



Published in final edited form as:

Pers Relatsh. 2004 March ; 11(1): 23–40.

Stress-buffering or stress-exacerbation? Social support and social undermining as moderators of the relationship between perceived stress and depressive symptoms among married people

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Abstract

This prospective panel study examined social support and social undermining from the spouse as moderators of the relationship between perceived stress and depressive symptoms. Participants were 181 married people who completed questionnaires at two points in time. The interval between time 1 (T1) and time 2 (T2) was approximately 6 weeks. Multiple regression analysis showed that T1 perceived stress and T1 spouse undermining, but not T1 spouse support, predicted increases in depressive symptoms from T1 to T2. T1 spouse undermining, but not T1 spouse support, moderated the association between T1 perceived stress and T2 depressive symptoms. These findings supported a stress-exacerbation hypothesis for the effect of spouse undermining on the stress process. Discussion focuses on possible mechanisms for the stress-exacerbation effect.

Do social relationships necessarily protect us from stress, or can they exacerbate the effects of stress on depressive symptoms? To date, research on stress-buffering effects of social support has focused on the positive aspects of social relationships (Cohen, Gottlieb, & Underwood, 2000; Cohen & Wills, 1985). This article takes an approach that recognizes the potential importance of negative aspects of social relationships, or what Vinokur, Price, and Caplan (1996) refer to as *social undermining*, in the relationship between stress and depressive symptoms. Specifically, in a panel study of married people, both social support (defined here as emotional support received by the participant from the spouse) and social undermining (defined here as negative behaviors initiated by the spouse that are directed toward the participant) were examined as potential moderators of the association between perceived stress and depressive symptoms.

Social support and social undermining

In recent years, researchers have supplemented work on the benefits of social support by focusing on the adaptational significance of the negative aspects of social relationships. Vinokur and van Ryn (1993) defined social undermining as “behaviors directed toward the target person that display (a) negative affect (anger or dislike), (b) negative evaluations of the person in terms of his or her attributes, actions, and efforts (criticism), and (c) behaviors that make difficult or hinder the attainment of instrumental goals” (p. 350).¹ In this article, the focus

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¹Finch, Okun, Pool, and Ruehlman (1999) noted that several terms have been used to describe the negative aspects of relationships, including *social strain*, *social hindrance*, *social conflict*, and *social undermining* (see, e.g., Rook, 1984; Rook & Pietromonaco, 1987; Ruehlman & Karoly, 1991).

is on the social undermining construct as defined by Vinokur and van Ryn (also see Finch, 1998; Suls, 1982; Vinokur et al., 1996; Vinokur & Vinokur-Kaplan, 1990).

One of the earliest studies comparing the effects of social support and undermining was conducted by Rook (1984), who asked a sample of 115 elderly widowed women about the supportive and problematic others in their social networks. Rook (1984) found that the range of problems caused by others in the social network predicted lower psychological well-being, but the range of supportive functions performed by others was not associated with well-being. Rook (1984) also found that the sheer number of problematic others in the social network predicted lower well-being, but the number of supportive others did not predict well-being. In contrast, Rook's results showed that frequency of socializing predicted higher well-being, but frequency of interaction with problematic others did not predict well-being. Overall, the pattern of results supported the hypothesis that "negative social interactions have more potent effects on well-being than positive interactions" (Rook, 1984, p. 1106).

Stimulated by Rook's (1984) finding that social undermining generally appeared to have a stronger association with psychological well-being than did social support, subsequent work further explored this *negativity effect*. Some studies have replicated this negativity effect. For example, Horwitz, McLaughlin, and White (1998) examined associations among support, undermining, and depressive symptoms in a sample of young married adults (ranging in age from 25 to 31 years). Social support from the spouse was assessed with items asking about emotional and practical support. A measure of social undermining included items asking respondents how often they and their spouses disagreed with each other, got angry with each other, and got on each other's nerves. Horwitz et al. (1998) found that support and undermining have independent effects on depressive symptoms, but the effect for spouse undermining was almost twice as large as the effect for spouse support. Manne, Taylor, Dougherty, and Kemeny (1997) studied social support, social undermining, and psychological adjustment in a sample of 158 married cancer patients (M age=55.8). Participants were asked about their spouse's (a) emotional and instrumental support behaviors, and (b) withdrawal/avoidant and overtly critical behaviors. Manne et al. (1997) found that withdrawal/avoidant and overtly critical spouse behaviors had stronger correlations with psychological distress than did the measure of spouse supportive behaviors. Other studies, however, have failed to find evidence for the negativity effect (e.g., Druley & Townsend, 1998; Lepore, 1992; Okun & Keith, 1998). A recent meta-analytic review concluded that the main effects of social support and undermining on psychological distress are comparable in magnitude; however, effect sizes appear to vary as a function of how support and undermining are assessed (Finch, Okun, Pool, & Ruehlman, 1999).

Research on social support and social undermining has recently turned from examination of their main effects to focus on their possible interactions. Studies of the interactive effects of social support and social undermining fall into one of two groups. The first group of studies conceptualizes social undermining as a stressor in its own right and examines social support as a moderator of the effects of social undermining. Walen and Lachman (2000) referred to this as the *joint effects hypothesis* (see Okun & Keith, 1998, for a review). The second group of studies conceptualizes social undermining and social support as moderators of the effects of various stressors, and simultaneously assesses *stress-buffering* and *stress-exacerbation* hypotheses. The stress-buffering hypothesis holds that the effect of stress on depressive symptoms is weaker among those with high levels of support (Cohen & Wills, 1985). The stress-exacerbation hypothesis holds that the effect of stress on depressive symptoms is stronger among those with high levels of undermining (Rook, 1998). Studies in each group are reviewed below.

