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## Interpersonal Processes and Intimacy Among Men with Localized Prostate Cancer and Their Partners

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### Abstract

The present study focused on intimacy processes in the relationships of men diagnosed with localized prostate cancer and their partners. Using the actor-partner interdependence model (APIM), we examined the Interpersonal Process Model of Intimacy, which proposes associations between self- and perceived partner disclosure about cancer and perceived partner responsiveness as predictors of global relationship intimacy. The study's outcomes were patients' and spouses' ratings of global relationship intimacy. Both actor (my disclosure predicts my intimacy) and partner (my partner's disclosure predicts my intimacy) effects were examined, as well as possible moderating effects for cancer-related concerns. Two hundred and nine couples in which one or both partners reported elevated cancer-specific distress completed measures of self- and perceived partner disclosure and perceived partner responsiveness regarding discussions about prostate cancer, global relational intimacy, and cancer-related concerns. Results were consistent with the Interpersonal Process Model of Intimacy in that perceived responsiveness mediated the association between self- and perceived partner disclosure about cancer and global relational intimacy for both patients and spouses. Results also indicated moderation of the links between disclosure and relational intimacy by level of patient cancer-related concerns such that the links were stronger

when concerns were higher. Finally, there was also evidence of moderated mediation such that indirect effects of disclosure on relational intimacy via perceived partner responsiveness were stronger when concerns were higher. Interventions for distressed couples coping with prostate cancer would benefit from focusing on facilitating disclosure and responsiveness, particularly among distressed couples who report cancer concerns.

## Keywords

Intimacy processes; prostate cancer; couples; relational intimacy

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Relational intimacy is widely considered a key element of satisfaction in close relationships, and the absence of intimacy is an indicator of relationship dysfunction (Gottman, 1994; Huston et al., 2001). Although relational intimacy has been defined in many ways (see Laurenceau et al., 2004), a common element of all definitions of this construct is a feeling of closeness and connectedness that develops through open communication between partners (Perlman & Fehr, 1987). One conceptualization of intimacy that has been described by Reis and Shaver (1988) and elaborated upon by Laurenceau and colleagues (1998) is that intimacy is a process that develops between partners. This conceptualization of relationship intimacy, which has been labeled the Interpersonal Process Model of Intimacy (IPMI; Reis & Shaver, 1988) is unique because interactions are considered the basis for the development and maintenance of intimacy. This conceptualization is similar to marital communication and marital therapy conceptualizations of intimacy (e.g., Clements et al., 1997; Gottman et al., 1994). There are four key components of the IPMI: self-disclosure, perceived partner disclosure, perceived partner responsiveness, and relational intimacy (Reis & Shaver, 1988). The speaker (the partner initiating the interaction) begins the process by self-disclosure, which is the sharing of facts, feelings, thoughts, and/or concerns. The listener (the other partner) responds by also sharing his/her own facts, feelings, thoughts, and/or concerns. The listener may also convey understanding, caring, and validation of what the speaker shared. For the interaction to be considered intimate, the speaker must interpret the listener's statements as responsive, which is defined as conveying a sense of acceptance, understanding, and caring (Reis & Patrick, 1996; Reis & Shaver, 1988). If the speaker perceives that the listener is responsive, then the result of the interaction will be a feeling of intimacy with the listener. Several studies have supported the IPMI (e.g., Laurenceau et al., 1998; 2004; 2005) and components of the model (e.g., Lippert & Prager 2001) among non-ill couples recruited from the general population as well as couples coping with breast cancer (Manne et al., 2004).

The present study focused on intimacy processes in the relationships of men diagnosed with localized prostate cancer and their partners. The diagnosis and treatment of prostate cancer impacts the marital relationship (Ramsey et al., 2013; Crowe et al., 2003; Garos et al., 2007). Along with the emotional and practical stressors that accompany the diagnosis of any type of cancer, the unique long-term treatment effects of prostate cancer, particularly impaired sexual functioning, urinary incontinence, and impaired bowel function (Burnett et al., 2007; Gacci et al., 2009), can adversely affect psychological and relationship functioning for both patient and partner (Trinchieri, Nicola, Masini, & Mangiarotti, 2005; Penson, McLerran,

Feng, Albertsen, & Gilliland, 2005). Sharing worries and concerns with one's spouse and a caring and empathic response to this sharing is thought to be critical to managing prostate cancer-related stressors effectively. Qualitative studies have described the importance of open communication among men with prostate cancer and their spouses (Wootten et al., 2014). Quantitative studies have suggested that open communication is associated with higher patient and spouse quality of life and marital satisfaction among men with prostate cancer and their spouses (Song et al., 2012).

Despite the importance of open communication in maintaining the well-being of patients, spouses, and the quality of their primary relationships, couples coping with cancer may struggle to communicate (Langer, Brown, & Syrjala, 2009). In our prior work, we examined the role of relational intimacy in mediating the association between perceived self-disclosure and psychological distress among men diagnosed with prostate cancer and their spouses (Manne et al., 2010). Results were not consistent with the IPMI in that self-disclosure was not associated with relational intimacy. However, studies focusing on couples coping with other types of cancer have supported aspects of the IPMI. Direct associations between self-disclosure and relational intimacy have been reported in studies of couples coping with gastrointestinal cancer (Porter et al., 2005) and breast cancer (Manne et al., 2004), and perceived partner responsiveness has been shown to mediate the association between self- and perceived partner disclosure and relational intimacy as rated after discussions between breast cancer patients and their partners in a laboratory setting (Manne et al., 2004). Among couples coping with prostate cancer, higher levels of holding back sharing prostate cancer-related concerns has been associated with less relational intimacy for the person engaging in holding back and also associated with less intimacy for the other partner (Manne et al., 2015).

In the present study, we extend previous work in three ways. First, our work expands knowledge beyond what has previously been examined by assessing the value of partner behavior – that is, self-disclosure and responsiveness – brings to both the cancer patient and spouse. Specifically, we evaluate the dyadic nature of the mediational role of partner responsiveness in the global relational intimacy process. Our prior work has evaluated the mediational role of partner responsiveness in the association between disclosure and intimacy separately for each partner. We tested these associations using dyadic modeling (Kenny, Kashy, & Cook, 2006; described below).

Second, we evaluated intimacy processes in a population of individuals and/or couples who are psychologically distressed. Studies have included dyads from either the general population of married couples (e.g., Laurenceau, Barrett, & Rovine, 2005; Laurenceau, Barrett, & Pietromonaco, 1998) or couples coping with cancer who were not experiencing elevated distress (Manne et al., 2004; Manne et al., 2010; Manne, Badr, & Kashy, 2012; Otto et al., 2015). Studying couples in which one or both partners report elevated psychological distress can elucidate intimacy processes in a clinically-relevant population and inform intervention development. Third, we evaluated the level of patient and partner concerns as a moderating variable in the global relational intimacy process. In our prior work, we have examined the role of illness-related and relationship factors as moderators of the association between couples' communication and distress. For example, we found that constructive

communication was more strongly associated with distress among breast cancer patients reporting greater physical impairment than among patients with less impairment (Manne et al., 2006). We also found that, among couples in more satisfying relationships, breast cancer patients' protective buffering was associated with greater distress for both patients and partners (Manne et al., 2007). In the current study, we evaluated the role of cancer concerns in the association between cancer-related disclosure, cancer-related responsiveness, and global relational intimacy. It was proposed that the associations between cancer-related self-disclosure and perceived partner responsiveness, and ultimately the mediating role of cancer-related responsiveness in global relational intimacy, would be stronger among individuals reporting more cancer concerns than among individuals endorsing fewer cancer concerns. The rationale was that sharing cancer concerns and partner responsiveness should have a stronger influence on global relational intimacy when either partner is experiencing more cancer concerns.

