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BRIEF REPORTS

A Dyadic Investigation of Exercise Support Between Cardiac Patients and Their Spouses

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The authors examined married partners' similarity in reported exercise behavior as a moderator of the association between social support for exercise provided and received by extending an actor–partner dyadic effects model. Participants were married cardiac rehabilitation patients and their spouses ($N = 99$ couples). For couples similar in their reported exercise behavior, a significant association was found between both partners' independent reports of providing exercise support to and receiving exercise support from one another ($n = 49$ couples). However, for couples differing in their reported exercise behavior ($n = 50$ couples), no association was found between either partner's provision and receipt of support for exercise. Findings have the potential to inform practitioners of patients who may not be receiving adequate social support for their recommended exercise. Future interventions may consider implementing dyadic educational or motivational strategies with patients and their spouses.

Keywords: couples, social support, spouse, exercise, cardiac rehabilitation

Following exercise recommendations can be difficult and may pose significant challenges for cardiac patients (Daly et al., 2002). Increased attention has been placed on the role of the spouse in facilitating cardiac patients' recovery and adaptation to illness (e.g., Coyne & Smith, 1994; Williams et al., 1992). However, as reviewed by Kiecolt-Glaser and Newton (2001), the mere presence of a spouse does not necessarily convey needed support leading to health benefits. Instead, whether intended support is perceived as effective depends on the degree to which the intended support meets the demands of the situation and the needs of the recipient (Cohen & McKay, 1984; Collins & Feeney, 2000; Goldsmith, McDermott, & Alexandar, 2000).

At times, well-intentioned support efforts are not effective because the recipient desires a different kind of support than what is being offered. A mismatch between the type of support provided and the type of support needed can be a reason for dissatisfaction with support (Cutrona & Russell, 1990). This mismatch may stem from the fact that there are individual differences in the extent to which support providers have experience and knowledge with a given problem or life event requiring support (Feld, 1984; Morgan & March, 1992; Suitor, Pillemer, & Keeton, 1995). Sharing similar experiences may facilitate effective support and lessen a mismatch by increasing empathic understanding, which is fundamental to the social support process (Suitor et al., 1995; Thoits, 1986). Support offered to others often reflects one's own coping strategies and may facilitate another's coping by helping them to reinterpret the situation as the support provider would (Thoits, 1986). Thus, the best match between the support provided and the support received may be that exchanged between individuals who have faced or are facing the same stressor.

Lifestyle modifications such as exercise are often conceptualized as solely an individual process, yet it is likely that a number

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of contextual factors play a role. As noted, one important factor that may affect health is the effective provision of support. The goal of the current study was to examine similarity of reported exercise behavior as a moderator of the association between social support for exercise provided and received. Our hypothesis was that dyadic exchanges of exercise support (i.e., the relationship between one partners' report of provision and the other's report of receipt) would be stronger among partners who are similar in their reported exercise behavior than among partners who are disparate in their reported exercise behavior.

Method

Participants

Couples were recruited at two tertiary care hospitals and received $25 for their participation. We contacted patients who enrolled in Phase II cardiac rehabilitation (three were continuing in Phase III) following a myocardial infarction, a percutaneous transluminal coronary angioplasty, or a coronary artery bypass graft surgery. Eligibility criteria included patients who were currently married and whose spouse also agreed to participate in the study.

Of 407 potential participants, 363 were contacted and 286 patients were eligible for participation. A total of 109 couples agreed to participate, a response rate of 38% of otherwise eligible patients. Most couples providing a reason for declining study participation reported that either or both partners were too busy or were too ill to participate.

Both partners in 100 couples completed separate in-person interviews conducted at the patient's rehabilitation center that lasted approximately 1 hr. One couple was excluded from analysis because of missing data regarding exchanges of exercise support. Sample characteristics for the remaining 99 marital pairs are displayed in Table 1.

Measures

Exercise support provided. Patients and spouses were asked how often they (a) listened to their partner's concerns about regular exercise, (b) assisted with their partner's exercise, (c) agreed with their partner's decisions about exercising regularly, and (d) encouraged choices favorable to their partner's regular exercise. Participants were asked to indicate (on a 5-point scale ranging from 0 = *never* to 4 = *every day*) how often they provided each type of support to their partner in the past month. Item responses were summed with higher scores representing greater provision of exercise support. Cronbach's alpha was acceptable for patient provision of exercise support (.75). The internal consistency for spouse provision (.67) was just short of the acceptable level of .70 (Cronbach, 1951).

