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Dynamics of Support Perceptions Among Couples Coping With Cardiac Illness: The Effect on Recovery Outcomes

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Objective: The current prospective study explored how male cardiac patients' perceptions of received support (i.e., active engagement, protective buffering, and overprotection) moderated the associations between female partners' perceptions of provided support and patients' recovery outcomes: psychological well-being, cholesterol levels, and smoking cessation. ***Methods:*** Couples ($N = 86$) completed surveys at the initial hospitalization after patients' Acute Coronary Syndrome (ACS), and 1 and 6 months later. Partners' ways of providing support and patients' concurrent perceptions of these ways were measured using the Ways of Giving Support Questionnaire; patients' depressive and anxiety symptoms were measured using the Brief Symptom Inventory (BSI). Patients' cholesterol levels were assessed during hospitalization and 6 months later, and smoking habits were reported by the patients. ***Results:*** Female partners' protective buffering was positively associated with male patients' depressive symptoms at follow-up only when male patients' own perceptions of partners' protective buffering were low. Female partners' active engagement was positively associated with better odds for male patients' cessation of smoking only when patients' own perceptions of partners' active engagement were high. Finally, female partners' overprotection was associated with higher levels of male patients' harmful blood lipids at follow-up, but only when patients' own perceptions of partners' overprotection were high. ***Conclusions:*** As hypothesized, the effect of partners' perceptions of support provided on patients' recovery was moderated by patients' own perceptions of the support received. The effect of this interaction was determined by the specific types of support provided or received and by the specific recovery outcome that was measured. The clinical and theoretical implications of the findings are discussed.

Keywords: cardiac illness, depression, dyadic coping, smoking cessation, blood lipids

Recovery from an Acute Coronary Syndrome (ACS, which is defined as a heart attack or new onset chest pain requiring hospitalization for stabilization) takes place in the context of social relationships, and individuals other than the patient may have a significant contribution to make toward the patient's recovery (Coyne & Smith, 1994; Revenson & DeLongis, 2011). With regard to married couples, in particular, the support provided by the partner can be an important element in the patient's healing process (Cutrona, 1996; Lyons, Sullivan, Ritvo, & Coyne, 1996; Rohrbaugh et al., 2004).

Despite partners' best intentions, however, their assistance is in fact not always helpful to the recipients (Burg & Seeman, 1994; Martire & Schulz, 2001; Taylor, 2007). Several explanations have been offered for this perplexing finding, including the idea that receiving support may undermine self-esteem and may make the recipient feel indebted to the provider (Buunk & Hoorens, 1992; Cohen & Willis, 1985; Dunbar, Ford, & Hunt, 1998). An additional factor to consider is the manner in which the partner provides support (Clark & Stephens, 1996; Coyne & Smith, 1991; Rafaeli & Gleason, 2009).

An interesting dichotomy exists in the social support literature showing that *received* support (i.e., perceived by the patients) has a positive association with well-being variables, yet partners' *provided* support is either unrelated or negatively related to these outcomes (Reinhardt, Boerner, & Horowitz, 2006). Lanza et al. (1995) claimed that it was not enough to know that one partner was trying to be supportive; it was also critical to know whether that support was *perceived* as helpful by the recipient. The main aim of the current study was, therefore, to investigate whether patients' own perceptions of received support moderated the associations between their partners' perceptions of provided support and patients' psychological, behavioral, and physiological outcomes after ACS.

Ways of Giving Support

Coyne and Smith (1991, 1994) distinguished among three ways in which healthy partners may provide support for their ill partners.

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The first style is labeled "active engagement" and includes involving the patient in discussions about his or her situation, asking how he or she feels, and engaging in constructive problem-solving activities. The second mode, "protective buffering," consists of behaviors such as hiding concerns, denying worries, and yielding to the patient to avoid disagreements. The third way is "overprotection," which refers to an underestimation of the patient's capabilities, and results in unnecessary assistance, excessive praise for accomplishments, or attempts to restrict activities.

Protective buffering strategies (either perceived by the patient or provided by the partner) are generally viewed as unhelpful and may interfere with the cognitive and emotional processing of stressful situations (Manne, Norton, Ostroff, Winkel, & Fox, 2007). Not surprisingly, protective buffering has also been found to be associated with lower levels of marital satisfaction (Hagedoorn et al., 2000) and poorer mental health (De Ridder, Schreurs, & Kuijer, 2005; Manne et al., 2007). There are, however, some studies that have found no link between protective buffering and concurrent distress (Hagedoorn et al., 2000; Kuijer et al., 2000; Suls, Green, Rose, Lounsbury, & Gordon, 1997). As for overprotection, several studies have reported on its negative effects on patients' mental well-being (Buunk, Berkhuysen, Sanderman, Nieuwland, & Ranchor, 1996; Joekes, Van Elderen, & Schreurs, 2007).

As opposed to the above-mentioned ways of providing support, most people perceive the active engagement method as helpful, and associations have been found between it and such positive outcomes as self-efficacy (Coyne & Smith, 1994; Kuijer et al., 2000) and marital satisfaction (Hagedoorn et al., 2000). Defying expectations, however, studies have yet to find a negative association between active engagement and distress in chronically ill patients (De Ridder et al., 2005; Hagedoorn et al., 2000; Kuijer et al., 2000). This inconsistency may be attributed to the tendency to investigate provided and perceived support separately, thus ignoring the nature of the dyad as an interactive entity.

Based on the cognitive appraisal theory of stress and coping (Lazarus & Folkman, 1984), we propose that the effects of the support provided by the partner on the patient's recovery must be examined within the context of the patient's *own* perceptions of the support received. The knowledge regarding the interactive effects of one partner's conscientious efforts and the other partner's awareness and acknowledgment of these efforts on the patient's recovery may be of great value to the field of dyadic coping, especially in the arena of coping with chronic illness. Equipped with this knowledge, health psychologists working with couples who face a major health crisis might be able to trace more precisely misconceptions in couples' perceptions of support. Consequently, they will be able to apply therapeutic techniques which could lead to mutual understanding and coordinated expectations.