The present study had two aims. The primary aim was to evaluate the associations between perceived self- and partner disclosure about cancer and global relational intimacy and the moderating role of cancer concerns in these associations. We hypothesized that greater self-disclosure and perceived partner disclosure would be associated with higher levels of one's own and one's partner's global relational intimacy. We also predicted that disclosures about cancer would be more strongly associated with global relational intimacy among patients or spouses reporting higher levels of cancer concerns. The second aim was to examine the mediational role of perceived partner responsiveness in the association between self- and perceived partner disclosures about cancer and global relational intimacy and the moderating role of cancer concerns in this mediational model. We proposed that responsiveness would mediate between disclosure and global relational intimacy, with significant actor and partner effects. We also proposed that the mediational model would be stronger among patients or spouses reporting higher levels of cancer concerns.

## Methods

### Participants

The sample was comprised of men diagnosed with localized prostate cancer who were seen at one of five comprehensive cancer centers or one of four community hospitals. These data were collected as part of a randomized clinical trial (RCT) of two couple-focused counseling interventions (Manne, unpublished data). Eligibility for the RCT were: surgery and/or radiation treatment for non-metastatic prostate cancer in the last year, Eastern Cooperative Oncology Group (Oken et al., 1982) performance status score of 0 or 1 (0 = fully active, 1 = restricted in physically strenuous activity but ambulatory), married or living with a significant other of either gender (co-habiting for a year or more), and either patient or spouse had elevated cancer-specific distress, a score at recruitment  $\geq 15$  (patient) or  $\geq 16$  (partner) on the Impact of Events Scale (IES; Horowitz, Wilner & Alvarez, 1979),  $\geq 18$  years of age, did not have a hearing impairment, and lived within a two hour commuting distance of the center.

Of the 1479 eligible couples, 1223 (82.6%) refused (either by directly refusing or passively refusing by not responding to calls after being ascertained as eligible for the study) and 258

(17.4%) signed the consent. Of these 258 couples, 236 (91.4%) completed a survey. However, 27 dyads were excluded due to missing data on variables included in the analysis. Thus, the final sample consisted of 209 couples. The most common reasons for refusal were that they thought the study would take “too much time” (13%), “just not interested” (14%), and having a work conflict that would interfere with sessions (13%). Comparisons were made between patient participants and refusers on available data (i.e., age, site recruited from, race, stage, Gleason score, performance status, treatment type, time since diagnosis). Results indicated that participants were more likely to accept participation at one site (26%) than at the other study sites ( $\chi^2(3) = 10.9, p < .05$ ), and that participants were more likely to have had surgery as a part of their treatment (91.8%) than refusers (84.6%;  $\chi^2(1) = 7.5, p < .01$ ).

## Procedures

Letters were sent to participants. Next, they were seen during an outpatient visit by study staff or contacted by telephone. The patient was first administered the Impact of Events Scale as a screener. If the patient met screening eligibility, the couple was invited to participate. If the patient did not meet screening eligibility, the spouse was contacted and screened. If the spouse was eligible, the couple was invited to participate. If interested, they were provided with an informed consent and the questionnaire to return by mail. If the consent and survey were not returned within two weeks, participants were contacted. Participants were followed up by telephone weekly until the consent and survey were returned. If the material was not returned after two months, a reminder letter was sent. If the material was not returned after three months, the participant was considered a study refuser. Participants signed an informed consent form approved by their institution’s Institutional Review Board.

## Measures

**Demographic information**—Age, ethnicity, gender, education level, income, occupational status, relationship (married, cohabitating) and length of marriage/relationship were collected.

**Medical Information**—Gleason score (an index used to score the risk for cancer progression), disease stage, treatment type, and time since the initiation of treatment were collected from the medical chart.

**Disclosure and responsiveness**—Participants were asked to rate disclosure about thoughts, information and feelings about cancer. The following measures were obtained from their responses: 1) Participant Self-disclosure (3 items), assessed the degree to which participants disclosed thoughts (“How much did you disclose your thoughts to your partner?”), information and facts (“How much did you share information and facts to your partner?”), and feelings (“How much did you share your feelings and concerns with your partner?”) in the past week on a 7-point Likert scale (1 = *not at all*, 7 = *very much*). This measure was adapted from Laurenceau and colleagues’ work (1998) and has been used in our prior work (Manne et al., 2004). Internal consistency as calculated by Cronbach’s alpha was  $\alpha = .92$  for patients and  $\alpha = .95$  for spouses. 2) Perceived Partner Disclosure (3 items),

assessed the degree to which participants perceived their partner disclosed thoughts (“How much did your partner disclose thoughts to you?”), information and facts (“How much did your partner share information and facts?”) and feelings (“How much did your partner share feelings and concerns with you?”) about the cancer experience in the past week on a 7-point Likert scale (1= *not at all*, 7= *very much*). This measure was adapted from Laurenceau and colleagues’ work (1998) and has been used in our prior work (Manne et al., 2004). Internal consistency as calculated by Cronbach’s alpha was  $\alpha = .96$  for patients and  $\alpha = .94$  for spouses. 3) Perceived partner responsiveness (3 items), assessed the degree to which participants felt accepted (“To what degree did you feel accepted by your partner?”), understood (“To what degree did you feel understood by your partner?”), and cared for (“To what degree did you feel cared for by your partner?”) on a 7-point Likert scale (1 = *not at all*, 7= *very much*). This measure was adapted from Laurenceau and colleagues’ work (1998) and has been used in our prior work (Manne et al., 2004). Internal consistency as calculated by Cronbach’s alpha was  $\alpha = .93$  for patients and  $\alpha = .91$  for spouses.

**Global Relational Intimacy**—A modified version of the Personal Assessment of Intimacy in Relationships (PAIR) (Schaefer & Olsen, 1992) was used. Two items were deleted from the 6-item scale because they were similar to items from the perceived partner responsiveness scale (“My partner understands my hurts and joys”) or evidenced high correlations with perceived responsiveness scale items (“My partner listens to me when I need someone to talk to”  $r$ ’s = .58 –.66). The PAIR has been used in studies of intimacy among healthy married couples (Talmadge & Dabbs, 1990). Internal consistency as calculated by Cronbach’s alpha was  $\alpha = .82$  for patients and  $\alpha = .83$  for spouses.

### Moderators

**Cancer-related concerns**—Participants were asked to rate the degree of concern they experienced for ten cancer-related concerns on a 5-point Likert scale (1= not at all concerned, 5 = extremely concerned). Patients were asked about their concern about their physical symptoms, cancer treatment, the sexual relationship with the partner, satisfaction with their body/appearance, emotional reactions to cancer, fears or worries about cancer progression, relationship with spouse, relationship with others, financial concerns related to cancer, and other concerns. The wording of three items was changed for spouses to reflect concerns about the patient’s physical symptoms, the patient’s cancer treatment, and the patient’s body/appearance. The score reflected average concern across the ten concerns.

