), compared to their happiness levels before a stressor (T1), $t = -3.15$, $p \leq .005$. Ratings for situational control were also lower after a stressor (T2), compared to control levels before a stressor (T1), $t = -4.99$, $p \leq .001$. These findings suggest that, in general, participants were emotionally and cognitively reactive to a stressor occurring in their natural environments.

**Social Support, Control, and Mood**

Results of the regression analyses examining the study hypotheses are presented in Table 3. For analyses focused on negative mood, results provided some evidence for the study predictions. Consistent with the first hypothesis (i.e., stress-buffering), perceived social support was significantly and inversely associated with change in negative mood after a stressor (Model 1). Caregivers with lower levels of perceived support reported smaller increases in control, whereas those with higher levels of perceived support reported greater increases in control. Furthermore, the significant relationship between perceived support and change in negative mood after perceived support was held constant ($\beta = -.36$, $p \leq .01$; Model 1) was reduced to nonsignificance after change in situational control was held constant ($\beta = -.27$; Model 3). Finally, change in situational control was significantly and inversely related to change in negative mood after perceived support was held constant ($\beta = -.33$, $p \leq .05$; Model 3). Although the relationship between perceived support and negative mood was not zero, but reduced ($\beta = -.36$ to $\beta = -.27$). Therefore, these results provide evidence that change in situational control served as a partial mediator between perceived support and change in negative mood (Baron & Kenny, 1986).

This partial mediation effect of situational control is further illustrated in Figure 1. For descriptive purposes, a median split procedure was used to define those with low versus high perceived social support. Moreover, participants with positive residualized situational control scores were classified as individuals with increased control, whereas those with negative residualized situational control scores were classified as individuals with decreased control. As shown in Figure 1, participants with low levels of perceived support and decreased control (33% of the sample) displayed the greatest increase in negative mood in response to a stressor. Comparatively, participants with high levels of perceived support and increased control (27% of the sample) displayed the smallest increase in negative mood in response to a stressor. Participants with low support and increased control (22% of the sample) and high support and decreased control (18% of the sample) had intermittent increases in negative mood.

For analyses focused on happiness, we failed to find evidence for the study hypotheses (see Table 3). Perceived sup-

### Table 2. Bivariate Correlations for the Study Measures ($N = 49$)

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<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Perceived social support</td>
<td>—</td>
<td>—</td>
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<td>—</td>
<td>—</td>
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<td>—</td>
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<tr>
<td>(2) Situational control (T1)</td>
<td>.03</td>
<td>—</td>
<td>—</td>
<td>—</td>
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<td>—</td>
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<tr>
<td>(3) Situation control (T2)</td>
<td>.28*</td>
<td>.47***</td>
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<td>—</td>
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<tr>
<td>(4) Negative mood (T1)</td>
<td>-.01</td>
<td>-.42***</td>
<td>-.11</td>
<td>—</td>
<td>—</td>
<td>—</td>
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<tr>
<td>(5) Negative mood (T2)</td>
<td>-.35**</td>
<td>-.04</td>
<td>-.36**</td>
<td>.19</td>
<td>—</td>
<td>—</td>
<td>—</td>
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<tr>
<td>(6) Happiness (T1)</td>
<td>.26</td>
<td>.14</td>
<td>.13</td>
<td>-.26</td>
<td>-.02</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>(7) Happiness (T2)</td>
<td>.28*</td>
<td>.33*</td>
<td>.32*</td>
<td>-.25</td>
<td>-.28*</td>
<td>.70****</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>(8) Social desirability</td>
<td>.16</td>
<td>.00</td>
<td>-.14</td>
<td>-.07</td>
<td>.06</td>
<td>.12</td>
<td>.5</td>
<td>—</td>
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</tbody>
</table>

*Note:* T1 = Time 1 (Pre-stressor); T2 = (Post-stressor).

*p $\leq .05$; **p $\leq .01$; ***p $\leq .005$; ****p $\leq .001$. 

The present study used a prospective, microanalytic design to investigate whether a sense of control over the situation mediated the effects of perceived social support on caregiver's stress-induced mood states. Results indicated that while a stressor occurring in the natural environment of caregivers decreased emotional well-being (i.e., mood states), the detrimental impact of a stressor on some aspects of mood was reduced by believing that support from others would be available if needed. Moreover, study results provide evidence that situational control served as a psychological mechanism that partially explained the beneficial effects of perceived support on stress-induced mood states. Results from the present study further suggest that the effects of perceived support and situational control are not simply explained by caregivers' tendencies to respond in a socially acceptable or defensive manner (i.e., social desirability or defensiveness) or by engaging in positive interactions with others after a stressor (i.e., social support mobilization).