Very few studies have targeted the interaction between perceptions of support provided versus perceived in the field of chronic illness. In a recent study investigating women coping with cancer, Hinnen, Ranchor, Baas, Sanderman, and Hagedoorn (2009) found that active engagement was unrelated to distress, regardless of patients' awareness of the support received, and that protective buffering that remained unnoticed by patients was associated with more distress. Moreover, the studies conducted thus far within the context of support have primarily assessed outcomes such as marital satisfaction or patients' psychological well-being (e.g., Badr, 2004; Reinhardt et al., 2006). Although partner support has been found to facilitate healthier behaviors such as exercise, eating right, and not smoking, as well as greater adherence to medical regimens (Uchino, 2006), very few studies have assessed the associations between partners' perceptions of support and actual acts of illness self-management or physiological outcomes (Franks, Stephens, Rook, Franklin, & Ketteyian, 2002; Joekes et al., 2007; Sol, Van der Graaf, Goessens, & Visseren, 2009). The findings show, for example, that low levels of perceived protective buffering were associated with a decrease in blood glucose, and that low levels of perceived active engagement were associated with an increase in body mass index (Sol et al., 2009). None of these studies, however, has assessed whether the contribution of the partner's support to the patient's psychological, behavioral, and physiological outcomes was moderated by the patient's own perception of the support received.

We expected that: (a) partners' active engagement would be beneficial in terms of patients' outcomes only for patients *high* on perceptions of received active engagement; (b) partners' overprotection would be beneficial in terms of patients' outcomes, but only for patients *low* on perceptions of received overprotection; and (c) partners' protective buffering would be beneficial in terms of patients' outcomes but only for patients *low* on perceptions of received protective buffering. We expected to see the improved outcomes manifested in lower levels of depression and anxiety symptoms, smoking cessation, and improved blood lipids.

Method

Participants and Procedure

The target population was defined as Jewish men with the diagnosis of first (myocardial infarction [MI] or unstable angina [UA]) whose female partners also agreed to participate in the study. These male patients were admitted between March, 2005 and July, 2007 to the Cardiac Care Unit (CCU) at Meir Medical Center, located in the central region of Israel. During this period, 2,060 patients were hospitalized in the CCU. The individuals excluded from the study included 523 women (26%); 315 Muslims (15%); 354 male patients with a history of previous cardiac events (17%); 270 male patients aged above 75 years (13%); 188 male patients with a diagnosis other than ACS (9%); 50 male patients who had comorbid conditions that could have potentially influenced either symptom presentation or mood (including severe psychiatric illness, neoplasia, acute or chronic infection or inflammatory conditions, and renal failure); 31 male patients who did not have a partner (2%); and an additional 23 male patients who could not be interviewed in Hebrew (1%). Israel comprises a majority (75.4%) of Jewish citizens; the remainder consists of Muslims and other minorities (Israel Central Bureau of Statistics, 2009). In the current study we focused on the majority to be better able to generalize from the findings. The rationale behind solely targeting men stemmed from the fact that the average female cardiac patient is older and therefore more likely to be widowed and not have the social support provided by marriage (Lemos, Suls, Jenson, Lounsbury, & Gordon, 2003).

Of the 306 patients (15%) potentially eligible for the study, 80 (26%) were discharged or transferred to other departments; 85 (28%) refused to take part in the study; 25 (8%) had partners who

refused to participate; and 5 (2%) were excluded because of their partners' life-threatening illnesses. Overall, 111 male patients and female partners agreed to participate in the study (36%) and completed the study questionnaires at baseline, that is, during hospitalization ($N = 111$); 1 month after hospitalization; and at follow-up, 6 months after hospitalization ($N = 101$). The attrition rate was 9%. Reasons for attrition included loss of contact with patients and refusal to continue to participate because of lack of time or interest.

Of the 101 dyads enrolled in the study, one dyad was excluded because of the patient's death between baseline and follow-up. Of the 100 remaining dyads, 86 couples completed the study questionnaires without any missing values, while 14 couples had missing values in one or more of the questionnaires. Therefore, the analyses were conducted only on the 86 dyads with full data available. No significant differences were found between the 86 dyads with complete data and the 14 dyads who had missing data in the following areas: patients' and partners' ages, perceived economic status, years of education, and patients' illness severity as measured both by echocardiogram and angiogram scores. The only significant difference between the two groups was found in patients' depressive symptoms at baseline, $F(1, 92) = 5.26$; $p < .05$. Levels of patients' depressive symptoms at baseline were significantly higher among dyads with missing data ($M = 1.55$; $SD = .40$) than among dyads who completed the questionnaires fully ($M = 1.27$; $SD = .36$).

At baseline, while the patients were hospitalized in the CCU, all of the patients and partners who were eligible for the study were approached by the research team. Upon agreement, both male patients and female partners were given the study's questionnaire, which each was instructed to fill out independently (i.e., without consulting one another). A research assistant was available to answer their questions and offer help. One month later, both patients and partners were interviewed by telephone, and again 6 months later. At the 6-month follow-up, the patients were asked to come to the Cardiac Clinic at the Medical Center for blood tests. The study was approved by the Meir Medical Center Institutional Review Board.

Measures

Ways of Providing and Receiving Support. Partners' ways of providing support and patients' concurrent perceptions of these ways were measured using the *Ways of Giving Support Questionnaire* (WOGS; Buunk et al., 1996). Based on Coyne, Ellard, and Smith (1990); Buunk et al. (1996) constructed a questionnaire to measure the three ways of providing support: active engagement, protective buffering and overprotection. This questionnaire has been used extensively (e.g., De Ridder et al., 2005; Hagedoorn et al., 2000; Hinnen et al., 2009), and in the current study we used the validated Hebrew version (Vilchinsky et al., 2010). One version of the questionnaire was presented to the partner and another version to the patient. Participants were asked to respond specifically regarding the patient's illness. This instrument was administered 1 month after the initial coronary event to give both patients and partners the opportunity to recall what kind of support they received/provided during the period of time after the onset of illness.