### Data Analytic Approach

Using the APIM (Kenny et al., 2006) allows for estimation of both actor effects (e.g., the actor effect for patients is the association between the patient’s rating of his self-disclosure and his global relational intimacy; the actor effect for spouses is the association between the spouse’s rating of her self-disclosure and her global relational intimacy) and partner effects (e.g., the partner effect for patients is the association between the spouse’s self-disclosure and the patient’s perception of relationship intimacy; again, there is a parallel partner effect for spouses). Thus, the dyadic nature of disclosure and responsiveness and global relational intimacy can be examined.

In our first set of analyses, we used multi-level modeling (MLM) to estimate the APIM. These analyses estimated actor and partner effects for disclosure (separate models for self-disclosure and perceived partner disclosure) on both partners' global relational intimacy. The analyses also examined whether those effects were moderated by either patient cancer-related concerns or spouse cancer-related concerns. Thus, four models were estimated. We treated dyad members as distinguishable by their role (i.e., patient versus spouse), and we tested whether actor and partner effects differed for patients and spouses by including interactions between a role variable and the actor and partner effects in our models. The models included actor and partner effects for a predictor (i.e., self-disclosure, or perceived partner disclosure), individual role (patient = 1, spouse = -1), and the moderator (i.e., either level of patient concerns or level of spouse concerns). All two- and three-way interactions were included, with the exception that we did not include actor by partner interactions. These analyses address the question of whether a person's disclosure (either self or perceived partner) predicts their own or their partner's global relational intimacy, whether there are differences in these associations for patients and spouses, and whether patient or spouse cancer concerns moderate those associations.

Restricted maximum likelihood was used and separate residual variances were estimated for patients and spouses. This approach treats dyad as the unit of analysis and allows for a dyadic correlation between the residual variance in the two partners' outcomes (i.e., the error structure was heterogeneous compound symmetry). Although MLM is used to model the non-independence between the dyad members' outcome scores, each of these models is essentially a moderated regression model in which each of the predictors and the interactions among the predictors (all of the effects in the model are shown in the first column of Table 3) is included as a fixed effect in the model. There are no random effects other than the residual variances and the dyadic covariance.

Covariates included time since treatment initiation, the person's age, and ethnicity (coded as White-not Hispanic = 1; Others = -1). All continuous predictors were grand-mean centered, and categorical predictors were effect coded. Significant interactions were followed by estimating simple slopes at plus and minus one standard deviation from the moderator's mean.

**Moderated mediation analyses**—The APIM approach can also be modified to evaluate both actor and partner mediation effects for perceived partner responsiveness using the actor-partner interdependence mediational model (APIMeM; Ledermann, Macho, & Kenny, 2011). For example, the APIMeM evaluates whether the association between patient self-disclosure and spouse relationship intimacy is mediated by the patient's perceptions of how responsive the spouse is to the patient's disclosure. We used the APIMeM as the basis for our moderated mediation analysis. In these models, patient and spouse self-disclosure (or perceived partner disclosure) served as the initial variables, patient and spouse perceived partner responsiveness during discussions about cancer served as mediating variables, and patient and spouse intimacy served as the outcome variables (see Figure 1). To estimate and test the statistical significance of indirect effects using bootstrapping (5000 samples), we used the statistical package MPLUS (Muthen & Muthen, 2016). An initial test of distinguishability was conducted to determine whether constraining the paths for patients

and spouses to the same value (i.e., estimating an indistinguishable model) significantly worsened model fit, and results indicated that the indistinguishable model constraints were not tenable for either the self-disclosure model,  $\chi^2(12) = 63.15, p < .001, RMSEA = .143, CFI = .872$ , or the perceived partner disclosure model,  $\chi^2(12) = 57.45, p < .001, RMSEA = .135, CFI = .894$ . Therefore, we used the distinguishable model, which results in eight possible indirect paths between self-disclosure (or partner disclosure) and global relational intimacy.

Given the complexity of the mediation model, we chose to use a relatively simple approach to adding moderation: We used a median split for the moderator (e.g., level of patient concerns) and then ran a two-group model for high and low values on the moderator. Although this approach is not optimal statistically given the weaknesses of the median split approach, it allowed us to get a sense of the extent to which the indirect effects or mediational paths differed for couples high versus low on the moderator. Finally, because a number of participants had the exact value of the medians we performed the median split two ways (e.g., 0–2.99 versus 3.00 or greater and 0–3.00 versus 3.01 or greater), and to consider a model significantly moderated by that variable, results for both ways of defining the median split had to attain statistical significance. Notably, using this standard, only level of patient concerns showed significant moderation, and this was limited to the model of perceived partner disclosure. That is, neither patient concerns nor spouse concerns showed consistently significant moderation effects on the mediational model for self-disclosure, and for perceived partner disclosure, only patient concerns was a significant moderator.

## Results

### Descriptive Information on the Study Sample

The sample consisted of 209 couples. The average age of patients was approximately 61 years and the average age of spouses was 56 years. The majority was White, non-Hispanic and had completed a college degree or higher education. The vast majority of couples were married (given the specific meaning of “partner” in the APIM, for clarity of presentation, we refer to the partners as spouses regardless of actual marital status), and the average relationship length was more than 27 years. The average time since treatment was initiated was approximately five months, and most patients underwent prostatectomy as their treatment. Fourteen percent of patients had high risk disease (more likely to show cancer progression; Gleason score  $\geq 8$ ).

For patients, the three highest-rated cancer concerns were the sexual relationship with the partner ( $M = 3.74$ ), physical symptoms (pain, fatigue, urinary, bowel function) ( $M = 3.1$ ), and their emotional responses to the cancer ( $M = 2.83$ ). For partners, the three highest-rated cancer concerns were the patients’ physical symptoms ( $M = 3.6$ ), the sexual relationship with the patient ( $M = 3.31$ ), and worry that the patient’s cancer will return ( $M = 3.21$ ). Table 1 presents the means and correlations between variables included in the analyses.



### Actor and partner effects of disclosure on intimacy and moderation of these effects by patient and spouse concerns

Table 2 presents the moderated APIM results predicting intimacy as a function of self-disclosure and perceived partner disclosure, treating level of patient concerns a moderator. As can be seen in the self-disclosure section of the table, there was a significant role main effect, indicating that intimacy scores were higher for patients than spouses. There was also a main effect for number of patient concerns, such that couples in which the patients had more concerns reported lower global intimacy on average. There were also significant actor and partner effects for self-disclosure predicting global intimacy. The actor effect ( $\beta = .303$ ,  $se(\beta) = .044$ ,  $d = .34$ ) indicates that individuals who reported higher levels of self-disclosure about cancer-related issues also reported higher global intimacy, and the partner effect ( $\beta = .203$ ,  $se(\beta) = .045$ ,  $d = .22$ ) shows that individuals whose partners reported higher self-disclosure also reported higher global intimacy. These general actor and partner effects are equally descriptive for patients and partners because neither the actor by role nor the partner by role interactions was statistically significant. The only other statistically significant effect was an interaction between the level of patient concerns and the partner effect for self-disclosure ( $\beta = .100$ ,  $se(\beta) = .041$ ,  $d = .12$ ; note that there was no three-way interaction between patient concerns, the partner effect for self-disclosure, and role, and so the interaction between the partner effect and patient concerns does not differ for patients and spouses). Simple slopes analyses for low and high patient concerns revealed that when patient concerns were low, the partner effect for self-disclosure on global intimacy (i.e., the effect of the patient's self-disclosure on the spouse's global intimacy and the effect of the spouse's self-disclosure on the patient's global intimacy) was relatively small,  $b = .016$ ,  $se = .010$ ,  $\beta = .103$ ,  $se(\beta) = .063$ ,  $d = .08$ ,  $p = .086$ . When patient concerns were high, the partner effect of self-disclosure on global intimacy was  $b = .048$ ,  $se = .010$ ,  $\beta = .304$ ,  $se(\beta) = .062$ ,  $d = .24$ ,  $p < .001$ . This suggests that when patient concerns were high, the partner effect of self-disclosure was stronger such that for both patients and spouses, having a partner who disclosed more about cancer-related issues was more strongly predictive of the individuals' global intimacy. Finally, the effect of ethnicity was also statistically significant, indicating that White-not Hispanic participants reported higher global intimacy.