Exercise support received. Patients and spouses were also queried regarding the exercise support they received from their partner. Patients and their spouse were asked how often their partner (a) listened to their concerns about regular exercise, (b) assisted with their exercise, (c) agreed with their decisions about exercising regularly, and (d) encouraged choices favorable to their exercise. Participants were asked to indicate (on a 5-point scale ranging from 0 = *never* to 4 = *every day*) how often they received each type of support from their partner in the past month. Item responses were summed with higher scores representing greater receipt of exercise support. Cronbach's alpha for patient receipt of exercise support was .74, and for spouse receipt of exercise support it was .74.

Exercise similarity. First, the staging algorithm developed by Prochaska and DiClemente (1983) was used to assess participants' reported exercise behavior. Participants were given a definition for regular exercise and then asked if they exercise regularly according to the definition. Answer choices were as follows: Yes, more than 6 months (maintenance); Yes, less than 6 months (action); No, but intend to in 30 days (preparation); No, but I intend to in the next 6 months (contemplation); and No, and I do not intend to in the next 6 months (precontemplation). The first stage is precontemplation, wherein one is not considering modifying the target behavior; followed by contemplation, where one is thinking about the pros and cons of changing; and preparation, where a plan is being developed to take action in the future. The first three early stages are nonaction stages, in which an individual is not ready to change his or her behavior. The last two stages consist of actions to change behavior; in the action stage one has made overt attempts at modifying the target behavior, and finally in the maintenance stage the target behavior is incorporated into one's lifestyle, with the focus on preventing relapse.

Second, to determine similarity in reported exercise behavior, we collapsed the stages of change into early nonaction (including precontemplation, contemplation, and preparation) and later action (action and maintenance) stages of exercise. Next, we formed two groups comprising partners similar in reported exercise behavior (both in a nonaction or both in an action stage) and partners distinctly different in reported exercise behavior (one in a nonaction and the other in an action stage).

Table 1
Sample Characteristics

	Patient		Spouse	
Variable	*M*	*SD*	*M*	*SD*
Age	64.82	10.05	62.62	11.37
Education (yr)[a]	14.23	2.89	13.97	2.78
Years married[a]	35.63	14.94	35.72	14.99
Marital satisfaction	18.39	2.42	17.97	2.90
Gender				
Men	82%		18%	
Women	18%		82%	
Annual household income[a]	$40,000–59,999		$40,000–59,999	

Note. $N = 99$ couples.
[a] N varies due to missing data.

Analysis Plan

Comparisons between partners' provision and receipt of exercise support in two groups of couples were tested using an actor–partner interdependence model. The actor–partner interdependence model allowed us to simultaneously estimate individual (i.e., actor) and shared (i.e., partner) contributions to dyadic outcomes (Gonzalez & Griffin, 1999; Kenny, 1996), and it is increasingly used to address research questions of relational experiences (Franks, Wendorf, Gonzalez, & Ketterer, 2004; Murray, Holmes, & Griffin, 1996; Robins, Caspi, & Moffitt, 2000). In Kenny's (1996) actor–partner model, the influence of each individual's initiation on his or her receipt represents actor effects (Paths a and d in Figure 1). The influence of a spouse's initiation on the other's receipt represents partner effects (Paths b and c in Figure 1). We used this model with multiple groups analysis and path models of observed variables in LISREL 8.5 (Jöreskog & Sörbom, 2001) to examine whether dyadic exchanges of exercise support will be moderated by similarity in marital partners' reported exercise behavior.