The joint effects hypothesis—Some studies testing the joint effects hypothesis have found that social support moderates the association between social undermining and psychological distress. For example, Lepore (1992) assessed support and conflict from roommates and friends in a student sample and found that (a) conflict with roommates predicted subsequent distress among those with low levels of support from friends, and (b) conflict with friends predicted subsequent distress among those reporting low support from roommates. Conceptually similar findings were reported by Revenson, Schiaffino, Majerovitz, and Gibofsky (1991), who found that a measure of “problematic support” concurrently predicted depressive symptoms among those with lower levels of “positive support.” In other studies, however, this interaction effect did not emerge (Manne et al., 1997; Rook, 1984), or was observed only for specific providers (Schuster, Kessler, & Aseltine, 1990; Walen & Lachman, 2000), specific subgroups of participants (Okun & Keith, 1998), or specific types of support (Rhodes & Woods, 1995).

Research on the joint effects hypothesis has also shown that the nature of the interaction between support and undermining sometimes takes different forms. For example, some studies have found that the effects of undermining on distress are stronger among those reporting *high* levels of support (e.g., Major, Zubek, Cooper, Cozzarelli, & Richards, 1997; Pagel, Erdly, & Becker, 1987). This pattern of results was observed by Major et al. when the source of support and undermining was the participant's mother or close friend, but not when the source was the participant's partner. Major et al. speculated that undermining in the context of an otherwise supportive relationship may be more salient, and therefore have a stronger effect on psychological distress because it is unexpected.

The stress-buffering and stress-exacerbation hypotheses—Studies testing the stress-buffering and stress-exacerbation hypotheses do not rule out the possibility that social undermining is a stressor, but they typically focus on social support and undermining as possible moderators of the relationship between some other stressor (e.g., life events, disease severity, etc.) and psychological adaptation. The utility of this approach is supported by research showing that social undermining and other stressors are independent predictors of psychological distress. For example, Lakey, Tardiff, and Drew (1994, study 1) found that social undermining predicted increases in depressed and anxious mood when stressful life events were statistically controlled. Similarly, Rhodes and Woods (1995) showed that social undermining and stressful life events were independent predictors of depressed mood.

Several studies using diverse measures of social relationships have simultaneously examined the stress-buffering and stress-exacerbation hypotheses. Sandler and Barrera (1984) found support for both hypotheses, whereas other studies have yielded evidence consistent with stress-buffering but not stress-exacerbation (Barrera, 1981; Okun, Melichar, & Hill, 1990). In contrast, another set of studies has produced results supporting stress-exacerbation but not stress-buffering (Fiore, Becker, & Coppel, 1983; Ingersoll-Dayton, Morgan, & Antonucci, 1997; Kiecolt-Glaser, Dyer, & Shuttlesworth, 1988; Rautkis, Koeske, & Tereshko, 1995; Rhodes, Ebert, & Myers, 1994). Finally, some studies have found no support for either the stress-buffering or stress-exacerbation hypotheses (Finch, Okun, Barrera, Zautra, & Reich, 1989; Revenson et al., 1991).

Taken as a whole, the available evidence appears to support the stress-exacerbation hypothesis. However, there is considerable variability in the results from these studies. One possible reason for this variability is that the studies reviewed above all assessed social support and social undermining from multiple providers (e.g., the total number of others in the social network who were identified by participants as sources of support and/or conflict; see Barrera, 1981; Finch et al., 1989; Ingersoll-Dayton et al., 1997; Rhodes et al., 1994). As noted by Major et al. (1997), support and undermining from the social network may be very different from support and undermining from a specific person. Additionally, studies that have simultaneously tested

the stress-buffering and stress-exacerbation hypotheses have all relied on cross-sectional designs. These issues are elaborated below.

Main and interactive effects of social support and social undermining from the spouse

The source of support (e.g., spouse versus close friend) is likely to influence the nature of the relationships between social support, social undermining, and adaptational outcomes.

Although sources of support and undermining may assume differential importance across various populations, there is reason to believe that support and undermining from the spouse are particularly important (Coyne & DeLongis, 1986). Compared to other relationships, the marital relationship is more exclusive and generally involves more frequent and emotionally intense interaction (Cutrona, 1996; Vinokur & Vinokur-Kaplan, 1990). Some researchers have suggested that “the intensity and importance of intimate relationships exacerbate the negative and demanding, as well as the positive and rewarding, side of human interaction” (Horwitz et al., 1998, p. 125). The high levels of interdependence that characterize the marital relationship may enhance the salience of the partner's behavior because of its implications for the target's outcomes (Berscheid, 1983), and this is especially apparent when the spouse engages in negative behavior (Vinokur & van Ryn, 1993). Indeed, research on married couples indicates that stable marriages are characterized by a 5 : 1 ratio of positive to negative behaviors during discussions of marital difficulties and daily events (Gottman, 1998). In contrast, unstable marriages are characterized by ratios of about 1 : 1 for positive to negative behaviors (Gottman, 1998).

Does the source of support influence the interactive effects of support and undermining? Some evidence indicates that social support from the spouse does not moderate the effects of social undermining from the spouse (Major et al., 1997; Schuster et al., 1990; Walen & Lachman, 2000). For example, Schuster et al. examined support and undermining across three sources: spouse, relatives, and friends. Support from relatives reduced the effect of undermining from relatives on psychological distress, but no evidence for the joint effects of support and undermining from the spouse or from friends was found. The study by Major et al. (1997) described earlier found that (a) support from mothers increased the effect of mothers' undermining on psychological distress and (b) support from a friend increased the effect of friends' undermining on psychological distress, yet no interaction was observed between support and undermining from the partner. Other studies assessing support and undermining from the spouse have also failed to observe an interaction effect (e.g., Manne et al., 1997; Walen & Lachman).

Nevertheless, there is evidence consistent with the joint effects hypothesis when the source is the spouse. Okun and Keith (1998) showed that the effects of spouse undermining on psychological distress decreased as support from the spouse increased, but this interaction effect was observed only among a subsample of younger adults. This interaction effect was not observed among a subsample of older adults, leading to the conjecture that interactions between spouse support and undermining may emerge only for certain subgroups (e.g., younger adults).