Table 2 also depicts the APIM results from the model in which perceived partner disclosure is the key predictor of global intimacy, and again level of patient concerns is the moderator. Evidence of both actor and partner effects emerged. The actor effect ( $\beta = .387$ ,  $se(\beta) = .042$ ,  $d = .45$ ) indicates that, for both patients and partners (since the interactions with role were not significant), individuals who perceived that their partners disclosed more about cancer-related issues reported higher global intimacy. The partner effect, which was relatively weak ( $\beta = .089$ ,  $se(\beta) = .043$ ,  $d = .10$ ) suggests that for both patients and partners, individuals whose partners perceived that they (the individual) disclosed more reported higher global intimacy. In this case, there was an interaction between patient concerns and the actor effect. When level of patient concerns was low, the actor effect was moderate in size,  $b = .039$ ,  $se = .009$ ,  $\beta = .245$ ,  $se(\beta) = .054$ ,  $d = .22$ ,  $p < .001$ , but when concerns were high, the actor effect was about twice that size,  $b = .085$ ,  $se = .010$ ,  $\beta = .529$ ,  $se(\beta) = .062$ ,  $d = .42$ ,  $p < .001$ . Thus, in couples in which the patient reported greater concerns, if the individual perceived

that his or her partner disclosed a great deal, the individual also reported higher global intimacy.

We also tested whether spouse's level of cancer-related concerns moderated the actor and partner effects of self-disclosure on global intimacy, and, in a separate model, whether spouse concerns moderated actor and partner effects of perceived partner disclosure on global intimacy. However, because many of the results overlapped those in Table 2 (i.e., all effects that did not involve the moderator are the same as those in the Table), only significant moderation results involving spouse cancer concerns are presented in the text. In this case, the only significant moderation was for perceived partner disclosure such that level of spouse concerns interacted significantly with the actor effect,  $b = .020$ ,  $se = .008$ ,  $\beta = .100$ ,  $se(\beta) = .041$ ,  $d = .12$ ,  $p = .016$ , (i.e., the effect of a person's perceived partner disclosure of cancer-related issues on their own global intimacy). As was the case for patient concerns, simple slopes analyses indicated that when the level of spouse concerns was low, the actor effect of perceived partner disclosure was moderate in size,  $b = .043$ ,  $se = .009$ ,  $\beta = .272$ ,  $se(\beta) = .058$ ,  $d = .23$ ,  $p < .001$ , but when spouse concerns were high, there was a stronger association between a person's report of perceived partner disclosure and the person's global intimacy,  $b = .075$ ,  $se = .010$ ,  $\beta = .472$ ,  $se(\beta) = .061$ ,  $d = .38$ ,  $p < .001$ . Finally, because there was no interaction between spouse concerns, the actor effect, and role, this moderation effect does not differ for patients and spouses: For both, there is a stronger link between perceived partner disclosure and global intimacy when the spouses' concerns were high.

### Tests of Mediation for the IPMI Model

Table 3 presents the total, indirect, and direct effects of self-disclosure (and perceived partner disclosure) predicting global intimacy as mediated by perceived partner responsiveness. There was evidence of significant mediation of both the patient actor effect and the spouse actor effect for disclosure (both self-disclosure and perceived partner disclosure) on global intimacy. For both patients and spouses, the primary mediational pathways were via the person's own perceived partner responsiveness. In other words, it was the actor effect for perceived partner responsiveness that mediated the link between a person's own self-disclosure (or perceived partner disclosure) and that person's report of global intimacy. Thus, individuals who self-disclosed more tended to perceive that their partners were more responsive and they also reported higher global intimacy.

The patient partner effects of both self-disclosure and perceived partner disclosure on global intimacy showed some relatively weak evidence of mediation. For both types of disclosure, patients whose partners reported greater disclosure tended to report higher global intimacy, and these effects were partially mediated by the spouse's perceived partner responsiveness. These results imply that spouses who disclosed more or who perceived that their partners disclosed more tended to perceive their partners as more responsive and the patients in those couples tended to report higher global intimacy.

Finally, there was stronger evidence of mediation of the spouse partner effect. In this case the total indirect effects were significant, but the significance of the specific indirect effects varied. However, because in all four cases (the two disclosure variables mediated by either the patient or the spouse perceived responsiveness) the 95% bootstrapped confidence

intervals (CI) did not contain zero, we interpret these indirect effects as well. Given the similarity in size of the two indirect effects, the partner effect estimating the association between the patient's self-disclosure (or perceived partner disclosure) on the spouse's intimacy was about equally mediated by both partners' perceived patient responsiveness. In other words, in couples in which patients disclosed more or who reported that their partners disclosed more, both partners tended to report higher partner responsiveness, and the spouse also reported higher global intimacy.

### Moderated IPMI Model

To test the overall moderated mediation effect, we used a chi-square test to compare the relative fit of a model that allowed the path coefficients to differ for high and low levels of patient concerns to a model that constrained these parameters to be the same. Although there was no evidence that patient concerns moderated the mediated self-disclosure model, the analysis testing moderation by high and low patient concerns yielded  $\chi^2(12) = 26.41, p = .009$  for the mediational model of perceived partner disclosure, indicating that the fit of the mediational model differed across the two groups. Figure 2 presents the path coefficients for the direct effects of the model separately for low and high levels of patient concerns.

Examination of the total and indirect effects in Table 4 shows that associations in the model for couples in which patients were higher in concerns were stronger than for couples in which patients were lower in concerns. To determine whether an indirect effect differed across high and low patient concerns, we examined whether the parameter estimates for each subgroup were within the 95% CI of the other subgroup. We discuss results when an estimate of one subgroup does not fall within the 95% CI for the other group, as well as when each subgroup estimate is outside of the 95% CI of the other subgroup. Note that the strongest evidence for moderation is when both parameter estimates were outside of the other subgroup's CI.

Examination of the indirect effects in Table 4 shows evidence that the overall total and the total indirect effects for the patient actor effect differed for couples in which the patient was low versus high in level of concerns such that effects were stronger when level of concern was high. For example, the total indirect effect for couples high in patient concerns was  $b = .86$  which not in the 95% CI for couples low on this variable (the 95% CI was .022 to .082); however, the reverse was not true (i.e., the coefficient for couples low in concerns,  $b = .051$ , was within the 95% CI for high couples which was .050 to .119). The same pattern occurred for the two specific indirect effects which are the indirect effects of the patient actor effect via: 1) the patient perceived responsiveness, and; 2) the spouse perceived responsiveness.