Each version contained 19 items that were measured on a 5-point scale, ranging from (1) *never* to (5) *very often*. Five items measured active engagement (e.g., "I try to discuss it with my partner openly;" "My partner tries to discuss it with me openly"). Eight items measured protective buffering (e.g., "I try to hide my worries about my partner;" "My partner tries to hide her worries about me"). The subscale for overprotection consisted of six items (e.g., "I more or less treat my partner like a baby;" "My partner treats me like a baby"). Cronbach's alphas were .78, .62, and .72 for patients' perceptions of active engagement (PAE), protective buffering (PPB), and overprotection (POP), respectively. Cronbach's alphas were .63, .75, and .71 for partners active engagement (WAE), protective buffering (WPB), and overprotection (WOP), respectively.

Depression and Anxiety. Male patients' depressive and anxiety symptoms were measured using the Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 1983). Each participant was asked to rate the degree to which he had suffered from each symptom during the previous month on a scale ranging from 0 (*not at all*) to 4 (*very much*). We used the Hebrew translation of the subscales of depressive and anxiety symptoms (Gilbar & Ben-Zur, 2002). In the current study, the Cronbach's alphas at baseline were .72 and .70 for depressive symptoms and anxiety symptoms, respectively, and at the 6-month follow-up were .86 and .84 for depressive symptoms and anxiety symptoms, respectively.

In comparison with the Israeli community norms of the BSI for men (Gilbar & Ben-Zur, 2002), the current sample reported higher levels of both depressive symptoms and anxiety symptoms, and these high levels were stable over 6 months (see Table 1). In accordance with the Piersma, Reaume, and Boes (1994) definition for the BSI clinical cutoff (2 *SD* the normative mean), 6.3% of the patients were above the normal range for depression and 7.2% were above the normal range for anxiety.

Cholesterol Levels. Male patients' recovery on the physiological dimension was defined as reduced levels of low-density lipoprotein cholesterol (LDL-C) and elevated levels of high-density lipoprotein cholesterol (HDL-C) at follow-up. Elevated LDL-C is a well-established risk factor for cardiac illness (Voils et al., 2009). Blood cholesterol tests are routinely performed in the CCU during hospitalization; therefore, we were able to retrieve baseline levels from the patients' medical files, eliminating the need for them to endure an additional blood test. Cholesterol levels were assessed again 6 months later when patients were asked to come to the Meir Medical Center cardiology clinic for blood tests.

Smoking Cessation. Male patients' recovery on the behavioral dimension consisted of self-report measures of their smoking cessation at follow-up as compared with their smoking behavior before their initial ACS. Smoking (tobacco addiction) is the most significant of the modifiable cardiovascular risk factors for ACS, and smoking cessation is a priority in the management of any patient with cardiovascular disease (Pipe, Papadakis, & Reid, 2010).

At the time of the initial examination, the severity of the patient's illness was determined by a senior cardiologist using two sets of criteria: an echocardiogram score, which assesses cardiac damage, and an angiogram score (status of obstructed arteries), which assesses the risk of future damage. Both scores were measured on a scale ranging from 1 (*normal*) to 5 (*extremely severe*).

Table 1
Socio-Demographic Characteristics of the Sample

Characteristics	Male patients	Female partners
Age (years)	$M = 56.89$, $SD = 7.62$	$M = 55.99$, $SD = 7.51$
Education (years)	$M = 13.81$, $SD = 3.32$	$M = 14.36$, $SD = 3.02$
Perceived economic status		
Good-very good	66.3%	62.7%
Moderate	33.7%	36.1%
Bad	0%	1.2%
Level of religiosity		
Secular	73%	74.4%
Traditional	16.5%	14.6%
Religious	10.5%	11%
Perceived health status		
Good-very good		81%
Moderate		17.9%
Bad		1.1.%

Note. Only female partners were asked about their perceived health status to rule out alternative explanations for partners' (lack of) support.

Data Analysis Plan

To examine the interactive effects of patients' and partners' ways of receiving or providing support in predicting depression and anxiety at the 6-month follow-up, the data were analyzed in a series of six 4-step hierarchical regressions. In each regression, the predicted variable alternated between depression and anxiety. Step 1 of each regression consisted of the baseline data of the dependent variable predicted in the regression (either depression or anxiety). In addition, because of the fact that among the relevant demographic parameters (patients' age, patients' perceived socioeconomic status, and patients' illness severity) only patients' perceived socioeconomic status was found to correlate significantly with depression at follow-up ($r = -.22$, $p < .05$), this variable was also entered in the first step to control for it. Step 2 consisted of female partners' perceptions of one of the three ways of providing support (active engagement, protective buffering, or overprotection) and the corresponding perceptions of the male patients. The two-way interaction between these perceptions was entered in Step 4, which consisted of the product of the centered scores of ways of providing support and ways of perceiving support (e.g., WAE × PAE). The same analyses were conducted to assess the interactive effects of patients' and partners' ways of receiving or providing support in predicting cholesterol levels (HDL, LDL) at the 6-month follow-up. In these regressions, the dependent variable was either HDL or LDL levels at follow-up, while controlling for their baseline levels in the regression's first step. Because of the fact that among the relevant demographic parameters only patients' illness severity as measured by their echocardiogram scores was found to correlate significantly with HDL levels at follow-up ($r = -.42$, $p < .001$), this variable was also entered in the first step to control for it when HDL was the dependent variable. Overall, an additional six regressions were executed.