Are the stress-buffering and stress-exacerbation effects observed when the source of support and undermining is the spouse? There is little direct evidence bearing on this question, primarily because (a) many studies in this area use measures of social support and undermining that do not specify a source (e.g., Ingersoll-Dayton et al., 1997; Okun et al., 1990), and (b) among those studies that ask about spouse support and spouse undermining, the focus has been on the joint effects hypothesis (e.g., Major et al., 1997; Okun & Keith, 1998). Of those studies that have simultaneously examined social support and social undermining, none appear to have tested the stress-buffering and stress-exacerbation hypotheses with respect to the spouse.

Importance of longitudinal designs in studies of social relationships and adaptation

The need for longitudinal studies of social relationships and adaptation has been noted by several researchers (e.g., Finch & Zautra, 1992). Indeed, the social support literature has been criticized for its “overreliance” on cross-sectional designs (Finch & Zautra). Such designs are generally inconclusive with respect to the identification of causal relationships. Longitudinal designs are particularly useful in research on social relationships and adaptation because they allow for assessment of the causal direction of associations between positive and negative social interactions and psychological distress (Finch, 1998; Vinokur & van Ryn, 1993). Although longitudinal designs are not unambiguous in determining the direction of causality, they represent an improvement over cross-sectional designs in this respect. Further, the importance of longitudinal designs is underscored by evidence showing that main and joint effects of social support and undermining on depressive symptoms differ when assessed cross-sectionally and longitudinally (Pagel et al., 1987; Vinokur & van Ryn; cf. Finch).

Purpose of the present study

Research testing the stress-buffering and stress-exacerbation hypotheses has yielded conflicting findings. These inconsistent results may be due to the use of measures of support and undermining that do not specify a source. Studies of stress-buffering and stress-exacerbation have also been characterized by a reliance on cross-sectional designs. In the present study, an attempt was made to address these issues by (a) asking participants about support and undermining from the spouse, (b) testing the joint effects, stress-buffering, and stress-exacerbation hypotheses using a prospective panel design, and (c) examining these effects in a community sample of married people. Specifically, we tested the following hypotheses:

H1: *Consistent with the main effects hypothesis (Finch et al., 1999), it was hypothesized that spouse support would predict (a) lower levels of depressive symptoms at time 1 (T1) and (b) decreases in depressive symptoms from T1 to time 2 (T2). It was also hypothesized that spouse undermining would predict (c) higher levels of depressive symptoms at T1 and (d) increases in depressive symptoms from T1 to T2.*

H2: *Consistent with the joint effects hypothesis (Walen & Lachman, 2000), it was predicted that the effects of spouse undermining on (a) T1 depressive symptoms and (b) increases in depressive symptoms from T1 to T2 would be moderated by spouse support. Specifically, it was hypothesized that the cross-sectional and prospective effects of spouse undermining on depressive symptoms would decrease in magnitude as a function of increases in spouse support.*

H3: *Consistent with the stress-buffering hypothesis (Cohen & Wills, 1985), it was hypothesized that the effects of perceived stress on (a) T1 depressive symptoms and (b) increases in depressive symptoms from T1 to T2 would be moderated by spouse support. Specifically, it was hypothesized that the cross-sectional and prospective effects of perceived stress on depressive symptoms would decrease in magnitude as a function of spouse support.*

H4: *Consistent with the stress-exacerbation hypothesis (Rook, 1998), it was hypothesized that the effects of perceived stress on (a) T1 depressive symptoms and (b) increases in depressive symptoms from T1 to T2 would be moderated by spouse undermining. Specifically, it was hypothesized that the cross-sectional and prospective effects of perceived stress on depressive symptoms would increase in magnitude as a function of spouse undermining.*

Method

Sampling design

In this research, a Type D mixed-mode prospective panel design was utilized (Dillman & Tarnai, 1988). Mixed-mode surveys are those that use “two or more methods to collect data for a single data set” (Dillman & Tarnai, 1988, p. 511). Brief telephone interviews with systematically selected participants were conducted to determine eligibility and willingness to participate in the study. Those who indicated an interest in participating were then asked to complete two mail surveys at two points in time, approximately 1 month apart.

For this study, the target population was defined as all married people living in and around the city of Albany, New York, who reported having regular contact with at least one close friend. Data relevant to the close friend are not included in this report. The *sampling frame* of this research consisted of all households with working telephone numbers that were listed in the Bell Atlantic Telephone Directory for the Capital District (1999). From this directory, a *sampling pool* of 1,404 phone numbers was systematically selected using procedures suggested by Lavrakas (1993).

Procedure

For the telephone survey phase of this study, calls were made by undergraduate research assistants and the principal investigator. Interviewers were trained using procedures suggested by Lavrakas (1993). All potential participants in the sampling pool were called a minimum of two times if they could not be reached in the first call. Upon the initial telephone contact, potential participants were asked if they would be willing to complete a 2-minute telephone interview on the topic of “quality of life and marriage.” Those who met screening criteria (i.e., those who were married and who reported having regular contact with at least one close friend) were then informed about the larger study and asked if they would be interested in participating. Of the original 1,404 telephone numbers in the sampling pool, the status (i.e., working vs. nonworking) of 988 (70%) numbers was determined. Of these 988 numbers, 682 (69%) were for potentially eligible respondents. Of these 682 potentially eligible respondents, 369 (54%) eligible participants agreed to complete the telephone survey. Among those who completed the telephone survey, a total of 306 married people (83%) agreed to participate in the larger mail survey. Within two days after the telephone survey, questionnaires were mailed to these 306 potential participants. Of the 306 people who initially agreed by telephone to complete the mail surveys, 215 (70%) participants completed the T1 questionnaire.

Telephone follow-up calls were used in an attempt to maximize response rates for the mail surveys (Fowler, 1993). All nonrespondents were contacted by telephone two weeks after the initial mailing of the questionnaire. Those who indicated they had not yet received the questionnaire were asked to confirm that their mailing address was correct. New questionnaires were then sent to these potential participants. Those who indicated that they had received the questionnaire were thanked again for their cooperation. A second follow-up call was made to nonrespondents approximately two weeks after the first follow-up call. This procedure was used for the T1 and T2 questionnaires.