On the basis of results of preliminary analyses (not shown), we constrain both actor and partner effects to equality within each group. In the multiple group analyses, we first constrain the partner effects across the two groups of couples to be equal. That is, parameter estimates for the two partner paths in Figure 1 (b_1, c_1) for couples similar in reported exercise behavior and those for spouses different in reported exercise behavior (b_2, c_2) are made equivalent. Next, a moderation model is estimated wherein these

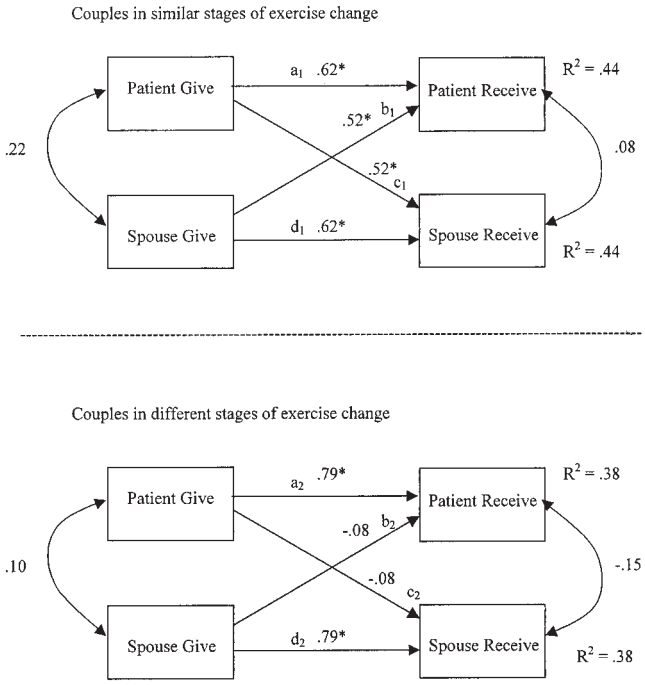

Figure 1. Dyadic effects model of married partners' exercise support exchanges as indicated by actor and partner effects. Asterisk indicates $p < .05$. Actor effects are represented by Paths a and d, whereas partner effects are represented by Paths b and c.

partner paths are free to be estimated across the two groups. If the fit of this moderation model is significantly better than that of the initial constrained model, this evidence indicates that similarity in partners' reported exercise behavior modifies associations between married partners' perceptions of their dyadic exchanges of exercise support.

Results

Couples with partners similar in reported exercise behavior (n = 49 couples) were compared with those distinctly different in reported exercise behavior (n = 50 couples). No mean differences were detected between these two groups of couples on any demographic characteristic. Further, among the 49 couples with similar reported exercise behavior, 84% of patients and spouses were both in a later active stage of exercise (i.e., action or maintenance). Among the remaining 50 couples with partners in different stages of change, 72% of patients were in a later stage with their spouse in an early stage of exercise.

To test our moderation hypothesis, we first estimated a constrained model in which the partner effects were set to equality across groups. The fit of this model was poor with a significant chi-square estimate, $\chi^2(5, N = 99) = 17.32, p < .01$, comparative fit index (CFI) = .87, normed fit index (NFI) = .84, nonnormed fit index (NNFI) = .69, incremental fit index (IFI) = .88, and root mean square error of approximation (RMSEA) = .22. Next, a moderation model was estimated in which the partner effects (Paths b and c) were freely estimated across the two groups. The fit of this moderation model was good, $\chi^2(4, N = 99) = 2.22, p < .05$ (CFI 1.00, NFI = .98, NNFI = 1.00, IFI = 1.00, RMSEA = .00), and it was significantly better than the constrained model as evidenced by a significant difference between the models' chi-square, $\chi^2_{\text{diff}}(1) = 15.10, p < .01$. This improvement in model fit indicates a moderating influence of similarity in exercise on dyadic exchanges of exercise support, because the partner effects for spouses similar in their reported exercise behavior are not equivalent to partner effects for spouses with distinctly different reported exercise behaviors.

For the group in which partners were similar in their reported exercise behavior, partner effects were significant and positive (β = .52) indicating that there was a relationship between the provision and receipt of support. In other words, for the couples with similar reported exercise behavior, their dyadic exchanges were effective, in that intended exercise support given by one spouse was perceived as such by the other. Whereas for partners with different reported exercise behavior, partner effects were nonsignificant (β = .08), indicating that there was no relationship between exercise support provided by one spouse and that received by the other.

Discussion

Results of the current study indicate that effective dyadic exchanges of support were evident when partners were similar in their reported exercise behavior. For partners who were dissimilar in their reported exercise behavior, however, no association between one partner's provision and the other's receipt of exercise support was detected. Notably, as shown in Figure 1, the pattern of coefficients from the moderation model was consistent with our expectations. It appears that when partners differed in their reported exercise behavior, their support attempts often went unrecognized. Whereas, when both partners were similar in their reported exercise behavior, the exercise support given to their partner was more often recognized as such. Given that 84% of partners with similar reports of exercise behavior were both engaged in regular exercise, our detection of effective support exchanges may reflect a shared understanding of the rewards and difficulties of a regular exercise routine.