Finally, three logistic regressions were applied to assess the interactive effects of patients' and partners' ways of receiving or providing support in predicting patients' smoking cessation at follow-up. Because of the fact that among the relevant demographic parameters only patients' illness severity as measured by an angiogram score was found to be significantly lower among smokers ($M = 3.0$, $SD = .77$) than nonsmokers ($M = 3.53$, $SD = .61$), $F(1, 28) = 4.24$; $p < .05$, this variable was entered in the first step to control for it. The subsequent steps were identical to the procedure outlined above with regard to the linear regressions.

Results

Characteristics of the Baseline Sample

Patients' and partners' psychosocial characteristics are presented in Table 1. Patients (all male) ranged in age from 39 to 74 years. Eighty-six percent of the patients who had been working before the ACS resumed their jobs within 6 months of its occurrence (62 out of 72 patients), and 65% of the smokers ceased smoking (24 out of 37 who were smoking at baseline). The female partners ranged in age from 39 to 74 years. Most of the partners declared that they were in good to very good health. The couples had been married or living together for an average of 29.17 years ($SD = 10.93$) and had on average 2.94 children ($SD = 1.18$).

Table 2 contains means, standard deviations, and frequencies of illness characteristics and medical outcomes. As is evident, the majority of patients experienced an MI without severe damage to the heart or severe obstruction of the arteries. They had experienced very few repeat acute coronary events or readmissions 6 months after their first ACS. In comparison with the Israeli community norms of the BSI for men (Gilbar & Ben-Zur, 2002), the current sample reported higher levels of both depressive symptoms and anxiety symptoms at baseline, and these high levels were stable over 6 months for both depression and anxiety.

The Associations Between Female partners' Ways of Providing and Male patients' Ways of Receiving Support

Bivariate correlation coefficients between the female partners' ways of providing and the male patients' ways of perceiving support, and the intercorrelations among the partners and among the patients, are presented in Table 3. It was found that the female

Table 2
Clinical Characteristics of the Sample

Illness characteristics and medical outcomes		
	M (*SD*)	*n* (%)
ACS		
Myocardial infarction		73 (84.9)
Unstable angina		13 (15.1)
Illness severity		
^Echo score		
Normal-moderate		68 (94.4)
Severe-extremely severe		4 (5.3)
Angio score		
Normal-moderate		53 (61.6)
Severe-extremely severe		33 (38.4)
Readmissions		
1		16 (18.6%)
1–3		3 (3.5%)
Mace		
Repeat MI		2 (2.3)
CABG		0 (0.0)
Repeat PTCA		8 (9.3)
Blood lipids LDL		
Baseline	126.60 (33.56)	
Follow-up	83.29 (24.98)	
HDL		
Baseline	40.09 (7.89)	
Follow-up	43.35 (8.17)	
Psychological characteristics		
Depressive symptoms		
Baseline	1.27 (.36)	
Follow-up	1.30 (.52)	
Anxiety symptoms		
Baseline	1.51 (.47)	
Follow-up	1.51 (.67)	

Note. MACE = major cardiovascular events; MI = myocardial infarction; CABG = coronary artery bypass graft surgery; PTCA = percutaneous transluminal coronary angioplasty ^Number of patients who had an echo score does not add up to 86 because of the fact that not all patients were referred for an echocardiogram at baseline.

partners' overprotection (OP) was associated only with the male patients' corresponding perceptions of OP. Both among female partners and male patients, OP and protective buffering (PB) were highly associated; however, only among male patients were perceptions of OP also associated with perceptions of active engagement (AE).

Depression and Anxiety

Table 4 presents the results of each step as well as the standardized regression coefficients (βs) for each effect at the step in which it was entered into the regression equation. Clearly, depression at follow-up was highly predictable from the measure of depression at baseline. However, the interaction between partners' PB and patients' perceptions of their partners' PB also came up as significant. To test the simple slopes of this interaction, we used the procedures outlined by Preacher, Curran, and Bauer (2006), developed specifically for 2-way regression models. We found that partners' PB was positively associated with patients' depression at follow-up when patients' perceptions of partners' PB were low (1 *SD* below the mean), $b = 0.25$, $t(77) = 4.77$, $p < .001$, but not when patients' perceptions of partners' PB were high (1 *SD* above the mean), $b = 0.01$, $t(77) = 0.21$, $p > .05$. No interaction between any of the partners' ways of providing support and patients' corresponding perceptions of these efforts were found to be significant in explaining patients' anxiety at follow-up.

Cholesterol Levels

Among the 86 dyads participating in the study, 79 had complete data regarding patients' LDL-C and HDL-C levels at baseline. Seven patient files were missing this data because of logistical problems. Out of the 79 with complete data, 68 patients had full reports of their LDL and HDL levels at follow-up, and 11 were missing data. These 11 patients completed the study questionnaires; however, they refused to attend the clinic to have their blood taken. Therefore, the analyses regarding LDL-C and HDL-C levels were conducted on those 68 dyads with no missing data at either baseline or follow-up.

Male patients' LDL-C levels at follow-up were predicted by the interaction between female partners' OP and patients' perceptions of their female partners' OP. Table 5 presents the results of each step as well as the standardized regression coefficients (βs) for each effect at the step in which it was entered into the regression equation. To test the simple slopes of this interaction, we used the procedures outlined by Preacher et al. (2006). We found that partners' OP was associated with higher levels of patients' LDL at follow-up only when patients' perceptions of partners' OP were high (1 *SD* above the mean), $b = 19.84$, $t(63) = 3.08$, $p = .003$, but not when patients' perceptions of partners' OP were low (1 *SD* below the mean), $b = -8.47$, $t(63) = -1.39$, $p > .05$. No interaction between any of the partners' ways of providing support and patients' corresponding perceptions of these efforts were found to be significant in explaining patients' HDL levels at follow-up.