Participants were mailed a check for \$15.00 when their T1 questionnaires were received. T2 questionnaires were mailed out an average of 25 days after receipt of the T1 questionnaire. All measures in the T1 questionnaire were included in the T2 questionnaire. Among the 215 participants who returned the T1 questionnaire, 182 (85%, or 49% of the eligible sample) completed the T2 questionnaire. Data were analyzed from 181 of these participants.² A second check for \$15.00 was mailed to those participants who completed the T2 questionnaire. Although the study design called for a 1-month interval between the T1 and T2 questionnaires,

the average interval between receipt of the T1 and T2 questionnaires was 44.4 days, with a range of 23 to 154 days ($SD = 19.1$ days).

Response and attrition rates

For the telephone survey, the *most reasonable response rate* (Groves, 1989; Lavrakas, 1993), which compares all completions to the total number of potentially eligible households, was calculated. In this study, the total number of potentially eligible respondents was 682, and the most reasonable estimate of the response rate was 54%. The most reasonable response rate for the T1 mail survey compared the total number of those who completed the T1 questionnaire ($N = 215$) to the total number of people who had been defined as eligible for participation during the telephone survey ($N = 369$). The most reasonable response rate for the T1 mail survey was 58%.³ The most reasonable response rate compares favorably with those reported in other studies of married people that used mail survey techniques (e.g., 18% in the Karney et al., 1995, study).

The attrition rate for the T2 mail survey was calculated (see Menard, 1991) by comparing the total number of those who completed the T1 but not the T2 survey ($N = 33$) with the total number who completed the T1 survey ($N = 215$). The attrition rate for this study was 15%. Evaluation of attrition bias for the T2 mail survey was conducted by comparing those who completed the T1 and T2 questionnaires (i.e., *stayers*) with those who completed the T1 but not the T2 questionnaire (i.e., *leavers*; see Menard, 1991). Comparisons of stayers and leavers on all the variables included in this study yielded only one difference between the two groups. There was a marginally significant trend ($p = 0.06$) showing that leavers reported higher levels of spouse undermining ($M = 0.90$) than did stayers ($M = 0.63$).

Participants

Among the 181 participants who completed the T1 and T2 surveys, 76% were women. Participants ranged in age from 24 to 82 years old ($M = 45.5$, $SD = 13.4$). Length of marriage ranged from 2 months to 60 years ($M = 18.5$ years, $SD = 14.4$). The modal category for education was *some college*, and the modal category for annual household income was *greater than \$80,000*. The sample was 94% white, and the modal category for religious orientation was *Catholic*. The majority of the sample (80%) indicated that this was their first marriage.

Measures

For all the measures used in this study, participants were asked to respond based on their experiences during the previous month.

Social undermining from spouse—The Social Undermining Scale (SUND) was drawn from the work of Vinokur and colleagues (1996). The SUND consists of 7 items designed to reflect the construct of social undermining. Participants are asked to indicate on a 5-point scale (0 = *not at all* to 4 = *about every day*) how frequently a specific person has engaged in “behaviors directed toward the target person that display (a) negative affect (anger, dislike), (b) negative evaluation of the person in terms of his or her attributes, actions, and efforts (criticism), and (c) behaviors that hinder the attainment of instrumental goals” (Vinokur et al., p. 167). Scores were calculated as the mean of the item scores. Participants in this study completed the SUND with respect to their spouse. A sample item is “During the past one month,

²The original sample size was 182, but one influential case was dropped from all analyses. Details concerning the decision to drop this influential case can be obtained from the author.

³The most reasonable response rate for the T1 mail survey was also computed by comparing the total number of those who completed the T1 questionnaire ($N = 215$) to the total number of potentially eligible participants ($N = 682$). This yielded a response rate of 31.5%.

how often has your spouse made you feel unwanted?” Coefficient alpha for the SUND at T1 was .91 (test-retest $r = .76$).

Received support from spouse—A measure of received social support, the Received Social Support Scale (RSSS), was also taken from the work of Vinokur and colleagues (1996). The RSSS, which consists of 10 items, measures the extent of emotional support received from a specific other person (e.g., “During the past one month, how often has your spouse showed that he/she cares about you as a person?”). In this research, participants completed the RSSS with respect to their spouse. Participants responded to each item using a 5-point scale (from 0 = *not at all* to 4 = *about every day*). Scores were calculated as the mean of the item scores. Coefficient alpha for the RSSS at T1 was .92 (test-retest $r = .74$).

Previous studies of support as a stress-buffer have relied on measures of perceived social support (defined as the perception that support is available if needed; see Cohen & Wills, 1985). It has been noted that measures of received support (defined as the actual receipt of support from others; see Finch et al., 1997) are less likely than measures of perceived support to show buffering effects (Wills & Shinar, 2000). However, recent work (Finch et al., 1997) has shown that the construct of received social support is multidimensional, and some aspects of received support (e.g., practical support) show positive associations with distress, whereas other aspects (e.g., positive interactions with others) show negative associations with distress. The RSSS is specifically designed to assess positive interactions with the spouse. Therefore, it is not surprising that this scale typically shows negative associations with measures of psychological distress (see Vinokur et al., 1996; Vinokur & Vinokur-Kaplan, 1990).

Perceived stress—A measure of perceived psychological stress, the Perceived Stress Scale (PSS), was drawn from the work of Cohen and Williamson (1988). The PSS assesses three dimensions of perceived stress: feelings of unpredictability, uncontrollability, and being overloaded. Based on the recommendation of Cohen and Williamson, we used the 10-item version of the PSS. Participants were asked to indicate, along a 5-point scale (0 = *not at all* to 4 = *about every day*), how often they had experienced various symptoms of stress during the past one month (e.g., “During the past one month, how often have you felt nervous and ‘stressed’?”). Scores were calculated as the mean of the item scores. Coefficient alpha for the PSS at T1 was .86 (test-retest $r = .70$).