The present investigation drew from several theoretical
perspectives on social support, stress, and control to propose situational control as a mediator linking perceived support and psychological well-being among caregivers. Some theorists have argued that stressors can erode personal control and, in turn, increase psychological distress (Pearlin, Menaghan, Lieberman, & Mullan, 1981). Consistent with this proposal, results from the present study show that control beliefs generally decreased after a stressor. However, social support theorists have suggested that believing that support will be available if needed (i.e., perceived social support) can act as a buffer of the negative effects of stress on psychological well-being (Barrera, 1986; S. Cohen & Wills, 1985; Dunkel-Schetter & Bennett, 1990; Kessler, Price, et al., 1985; Thoits, 1995; Vaux, 1988). Finally, theorists integrating these two perspectives have suggested that perceived support may protect individuals from the detrimental effects of stress by bolstering or sustaining control beliefs within the context of stressful situations (Krause, 1997; Thoits, 1995).

In the current investigation, we found evidence for the stress-buffering effects of perceived support and the mediating effects of situational control primarily in analyses focused on the negative mood of caregivers. The results indicated that the occurrence of a stressor produced an increase in negative mood in caregivers, a finding consistent with the general literature on stress experienced in the natural environment (Bolger et al., 1989; Marco & Suls, 1993). Consistent with predictions, findings also indicated that believing that support would be available if needed reduced (i.e., buffered) the otherwise deleterious impact of stress on the negative mood of caregivers. Caregivers with higher levels of perceived support were less emotionally reactive to a stressor occurring in their natural environments compared to caregivers with lower levels of perceived support. As predicted, in the present study we further found that changes in situational control partially mediated the stress-buffering effects of perceived support on negative mood. Most caregivers with greater perceived support had sustained or increased situational control beliefs after a stressor, while most caregivers with lower perceived support had decreased situational control. These changes in situational control, in turn, inversely influenced stress-induced changes in negative mood. Taken together, these prospective findings are consistent with prior cross-sectional and longitudinal studies that have investigated control, typically assessed at one point in time, as a mediator of perceived support and well-being among individuals without older adult caregiving responsibilities (Bisconti & Bergeman, 1999; Cutrona & Troutman, 1986; Major et al., 1990). The present study extends these prior studies by demonstrating that the relationship between generalized perceptions of support and emotional reactivity to a stressor (i.e., change in negative mood) may be explained, in part, by changes in the sense of control caregivers hold concerning a stressful situation at hand.

As researchers have encouraged more empirical studies on positive aspects of psychological well-being (e.g., Seligman & Csikszentmihalyi, 2000), we also examined the effects of perceived support and situational control on the happiness and/or pleasant moods of caregivers. In contrast to negative mood, results failed to provide evidence for stress-buffering effects of perceived support or mediating effects of situational control on happiness. Overall, caregivers reported significantly lower levels of happiness after a stressor compared to their levels of happiness before a stressor. However, perceived support was not significantly related to these stress-induced changes in happiness. In addition, situational control was not related to change in happiness after holding perceived support constant, a finding inconsistent with the mediation hypothesis.

One possible explanation for the significant effects that occurred in analyses that focused on negative mood, but not in analyses that focused on happiness, may be that happiness is more stable than negative mood over time. In the present study, happiness levels before a stressor were strongly correlated (r = .70) with happiness levels after a stressor. In contrast, negative mood levels before a stressor were not significantly related to negative mood levels after a stressor (r = .19). Thus, stress-induced changes in happiness may be primarily determined by initial levels of happiness, whereas changes in negative mood may be determined by other factors, such as social support and situational control. It is also possible that the failure to detect effects in analyses that focused on happiness may be due to psychometric issues (e.g., scale reliability) concerning the single item measure of happiness used in the present study. We limited the number of items assessing mood and its specific dimensions to reduce the time and effort (i.e., subject burden) needed to complete the hourly logging reports. Future research should employ fuller measures of happiness in which more items assessing the construct are included so that the psychometric properties of the measure can be better ascertained.

The present study has several limitations. The principal limitations concern the size and representativeness of the caregiver sample examined in the present study. Although participants included in analyses were not significantly different from those excluded from analyses on a host of variables (i.e., perceived social support, age, education, proportion of Alzheimer’s disease patients, hours providing care, years providing care, and depressive symptoms), the overall sample still represents caregivers who volunteered for the study and may not be a representative sample of persons providing care to older adults. Therefore, the generalizability of the present findings to caregivers of persons with dementia at large remains unclear. In addition, the relatively small number of participants in the present study may also limit the generalizability of the study conclusions and reduces the confidence of the study findings. Although a number of statistically significant effects were detected, the results require replication to better determine their robustness. Replication of the present study using a larger, more representative sample of those caring for persons with dementia is needed. Larger sample sizes may also help to clarify the veridicality of the nonsignificant findings concerning happiness in the present study.