Smoking Cessation

Cessation of patients' smoking at follow-up was significantly predicted by the interaction between partners' AE and patients' perceptions of their partners' AE. Table 6 presents the results of the last step as well as the odds ratios for each effect. To further examine the interaction, two additional logistic regressions were

Table 3
The Associations Among Male Patients' and Female Partners' Ways of Providing and Receiving Support

	PAE	PPB	POP	WAE	WPB	WOP
1. PAE	1					
2. PPB	.13	1				
3. POP	.34**	.40***	1			
4. WAE	.27	.008	−.03	1		
5. WPB	−.05	.24	.07	.10	1	
6. WOP	.17	.18	.32**	.09	.40***	1

Note. After applying the Bonferroni correction we accepted as significant only correlations with *p* value lower than 0.0033. PAE = patients' perceived active engagement; PPB = patients' perceived protective buffering; POP = patients' perceived overprotection; WAE = partners' active engagement; WPB = partners' protective buffering; WOP = partners' overprotection.
** $p < .0033$. *** $p < .001$.

Table 4
Patients' Perceptions of Partners' Protective Buffering as Moderators of the Association Between Partners' Protective Buffering and Patients' Depression, 6 Months Post-ACS (N = 83)

Variables	Depression at follow-up			
	ΔR^2	*B*	*SE* B	β
Step 1				
Depression at baseline	.67	1.18	.10	.80***
Patients' perceived socioeconomic status		−.06	.05	−.08
		$F(2, 80) = 80.02^{***}$		
Step 2				
Partners' Protective Buffering (WPB)	.04	.12	.04	.18**
Patients' Perceived Protective Buffering (PPB)		−.12	.05	−.16*
		$F(4, 78) = 47.83^{**}$		
Step 3				
WPB × PPB	.04	−.17	.05	−.21***
		$F(5, 77) = 45.95^{***}$		

Note. Three patients did not report on their socio-demographic data and therefore were omitted from the analysis.
* $p < .05$. ** $p < .01$. *** $p < .001$.

calculated for men who were high (centered scores above 0) versus men who were low (centered scores below 0) in perceived AE. Both regressions consisted of partners' AE, with patients' angiogram scores controlled for in the first step. Results showed that partners' AE was significantly associated with better odds for patients' smoking cessation (OR = 29.75; CI% = 2.09, 423.62; $p < .05$), but only when patients' perceptions of female partners' AE were high (above the mean).

Discussion

The current study assessed whether the associations between caregivers' perceptions of their provided support and the psychological, behavioral, and physiological recovery of the patients were moderated by the patients' own perceptions of the support received. As predicted, the findings seemed to strengthen Lanza's (1995) assertion that whereas partner support contributed to male patients' recoveries, it was the interaction between support provided (i.e., perceived by the female partners) and received (i.e., perceived by the male patients) that was more substantial.

Whether the effect of the interaction between partners' and patients' perceptions of support was positive or negative was dependent on the specific type of support measured. It was found that female partners' more active engagement was associated with higher odds for patients' smoking cessation (a positive outcome), but only for patients who themselves perceived their partners to be highly actively engaged. On the other hand, when patients perceived their partners to be highly overprotective of them, then higher levels of partners' actual overprotectiveness were associated with an increase in LDL levels (a negative outcome). We also found that a negative outcome could result when PB was the mode of support assessed. When patients perceived their partners to be *low* on PB, then higher levels of partners' actual PB were associated with more symptoms of depression among patients.

The current findings showed that female partners' perceptions of providing high levels of OP bore serious health consequences for those patients who conceived of their partners as providing high levels of OP. The mechanism that might explain the deleterious effect of OP may be attributed to patients' self-efficacy with

Table 5
Patients' Perceptions of Partners' Overprotection as Moderators of the Association Between Partners' Overprotection and Patients' LDL Levels, 6 Months Post-ACS

Variables	LDL at follow-up			
	ΔR^2	*B*	*SE* B	β
Step 1				
LDL at baseline	.03	.12	.09	.16
		$F(1, 66) = 1.69$		
Step 2				
Partners' Overprotection (WOP)	.02	4.84	4.66	.13
Patients' Overprotection (POP)		−2.10	4.0	−.07
		$F(3, 64) = 0.93$		
Step 3				
WOP × POP	13.2	17.84	5.62	.40**
		$F(4, 63) = 3.31^{*}$		

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 6
Patients' Perceptions of Partners' Active Engagement as Moderators of the Association Between Partners' Active Engagement and Patients' Smoking Cessation, 6 Months Post-ACS

Variables	OR (95% CI)	*p*
Step 1		
Angiogram score at baseline	8.37 (1.32, 52.95)	.024
Step 2		
Partners' Active Engagement (WAE)	11.46 (1.35, 97.29)	.025
Patients' Active Engagement (PAE)	.912 (.30, 2.77)	.870
Step 3		
WAE × PAE	42.47 (1.57, 1148.87)	.026

Note. Smoking (0 = continued, 1 = ceased).

regard to health-promoting behaviors. Partner support is considered health-promoting because it facilitates healthier behaviors such as exercise, maintaining a nutritious diet, and not smoking, as well as greater adherence to medical regimens (Uchino, 2006). On the other hand, studies also report a negative association between partners' overdoing it in their support efforts and patients' feelings of self-efficacy with respect to a number of disease management behaviors (Berkhuysen et al., 1999; Schokker et al., 2010). Coyne, Wortman, and Lehman (1988) claimed that OP could result in patient resistance and reduced patient self-efficacy, yielding negative consequences for patient behavior change and health.