In contrast, the overall total effect and the total indirect effect for the spouse actor effect were considerably stronger when patient concerns were high relative to low. Spouses of patients who had higher levels of concerns and who perceived that their partners disclosed more reported higher global intimacy. This effect was mediated by the spouse's perception of partner responsiveness. However, in couples in which the patient had relatively low levels of concerns, the indirect effects were considerably smaller.

There was also evidence of moderated mediation for the patient partner effect. Among patients with higher levels of concerns, when the spouse perceived that the patient disclosed more, the patient reported higher global intimacy. This effect was mediated by the spouse's perceived partner responsiveness. In contrast, when concerns were low, there was no evidence of mediation. Finally, the total indirect effect for the spouse partner effect was similar in that there was evidence of mediation when concerns were high, but no evidence when concerns were low.

## Discussion

In this study, we evaluated the Interpersonal Process Model of Intimacy among couples coping with localized prostate cancer who were either in treatment or had recently completed treatment for this cancer. One or both partners reported elevated levels of cancer-specific distress. Our findings were partially consistent with this model and prior work (Laurenceau et al., 2004; 2005) in that perceived responsiveness mediated the association between self- and perceived partner disclosure about cancer-related concerns and global relational intimacy for both patients and spouses. Consistent with prior work among couples in the general population (Laurenceau et al., 2004; 2005) and work with couples coping with other types of cancer (Manne et al., 2004; Porter et al., 2005), self- and perceived partner disclosure were both associated with greater global relationship intimacy.

Our findings extend what we know about intimacy processes in two ways. First, we evaluated partner effects in the direct associations between self- and partner disclosure and intimacy as well as in the mediation models. When either individual in the couple reported more self-disclosure, the other individual reported greater global intimacy. In addition, when either individual in the couple reported that their partner disclosed more to them, the other individual reported greater global intimacy. Mediation partner effects were significant but weak in predicting patient intimacy: Spouse perceptions of the patient's responsiveness mediated the association between spouse self-disclosure and the patient's relationship intimacy, and spouse perceptions of the patient's responsiveness also mediated the association between spouse perceptions of patient's self-disclosure and the patient's relationship intimacy. Mediation partner effects were stronger in predicting spouse intimacy: For couples in which patients disclosed more or patients reported that the spouse disclosed more, both partners tended to report higher partner responsiveness, and the spouse also reported higher intimacy. Taken together, our findings illustrate the dyadic nature of couples' intimacy processes. Each person's perception of the other partner's disclosures had an effect on their own and the other partner's intimacy. These findings are consistent with prior work and with the IPMI (Laurenceau et al., 1998; 2005). However, they differ from our work studying breast cancer patients and their spouses (Manne et al., 2004). In that study, the breast cancer patient reported higher relational intimacy when she perceived that her spouse was disclosing and her spouse was responsive to her self-disclosures. The patient's self-disclosure did not play a role in her relational intimacy. The spouse reported greater relational intimacy when s/he disclosed more, s/he perceived the patient was disclosing more, and s/he perceived the patient was responsive. The explanation for this finding proposed was that there may be a sex difference in intimacy processes (female patients, primarily male spouses). We proposed that the breast cancer patient was more comfortable

sharing her concerns and that her relational intimacy was based more upon her spouse's disclosure (who was primarily a male) and her spouse's responsiveness to her disclosures than her own disclosures. The current study's findings are more consistent with the IMPI model. Future studies that focus on cancers that are diagnosed among both men and women (e.g., colorectal cancer) would help elucidate both sex and role differences (patient vs. spouse) in intimacy processes.

Second, the associations in the IPMI for perceived partner disclosure (but not self-disclosure) were moderated by the patient's level of cancer-related concerns. Perceived partner responsiveness had a stronger mediational role in the association between patient perceived partner disclosure and patient intimacy when the patient reported higher levels of cancer concerns than when the patient reported lower levels of cancer concerns. Perceived responsiveness also had a stronger mediational role in the association between spouse perceived partner disclosure and spouse intimacy when the patient's level of cancer-related concerns was high than when the level was low. There were also stronger partner effects when patient concerns were high. That is, if the spouse perceived that the patient disclosed more, the patient reported higher intimacy, and this effect was mediated by the spouse's perceived partner responsiveness. The association between patient perceptions of spouse disclosure and spouse intimacy was also mediated by spouse perceptions of patient responsiveness when patient cancer concerns were high. These results suggest that intimacy processes play a more important role in couples in which the patient is experiencing more concerns about his cancer. One possible explanation is that these couples have higher expectations for the level of disclosure and understanding for both themselves and their partners. The fact that couples in which the patient reported higher levels of concern had lower average intimacy supports this explanation. Both partners may be focused on how responsive their partner is and how much their partner discloses when levels of intimacy are low.

There are study limitations. First, the sample consisted of participants who enrolled in a clinical trial of two different couple-focused interventions. It is possible that the couples who participated had higher relationship satisfaction, more relationship intimacy, or engaged in more disclosure than couples who refused participation. Second, the sample excluded couples in which either patient, spouse, or both partners did not exhibit elevated cancer-specific distress. Thus, we do not know whether the findings would generalize to a sample of couples in which one or both were not distressed. A more heterogeneous sample could illustrate the present findings more clearly or illustrate a different pattern of associations. In particular, the moderating effects for cancer-related concerns may have been stronger in this sample than in a sample of non-distressed patients and/or partners. Third, our sample was comprised of men with non-metastatic disease, couples who were mostly college educated, and couples in lengthy relationships. Our findings may not generalize to men with later stage prostate cancer, less educated samples, and/or couples in relationships of shorter duration. Fourth, due to the complexity of the analyses, we did not include symptom side effects, such as erectile dysfunction or bowel symptoms, which may have been associated with couples' disclosure. Fifth, the participation rate was lower than other couples' psychosocial interventions (22.7%, Barsky-Reese et al., 2014; 60%, Heinrichs et al., 2011). Reviews have shown highly variable uptake (Regan, Lambert & Kelly, 2013) and concluded that

acceptance is lower when couples are must participate together and when the intervention focuses on communication. Our intervention required simultaneous participation and focused on communication in IET, which may have contributed to the uptake. This low participation may have biased average levels of intimacy, but it is not likely that it impacted the association between intimacy process constructs. Sixth, the sample size was relatively small for a moderated-mediation analysis, and future studies should include larger samples. Seventh, due to the fact that radiation is widely available in community settings and we collected data at cancer center settings, the majority of our sample had undergone prostatectomy rather than radiation and/or androgen deprivation therapy. Future studies should include a more patients undergoing other types of treatment. Finally, the data are cross-sectional, and alternative models are possible. For example, couples in more intimate relationships may disclose more and be more responsive to these disclosures. The cross-sectional design is also a limitation with respect to the mediational analysis. As Maxwell and Cole (2007) note, mediation is a longitudinal process and the use of cross-sectional data to assess mediation may generate biased estimates. Thus, while our cross-sectional results may be imprecise, they suggest the data are at minimum consistent with our model.

In terms of clinical implications, psychological interventions that promote both patient and spouse responsiveness to self-disclosure in terms of expressions of caring and understanding and increase each partner's self-disclosure about the cancer experience may enhance global relationship intimacy among couples coping with localized prostate cancer. Moreover, health care professionals working with couples to improve their communication about cancer should ensure that both partners feel that the *other* partner is disclosing his or her cancer concerns and that *both* partners feel that the other partner is responsive to these disclosures because each partner's perceptions of cancer communication is important in enhancing global relationship intimacy. This study provides evidence that psychological interventions which promote sharing concerns specific to the cancer experience between partners may prove particularly beneficial, and suggest that couples in which the patient reports elevated cancer concerns and one or both partners experience elevated cancer-specific distress may particularly benefit from a communication-focused intervention.