A shared understanding of the demands of a stressor is a key component to empathic expressions of support (Thoits, 1986). Spouses' participation in regular exercise may itself promote a supportive atmosphere between partners. Patients' awareness that the spouse is undertaking the same modification to lifestyle may increase their appreciation of the spouse's involvement and also may motivate their reciprocation of support to promote exercise. Further, a shared understanding and commitment to regular exercise may also protect against interpretations of support attempts as controlling or overbearing. Each spouse may recognize that the other is indeed well-intentioned, and thus, for example, accept reminders to exercise as supportive encouragement rather than as nagging attempts to regulate their behavior.

Conversely, when partners' lack a shared understanding, their support attempts may be misguided or misinterpreted. Specifically, when one partner is actively exercising and the other is not, each partner may possess disparate criteria for supportive behaviors. For instance, exercise support from a sedentary spouse may be discounted by a partner whose health depends on adherence to regular exercise. Likewise, exercise support from an active partner may be

purposefully ignored by a sedentary partner, especially one who is not ready to adopt an exercise routine. Identifying patients and spouses with starkly different reports of exercise behavior may alert practitioners that these individuals may lack effective spousal support for exercise recommendations.

The findings of this study should be considered in light of its cross-sectional nature; replication and extension with longitudinal data are required. Also it should be noted that although our full sample comprised 99 couples, the sample was divided into two smaller samples (i.e., partners with similar or different reported exercise behaviors), which reduces power to detect small differences between groups. However, sufficient power is available to detect relatively large differences, and the goal of the current study was to identify these differences in a unique sample of married couples. Notably, we were able to demonstrate an association between partners' receipt of support for those spouses similar in reported exercise behavior that was not found among those differing in reported exercise behavior.

The stages of change algorithm from the transtheoretical model was used to classify couples as similar or different in current exercise, but was not fully used to identify changes in their behavior over time. The transtheoretical model conceptualizes individuals as varying in stage of readiness to change and identifies distinct processes specific to each stage (Prochaska, DiClemente, & Norcross, 1992). The influence of others on an individual's progression through the stages of change in adopting a desired behavior is evidenced in many of the identified processes of behavior change, and several studies have shown positive results when using interventions that are matched to the participant's stage of change. For example, stage-matched interventions produced greater physical activity (Blissmer & McAuley, 2002; Steptoe, Kerry, Rink, & Hilton, 2001). Researchers conducting future studies in this area may want to examine stage-matched interventions for couples and whether couples in the same stage of exercise readiness are better able to adhere to exercise recommendations.

The small number of couples composed of female patients and male spouses precluded further investigation of potential gender differences. Moreover, the majority of these couples was in first and long-term marriages, in which both partners were highly satisfied with their marriage. Finally, all couples were participating in a formal program of Phase 2 or Phase 3 cardiac rehabilitation. Hence, findings may be limited in generalizability. Researchers conducting subsequent studies in this area should examine if different patterns of support exist for patients in different phases of cardiac rehabilitation. Future researchers should also examine whether the results are substantiated in other samples such as those with different marital histories, distressed marriages, or to those couples who do not participate in formal programs of cardiac rehabilitation. It should also be noted that our investigation focused only on dyadic exchanges of spousal support for exercise and did not include prediction of subsequent exercise behaviors.

Despite these limitations, this study possesses a number of strengths: (a) Social support for reported exercise behavior is measured from the perspective of both the support provider and the support recipient, (b) analyses appropriately captured the dyadic aspects of support, (c) the support measure was specific to exercise, and (d) a patient population was used. It is important to note that the current study represents a departure from individual-centered assessments of social support. Like most individuals with a chronic illness, cardiac patients must navigate a complex social environment as they adapt to required lifestyle modifications. Thus, it is vital to consider social support for exercise as occurring within the natural social context rather than as an individual process. Future interventions may consider implementing dyadic educational or motivational strategies with patients and their spouses to capture and appropriately use social support resources.

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