Cohen and Williamson (1988) have argued that the PSS is conceptually distinct from depressive symptoms and generalized distress. Although perceived stress and distress are empirically related, Cohen and colleagues (Cohen, Kamarck, & Mermelstein, 1983) have shown that the PSS adds unique information to the prediction of physical symptoms after controlling for psychological distress. Moreover, the PSS predicted psychological distress scores after controlling for distress scores 2½ months earlier (Cohen, 1986).

We attempted a conceptual replication of Cohen's (1986) findings by examining the PSS as a predictor of T2 depressive symptoms (as assessed with the Beck Depression Inventory; see below). The cross-lagged correlation between T1 perceived stress and T2 depressive symptoms was strong and statistically significant, $r = 0.62$, $p < .01$. When T1 depressive symptoms were statistically controlled, the partial cross-lagged correlation between T1 perceived stress and T2 depressive symptoms was substantially reduced, but remained statistically significant, $pr = 0.21$, $p < .01$. These results support Cohen and Williamson's (1988) argument that “the PSS does not measure the same thing as standard psychological distress scales” (p. 36).

Depressive symptoms—We used the Beck Depression Inventory (BDI; Beck, Rush, Shaw, & Emery, 1979) to assess depressive symptoms at T1 and T2. The BDI consists of 21 items reflecting the intensity of various depressive symptoms. For each of the 21 items, participants

were presented with a series of response options that reflect a gradually increasing degree of intensity for that particular depressive symptom. A sample item and its corresponding set of response options is *I do not feel sad* (0), *I feel sad* (1), *I am sad all the time and I can't snap out of it* (2), and *I am so sad or unhappy that I can't stand it* (3). Scores were calculated as the mean of the item scores. Coefficient alpha for the BDI at T1 was .82 (test-retest $r = .80$).

Results

Correlational analyses

Means, standard deviations, and correlations between all T1 and T2 variables are presented in Table 1. This sample was characterized by relatively high levels of spouse support and relatively low levels of spouse undermining, perceived stress, and depressive symptoms. Spouse undermining and spouse support were moderately and inversely correlated at both time points. Spouse undermining and spouse support were correlated in predicted directions with perceived stress and depressive symptoms at T1 and T2. The magnitude of these associations was somewhat stronger for spouse undermining compared with spouse support. Perceived stress and depressive symptoms at T1 and T2 were highly correlated in the predicted direction.

Tests of study hypotheses

Recall that the purpose of this study was to test the following hypotheses with respect to the cross-sectional and longitudinal associations among spouse support, spouse undermining, perceived stress, and depressive symptoms:

H1: Consistent with the main effects hypothesis (Finch et al., 1999), it was hypothesized that spouse support would predict (a) lower levels of depressive symptoms at time 1 (T1) and (b) decreases in depressive symptoms from T1 to time 2 (T2). It was also hypothesized that spouse undermining would predict (c) higher levels of depressive symptoms at T1 and (d) increases in depressive symptoms from T1 to T2.

H2: Consistent with the joint effects hypothesis (Walen & Lachman, 2000), it was predicted that the effects of spouse undermining on (a) T1 depressive symptoms and (b) increases in depressive symptoms from T1 to T2 would be moderated by spouse support. Specifically, it was hypothesized that the cross-sectional and prospective effects of spouse undermining on depressive symptoms would decrease in magnitude as a function of increases in spouse support.

H3: Consistent with the stress-buffering hypothesis (Cohen & Wills, 1985), it was hypothesized that the effects of perceived stress on (a) T1 depressive symptoms and (b) increases in depressive symptoms from T1 to T2 would be moderated by spouse support. Specifically, it was hypothesized that the cross-sectional and prospective effects of perceived stress on depressive symptoms would decrease in magnitude as a function of spouse support.

H4: Consistent with the stress-exacerbation hypothesis (Rook, 1998), it was hypothesized that the effects of perceived stress on (a) T1 depressive symptoms and (b) increases in depressive symptoms from T1 to T2 would be moderated by spouse undermining. Specifically, it was hypothesized that the cross-sectional and prospective effects of perceived stress on depressive symptoms would increase in magnitude as a function of spouse undermining.

Hierarchical multiple regression analysis of T1 depressive symptoms

Cross-sectional hierarchical multiple regression analysis was used to test the main and interactive effects of T1 spouse support, T1 spouse undermining, and T1 perceived stress on T1 depressive symptoms. Prior to formally testing our hypotheses, all predictor variables were

centered around their respective means (Aiken & West, 1991) and three product terms reflecting all possible two-way interactions were computed: (a) Spouse Undermining \times Spouse Support, (b) Spouse Support \times Perceived Stress, and (c) Spouse Undermining \times Perceived Stress. A product term reflecting the three-way interaction between spouse undermining, spouse support, and perceived stress was also computed. Although this three-way interaction effect was not predicted, its product term was included for exploratory purposes.

To evaluate the main effects hypothesis, perceived stress, spouse support, and spouse undermining were entered at the first step of the regression equation. To evaluate the joint effects, stress-buffering, and stress-exacerbation hypotheses, the product terms reflecting the two-way interactions were entered at the second step of the equation. The product term reflecting the three-way interaction was entered at the third step. The results showed that only one statistically significant effect emerged. Perceived stress had a statistically significant positive association with T1 depressive symptoms ($B = 0.24, p < .01$). The main effect of spouse support was in the predicted direction, but was weak in magnitude and statistically nonsignificant ($B = -.02, p > 0.30$). The main effect of spouse undermining was also in the predicted direction, but it too was weak in magnitude and statistically nonsignificant ($B = .002, p > 0.30$). None of the two- or three-way interaction effects were statistically significant. Thus, the cross-sectional results were not supportive of Hypotheses 1a, 1c, 2a, 3a, or 4a.