Therefore, one possible explanation for the current findings may be that when a patient correctly perceives his female partner to be highly overprotective of him, he either acts in resistance to her, or his self-efficacy is hampered: he performs fewer health-promoting behaviors, including exercising, dieting and, especially, taking medication. Because of the fact that all patients who have undergone an MI are prescribed lipids-control medications that are very potent in lowering cholesterol levels, this putative lack of adherence leads inevitably to elevated levels of LDL-C. This explanation is in keeping with the work of Franks, Stephens, Rook, Franklin, and Keteyian (2002), who found that partner social *control* (e.g., prompting or reminding, trying to prevent the other from engaging in unhealthy behaviors) as opposed to social *support* (e.g., encouraging healthy choices) was associated with worse adherence to a heart-healthy lifestyle 6 months after the cardiac event.

In the same vein, the finding with regard to active engagement (AE) may be attributed to the established positive association between AE and self-efficacy (Coyne & Smith, 1994; Kuijer et al., 2000). In the current study, active engagement was found to have a strong association with the health-promoting behavior of smoking cessation. Partners' AE was associated with higher odds of smoking cessation among patients who conceived of their partners as providing high levels of this type of support. Several studies have emphasized the predictive value of self-efficacy for behavior change among smoking cessation treatment participants (Baer, Holt, & Lichtenstein, 1986; DiClemente, 2005). Self-efficacy was also found to be a consistent predictor of relapse in smoking among those who had managed to stop smoking on their own (Gulliver, Hughes, Solomon, & Dey, 2006; Van Zundert, Ferguson, Shiffman, & Engels, 2010). One can deduce from these findings that when patients conceive of their partners as being collaborative in making illness-related decisions, active in the patients' illness management and emotionally involved with them, then partners' own support efforts of these kinds lead to heightened levels of patients' self efficacy and better self-regulation with regard to smoking.

Our findings in this regard may also contribute to the explanation of the apparent enigma concerning the lack of consistent association between AE and well-being. AE seems to be a useful, problem-focused coping strategy that—especially when provided by the partner and perceived as such by the patient—may enhance a patient's adherence to health-promoting behaviors. However, these positive lifestyle changes may be followed by a decrease in well-being because of the effects of withdrawal (Hughes, Stead, & Lancaster, 2007) or the mere difficulty in changing longstanding habits (Frenn, Borgeson, Lee, & Simandl, 1989). Further studies are needed to establish the positive relationship between partners' AE and patients' adherence, especially when partners' AE is compatible with patients' own recognition of it.

Interestingly, the theory offered by Bolger and colleagues (Bolger, Zuckerman, & Kessler, 2000), that is, they asserted that supportive interactions, such as AE, are most effective when they are *not* perceived by recipients but only reported by providers (*invisible support*), was not supported in the present study. One explanation may be that Bolger and colleagues focused on acute stressors (i.e., the bar examination, a speech task) that allowed people to exert a high degree of control (Bolger et al., 2000; Bolger & Amarel, 2007; Shrout, Herman, & Bolger, 2006), whereas in the present study we focused on a chronic, less controllable stressor. It is quite possible that in the former scenario, knowing that one needs help is deleterious, while in the latter, needing and receiving support may be much more accepted and appreciated (Hinnen et al., 2009).

Regarding the idea of invisible support (Bolger et al., 2000), our findings on the subject of protective buffering seem to correspond with Hinnen et al. (2009), who found that unnoticed PB was associated with more distress over time among female cancer patients. The authors suggested that the PB strategies, even when the actual buffering behaviors remained unnoticed, might have given the patient the feeling that the partner—who did not express his own concerns and tried to act as if everything were fine—was oblivious to the patient's suffering.

Likewise, what we have found in this study is that when the female partner tries to be helpful by hiding her worries from her ill male partner—but he recognizes these PB behaviors, though he does not see them as *protective*—the result is heightened levels of depression. Our findings in this regard are in line with many studies showing that behaviors intended to be "protective" and supportive may actually have negative consequences for the person one is trying to protect (Suls et al., 1997).

In conclusion, the interaction between patients' and partners' perceptions of provided and received support makes an important contribution to the understanding of patients' psychological, physiological, and behavioral recovery outcomes. The link between patients' and partners' perceptions and recovery outcomes is putatively mediated through self-efficacy and health-promoting behaviors. The beneficial as well as the injurious effects of this dyadic interplay of couples' perceptions is dependent on the specific type of support provided or received and on the specific recovery outcomes that are measured.

The present study has some distinct strengths: a prospective, longitudinal design; the availability of partner reports and patient reports of the support provided or received; and various outcome measures, some of which are based on "hard" physiological data and not only on psychological measures. It has some limitations, as well. First, the 36% participation rate may have resulted in a nonrepresentative sample of couples and may, therefore, limit the possibility of generalizing from these findings. Our analysis also revealed that those male patients who were excluded because of missing data were more depressed than those who were included in the final analysis. Therefore, our sample consists of a bias toward less depressed patients, and any generalizing from these findings must be done cautiously. All patients in this study were male and their partners female; thus, it is difficult to determine which findings may be attributable to gender differences and which to patient versus partner role differences. The studied patients were

Israeli Jews; any generalization to other cultures must take this fact into consideration. Smoking cessation was measured based only upon patients' self reports which might be biased by social desirability. We did not measure medication adherence directly, but rather by proxy (i.e., we measured blood cholesterol levels). Finally, whereas the effect sizes found in the current study with regard to the interaction effects explaining LDL reduction and smoking cessation were relatively high, the relatively low sample size limits the statistical power of these results.

Despite these limitations, the results of this study have some important clinical implications. Clinicians working with male patients who have experienced a recent MI may wish to assess both patients' and partners' ways of providing and receiving support. Equipped with this information, they may be better prepared to help patients accept the support provided by their partners. In addition, they may be able to facilitate the partners' awareness of patients' difficulties in accepting their support, thereby contributing to a better patient-partner fit in which to cope with major stressors, such as a sudden ACS. Helping couples master the challenge of providing and receiving support may even contribute to enhanced levels of adherence among patients that, in turn, may lead to improved health and saved lives.