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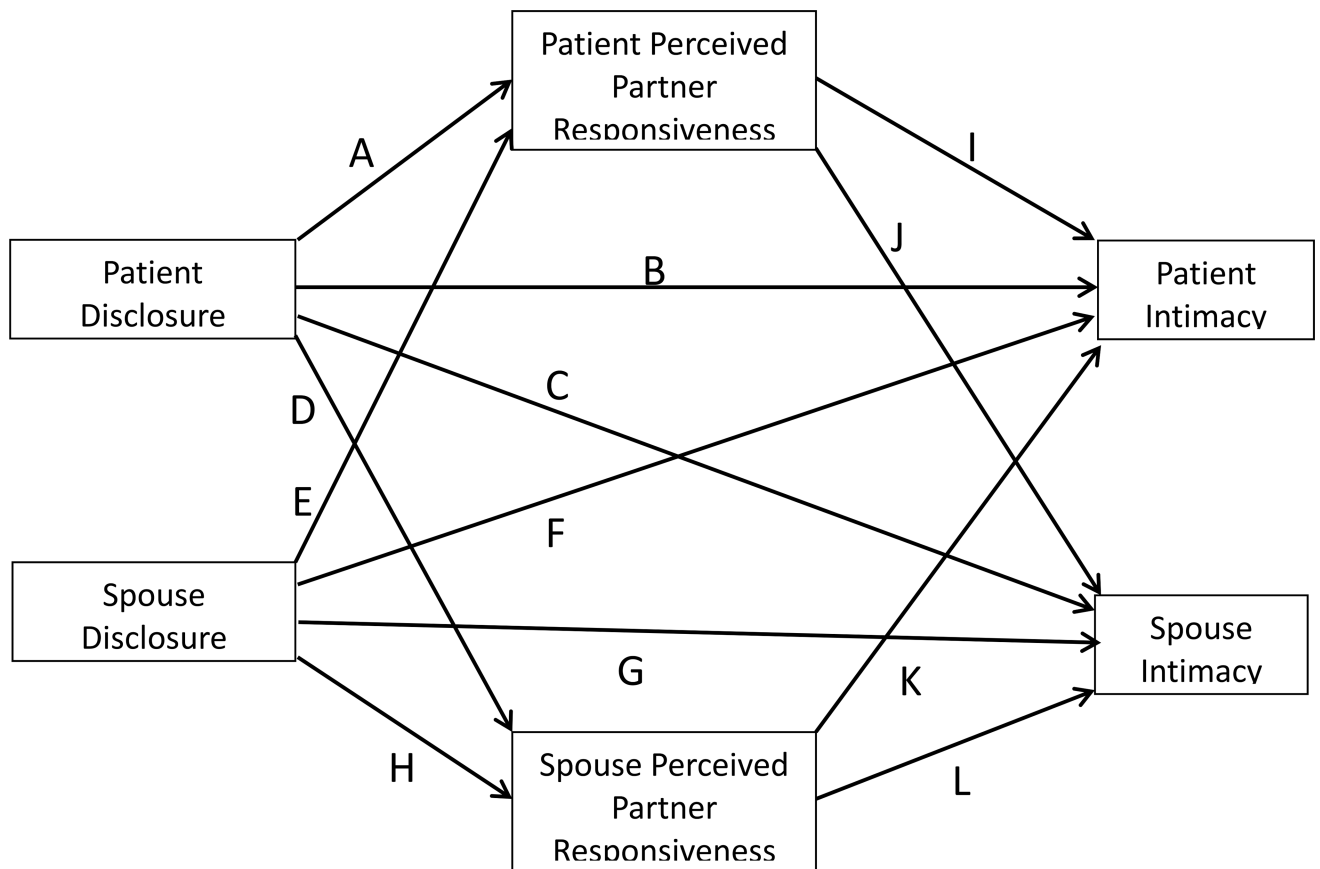
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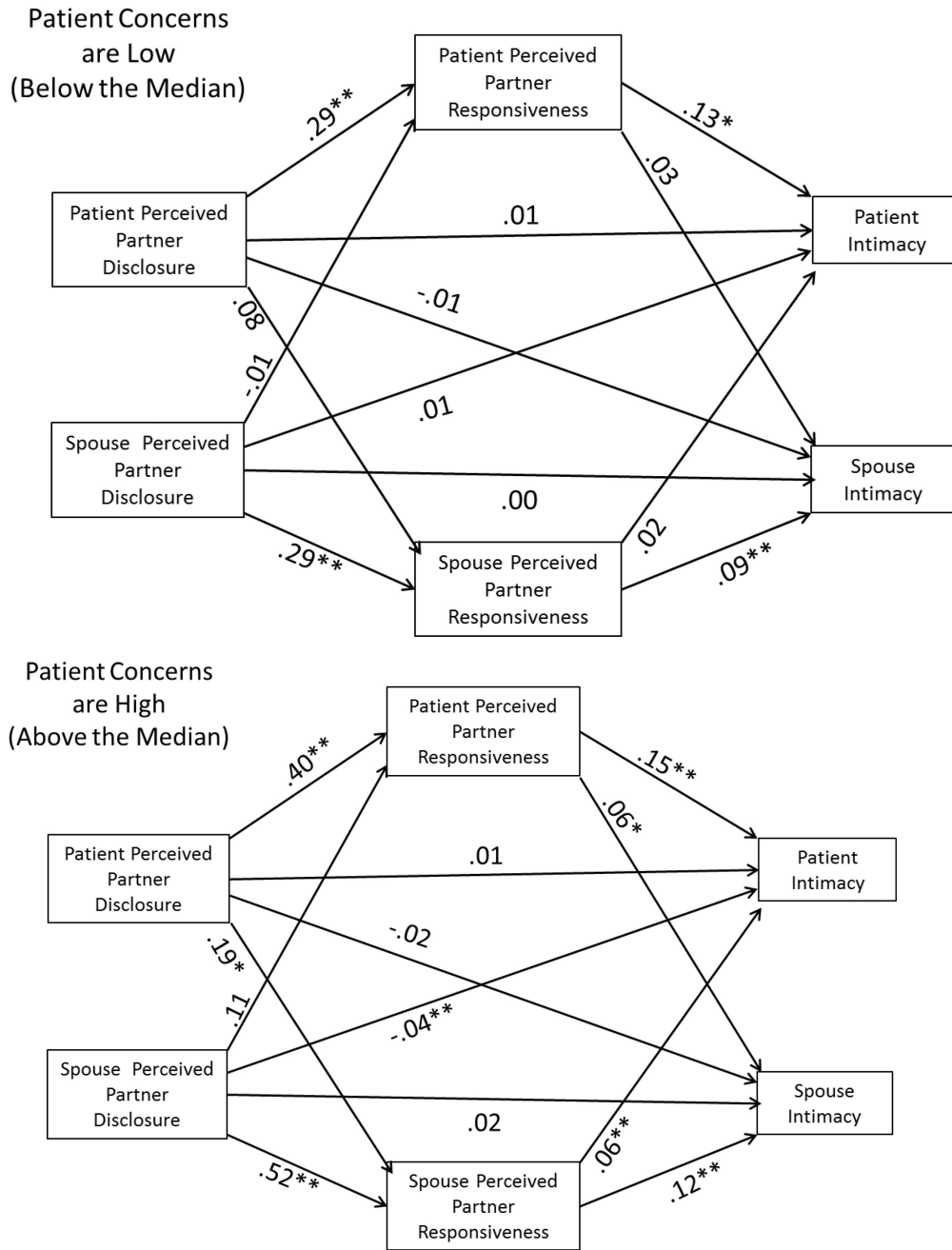
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**Figure 1.** The Actor-Partner Mediation Model for the Interpersonal Process Model of Intimacy. Note that disclosure refers to self-disclosure for one model and perceived partner disclosure for the second model. Although not included in the figure, the disclosure variables are allowed to correlate across the two partners, as are the residual variances for partner responsiveness and residual variances for intimacy. Path labels are used in Tables 4 & 5 to assist in tying results to the figure.