Hierarchical multiple regression analysis of T2 depressive symptoms

Hierarchical multiple regression analysis was used to examine main and interactive effects of T1 spouse undermining, T1 spouse support, and T1 perceived stress on depressive symptoms at T2, controlling for T1 depressive symptoms. In this analysis, the T1 depressive symptoms variable was entered at the first step of the equation. Perceived stress, spouse support, and spouse undermining were then entered at the second step of the equation. The product terms reflecting the two-way interactions were entered at the third step of the equation, and the product term reflecting the three-way interaction was entered at the fourth step.

The results from this hierarchical multiple regression analysis are presented in Table 2. The findings from the first step indicated that T1 depressive symptoms were strongly related to T2 depressive symptoms. Results from the second step showed that perceived stress and spouse undermining, but not spouse support, predicted increases in depressive symptoms from T1 to T2.⁴ These findings supported Hypothesis 1d but did not support Hypothesis 1b.

Steps 3 and 4 present results from tests of the interaction hypotheses. The addition of the product terms for the two-way interactions at Step 3 explained an additional 3% of the variance in T2 depressive symptoms, $\Delta R^2 = .03, F(3, 172) = 7.18, p < .01$. The results showed that (a) contrary to Hypothesis 2b there was no interaction between spouse undermining and spouse support; (b) contrary to Hypothesis 3b there was no interaction between perceived stress and spouse support; but (c) consistent with Hypothesis 4b the effect of perceived stress on changes in depressive symptoms from T1 to T2 was moderated by spouse undermining. These results support the stress-exacerbation hypothesis. The three-way interaction between perceived stress, spouse support, and spouse undermining was not statistically significant.

⁴At the suggestion of an anonymous reviewer, an additional multiple regression analysis was conducted with T1 depressive symptoms entered at step 1, followed by perceived stress at step 2, spouse support at step 3, and spouse undermining at step 4. When entered alone at step 2 of the regression equation, perceived stress explained a statistically significant increase in the proportion of variance in T2 depressive symptoms, $\Delta R^2 = .02, F(1, 177) = 8.47, p < .01$. We then entered spouse support at step 3 of the regression equation. The results showed that spouse support did not add to the prediction of T2 depressive symptoms, $\Delta R^2 = .001, F(1, 176) = 2.94, p = .41$. Finally, we entered spouse undermining at step 4 of the regression equation. We found that spouse undermining explained a statistically significant proportion of the variance in T2 BDI scores, over and above the variance explained by T1 depressive symptoms, perceived stress, and spouse support, $\Delta R^2 = .01, F(1, 175) = 5.18, p = .02$. These findings suggest that, as main effects, perceived stress and spouse undermining are unique predictors of increases in depressive symptoms from T1 to T2.

As seen in Table 2, the unstandardized regression coefficient for the stress-exacerbation interaction effect indicated that the relationship between T1 perceived stress and T2 depressive symptoms increased by .09 units for every one unit increase in spouse undermining. To gain further perspective on this two-way interaction, procedures suggested by Aiken and West (1991) were used to compute the simple slopes of the regression of T2 depressive symptoms on T1 perceived stress at low (i.e., the lowest score), average, and high values (i.e., the highest score) of spouse undermining. The results from the simple slope analysis are presented in Table 3. The effect of T1 perceived stress on changes in depressive symptoms from T1 to T2 was statistically nonsignificant at low levels of spouse undermining. At average and high levels of spouse undermining, the effect of perceived stress on changes in depressive symptoms from T1 to T2 was statistically significant. Figure 1 depicts these simple slopes graphically.

These analyses were also conducted controlling for age, sex, years married, education, and annual income. This did not change the results.

Discussion

The purpose of this research was to examine the main and interactive effects of spouse support and spouse undermining on depressive symptoms in a prospective panel design. Consistent with previous research (e.g., Druley & Townsend, 1998; Major et al., 1997), the findings suggest a strong inverse relationship between spouse support and undermining. However, the magnitude of the association was not such that the two constructs were redundant with each other. In the present study, the amount of shared variance between spouse support and undermining was 14.4% at T1 and 22.1% at T2. Thus, it appears that support and undermining are relatively distinct constructs, even when the source of support and undermining is the same person (cf. Rook, 1984). This result speaks to the utility of conceptualizing aspects of social relationships in terms of a two-dimensional structure.

In the present study, main and interactive effects involving spouse undermining were observed in the longitudinal but not the cross-sectional data. These findings underscore the importance of assessing the effects of support and undermining using longitudinal designs. The finding that spouse undermining but not spouse support is predictive of increases in depressive symptoms from T1 to T2 is consistent with the “negativity effect” observed in other studies (see Rook, 1998). Results from several studies have suggested that social undermining is a stronger predictor of psychological adaptation than is social support (e.g., Finch & Zautra, 1992; Fiore et al., 1983; Kiecolt-Glaser et al., 1988; Pagel et al., 1987; Rook, 1984), and this negativity effect has also been observed when support and undermining are assessed specifically from the spouse (e.g., Manne et al., 1997; Orden & Bradburn, 1968). The present findings add to existing evidence for negativity effects in social relationships and are consistent with theoretical work on the greater potency of negative compared to positive stimuli (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001; Taylor, 1991).

This apparent negativity effect should be considered in the context of the measures used in the current study. It has been noted (Rook, 1998) that the observation of negativity effects may be due in part to the differential intensity of supportive and undermining behaviors that participants are asked to report on. Measures of social undermining typically ask about behaviors that may be more intense or extreme (e.g., “how often has your spouse made you feel unwanted?”) than those reflected in measures of social support (e.g., “how often has your spouse provided you with useful information?”).⁵ Thus, one important avenue for future investigation involves development of undermining and support items that are roughly equivalent in terms of their intensity (Rook, 1998).

⁵I would like to thank an anonymous reviewer for insightful comments on this issue.