Another limitation of the present study pertains to the generalizability of its findings to caregivers with different characteristics than those assessed in the present study. This study focused specifically on the experiences of caregivers of dementia patients, who have been shown in prior re-
search to experience significant amounts of stress and psychological distress (Clipp & George, 1993; Schulz & Williamson, 1991). Yet, it is unclear whether the findings would extend to caregivers who assist older adults with other types of illnesses or disabilities. Moreover, as participants in the present study were women, middle to upper-middle class, and primarily White, it remains unclear whether the study findings will generalize to caregivers with different socioeconomic and/or demographic backgrounds (e.g., men caregivers, ethnic minority caregivers). Past research has suggested that women generally report more exposure to stress (Davis, Matthews, & Twamley, 1999; Kessler, McLeod, & Wethington, 1985; Nolen-Hoeksema, Larson, & Grayson, 1999), appraise undesirable effects as more stressful (Davis et al., 1999), believe that they have less personal control or mastery (Nolen-Hoeksema et al., 1999), and report greater psychological distress (Davis et al., 1999; Kessler, McLeod, et al., 1985; Mirowsky & Ross, 1995; Nolen-Hoeksema et al., 1999) compared to men. Moreover, the limited research on ethnic minority caregivers suggests that minority caregivers may experience less stress, greater control beliefs about caregiving situations, and/or better psychological well-being (Aranda & Knight, 1997; Connell & Gibson, 1997) compared to nonminority caregivers. Given these initial gender and ethnic minority differences found in past research and the limited amount of research on ethnic minorities, caution must also be taken concerning the generalizability of the conclusions that can be drawn to these groups. Additional research with individuals from diverse backgrounds is indicated.

A further limitation of the present study concerns the proposed temporal order of the study variables. Although situational control and mood were examined prospectively (i.e., before and after a stressor), the causal relationship between changes in control and changes in mood cannot be definitively ascertained with the present design. Rather than the causal order proposed, it is possible that stress-induced changes in mood may have produced changes in appraisals of control (Schulz & Heckhausen, 1997). However, consistent with the causal order proposed in the present study and theoretical models of perceived support mechanisms (Krause, 1997; Thoits, 1995), prior research has found that control beliefs can predict later psychological well-being (Major et al., 1990). The present study further conceptualized perceived support as a moderately stable, generalized cognitive appraisal of support availability, on the basis of prior theoretical and empirical social support research (S. Cohen & Matthews, 1987; Sarason et al., 1986, 1990). As the stability of perceived support over brief time periods was not assessed in the present study, it may be possible that general perceptions of support may be affected by the occurrence of a stressor. However, previous research using the same measure (i.e., ISEL) in a community sample has found it to be very stable (r = .97, two day; r = .74, 6-month; S. Cohen et al., 1985). Further prospective or experimental research in which perceived support, control, stress, and psychological well-being are each assessed over multiple time periods would help to delineate the causal order of these constructs.

The present study further cannot discern the nature of the stressor experienced. Because of subject burden issues in completing the hourly logging reports, we did not assess the specific types of stressful events (e.g., argument with care recipient, personal injury, financial problems, etc.). In addition, we did not measure the frequency (e.g., rare vs. reoccurring), severity (e.g., moderate vs. severe), and chronicity (e.g., acute vs. chronic) of the stressors. Thus, it is unclear which particular type of stressor(s) contributed most to diminished psychological well-being or which specific kind of stressor was most influenced by perceived support and control. Assessing characteristics (e.g., chronicity) of stressors occurring in the natural environment in future research may facilitate greater specificity regarding when perceived support and control most effectively protect psychological well-being. In addition, it may be instructive for future research to examine the study constructs (i.e., social support, situation control, stress, and mood) within the context of other individual difference variables (e.g., neuroticism, extraversion; Bolger & Zuckerman, 1995).

Notwithstanding these limitations, the present study extends the gerontology and social support literatures by being one of the first to provide prospective evidence that situational control can mediate the stress-reducing effects of perceived support on psychological distress among caregivers. As situational control served as a partial mediator of the relationship between perceived support and psychological distress, investigation of alternative mediating factors should also be explored. The present study also provides ecological evidence that stress and situational control experienced in the natural environments of caregivers can influence their psychological distress. As caregivers of dementia patients are vulnerable to the experience of significant stress and poorer psychological well-being (Clipp & George, 1993; G. Schulz & Williamson, 1991), identification of health protective factors, such as perceived support, and their mediating processes or mechanisms can help to guide interventions that reduce psychological distress and/or preserve psychological well-being in vulnerable individuals. The potential health benefits of perceived support warrant future research investigating the development and enhancement of social support perceptions, particularly among family caregivers of dementia patients.

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References


Editor Nominations

Journal of Gerontology: Biological Sciences

The Gerontological Society of America’s Publications Committee is seeking nominations for the position of Editor of the Journal of Gerontology: Biological Sciences.

The position will become effective January 1, 2002. The Editor makes appointments to the journal’s editorial board and develops policies in accordance with the scope statement prepared by the Publications Committee and approved by Council (see the journal’s masthead page). The Editor works with reviewers and has the final responsibility for the acceptance of articles for his/her journal. The editorship is a voluntary position. Candidates must be dedicated to developing a premier scientific journal.

Nominations and applications may be made by self or others, but must be accompanied by the candidate’s curriculum vitae and a statement of willingness to accept the position. All nominations and applications must be received by May 1, 2001. Nominations and applications should be sent to the GSA Publications Committee, Attn: Jennifer Campi, The Gerontological Society of America, 1030 15th Street, NW, Suite 250, Washington, DC 20005-1503.

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