**Figure 2.** Direct effects in the Actor-Partner Interdependence Mediation Model for Perceived Partner Disclosure Predicting Intimacy, Mediated by Perceived Partner Responsiveness and Moderated by Low and High Patient Concerns (defined by median split). Path coefficients are unstandardized.

Means, standard deviations, t-tests for differences between patient and spouse means, and correlations among the study variables

**Table 1**

| Variable                         | 1.                       | 2.                       | 3.                       | 4.                       | 5.                       | 6.                       | 7.                 |
|----------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------|
| 1. Intimacy                      | <b>.47</b> <sup>**</sup> | .60 <sup>**</sup>        | .23 <sup>**</sup>        | .32 <sup>**</sup>        | -.29 <sup>**</sup>       | .13                      | .20 <sup>**</sup>  |
| 2. Perceived Part Responsiveness | .71 <sup>**</sup>        | <b>.43</b> <sup>**</sup> | .46 <sup>**</sup>        | .49 <sup>**</sup>        | -.26 <sup>**</sup>       | .14                      | .16 <sup>*</sup>   |
| 3. Self-Disclosure               | .38 <sup>**</sup>        | .50 <sup>**</sup>        | <b>.23</b> <sup>**</sup> | .74 <sup>**</sup>        | .03                      | -.15                     | -.06               |
| 4. Perceived Part Disclosure     | .44 <sup>**</sup>        | .53 <sup>**</sup>        | .67 <sup>**</sup>        | <b>.21</b> <sup>**</sup> | -.08                     | -.09                     | -.09               |
| 5. Concerns                      | -.29 <sup>**</sup>       | -.46 <sup>**</sup>       | -.06                     | -.14 <sup>*</sup>        | <b>.32</b> <sup>**</sup> | -.27 <sup>**</sup>       | -.27 <sup>**</sup> |
| 6. Age                           | .19 <sup>**</sup>        | .11                      | -.02                     | .05                      | -.19 <sup>**</sup>       | <b>.78</b> <sup>**</sup> | .37 <sup>**</sup>  |
| 7. Ethnicity                     | .19 <sup>**</sup>        | .10                      | -.06                     | -.02                     | -.22 <sup>**</sup>       | .23 <sup>**</sup>        | .92 <sup>**</sup>  |
| Patient Mean                     | 3.90                     | 18.18                    | 15.11                    | 14.77                    | 2.52                     | 60.32                    |                    |
| SD                               | .93                      | 3.70                     | 5.14                     | 5.36                     | .82                      | 7.11                     |                    |
| Spouse Mean                      | 3.67                     | 16.83                    | 13.42                    | 13.11                    | 2.63                     | 56.89                    |                    |
| SD                               | .96                      | 4.73                     | 5.96                     | 5.69                     | .81                      | 8.59                     |                    |
| Paired t-test (df = 208)         | 3.47 <sup>**</sup>       | 4.27 <sup>**</sup>       | 3.53 <sup>**</sup>       | 3.43 <sup>**</sup>       | -1.78                    | 9.17                     |                    |

**Note**

\*  $p < .05$

\*\*  $p < .01$ .

Part = Partner. Correlations above the diagonal are for spouses, correlations below the diagonal are for patients, and bolded correlations on the diagonal are across partners. Ethnicity is coded White-Not Hispanic = 1, Other = -1.

APIM results for two regression equations in which the first equation includes self-disclosure predicting intimacy (PAIR) and perceived partner disclosure predicting intimacy (PAIR): The moderating role of level of patient cancer-related concerns

**Table 2**

|  | <u>Results of two Multilevel Regression Equations predicting Intimacy</u> |      |         |  |      |         |
|--|---|------|---------|--|------|---------|
|  | <u>Equation in which Self-disclosure is the Predictor</u>                 |      |         | <u>Equation in which Perceived Partner Disclosure is the Predictor</u> |      |         |
|  | b   | se   | $\beta$ | b  | se   | $\beta$ |
| Intercept                                  | 3.760   | .053 | -       | 3.787  | .054 | -       |
| Role                                       | .087**  | .033 | .097    | .081*  | .031 | .091    |
| Patient Concerns                           | -.197**   | .057 | -.182   | -.235**  | .060 | -.217   |
| Actor Effect of Predictor                  | .048**  | .007 | .303    | .062**   | .007 | .387    |
| Partner Effect of Predictor                | .032**  | .007 | .203    | .014*  | .007 | .089    |
| Actor $\times$ Role                        | .012  | .007 | .073    | .005   | .007 | .034    |
| Partner $\times$ Role                      | -.003   | .007 | -.021   | -.002  | .008 | -.014   |
| Actor $\times$ PT Concerns                 | .011  | .008 | .057    | .028**   | .008 | .142    |
| Partner $\times$ PT Concerns               | .019*   | .008 | .100    | -.002  | .008 | -.004   |
| Concerns $\times$ Role                     | -.043   | .039 | -.039   | -.056  | .038 | -.051   |
| Actor $\times$ PT Concerns $\times$ Role   | -.007   | .009 | -.036   | .004   | .009 | .021    |
| Partner $\times$ PT Concerns $\times$ Role | .006  | .009 | .030    | -.013  | .009 | -.065   |
| Time since Treatment Initiated             | .005  | .014 | .016    | -.004  | .014 | -.013   |
| Age  | .007  | .006 | .066    | .007   | .006 | .067    |
| Ethnicity                                  | .167**  | .053 | .188    | .158**   | .053 | .177    |

Note.

\*  $p < .05$

\*\*  $p < .01$ .

PT = patient. Role is coded Patient = 1, Spouse = -1; Ethnicity is coded White-Not Hispanic = 1, Other = -1. All continuous predictors were grand-mean centered.  $N = 209$  couples for a total of 418 individuals.