Evidence for the stress-exacerbation hypothesis

Results showed that the effect of T1 perceived stress on T2 depressive symptoms increases as a function of T1 spouse undermining. This finding is consistent with those from previous studies that have found support for stress-exacerbation but not stress-buffering (Fiore et al., 1983; Ingersoll-Dayton et al., 1997; Kiecolt-Glaser et al., 1988; Rauktis et al., 1995; Rhodes et al., 1994). These results are particularly noteworthy because the present study appears to be the first to find evidence for the stress-exacerbation hypothesis in longitudinal data, using a measure of social undermining that asked about a specific other person (i.e., the spouse), in a community sample of married people.

What mechanisms might underly this stress-exacerbation effect? One possibility is that spouse undermining has a detrimental effect on people's ability to cope with other stressors. For example, Manne and Zautra (1989) found that spouse undermining led to increases in wishful thinking, which in turn predicted poor psychological adjustment in a sample of rheumatoid arthritis patients and their spouses. Thus, undermining from the spouse may increase one's use of maladaptive coping behaviors and/or decrease the use of adaptive coping behaviors. A related possibility is that undermining from the spouse draws attention and other coping resources away from other stressors and thus makes their resolution less likely (Rook, 1998; cf. Ingersoll-Dayton et al., 1997). This mechanism might be especially potent if spouse undermining develops into overt marital conflict. One task for subsequent research is to address these possible mechanisms.

Another possibility is that spouse undermining has negative effects on physical health that render people more vulnerable to other stressors (see Kiecolt-Glaser et al., 1997; Rook, 1998). There is also some evidence that the effect of spouse undermining on depressive symptoms is mediated by self-esteem, and this effect appears to be limited to those experiencing chronic stress (Druley & Townsend, 1998). Further research might benefit from exploring these moderated-mediation models.

Why no joint effect?—Earlier, the mixed nature of the evidence for the joint effects hypothesis was discussed. Among those studies that have tested the joint effects hypothesis with measures of support and undermining from the spouse or significant other, only the study by Okun and Keith (1998) found evidence consistent with this hypothesis. Although caution is warranted when interpreting null findings, the present results are consistent with the majority of studies that have tested and failed to find evidence for the joint effects hypothesis. Yet, it is important to note that the effect observed in this study, though statistically nonsignificant, was in the predicted direction. A recent daily diary study of social undermining and support (Rook, 2001) found evidence for the joint effects hypothesis, and it may be that such effects emerge within shorter time lags than the one examined here.

Why no stress-buffering effect?—The lack of a stress-buffering interaction in these data also deserves comment. Cohen and Wills (1985) reviewed the social support literature and found consistent evidence for the stress-buffering hypothesis when (a) measures of perceived support were used and (b) there was a match between the type of support available and the demands imposed by the stressor. Subsequent research has supported the stress-buffering hypothesis when social support is operationalized as the perceived availability of support (see Wills & Shinar, 2000).

In the present study, a measure of received support from the spouse was used. This may be one reason why a stress-buffering effect was not observed in this sample. However, stress-buffering effects have been observed in some studies using measures of received social support (e.g., Collins, Dunkel-Schetter, Lobel, & Scrimshaw, 1993). Also, as noted earlier, the measure of received support used here typically shows inverse correlations with measures of psychological

distress. Thus, even though stress-buffering effects are more likely to emerge in studies using measures of perceived versus received support, use of a received support measure does not necessarily preclude stress-buffering. Another possibility is that the measure of received support used in this study did not “match” the demands assessed by the perceived stress scale (Cohen & Wills, 1985). Future studies might profit by including measures of received and perceived support, along with more specific measures of perceived stress that allow for examination of the matching hypothesis (Cutrona, 1990).

Limitations of the present study

The results from this study must be considered in the context of several limitations. First, despite efforts to obtain a probability sample of married people, the final sample was predominately female and was characterized by high levels of education and income. The generality of these findings awaits further study. Also, a measure of received social support was used in the present study. As noted earlier, stress-buffering effects are more likely to emerge when participants are asked about the perceived availability of support. Use of a measure of received support may decrease the likelihood of observing stress-buffering effects. In addition, the selection of a 6-week time lag between T1 and T2 was arbitrary.⁶ It is possible that these effects might differ over shorter or longer time lags.

Another limitation concerns the content of the undermining and support measures used in this study. As noted earlier, one possible reason that spouse undermining but not spouse support had a main effect on T2 depressive symptoms is that the items assessing spouse undermining and support may not have been parallel in their intensity (Rook, 1998; also see Taylor, 1991). This hypothesis has apparently not yet been tested. Yet, the present results suggest that it may be beneficial to move beyond questions of the relative importance of undermining and support in terms of main effects on psychological distress, and focus instead on more complex hypotheses involving moderated and mediated effects.

Contributions of the present study

Despite these limitations, the current study makes several contributions to the existing literature on social relationships and psychological adaptation. This appears to be the first study to find evidence for the stress-exacerbation hypothesis using a prospective panel design. The present findings complement those from cross-sectional studies that have found evidence for stress-exacerbation (e.g., Ingersoll-Dayton et al., 1997; Kiecolt-Glaser et al., 1988; Rauktis et al., 1995; Rhodes et al., 1994; Sandler & Barrera, 1984). Further, the present study is the first that has demonstrated stress-exacerbation using a measure of social undermining from the spouse. Coyne and DeLongis (1986) argued for greater attention to the spouse as a source of support and undermining. The present results add support to this argument and highlight the importance of assessing social support and undermining from specific sources.

Finally, this study appears to be the first to find evidence for stress-exacerbation in a community sample of married people. Existing evidence for the stress-exacerbation effect had come largely from studies of samples under stress (e.g., primary caregivers of a mentally ill family member in the Rauktis et al., 1995 study; spouses of Alzheimer's disease patients in the Fiore et al., 1983 study). The present results suggest that the stress-exacerbation effect generalizes to low-stress samples of married people.

⁶Finkel (1995) noted that “the problem of specifying the appropriate lag structure for the effects of variables on one another is one of the most difficult issues in panel (and other longitudinal) analyses” (p. 13). Likewise, Finch and Zautra (1992) observed that current theories of social relationships and adaptation have not yet reached the level of sophistication needed to specify the lag structure for these associations.