References

Badr, H. (2004). Coping in marital dyads: A contextual perspective on the role of gender and health. *Personal Relationships, 11,* 197–211.

Baer, J. S., Holt, C. S., & Lichtenstein, E. (1986). Self-efficacy and smoking reexamined: Construct validity and clinical utility. *Journal of Consulting and Clinical Psychology, 54,* 846–852.

Berkhuysen, M. A., Nieuwland, W., Buunk, B. P., Sanderman, R., Viersma, J. W., & Rispens, P. (1999). Effect of high- versus low-frequency exercise training in multidisciplinary cardiac rehabilitation on health-related quality of life. *Journal of Cardiopulmonary Rehabilitation, 19,* 22–28.

Bolger, N., & Amarel, D. (2007). Effects of social support visibility on adjustment to stress: Experimental evidence. *Journal of Personality and Social Psychology, 92,* 458–475.

Bolger, N., Zuckerman, A., & Kessler, R. C. (2000). Invisible support and adjustment to stress. *Journal of Personality and Social Psychology, 79,* 953–961.

Burg, M. M., & Seeman, T. E. (1994). Families and health: The negative side of social ties. *Annals of Behavioral Medicine, 16,* 109–115.

Buunk, B. P., Berkhuysen, M. A., Sanderman, R., Nieuwland, W., & Ranchor, A. V. (1996). Actieve betrokkenheid, beschermend bufferen en overbescherming: Meetinstrument voor de rol van de partner bij hartrevalidatie. *Gedrag en Gezondheid, 24,* 304–313.

Buunk, B. P., & Hoorens, V. (1992). Social support and stress: The role of social comparison and social exchange processes. *British Journal of Clinical Psychology, 31,* 445–457.

Clark, S. L., & Stephens, M. A. P. (1996). Stroke patients' well-being as a function of caregiving spouses' helpful and unhelpful actions. *Personal Relationships, 3,* 171–184.

Cohen, S., & Willis, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin, 98,* 310–357.

Coyne, J., Ellard, J. H., & Smith, D. A. (1990). Social support, interdependence and the dilemmas of helping. In B. R. Sarason, I. J. Sarason, & G. R. Pierce (Eds.), Social support: An interactional view (pp. 129–149). New York: Wiley.

Coyne, J. C., & Smith, D. A. (1991). Couples coping with myocardial infarction: A contextual perspective on wives' distress. *Journal of Personality and Social Psychology, 61,* 404–412.

Coyne, J. C., & Smith, D. A. (1994). Couples coping with myocardial infarction: Contextual perspective on patient self-efficacy. *Journal of Family Psychology, 8,* 43–54.

Coyne, J. C., Wortman, C. B., & Lehman, D. R. (1988). The other side of support: Emotional overinvolvement and miscarried helping. In B. Gottlieb (Ed.), *Marshaling social support: Formats, processes, and effects* (pp. 305–330). New York: Sage

Cutrona, C. E. (1996). *Social support in couples.* Thousand Oaks, CA: Sage.

DeLongis, A., & O'Brien, T. B. (1990). An interpersonal framework for stress and coping: An application to the families of Alzheimer's patients. In M. A. P. Stephens, J. H. Crowther, S. E. Hobfoll, & D. L. Tennenbaum (Eds.), *Stress and coping in later-life families* (pp. 221–239). Washington, DC: Hemisphere Publishing Corp.

De Ridder, D., Schreurs, K., & Kuijer, R. (2005). Is spousal support always helpful in asthma and diabetes? A longitudinal study. *Psychology & Health, 20,* 497–508.

Derogatis, L. R., & Melisaratos, N. (1983). The Brief Symptom Inventory: An introductory report. *Psychological Medicine, 13,* 595–605.

DiClemente, C. C. (2005). Self-efficacy and smoking cessation maintenance: A preliminary report. *Cognitive Therapy and Research, 5,* 175–187.

Dunbar, M., Ford, G., & Hunt, K. (1998). Why is the receipt of social support associated with increased psychological distress? An examination of three hypotheses. *Psychology and Health, 13,* 527–544.

Franks, M. M., Stephens, M. A. P., Rook, K. S., Franklin, B. A., & Keteyian, S. J. (2002). Spousal efforts as predictors of health behavior maintenance after cardiac rehabilitation. In C. Berg (organizer), *Marital couples coping with distress and managing chronic health.* Symposium presented at the 55th Annual Meeting of the Gerontological Society of America, November, Boston.

Frenn, M., Borgeson, D., Lee, H., & Simandl, G. (1989). Life style changes in a cardiac rehabilitation program: The client's perspective. *Journal of Cardiovascular Nursing, 3,* 43–55.

Gilbar, O., & Ben-Zur, H. (2002). Adult Israeli community norms for the Brief Symptom Inventory (BSI). *International Journal of Stress Management, 9,* 1–10.

Gulliver, S. B., Hughes, J. R., Solomon, L. J., & Dey, A. N. (2006). An investigation of self-efficacy, partner support and daily stresses as predictors of relapse to smoking in self-quitters. *Addiction, 90,* 767–772.

Hagedoorn, M., Kuijer, R. G., Buunk, B. P., DeJong, G. M., Wobbes, T., & Sanderman, R. (2000). Marital satisfaction in patients with cancer: Does support from intimate partners benefit those who need it most? *Health Psychology, 19,* 274–282.

Hinnen, C., Ranchor, A. V., Baas, P. C., Sanderman, R., & Hagedoorn, M. (2009). Partner support and distress in women with breast cancer: The role of patients' awareness of support and level of mastery. *Psychology and Health, 24,* 439–455.