**Table 3**

Total, direct, and indirect effects for mediation models of self-disclosure and perceived partner disclosure predicting intimacy via perceived partner responsiveness

| Paths corresponding to Figure 1  | Patient Disclosure Predicting Patient Intimacy (Actor Effect for Patient) |           |               | Initial Disclosure Variable is Self-Disclosure |           |               | Initial Disclosure Variable is Perceived Partner Disclosure |           |               |
|--|---|-----------|---------------|--|-----------|---------------|---|-----------|---------------|
|  | <i>b</i>  | <i>se</i> | 95% <i>CI</i> | <i>b</i>                                       | <i>se</i> | 95% <i>CI</i> | <i>b</i>  | <i>se</i> | 95% <i>CI</i> |
| AI + B + DK  | .064**  | .012      | .039, .088    | .074**   | .012      | .050, .098    |   |           |               |
| AI + DK  | .059**  | .010      | .040, .077    | .059**   | .009      | .042, .078    |   |           |               |
| AI   | .056**  | .010      | .038, .078    | .055**   | .009      | .039, .074    |   |           |               |
| DK   | .003  | .002      | .000, .010    | .004   | .003      | .001, .011    |   |           |               |
| B  | .005  | .010      | -.016, .023   | .015   | .009      | -.003, .034   |   |           |               |
| Spouse Disclosure Predicting Spouse Intimacy (Actor Effect for Spouse)     |   |           |               |  |           |               |   |           |               |
| HL + G + EJ  | .030**  | .011      | .009, .051    | .049**   | .011      | .027, .071    |   |           |               |
| HL + EJ  | .039**  | .008      | .026, .056    | .040**   | .008      | .025, .057    |   |           |               |
| EJ   | .002  | .002      | -.001, .009   | .002   | .003      | -.002, .009   |   |           |               |
| HL   | .037**  | .007      | .025, .053    | .038**   | .008      | .025, .055    |   |           |               |
| G  | -.010   | .009      | -.029, .008   | .009   | .010      | -.010, .028   |   |           |               |
| Spouse Disclosure Predicting Patient Intimacy (Partner Effect for Patient) |   |           |               |  |           |               |   |           |               |
| EI + F + HK  | .019  | .010      | -.002, .039   | .006   | .010      | -.016, .026   |   |           |               |
| EI + HK  | .015  | .008      | .000, .032    | .016*  | .008      | .001, .032    |   |           |               |
| EI   | .008  | .007      | -.004, .022   | .004   | .006      | -.007, .018   |   |           |               |
| HK   | .008*   | .004      | .001, .016    | .012**   | .004      | .004, .021    |   |           |               |
| F  | .003  | .010      | -.014, .025   | -.010  | .008      | -.027, .007   |   |           |               |
| Patient Disclosure Predicting Spouse Intimacy (Partner Effect for Spouse)  |   |           |               |  |           |               |   |           |               |
| AJ + C + DL  | .037**  | .014      | .009, .065    | .020   | .012      | -.004, .043   |   |           |               |
| AJ + DL  | .030**  | .009      | .013, .048    | .035**   | .010      | .017, .057    |   |           |               |

| Paths corresponding to Figure 1 | Initial Disclosure Variable is Self-Disclosure | Initial Disclosure Variable is Perceived Partner Disclosure | Initial Disclosure Variable is Perceived Partner Disclosure |
|---------------------------------|--|---|---|
| AJ                              | .014*  | .007  | .021*   |
| DL                              | .016*  | .008  | .014  |
| C                               | .006   | .012  | -.015   |
|                                 | Indirect thru Patient Perceived Responsiveness | .002, .032  | .007, .042  |
|                                 | Indirect thru Spouse Perceived Responsiveness  | .001, .033  | .007, .031  |
|                                 | Remaining Direct effect                        | -.017, .030   | -.038, .006   |

Note.

\*  $p < .05$

\*\*  $p < .01$ .

Path coefficients are unstandardized.

**Table 4**

Total, direct, and indirect effects for moderated mediation model of perceived partner disclosure predicting intimacy via perceived partner responsiveness, moderated by intensity of patient concerns.

| Paths corresponding to Figure 1   | Patient Concerns are Low |           |               |          | Patient Concerns are High |               |          |           |               |
|---|--------------------------|-----------|---------------|----------|---------------------------|---------------|----------|-----------|---------------|
|   | <i>b</i>                 | <i>se</i> | 95% <i>CI</i> | <i>b</i> | <i>se</i>                 | 95% <i>CI</i> | <i>b</i> | <i>se</i> | 95% <i>CI</i> |
| <u>Patient Perceived Partner Disclosure Predicting Patient Intimacy (Actor Effect for Patient)</u>  |                          |           |               |          |                           |               |          |           |               |
| AI + B + DK   | .051**                   | .015      | .022, .082    | .086**   | .018                      | .050, .119    |          |           |               |
| AI + DK   | .040**                   | .013      | .017, .070    | .073**   | .012                      | .051, .099    |          |           |               |
| AI  | .038**                   | .013      | .015, .069    | .061**   | .011                      | .041, .085    |          |           |               |
| DK  | .001                     | .003      | -.001, .012   | .012*    | .005                      | .004, .025    |          |           |               |
| B   | .011                     | .013      | -.013, .036   | .013     | .014                      | -.014, .042   |          |           |               |
| <u>Spouse Perceived Partner Disclosure Predicting Spouse Intimacy (Actor Effect for Spouse)</u>     |                          |           |               |          |                           |               |          |           |               |
| HL + G + EJ   | .026                     | .014      | -.002, .053   | .092**   | .016                      | .060, .122    |          |           |               |
| HL + EJ   | .026**                   | .009      | .010, .047    | .069**   | .014                      | .044, .099    |          |           |               |
| EJ  | .000                     | .002      | -.006, .002   | .007     | .007                      | -.001, .025   |          |           |               |
| HL  | .026**                   | .009      | .012, .047    | .061**   | .013                      | .037, .090    |          |           |               |
| G   | .000                     | .013      | -.026, .024   | .023     | .017                      | -.009, .058   |          |           |               |
| <u>Spouse Perceived Partner Disclosure Predicting Patient Intimacy (Partner Effect for Patient)</u> |                          |           |               |          |                           |               |          |           |               |
| EI + F + HK   | .009                     | .012      | -.014, .032   | .010     | .017                      | -.024, .041   |          |           |               |
| EI + HK   | .004                     | .008      | -.010, .020   | .050**   | .015                      | .022, .079    |          |           |               |
| EI  | -.001                    | .006      | -.012, .013   | .017     | .011                      | -.005, .039   |          |           |               |
| HK  | .005                     | .004      | -.002, .016   | .033**   | .009                      | .017, .054    |          |           |               |
| F   | .005                     | .010      | -.014, .027   | -.040**  | .012                      | -.063, -.016  |          |           |               |
| <u>Patient Perceived Partner Disclosure Predicting Spouse Intimacy (Partner Effect for Spouse)</u>  |                          |           |               |          |                           |               |          |           |               |
| AJ + C + DL   | .001                     | .016      | -.031, .031   | .030     | .018                      | -.005, .063   |          |           |               |

| Paths corresponding to Figure 1 | Patient Concerns are Low |      | Patient Concerns are High |             |
|---------------------------------|--------------------------|------|---------------------------|-------------|
|                                 |                          |      |                           |             |
| AJ + DL                         | .015                     | .011 | -.006, .038               | .048**      |
|                                 |                          |      |                           | .016        |
|                                 |                          |      |                           | .021, .083  |
| AJ                              | .008                     | .009 | -.005, .030               | .025        |
|                                 |                          |      |                           | .013        |
|                                 |                          |      |                           | .004, .057  |
| DL                              | .007                     | .010 | -.010, .029               | .022*       |
|                                 |                          |      |                           | .010        |
|                                 |                          |      |                           | .005, .043  |
| C                               | -.014                    | .014 | -.042, .013               | -.018       |
|                                 |                          |      |                           | .018        |
|                                 |                          |      |                           | -.055, .025 |

Note.

\*  $p < .05$

\*\*  $p < .01$ .

High and Low levels of concerns were defined by a median split so that the moderated mediation analysis could be conducted using a two group approach. Path coefficients are unstandardized.