Directions for future research

Results from the present study suggest several directions for further research. Elaboration of the mechanisms underlying the stress-exacerbation effect is a logical next step for future studies. In addition, further research aimed at identifying the critical elements of social undermining would contribute to our knowledge of this construct. One aspect of social undermining—criticism—has been identified as a consistent predictor of divorce in longitudinal studies of married people (Gottman, 1998). Whether the other dimensions of social undermining (i.e., expressions of negative affect and interference with goal-directed behavior) are equally detrimental remains to be seen.

These findings illustrate the importance of longitudinal designs in studies of relationship phenomena, but the arbitrary nature of the lag between T1 and T2 was noted. A particularly important avenue for further work involves the use of daily diary methods. Diary methods have proven useful in testing complex hypotheses concerning social support (e.g., Bolger, Zuckerman, & Kessler, 2000), and recent work has utilized diary methods to study the effects of social undermining and support on emotional health (Rook, 2001). Diary methods hold great promise in terms of providing descriptive data on the duration of lagged and reciprocal effects involving undermining, support, and psychological distress (Bolger, Davis, & Rafaeli, 2003).

In conclusion, results from the present study showed that spouse undermining predicts changes in depressive symptoms over time, even when perceived stress and spouse support are statistically controlled. Further, spouse undermining exacerbated the effect of perceived stress on changes in depressive symptoms over time among married people. These findings (a) suggest that undermining from the spouse may be particularly important for psychological adaptation, (b) highlight the utility of studying relationship processes over time, and (c) illustrate the importance of testing the main and interactive effects of social undermining and social support in studies of social relationships and adaptation.

Acknowledgements

This research is based on a doctoral dissertation submitted to the Department of Psychology, University at Albany, State University of New York by James A. Cranford. Partial support for this work came from NIH Grant T32-MH19890. I would like to thank Glenn S. Sanders (Chair), Donn Byrne, and James Jaccard for serving on my dissertation committee and for their guidance throughout this project. I also thank Patrick E. Shrout, Niall Bolger, James C. Coyne, Eshkol Rafaeli, members of the New York University Couples Research Lab, the action editor and four anonymous reviewers for helpful comments and suggestions on earlier drafts of this paper. I am especially grateful to Patrick E. Shrout for his assistance with the statistical analyses.

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Figure 1. Unstandardized simple slopes for the association between T1 perceived stress and changes in depressive symptoms from T1 to T2 at low, average, and high levels of T1 spouse undermining.

Zero-Order Correlations and Descriptive Statistics for T1 and T2 Variables (N = 181)

Table 1

Variable	Time 1 variables				Time 2 variables				M	SD
	1	2	3	4	5	6	7	8		
1. T1 Spouse Undermining	—								0.62 ^a	0.70
2. T1 Spouse Support	-.38**	—							2.81 ^a	0.86
3. T1 Perceived Stress	.28**	-.18*	—						1.31 ^a	0.72
4. T1 Depressive Symptoms	.21**	-.17**	.66**	—					0.32 ^b	0.27
5. T2 Spouse Undermining	.76**	-.38**	.32**	.25**	—				0.61 ^a	0.75
6. T2 Spouse Support	-.32	.74	-.22	-.20	-.47**	—			2.73 ^a	0.93
7. T2 Perceived Stress	.25**	-.07	.70**	.50**	.35**	-.17*	—		1.32 ^a	0.78
8. T2 Depressive Symptoms	.29	-.18*	.62	.80	.36**	-.22**	.70**	—	0.29 ^b	0.29

Note. T1 = Time 1; T2 = Time 2. Average lag between T1 and T2 = 44.4 days.

^a Scores on this variable had a possible range of 0 to 4.

^b Scores on this variable had a possible range of 0 to 3.

* $p < .05$.

** $p < .01$.

Table 2
 Hierarchical Multiple Regression Analysis of Main and Interactive Effects of Perceived Stress, Spouse Support, and Spouse Undermining on Changes in Depressive Symptoms from T1 to T2 (N = 181)

Variable	Step 1			Step 2			Step 3			Step 4		
	B	SE B	β	B	SE B	β	B	SE B	β	B	SE B	β
T1 Depressive Symptoms	0.85**	0.05	0.80	0.73**	0.06	0.68	0.71**	0.06	0.66	0.71**	0.06	0.66
T1 Spouse Support				0.001	0.02	0.001	0.008	0.02	0.02	0.008	0.02	0.02
T1 Spouse Undermining				0.04*	0.02	0.11	0.01	0.02	0.01	0.01	0.02	0.01
T1 Perceived Stress				0.06*	0.02	0.14	0.06**	0.02	0.15	0.06**	0.02	0.15
T1 Support \times T1 Undermining							-0.03	0.02	-0.06	-0.03	0.02	-0.06
T1 Stress \times T1 Support							-0.01	0.02	-0.01	-0.01	0.02	-0.01
T1 Stress \times T1 Undermining							0.09**	0.02	0.16	0.09**	0.03	0.16
T1 Stress \times T1 Support \times T1 Undermining										0.003	0.03	0.005

Note. Adjusted $R^2 = .64$ ** for Step 1; $\Delta R^2 = .03$ ** for Step 2; $\Delta R^2 = .04$ ** for Step 3; $\Delta R^2 = .001$, ns, for Step 4. Standardized regression coefficients were calculated using procedures suggested by Aiken and West (1991).

* $p < .05$.

** $p < .01$.

Table 3

Effects of T1 Perceived Stress on Changes in Depressive Symptoms from T1 to T2 at Low, Average, and High Levels of Spouse Undermining

Level of Moderator Variable	B	SE B	β	<i>t</i> Value
Low Undermining	0.004	0.03	0.01	0.17
Average Undermining	0.06	0.02	0.15	2.63**
High Undermining	0.33	0.08	0.85	4.08**

Note. Standardized regression coefficients were calculated using procedures suggested by Aiken and West (1991).

*
 $p < .05$.

**
 $p < .01$.