Hughes, J. R., Stead, L. F., & Lancaster, T. (2007). *Antidepressants for smoking cessation.* Cochrane Database of Systematic Reviews, Issue 1. Art. No.: CD000031. doi:10.1002/14651858.CD000031.pub3

Israel Central Bureau of Statistics. (2009). *Selected data from the New Israel Statistical Abstract No. 60–2009.* Retrieved from http://www.cbs.gov.il/reader/newhodaot/hodaa_template.html?hodaa200911294

Joekes, K., Elderen, T., & van, Schreurs, K. (2007). Self-efficacy and overprotection are related to quality of life: Psychological well-being and self-management in cardiac patients. *Journal of Health Psychology, 12,* 4–16.

Kuijer, R. G., Ybema, J. F., Buunk, B. P., De Jong, G. M., Thijs-Boer, F., & Sanderman, R. (2000). Active engagement, protective buffering, and overprotection: Three ways of giving support by intimate partners of patients with cancer. *Journal of Social & Clinical Psychology, 19,* 256–275.

Lanza, A. F., Cameron, A. E., & Revenson, T. A. (1995). Perceptions of

helpful and unhelpful support among married individuals with rheumatic diseases. *Psychology and Health, 10,* 449–462.

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping.* New York: Springer.

Lemos, K., Suls, J., Jenson, M., Lounsbury, P., & Gordon, E. E. I. (2003). How do female and male cardiac patients and their spouses share responsibilities after discharge from the hospital? *Annals of Behavioral Medicine, 25,* 8–15.

Lyons, R., Sullivan, M., Ritvo, P., & Coyne, J. (1996). *Relationships in chronic illness and disability.* Thousand Oaks, CA: Sage.

Manne, S. L., Norton, T. R., Ostroff, J. S., Winkel, G., & Fox, K. (2007). Protective buffering and psychological distress among couples coping with breast cancer: The moderating role of relationship satisfaction. *Journal of Family Psychology, 21,* 380–388.

Martire, L. M., & Schulz, R. (2001). Informal caregiving to older adults: Health effects of providing and receiving help. In A. Baum, T. Revenson, & J. Singer (Eds.), *Handbook of health psychology* (pp. 477–493). Mahwah, NJ: Erlbaum.

Piersma, H. L., Reaume, W. M., & Boes, J. L. (1994). The Brief Symptom Inventory (BSI) as an outcome measure for adult psychiatric inpatients. *Journal of Clinical Psychology, 50,* 555–563.

Pipe, A. L., Papadakis, S., & Reid, R. D. (2010). The role of smoking cessation in the prevention of coronary artery disease. *Current Atherosclerosis, 12,* 145–150.

Preacher, K. J., Curran, P. J., & Bauer, D. J. (2006). Computational tools for probing interaction effects in multiple linear regression, multilevel modeling, and latent curve analysis. *Journal of Educational and Behavioral Statistics, 31,* 437–448.

Rafaeli, E., & Gleason, M. E. G. (2009). Skilled support within intimate relationships. *Journal of Family Theory & Review, 1,* 20–37.

Reinhardt, J. P., Boerner, K., & Horowitz, A. (2006). Good to have but not to use: Differential impact of perceived and received support on well-being. *Journal of Social and Personal Relationships, 23,* 117–129.

Revenson, T. A., & DeLongis, A. (2011 in press). Couples coping with chronic illness. In S. Folkman (Ed.), *The Oxford handbook of stress, health, and coping.* New York: Oxford University Press.

Rohrbaugh, M. J., Shoham, V., Coyne, J. C., Cranford, J. A., Sonnega, J. S., & Nicklas, J. M. (2004). Beyond the "self" in self-efficacy: Spouse confidence predicts patient survival following heart failure. *Journal of Family Psychology, 18,* 184–193.

Schokker, M. C., Links, T. P., Bouma, J., Keers, J. C., Sanderman, R., Wolffenbuttel, B. H. R., & Hagedoorn, M. (2010). The role of overprotection by the partner in coping with diabetes: A moderated mediation model. *Psychology and Health, iFirst,* 1–17.

Shrout, P. E., Herman, C., & Bolger, N. (2006). The costs and benefits of practical and emotional support on adjustment: A daily diary study of couples experiencing acute stress. *Personal Relationships, 13,* 115–134.

Sol, B. G. M., van der Graaf, Y., Goessens, B. M. B., & Visseren, F. L. J. (2009). Social support and change in vascular risk factors in patients with clinical manifestations of vascular diseases. *European Journal of Cardiovascular Nursing, 8,* 137–143.

Suls, J., Green, P., Rose, G., Lounsbury, P., & Gordon, E. (1997). Hiding worries from one's spouse: Associations between coping via protective buffering and distress in male post-myocardialinfarction patients and their wives. *Journal of Behavioral Medicine, 20,* 333–349.

Taylor, S. (2007). Social support. In H. S. Friedman & R. Cohen Silver (Eds.), *Foundations of health psychology* (pp. 145–171). New York: Oxford University Press.

Uchino, B. N. (2006). Social support and health: A review of physiological processes potentially underlying links to disease outcomes. *Journal of Behavioral Medicine, 29,* 377–387.

Van Zundert, R. M. P., Ferguson, S. G., Shiffman, S., & Engels, R. C. M. E. (2010). Dynamic effects of self-efficacy on smoking lapses and relapse among adolescents. *Health Psychology, 29,* 246–254.

Vilchinsky, N., Haze-Filderman, L., Leibowitz, M., Reges, O., Khaskia, A., & Mosseri, M. (2010). Spousal support and cardiac patients' distress: The moderating role of attachment orientation. *Journal of Family Psychology, 24,* 508–512.

Voils, C. I., Yancy, W. S. Jr., Kovac, S., Coffman, C. J, Weinberger, M., Oddone, E. Z., . . . Bosworth, H. B. (2009). Study protocol: Couples Partnering for Lipid Enhancing Strategies (CouPLES): a randomized, controlled trial. *Trials, 6,* 10.